User Manual
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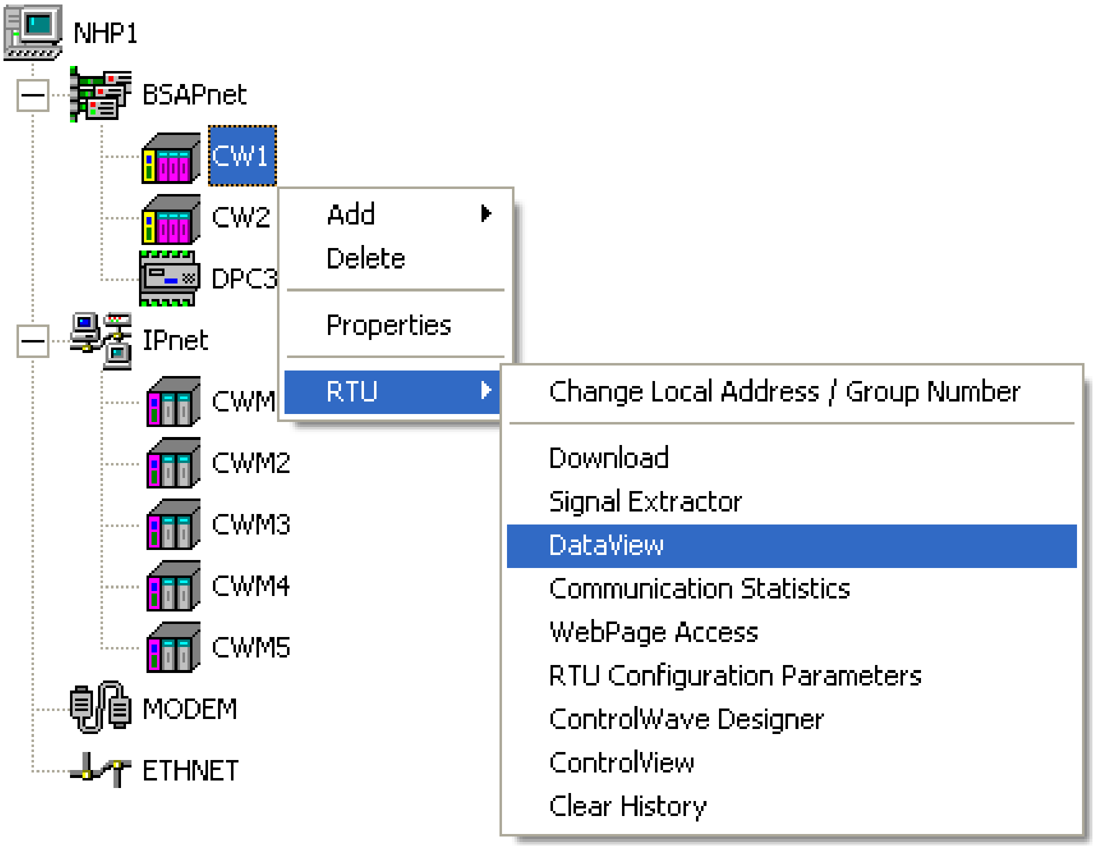
OpenBSI Version 5.9

OpenBSI Utilities Manual



EMERSON

Application Safety Considerations

- ## Protecting Operating Processes

  A failure of this application – for whatever reason -- may leave an operating process without appropriate protection and could result in possible damage to property or injury to persons. To protect against this, you should review the need for additional backup equipment or provide alternate means of protection (such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc.)

⚠CAUTION

When implementing control using this product, observe best industry practices as suggested by applicable and appropriate environmental, health, and safety organizations. While this product can be used as a safety component in a system, it is NOT intended or designed to be the ONLY safety mechanism in that system.

Changes added in OpenBSI 5.9 Service Pack 3

Support for newer Operating Systems

In addition to Windows 7 Professional, OpenBSI 5.9 Service Pack 3 now supports Windows 10 Professional, and Server 2012.

Support has been dropped for Windows XP. References to earlier operating systems are for users with older OpenBSI versions.

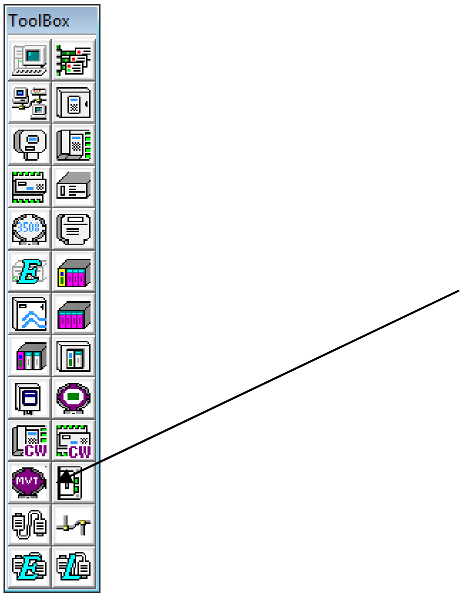
See *Chapter 2* for more information OpenBSI operating system compatibility.

Changes added in OpenBSI 5.9 Service Pack 1

Support for Rosemount 4088B Transmitter

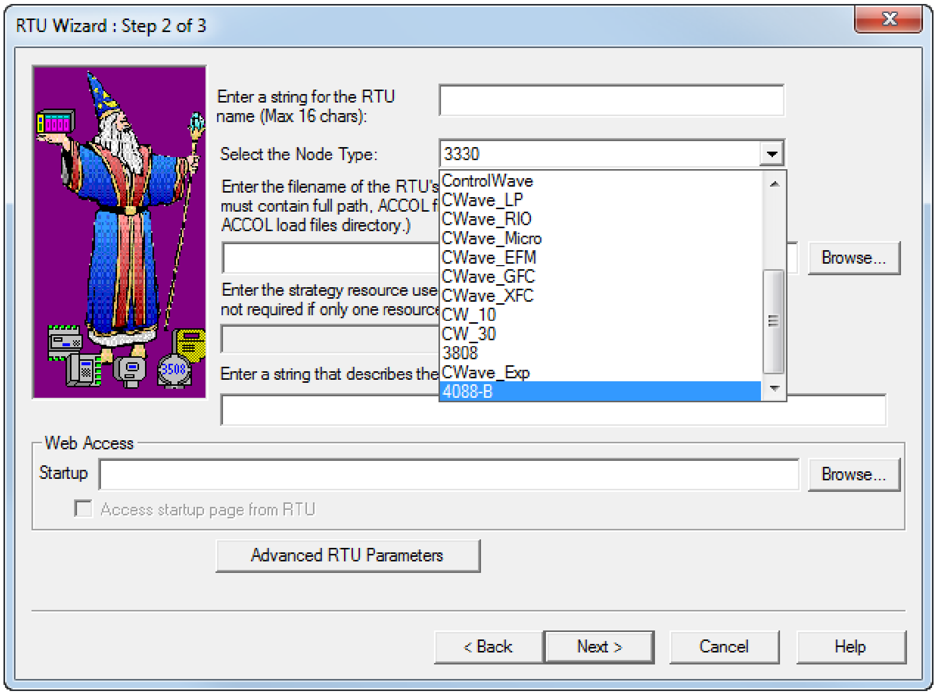
OpenBSI 5.9 Service Pack 1 includes several changes to support the Rosemount 4088B transmitter in addition to the legacy Bristol 3808 transmitter:

The NetView toolbox has been modified to replace the 3808 icon with a generic “MVT” icon that encompasses both the 4088B transmitter and the legacy 3808 transmitter.



MVT icon covers the 3808 and the 4088B

Various dialog boxes throughout the OpenBSI tools suite now include 4088B as a valid node choice.



RTU Wizard : Step 2 of 3

Enter a string for the RTU name (Max 16 chars):

Select the Node Type: 3330

Enter the filename of the RTU's must contain full path, ACCOL f ACCOL load files directory.)

Enter the strategy resource use not required if only one resourc

Enter a string that describes the

Web Access

Startup

□ Access startup page from RTU

A set of web pages for the 4088B is available at:

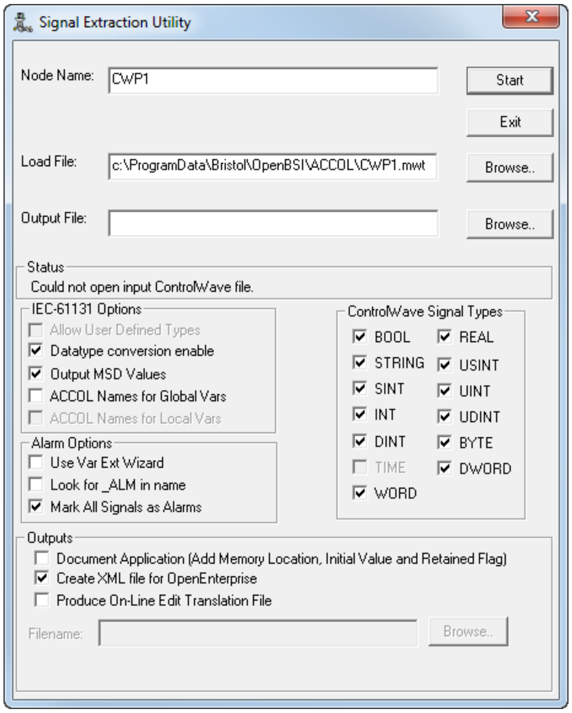
Start > Programs > Web Page Access > 4088B MVT Pages

TechView has been updated to support the 4088B with a specific set of configuration and calibration pages. See Chapter 10 of the *TechView User's Guide* for more information.

Signal Extractor change

The Signal Extractor now includes a new output option called **Create XML file for OpenEnterprise.**

If you are using OpenEnterprise 3.1 (or newer) check **Create XML file for OpenEnterprise** to allow Signal Extractor to generate an RTU definition for this device in XML that can be incorporated into the OE database.



Node Name: CWP1

Load File: c:\ProgramData\Bristol\OpenBSI\ACCOL\CWP1.mwt

Output File:

Status
Could not open input ControlWave file.

IEC-61131 Options
- □ Allow User Defined Types
- ☑ Datatype conversion enable
- ☑ Output MSD Values
- □ ACCOL Names for Global Vars
- □ ACCOL Names for Local Vars

Alarm Options
- □ Use Var Ext Wizard
- □ Look for _ALM in name
- ☑ Mark All Signals as Alarms

ControlWave Signal Types
- ☑ BOOL ☑ REAL
- ☑ STRING ☑ USINT
- ☑ SINT ☑ UINT
- ☑ INT ☑ UDINT
- ☑ DINT ☑ BYTE
- □ TIME ☑ DWORD
- ☑ WORD

Outputs
- □ Document Application (Add Memory Location, Initial Value and Retained Flag)
- ☑ Create XML file for OpenEnterprise
- □ Produce On-Line Edit Translation File

Filename:

Features Added in OpenBSI 5.9:

The following items were added in OpenBSI 5.9:

Support for 64-bit Windows Operating Systems

OpenBSI now runs on both 32-bit and 64-bit versions of the Windows 7 and Windows 2008 Server operating systems. Previously, only 32-bit was supported.

See *Chapter 2* for more information OpenBSI operating system compatibility.

New Version of ControlWave Designer

OpenBSI 5.9 includes a new version of ControlWave Designer (Version 5.35). For information, see the online help within ControlWave Designer.

Variable Extension Wizard Enhancement for Variable Descriptive Text

A **Store All Descriptors** option has been added to take all variable descriptive text residing in the ControlWave project and add it to the INI file so the user can view it. Previously, users had to do this manually for each individual variable. See the *ControlWave Designer Programmer's Handbook (D5125)* for more information.

Number of OpenBSI Networks Increased

OpenBSI 5.9 now supports up to 1,000 BSAP networks (including sub-networks). Previously the maximum number of networks was 99.

Harvester allows Pushdown Array/Archive Collection at Designated Hour

Harvester can now start historical collections of pushdown arrays and archives at a user-defined hour. Previously collections always began at midnight on the specified day. See the *OpenBSI Harvester Manual* (D5120) for more information.

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Contents

Chapter 1 – Introduction – What is OpenBSI? 1-1

Chapter 2 – Installing OpenBSI 2-1

Chapter 9 – Using the Communication Statistics Tool 9-1

Chapter 10 – Using Signal Writer 10-1

Chapter 11 – Using Alarm Router 11-1

Chapter 12 – Using the Signal Extractor 12-1

Chapter 1 – Introduction – What is OpenBSI?

The **Open B**ristol **S**ystem **I**nterface (**OpenBSI**) allows your PC to communicate with a BSAP or IP network of ControlWave and/or Network 3000-series controllers (RTUs). This chapter introduces some of the concepts and terminology used in OpenBSI.

In This Chapter

OpenBSI also includes a suite of programs known as the **OpenBSI utilities** that interact with the network to allow you to:

- Download ControlWave Designer projects and web pages to ControlWave series RTUs.
- Download ACCOL load files to Network 3000-series RTUs.
- Collect and display data from the RTUs.
- Monitor and control OpenBSI communications.

SCADA applications, such as **OpenEnterprise**, use OpenBSI communications, and data files generated by OpenBSI utilities, to access the network in order to display and report information from field instrumentation about a running process. You can then use this information to interact with the network and your process.

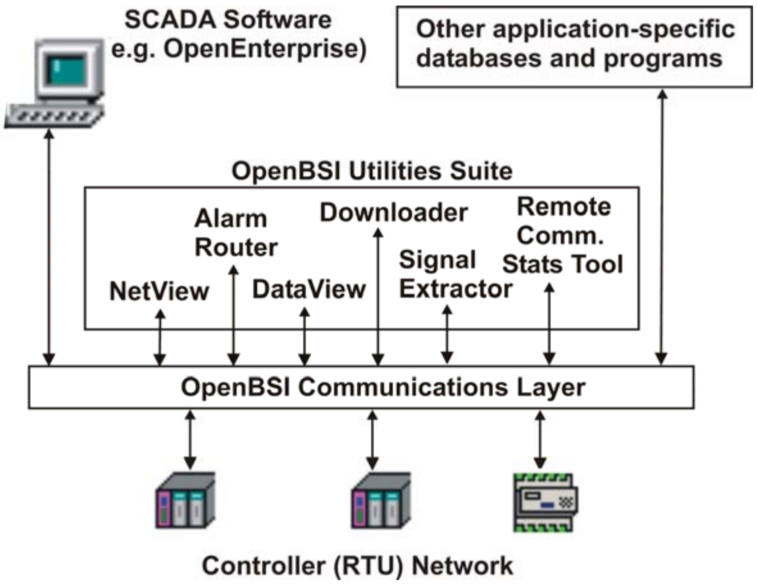


Figure 1-1. OpenBSI Architecture

You access the OpenBSI utilities from the Start Programs menu on the PC. *Table 1-1* provides a brief description of each utility.

Table 1-1. OpenBSI Utilities

Icon	Utility Description
NetView	**NetView** starts OpenBSI communications and allows you to define details about how OpenBSI should work. It includes a series of software “wizards” to help you specify characteristics of the communication network, as well as the remote process controllers (RTUs) which make up the network. NetView allows you to communicate with controllers in standard BSAP networks, in EBSAP networks, and in Internet Protocol (IP) networks. It also lets you specify system directory and file locations. NetView allows you to make on-line changes to the system configuration, and also helps you monitor the “health” of OpenBSI communications. See *Chapter 6 – Using NetView*.
DownLoader	The **ACCOL Downloader** transfers a linked ACCOL load file (*.ACL) from the PC to a running Network 3000-series RTU. The **1131 Downloader** transfers web pages (HTML) and ControlWave Designer projects to ControlWave series RTUs. See *Chapter 7 - Using the Downloader* .

Icon	Utility Description
DataView	**DataView** collects and displays several types of process data from a controller, including signal values, data array values, signal lists, archive data, and audit trail information. In addition, it lets you search for signals based on various criteria. See *Chapter 8 - Using DataView*.
stats Comm Stats Viewer	**Remote Communication Statistics Tool** allows you to monitor OpenBSI communication from the RTU end. It provides details on buffer usage, communication ports, and custom protocols. See *Chapter 9 - Using the Remote Communication Statistics Tool* .
LocalView	**LocalView** communicates locally with an RTU, and, for certain controllers, also allows field upgrades of system firmware. LocalView also lets you configure cold download parameters and Internet Protocol (IP) addresses for 386EX Protected Mode RTUs and ControlWave RTUs. See *Chapter 5 – Using LocalView*.
Alarm Router	**Alarm Router** collects alarm data from the network and displays it in a window for you to view. It also exports the alarm data to OpenEnterprise or other SCADA packages which provide alarm management capabilities. See *Chapter 11 – Using Alarm Router*.
Signal Writer	**Signal Writer** reads ASCII files containing signal values, and writes those values to corresponding signals or signal lists in the RTU. SigWrite scans for such files at a user-definable interval. See *Chapter 10 - Using Signal Writer*.
Signal Extractor	**Signal Extractor** reads an ACCOL Object (*.ACO) file or ControlWave Designer MWT file and generates an ASCII text file containing information about all global, alarm, and report by exception (RBE) signals defined in the file. Other user-specific applications use this file to construct a database. See *Chapter 12 - Using the Signal Extractor*.
Database Config Utility	**Database Config Utility** allows you to modify database portions of the OpenBSI 3.1 (or *newer*) Network Definition Files offline. This provides an alternative to using NetView to make modifications. **Note:** You can only *modify* existing components; you cannot add or delete items. See *Appendix B*.

Icon	Utility Description
Data Array Utility	**Data Array Save / Restore Utility** allows you to collect data arrays from an RTU and then store them in disk file(s) at the OpenBSI workstation. You can retrieve the file for a particular array, at a later time, to restore the original array values from the file into the array at the RTU. See *Chapter 13- Using the Data Array Save / Restore Utility* for details.

In addition to the standard set of utilities, just described, there are other utilities, available as separate kits which provide capabilities for scheduled data collection and file export such as the **Harvester**. See the *OpenBSI Harvester Manual* (document# D5120) for details.

1.1 RTUs and NHPs

For purposes of this discussion, a **network** refers to one or more **RTU**s connected using communication line(s) to a Network Host PC **(NHP)** running OpenBSI.

1.1.1 Remote Terminal Units (RTUs):

Controllers are generically referred to in OpenBSI software by the term **RTU** (**R**emote **T**erminal **U**nit); we use the term controller and RTU interchangeably in this manual.

OpenBSI supports the ControlWave series of RTUs, as well as the older Network 3000 series (3305, 3308, 3310, 3330, 3335, 3530-*xx*).

Field instrumentation devices (pressure transmitters, temperature transmitters, level transmitters, electrical contacts, etc.) provide data input/output to the controller (RTU) through the controller's process I/O boards. The control strategy/load program executing in the controller accesses this data to perform measurement and control tasks, tailored specifically for your application (e.g. pipeline monitoring, pump control, industrial automation, etc.).

Each RTU serves as a **node** in the network, and communicates with other RTUs and OpenBSI workstations through its communication ports. You can also configure an RTU to communicate with certain third-party devices (PLCs, etc.) or networks though the use of a custom communication protocol.

1.1.2 Network Host PC (NHP)

The term **Network Host PC (NHP)** refers to any PC workstation running OpenBSI Version 3.0 or newer software. Typically, you connect RTUs to it (so it serves as the **host** for those RTUs). You use NetView (described in *Chapter 6*) to define the RTUs in the NHP’s Network Definition (NETDEF) files. Any **other** NHP can only gain access to these RTUs if this NHP allows it. The other NHP does **not** need the address of the RTU it wants to communicate with; it only needs to know the address of the NHP which is hosting the RTU, and the RTU's name.

An OpenBSI workstation without attached RTUs though still considered an NHP, serves as a **proxy workstation**. A proxy workstation contacts other NHP(s) which do have attached RTUs, and requests **proxy access** to those RTUs. Depending upon the type of network configuration, you configure the proxy access as either direct to the RTU or only through the RTU’s NHP.

In addition to running OpenBSI, each NHP typically also runs some form of supervisory control and data acquisition (SCADA) or human machine interface (HMI) software to display data collected from RTUs for an operator. OpenEnterprise is the most common SCADA/HMI package used with OpenBSI.

1.2 Supported Network Configurations

OpenBSI supports the following basic network configurations:

- BSAP Networks
- IP Network(s)
- Mixed Network (mixture of IP and BSAP)

1.3 BSAP Networks

OpenBSI and all of the RTUs listed previously can communicate using the BSAP protocol. For advanced users who want to see a full description of BSAP, see the *Network 3000 Communications Application Programmer’s Reference* (document# D4052).

1.3.1 Local and Global Addressing

Based on its location in the network, you use NetView to assign a **local address** to each RTU in a BSAP network. The local address is an integer from 1 to 127 and NetView stores it as 7 bits. NetView also generates a 15-bit **global address** based on the local address. The local address you configure in NetView must match the local address hardware switch setting (or configuration parameter) set at the RTU.

1.3.2 Network Levels

BSAP networks use a hierarchical structure of 1 to 6 levels. You define this hierarchy in NetView. *Figure 1-2* shows an example of a 3-level network.

Each RTU (node) serves as a “master” to the nodes connected immediately below it in the network, and as a “slave” to a single master on the level immediately above it. No single master node can have more than 127 slave nodes. **Note:** NetView may impose additional restrictions on the network size based on limitations of the 15 bit global address.

A network master (which in OpenBSI is always the NHP) sits at the top of the network, and polls top-level nodes (nodes on level 1) for data. Each top-level node is a master to the nodes connected to it on level 2, and the level 2 nodes are masters to the nodes connected to them on level 3, and so on.

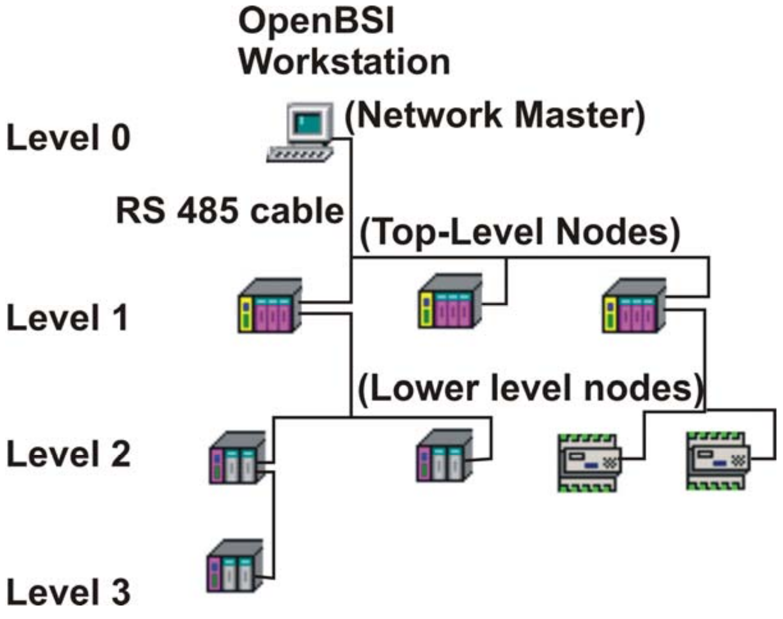


Figure 1-2. Network Levels

Data from the lowest level of the network passes from slave to master to slave to master etc. until it reaches the network master (NHP). At the NHP, you access the data using various OpenBSI utilities and SCADA software.

The level on which a node resides indicates the number of communication lines traversed to reach the network master. For example, a node on level 2 must send/receive data through two separate communication lines to reach the network master.

Note: Certain types of RTUs, for example, the 3308, can only serve as **terminal nodes**, i.e. they cannot serve as a master to slave nodes connected to them on a lower level.

1.3.3 Supported Communication Methods in BSAP

In BSAP, communication lines typically use direct cable connections, however, if your application requires it, you can use dial-up modems, radios, or even satellite links.

1.3.4 Peer-to-Peer Communication

From a given node, direct **peer-to-peer communication** using Client/Server function blocks is only possible to its master node, any connected slave nodes, and any siblings (nodes on the same level which share the same master). If you require communication to any node not in these categories, you must route messages up using Client/Server function blocks at each individual level of the network, until they reach either the network master, or a master which is a sibling to another master which can route the message down, using more Client/Server function blocks at each level, until it reaches the desired node. **Note:** Network 3000 RTUs use ACCOL Master/Slave modules instead of Client/Server function blocks.

1.3.5 Variations on Standard BSAP – EBSAP

Expanded node addressing (also known as “Expanded BSAP” or just EBSAP) operates identically to BSAP, except that it allows a single master to reference more than 127 slave nodes. EBSAP requires that network level 1 consist of “virtual nodes”, and that the actual slave nodes reside on level 2. See more information on EBSAP in *Chapter 6,* and in the *Expanded Node Addressing* sections of the *ControlWave Designer Programmer’s Handbook* (document# D5125) and the *ACCOL II Reference Manual* (document# D4044).

1.3.6 Variations on Standard BSAP – BSAP Local Line

BSAP Local Line

(for connecting a laptop at lower levels of the network)

Normally, in a BSAP network, the OpenBSI workstation resides at the top of the network (level 0). In addition to that workstation, you can optionally plug a laptop PC running OpenBSI directly into a lower level RTU's pseudo-slave port, and still retain the capability to connect with other RTUs in the same BSAP network. During system debugging and checkout this helps isolate a portion of the network and allows you to communicate only with nodes in that portion.

You may also find the BSAP local line useful if you visit a BSAP RTU that resides in a geographically remote location, with respect to the control room containing the NHP. By plugging a laptop running OpenBSI with a BSAP local line defined, you can, if your configuration allows it, view other portions of the network.

Figure 1-3 shows a typical use of the BSAP local line plugged into the pseudo slave port of an RTU. By default, the BSAP local line allows communication only with the locally attached RTU, and its slave RTUs (shown in the oval). When configuring the BSAP local line, you can enable communication with other RTUs as well.

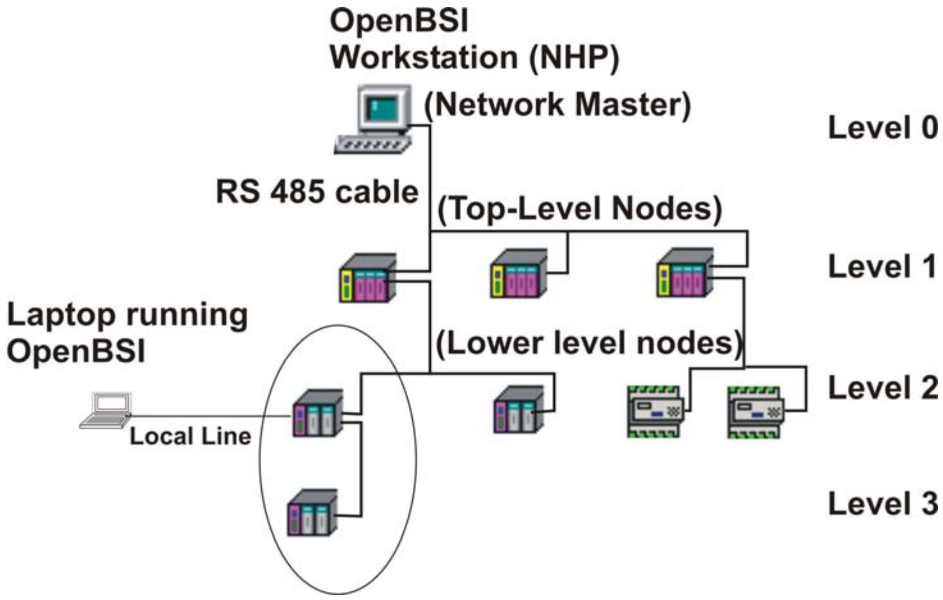


Figure 1-3. BSAP Local Line for Network Access at lower levels of the network

BSAP Local Line (Alternate Emergency Communication Line)

You can also use BSAP local lines to establish an alternate emergency communication connection to an RTU for use during a failure of the normal communication connection. You can use this to connect to any RTU configured with a slave, VSAT slave, pseudo slave, or pseudo slave with alarms port and an appropriate connection medium. (For this alternate connection, typically you use a dedicated modem configured at each end for dial-up operation; however, you could also use cables or radios.)

You use the BSAP local line in various scenarios in which the regular communication connection fails, and an operator can **manually** activate the alternate connection. Here is a typical example:

In *Figure 1-4* an OpenBSI workstation normally uses a serial cable connection to communicate with a single RTU. That RTU serves as the top-level node of a BSAP network (or BSAP sub-network). All of the RTUs in the BSAP network have dial-up modems. Using the BSAP auto-dial feature, and ACCOL logic, the top-level RTU periodically establishes dial-up connections to collect data, one at a time, from each of the lower-level RTUs; it then passes that data up to the OpenBSI workstation.

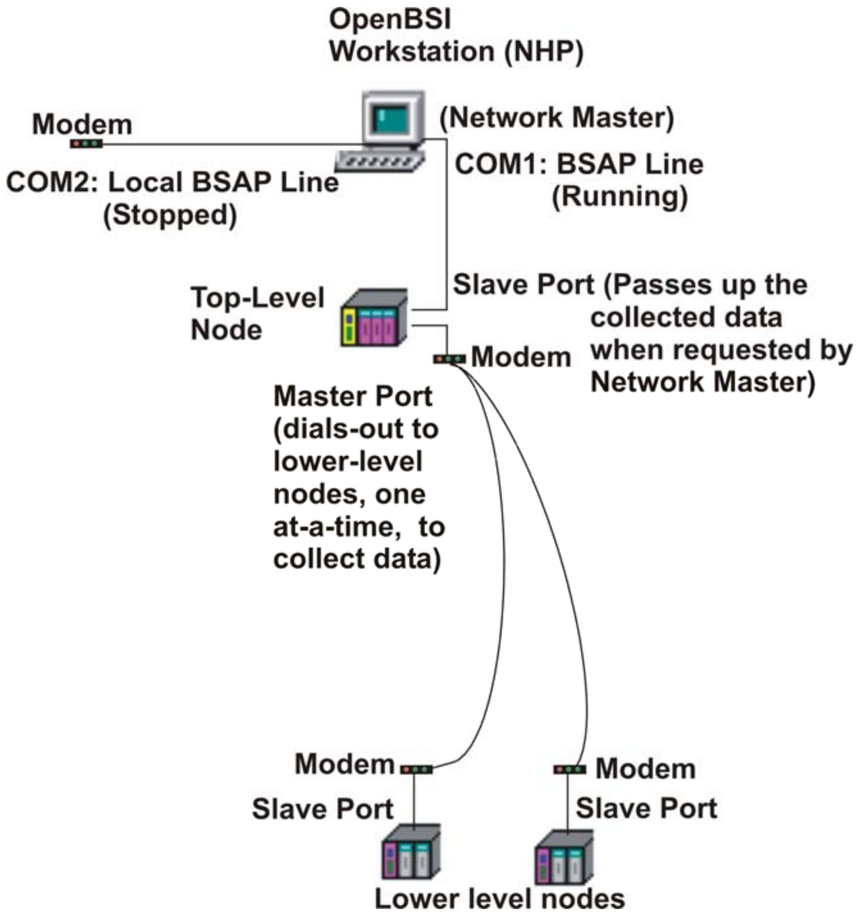

OpenBSI
Workstation (NHP)
(Network Master)
Modem
COM2: Local BSAP Line (Stopped)
COM1: BSAP Line (Running)
Top-Level Node
Slave Port (Passes up the collected data when requested by Network Master)
Modem
Master Port (dials-out to lower-level nodes, one at-a-time, to collect data)
Modem
Slave Port
Modem
Slave Port
Lower level nodes

Figure 1-4. Typical BSAP Network where top-level node dials lower levels nodes

A mishap occurs (see *Figure 1-5*) disrupting communication with the top-level RTU. Examples of mishaps include lightning strikes, cable breakage, etc. Such a mishap not only prevents communication with the top-level RTU, it also prevents the OpenBSI workstation from receiving data from the lower level RTUs, since it normally achieves its connection by receiving data that passes through the top-level RTU. An operator, who notices the communication failure activates a BSAP local line which bypasses the failed portion of the network, and one-at-a-time, manually selects an RTU, initiates dialing, and collects data, just as the failed RTU would have done. This allows communications to continue until the disruption is tracked down and repaired.

Another possible application for BSAP local lines is to provide backup communications with IP RTUs when an Ethernet communication line fails. For Network 3000 RTUs the backup link must use a configured pseudo slave port or pseudo slave with alarms port in each RTU since slave or VSAT slave ports **cannot** exist in the same ACCOL load as an IP slave port.

Note: In any of these scenarios, communication traffic only proceeds from one OpenBSI workstation to any particular RTU through one communication line at any one time. For this reason, any RTU reachable by the configured BSAP local line continues to receive its communication traffic via the BSAP local line, even after you repair problems affecting the regular communication line. Therefore, when the regular communication line is ready to return to service, shut down the BSAP local line to resume normal operation.

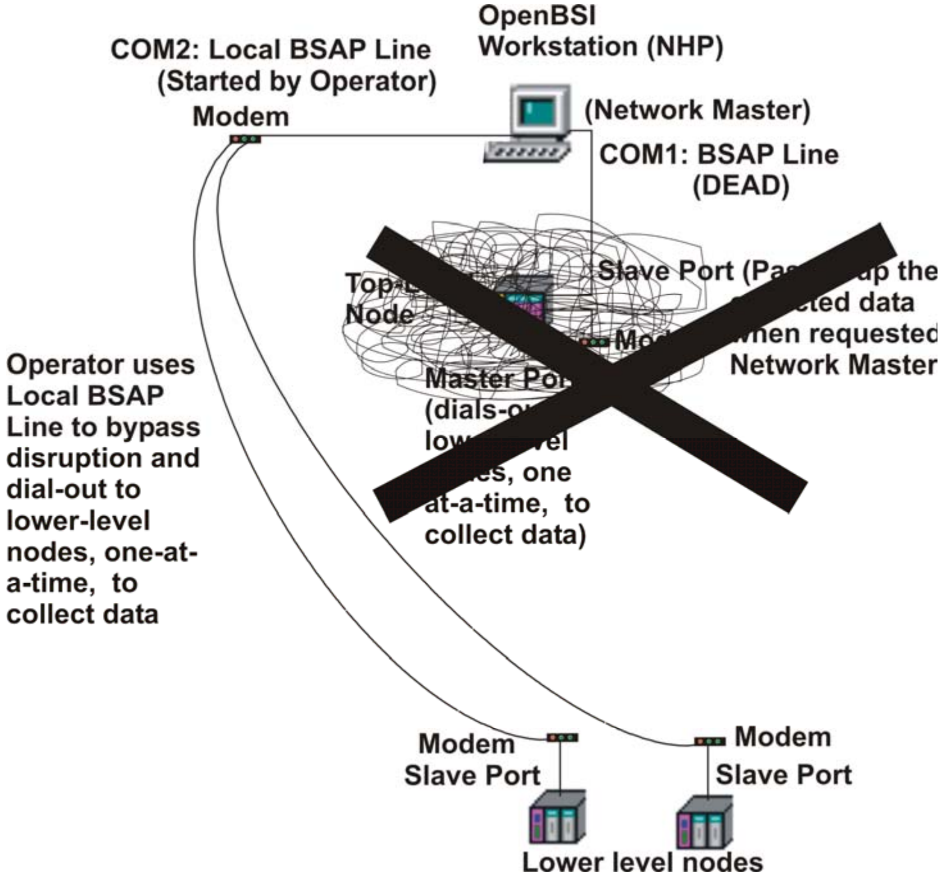


Figure 1-5. Using BSAP Local Line for Communication in an Emergency where top-level node dials lower levels nodes

1.4 IP Networks

Internet Protocol (IP) is a standard communications protocol for data transmission over a computer network. It also allows computers on different networks to exchange information with one another.

Note: For a general reference on IP, see *Internetworking with TCP/IP, Volume I: Principles, Protocols, and Architecture* by Douglas E. Comer.

1.4.1 Applications Using IP

IP allows you to connect ControlWave/Network 3000 RTUs together using **Ethernet**, a standard type of **local area network (LAN)** originally developed by Xerox Corporation. **IP nodes** are RTUs which support IP communication. IP nodes can also communicate using other protocols such as serial Point-to-Point Protocol (PPP).

⚠ **Warning**

We are discussing the Internet Protocol (IP) for use in communication between ControlWave or Network 3000 RTUs. The normal, intended application is for a “closed circuit” internet (LAN) of RTUs and workstations in a company plant or industrial site.

While, there is no built-in restriction against connecting an IP network of these nodes to the world-wide Internet, remember that any external IP connection (no matter what brand of RTUs and software you use) poses potential risks.

Always change default passwords, as well as default UDP/TCP socket numbers, to lessen the possibility that an unauthorized person could access your internal company process control data.

While these security features help prevent accidental access by plant personnel, **do not** consider them protection against intentional malicious activity by a sophisticated intruder, i.e. professional “hacker”. Consider purchasing commercially-available "firewall" software to gain a further degree of protection against such malicious intrusions.

1.4.2 Differences between IP Nodes and Other RTUs

From the user's point of view, IP nodes differ primarily in the configuration required for communications. In Network 3000 RTUs, for example, you must configure an IP port inside the ACCOL load. You configure characteristics of the port (baud rate, stop bits, etc.) using the Flash Configuration Utility.

In LocalView you assign an IP address for each IP port on the IP node. (We’ll discuss IP addresses in more detail, later.)

Networks using only IP nodes are somewhat different from standard BSAP networks. There is no hierarchical structure enforced at the network level. For certain applications, this has significant advantages over BSAP, because all nodes in a given section of the network exist on the same level; this simplifies peer-to-peer communication because you don’t need more than a single pair of IP_Client / IP_Server modules to get a message from one node to any other node because all nodes are “siblings” on the same level (see *Figure 1-6*.)

Note: There is no concept of “polling” in IP networks.

Network Definition Files (NETDEF) at the Network Host PC (NHP) hold Information on the IP addresses for a given section of the network. You use NetView to create the NETDEF files.

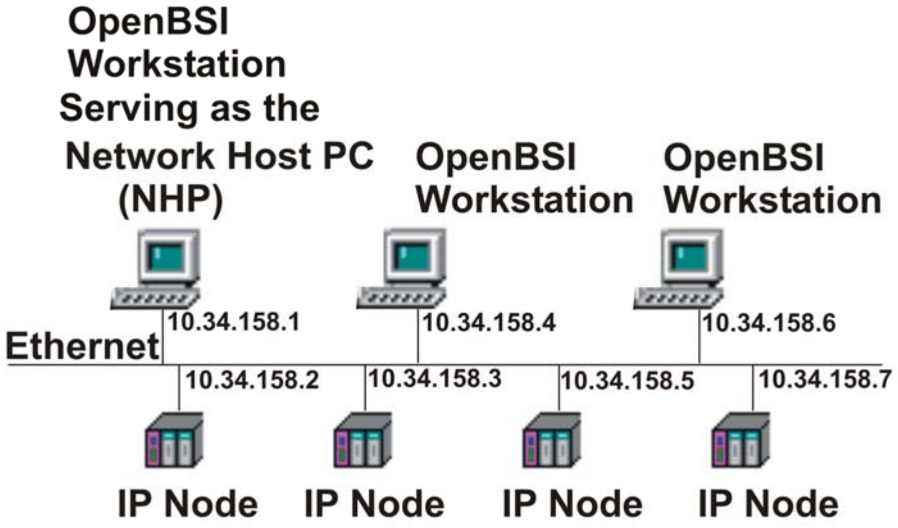


Figure 1-6. Typical IP Network Using Ethernet

If an IP node or an OpenBSI workstation needs to communicate with another IP node or OpenBSI workstation, and it doesn't know the address of the IP port for that node or workstation, it obtains the necessary addresses and routing information from the NETDEF files at the NHP.

1.4.3 Controllers That Support IP

The ControlWave series and two Network 3000-series RTUs (the 386EX Protected Mode DPC 3330 and DPC 3335 controllers with PES03 / PEX03 or newer firmware and Ethernet hardware) support IP.

In addition to Ethernet, ControlWave controllers support serial IP communications using the Point-to-Point Protocol (PPP).

Format of IP Addresses

Each network connection from an IP node has a unique **IP address** within the network. Remember that the system associates the IP address with the **network connection** (IP port) on the node, not the node itself. This potentially allows a single IP node more than one IP port, and consequently, more than one IP address.

IP addresses consist of 32 **bits** (1's and 0's) divided up into 4 groups of 8 bits each. A period separates each group. You convert each group of 8 bits from binary to a decimal number from 0 to 255 (see). The resulting IP address is in **dotted decimal** notation.

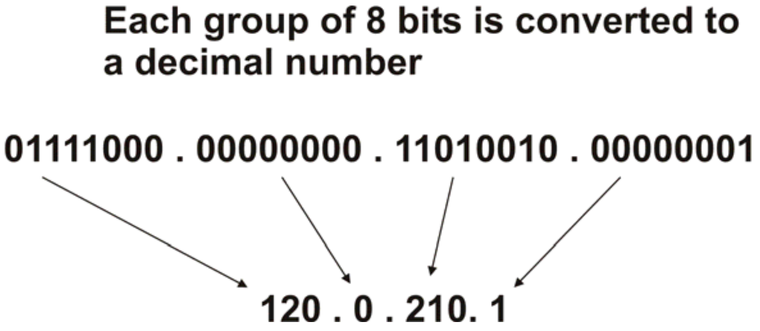


Figure 1-7. IP Address Explanation

Each of the numbers in the address has a specific meaning. For our purposes, the IP address consists of a common **network portion** for each node in the network, and a unique **local portion** for each particular node.

Meaning of IP Address Components

Assign addresses to be consistent with whatever conventions you establish for your system. In addition, you must follow certain rules for defining addresses – we discuss these later in this chapter.

You use the **sub-net mask** to define the specific meaning of each part of the address. The sub-net mask consists of another set of 32 bits (which you must convert to dotted decimal notation). Each bit in the sub-net mask corresponds to a bit in the IP address. If you set a bit in the sub-net mask to 1 (ON), then we assume the corresponding bit *in the IP address* is part of the **network portion** of the IP address. The system ignores (or "*masks*") the network portion when it communicates to nodes within the same network, because by definition, the network portions of the addresses for all nodes in the same network are identical. We assume any bit in the sub-net mask which is 0 (OFF) is part of the local addressing scheme.

Figure 1-8 shows the IP address and corresponding sub-net mask for an IP address of 120.0.210.1 and a sub-net mask of 255.0.0.0.

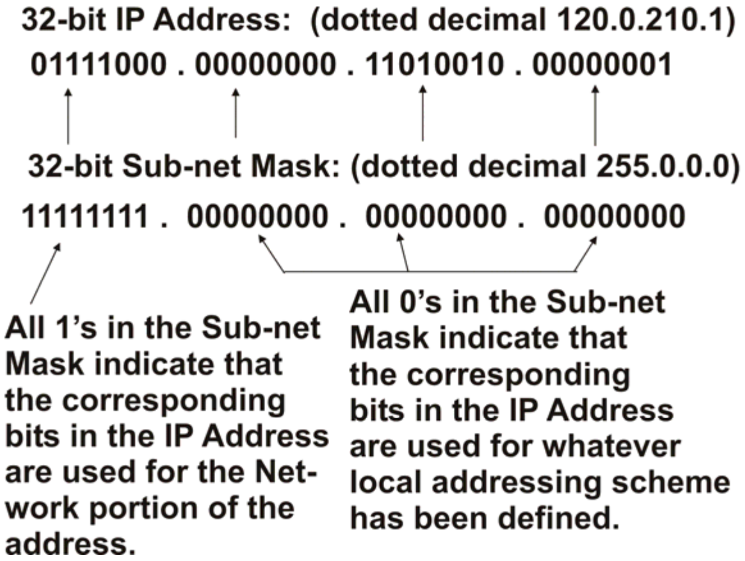

32-bit IP Address: (dotted decimal 120.0.210.1)
01111000 . 00000000 . 11010010 . 00000001
32-bit Sub-net Mask: (dotted decimal 255.0.0.0)
11111111 . 00000000 . 00000000 . 00000000
All 1’s in the Sub-net Mask indicate that the corresponding bits in the IP Address are used for the Net-work portion of the address.
All 0’s in the Sub-net Mask indicate that the corresponding bits in the IP Address are used for whatever local addressing scheme has been defined.

Figure 1-8. Sub-net Mask Explanation

Once again, a “1” in the sub-net mask indicates that the corresponding bit in the IP address bit belongs to the network portion of the address. Because the first part of the IP address “01111000”. has a corresponding sub-net mask of “11111111'”we know that “01111000” (120 in decimal) is the network portion of the address.

The remaining parts of the IP address “00000000.11010010.00000001” have a corresponding sub-net mask of “00000000.00000000.00000000”. These bits belong to the local portion of the address.

Rules for Local Addressing Schemes

When you create your IP address, the network portion of the address must appear first. For example, if the network portion is 200, you **cannot** define an IP address as 0.200.14.1. The network portion must appear first. This means that when you create the sub-net mask, the masked portion (i.e. all 1's) must appear first.

The organization of the remaining bits follows any local communications scheme you choose to devise, except that each group of bits that represents something **must be contiguous**.

For example, let's say you “mask out” the first 16 bits to define the network address, i.e. your sub-net mask is:

11111111 . 11111111 . 00000000 . 00000000

which in dotted decimal format is:

255 . 255 . 0 . 0

That leaves 16 bits (indicated by the 0's) for your local communications scheme.

You might want to use the first eight bits to indicate a section or area number for a section of your network. Eight bits allows you to define up to 256 sections. You can use another 8 bits (remaining out of the 16 available) to indicate a node number, allowing up to 256 IP RTUs and OpenBSI workstations in a given section (see *Figure 1-9*).

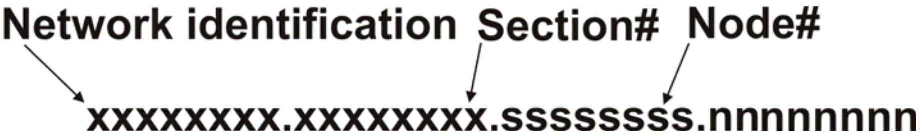


Figure 1-9. Sample IP Addressing Scheme

If you have a device (controller, or workstation) which will have *multiple* IP ports, we recommend you exercise special care when specifying the IP address and mask for each IP port to ensure that IP communication functions according to your plan. *For example, you typically would want each IP port to sit on a unique IP network*. This is because having two or more IP ports of the same device on the same network is not particularly useful, since only *one* of the ports will be allowed to send messages out to the network; the other ports will only be able to receive messages.

Sub-net masks determine which nodes are reachable from a given node

The previous sections cover the mechanics of creating IP addresses and sub-net masks. Another aspect we must discuss is the importance of IP addresses and subnet masks.

The IP address and sub-net mask defines the range of acceptable addresses with which the node potentially communicates. For example, if one node's IP address is 4.3.2.1 and another node's IP address is 100.100.0.1, there is no common network portion between the two addresses. For that reason, these two nodes **cannot** communicate with each other directly; they belong to different networks. Any messages between these nodes must pass through one or more **router** computers.

For two nodes to communicate directly, the network portion of their addresses (specified by the sub-net mask) must match exactly.

To illustrate this concept, look at *Figure 1-10*. The network shown has one Network Host PC (NHP) called NHP1, and three RTUs named OAK_STREET, ELM_STREET, AND WALNUT_AVE.

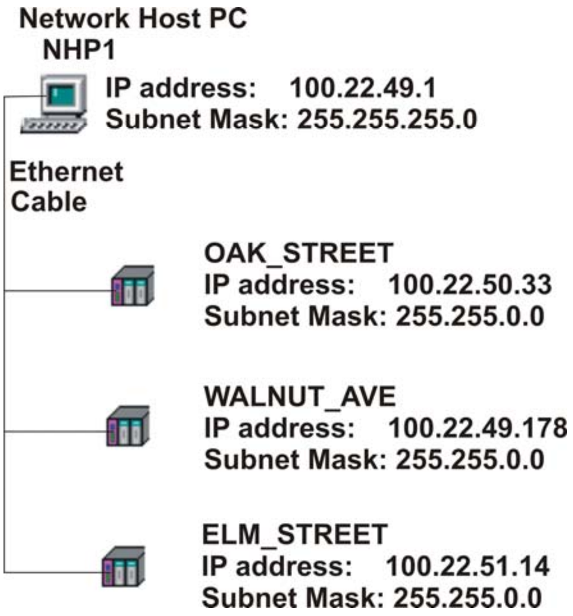


Figure 1-10. IP Network with Error in Sub-net Masks

Table 1-2, however, reveals a problem with the configured sub-net masks.

Table 1-2. Explanations of IP Addresses and Masks

Node Name	**IP Address, Sub-net Mask**	**Mask Says This Node Can Send Messages to All Nodes with These Addresses**
NHP1	IP ADR: 100.22.49.1 MASK: 255.255.255.0	100.22.49.*yyy* where *yyy* is an integer from 0 to 255.
WALNUT_AVE	IP ADR: 100.22.49.178 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
OAK_STREET	IP ADR: 100.22.50.33 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
ELM_STREET	IP ADR: 100.22.51.14 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
SW1-5	IP ADR: 100.22.49.1 MASK: 255.255.255.0	100.22.49.*yyy* where *yyy* is an integer from 0 to 255.
SW1-6	IP ADR: 100.22.49.178 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
SW1-7	IP ADR: 100.22.50.33 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
SW1-8	IP ADR: 100.22.51.14 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.
SW1-9	IP ADR: 100.22.49.1 MASK: 255.255.255.0	100.22.49.*yyy* where *yyy* is an integer from 0 to 255.

Node Name	IP Address, Sub-net Mask	Mask Says This Node Can Send Messages to All Nodes with These Addresses
SW1-10	IP ADR: 100.22.49.178 MASK: 255.255.0.0	100.22.*yyy.zzz* where *yyy* and *zzz* are integers from 0 to 255.

Based on their specified IP addresses and sub-net masks, OAK_STREET, ELM_STREET, and WALNUT_AVE can all communicate with each other. They can also send messages to NHP1.

There is a problem, however. NHP1’s sub-net mask specifies that it can only send messages to nodes with addresses 100.22.49.*nnn* where *nnn* is an integer from 0 to 255. Therefore, the only node it can send messages to is WALNUT_AVE.

To remedy this situation, we need to change NHP1's sub-net mask to 255.255.0.0 so that it can also send messages to OAK_STREET and ELM_STREET. See the corrected sub-net mask in *Figure 1-11.*

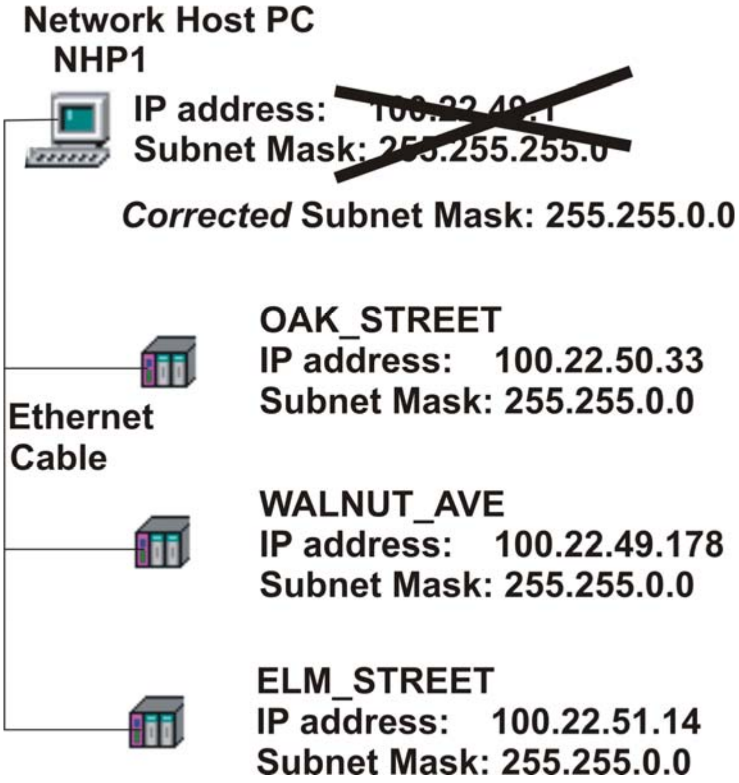


Figure 1-11. IP Network with Corrected Sub-net Mask

1.4.4 Guidelines for Choosing Addresses in a Private Network

If you have a small network which you don’t plan to connect to the world-wide Internet, your choice of IP addresses is largely unrestricted. Even if you have no plans to connect your network to the global Internet, however, the Internet Engineering Task Force recommends, as per *RFC 1918 (http://www.ietf.org/rfc/rfc1918.txt*) that you assign IP addresses for your private networks from the following ranges:

- 10.0.0.0 to 10.255.255.255

- 172.16.0.0 to 172.31.255.255
- 192.168.0.0 to 192.168.255.255

Internet governing bodies set aside these particular ranges of Internet addresses for private networks. Most Internet Service Providers (ISP) recognize any messages coming from these addresses as messages from private networks, and the ISPs filter them out. This helps avoid addressing conflicts should an accidental connection occur between a private network, and the global Internet.

Devices (e.g. RTUs, workstations) in our networks always use fixed IP addresses. This causes certain complexities if you choose to use Dynamic Host Configuration Protocol (DHCP) in your network. Because DHCP assigns IP addresses dynamically, as needed, you must examine your DHCP server to determine the addresses assigned for each RTU or workstation, and then *manually* enter those addresses in NetView. You should then specify the longest possible lease time for the addresses, to help prevent the loss of a given address through a device failure.

We also strongly recommend you configure the DHCP server to permanently reserve the addresses for the RTUs. (To do this, associate the addresses with RTU MAC addresses within the DHCP configuration or use a totally different address range). Do the same when you configure RAS servers or other machines designed to provide dynamic addressing information. Otherwise, you might accidently use duplicate IP addresses on your network.

1.4.5 IP Network Variations – Connecting Two Networks with a Single Router

Figure 1-12 shows a typical OpenBSI network using IP. A Network Host PC (NHP) and additional OpenBSI workstations sit on the same network as the RTUs (IP nodes). They exist on the same sub-network, and the addresses of all of the devices share the same range of IP addresses.

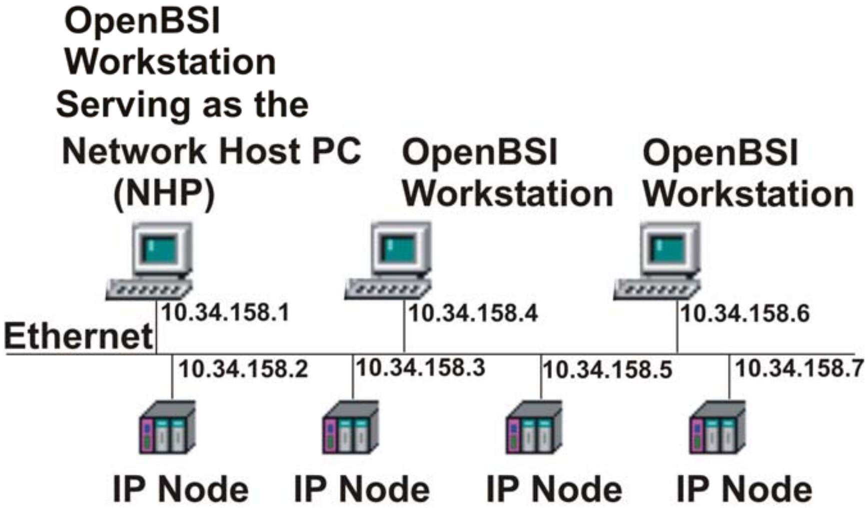


Figure 1-12. Typical IP Network Using Ethernet

For small networks of up to a few hundred nodes this type of configuration is fine. More complex network configurations are possible, however. When you need many hundreds or even thousands of nodes, or nodes in different geographical locations, the type of configuration, shown above, may prove inadequate.

You may find yourself in a situation where, because of new system requirements, devices on a self-contained existing network now need to share data with devices from an entirely different network.

Imagine, for example, a natural gas field (*Figure 1-13)* with hundreds of different RTUs and workstations that uses an address range beginning with 10.87.1.*x*. which now, because of changing requirements, must share data with another natural gas field full of controllers and workstations. This other network, in a different location, uses an address range beginning with 172.24.*x.x*. Because their current address ranges are incompatible, you cannot easily combine these two networks into a single network.

It might be impractical to try to assign new IP addresses to one group or the other; - - there might not even be enough unused addresses available for you to do that, or the man-hours required to physically re-program the devices might be prohibitive.

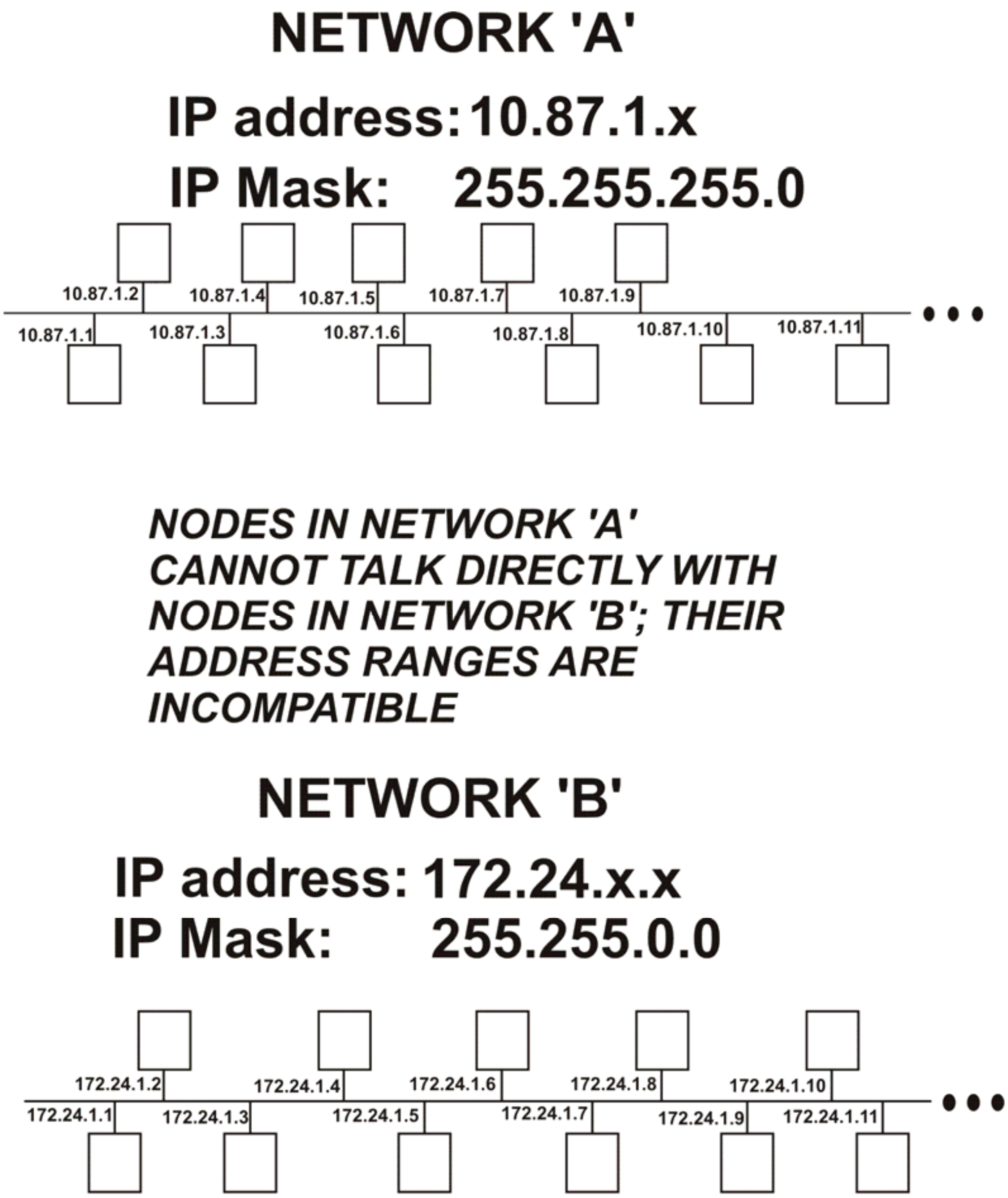


Figure 1-13. Two Separate IP Networks That Cannot Communicate with Each Other

You use a device called a **router** (also known as a gateway) in these sorts of situations. See *Figure 1-14*.

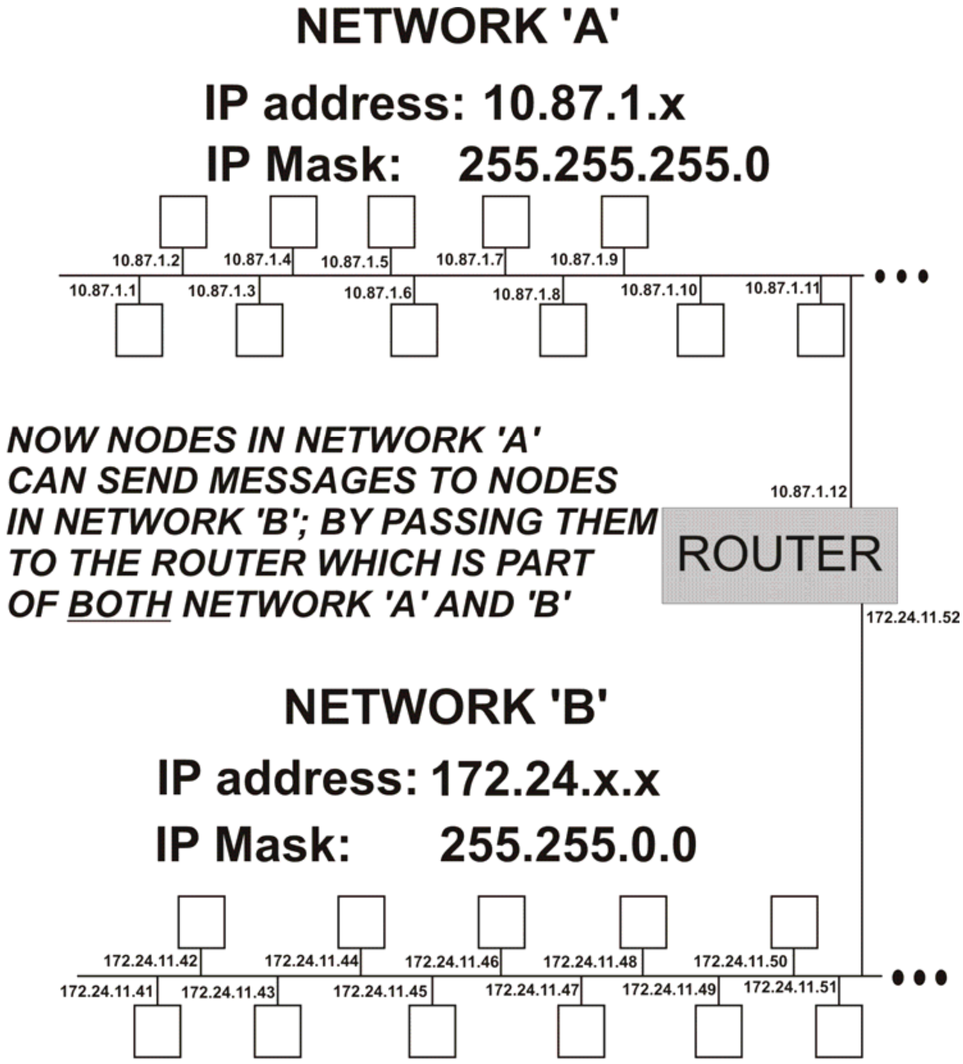


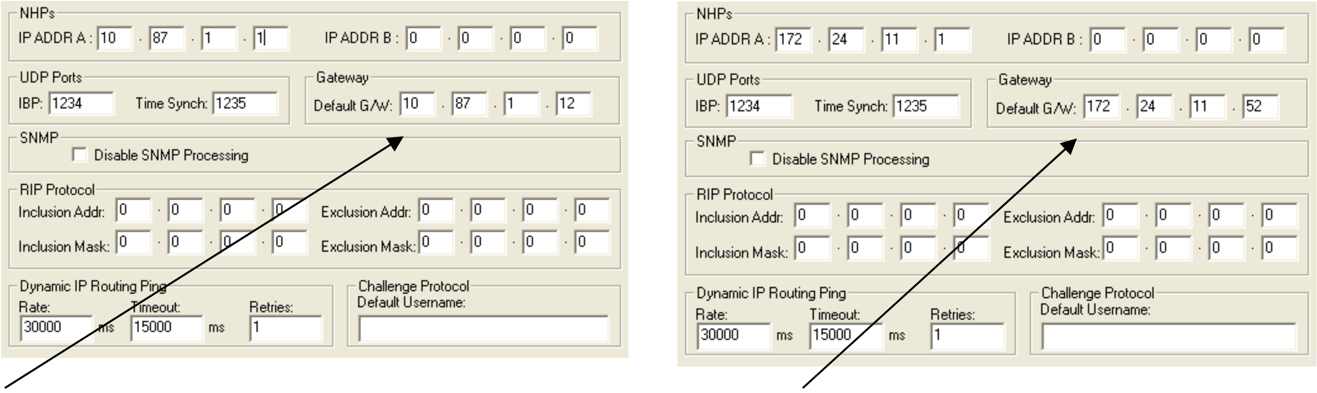
Figure 1-14. Connecting Two Separate IP Networks with a Router

A router is a device which has multiple IP ports such that the router belongs to more than one network. As part of each network, it takes messages from devices in one network and routes them to devices in another network. Typically, a router is a physical hardware device specifically designed for message routing. Software implementations of routers also exist.

Note: Because IP RTUs such as the DPC 3330, and ControlWave can contain more than one IP port (and so can sit on more than one network) the **RTUs can actually serve as routers**.

In our IP networks, one way you can specify a router is to designate it as the **default gateway**. When you define a particular IP network, the system automatically sends any message with a destination IP address which lies outside the defined address range for that network to the default gateway, i.e. the router. You define the default gateway from the **IP Parameters** tab of the Flash Configuration utility.

Figure 1-15 shows how to specify the default gateway address for Network "A" and Network "B" controllers, respectively, in our example. Both networks actually use the same device with two different IP ports (one RTU sits on each of the two networks).



NHPs
IP ADDR A : 10 . 87 . 1 . 1 IP ADDR B : 0 . 0 . 0 . 0
UDP Ports
IBP: 1234 Time Synch: 1235
Gateway
Default G/W: 10 . 87 . 1 . 12
SNMP
□ Disable SNMP Processing
RIP Protocol
Inclusion Addr: 0 . 0 . 0 . 0 Exclusion Addr: 0 . 0 . 0 . 0
Inclusion Mask: 0 . 0 . 0 . 0 Exclusion Mask: 0 . 0 . 0 . 0
Dynamic IP Routing Ping
Rate: 30000 ms Timeout: 15000 ms Retries: 1
Challenge Protocol
Default Username:

NHPs
IP ADDR A : 172 . 24 . 11 . 1 IP ADDR B : 0 . 0 . 0 . 0
UDP Ports
IBP: 1234 Time Synch: 1235
Gateway
Default G/W: 172 . 24 . 11 . 52
SNMP
□ Disable SNMP Processing
RIP Protocol
Inclusion Addr: 0 . 0 . 0 . 0 Exclusion Addr: 0 . 0 . 0 . 0
Inclusion Mask: 0 . 0 . 0 . 0 Exclusion Mask: 0 . 0 . 0 . 0
Dynamic IP Routing Ping
Rate: 30000 ms Timeout: 15000 ms Retries: 1
Challenge Protocol
Default Username:

Default Gateway (G/W) is an address where any message that cannot be routed within the network will be sent. All controllers in Network “A” have this as their default gateway.

All controllers in Network “B” have this as their default gateway

Figure 1-15. Defining an RTU as a Router

1.4.6 IP Network Variations - Using Multiple Routers (Gateways) and RIP for a Fault Tolerant Connection

Beginning with ControlWave firmware CWP02.0, you can configure multiple gateways (routers) to communicate using Routing Internet Protocol (RIP). We discuss this subject in *Chapter 5* in the description of the **IP Routes** tab of the Flash Configuration Utility.

1.4.7 IP Network Variations - Using Multiple Routers (Gateways) without RIP

The Routing Internet Protocol (RIP) we discuss in Chapter 5 only works if the PC and all devices that serve as routers on the network can send/receive RIP broadcasts. If they can’t, or, if you want to prevent the network overhead of a protocol like RIP, you must find an alternative method for using multiple routers.

One way you can configure this is through the ROUTE ADD command from the DOS prompt of your PC.

In *Figure 1-16*, an OpenBSI workstation (PC) only accesses devices in the 10.*x*.*x*.*x* network.

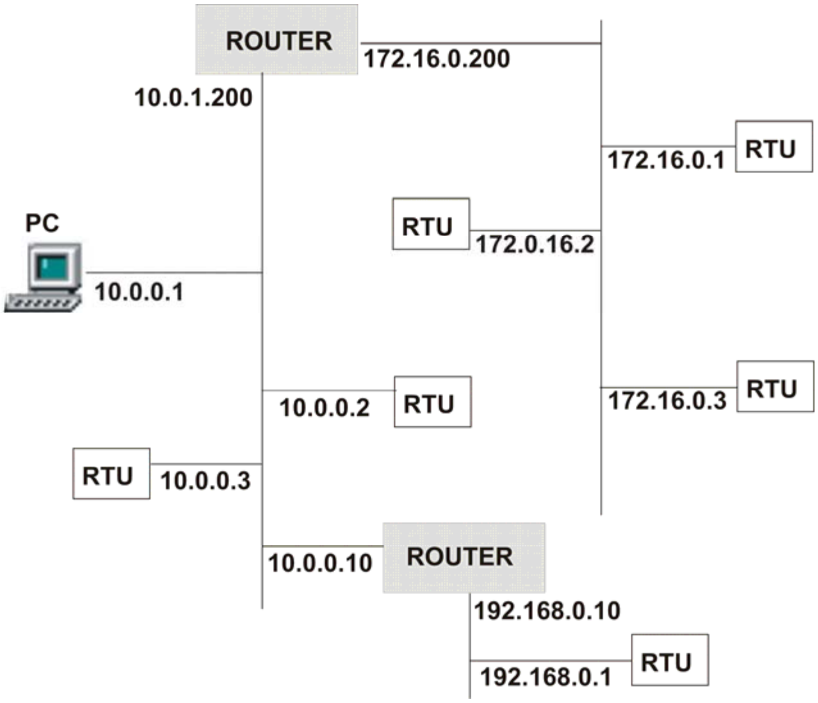


Figure 1-16. Separate Networks that Share a Router

Messages from the OpenBSI workstation cannot reach the other 172.16.*x.x* and 192.168.x.x networks. You can configure communication using ROUTE ADD because those networks have a connection (using routers) to the same network that the OpenBSI workstation is on. The syntax for the command is:

ROUTE ADD *aaa.bbb.ccc.ddd* **MASK** *eee.fff.ggg.hhh iii.jjj.kkk.lll*

Where:

aaa.bbb.ccc.ddd	is the destination address range you want to reach
eee.fff.ggg.hhh	is the IP Mask for that address range
iii.jjj.kkk.lll	is the address of the gateway or router which provides a route to that destination.

For the figure, shown earlier, if you enter the following ROUTE ADD commands at the DOS prompt, the PC allows messages traffic from the OpenBSI workstation to the RTUs on the 172.16.*x.x* and 192.168.*x.x* networks:

```
ROUTE ADD 172.16.0.0 MASK 255.255.0.0  10.0.1.200
ROUTE ADD 192.168.0.0 MASK 255.255.0.0  10.0.0.10
```

1.5 IP Network Security Protocols (CHAP and PAP) Used on PPP Links

While not required, we strongly recommend you consider using one of the two supported security protocols (PAP and CHAP) to help prevent unauthorized access to your network by an intruder (hacker). Typically, you should use CHAP since it is more secure.

The PAP and CHAP protocols operate in a client/server arrangement. The ControlWave RTU operates as a CHAP (or PAP) server. Either a ControlWave RTU or an OpenBSI workstation operates as a CHAP (or PAP) client. Any client must always supply a valid username/password combination to gain access to the server.

If the OpenBSI workstation is the client, you enter the username and password directly in response to a login prompt. These must match one of the username / password combinations stored in the ControlWave.

If a ControlWave RTU is the client, use the **"Challenge Protocol Default Username"** field in the “Ports” page of the Flash Configuration Utility to enter the username. The RTU automatically transmits the username / password text string for that username in response to a login prompt from the server.

Both of these security methods are similar at the user level. The difference is in the underlying operation of the protocols.

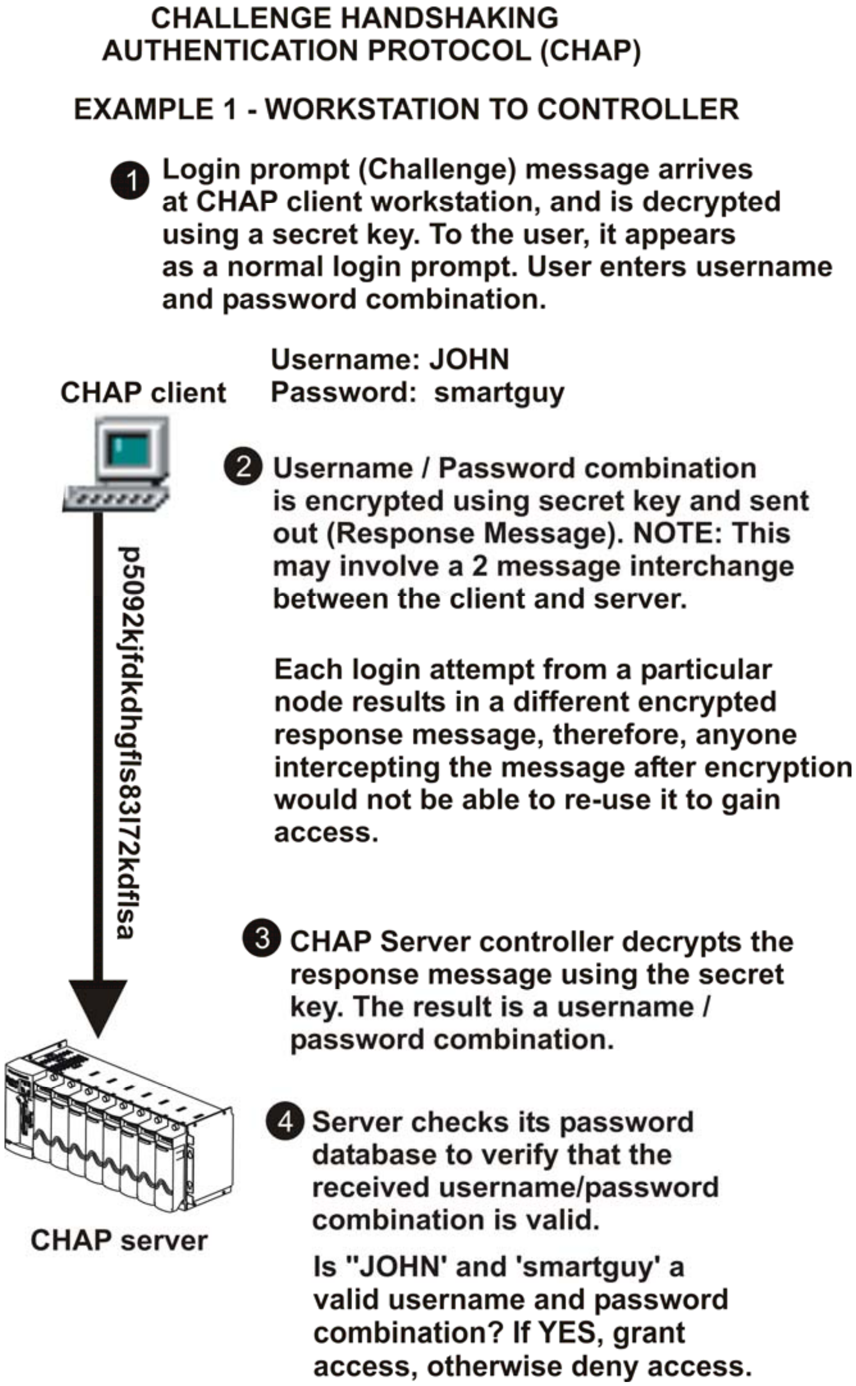
1.5.1 Challenge Handshaking Authentication Protocol (CHAP)

The CHAP server (ControlWave) issues an encrypted **challenge message** (which appears as a normal login prompt) to any CHAP client (workstation or ControlWave) that requests access. CHAP encrypts the supplied username and password according to a pre-defined secret encryption key. The result is called the **response message**.

Even though the username / password combination for a particular user does NOT change on each login attempt, the encrypted challenge and response messages are different on each attempt. This helps prevent an intruder from replicating the proper response message for a given challenge message, either through trial and error or “brute force” searches of all possible challenge messages.

Another characteristic of CHAP is that even after the client logs in, subsequent challenge / response transactions occur to verify that the connection is still with a valid user.

Example 1 - In this first CHAP example, the CHAP client is a PC workstation, and the CHAP Server is a ControlWave RTU.



CHALLENGE HANDSHAKING AUTHENTICATION PROTOCOL (CHAP)

EXAMPLE 1 - WORKSTATION TO CONTROLLER

1 Login prompt (Challenge) message arrives at CHAP client workstation, and is decrypted using a secret key. To the user, it appears as a normal login prompt. User enters username and password combination.

Username: JOHN
Password: smartguy

2 Username / Password combination is encrypted using secret key and sent out (Response Message). NOTE: This may involve a 2 message interchange between the client and server.

Each login attempt from a particular node results in a different encrypted response message, therefore, anyone intercepting the message after encryption would not be able to re-use it to gain access.

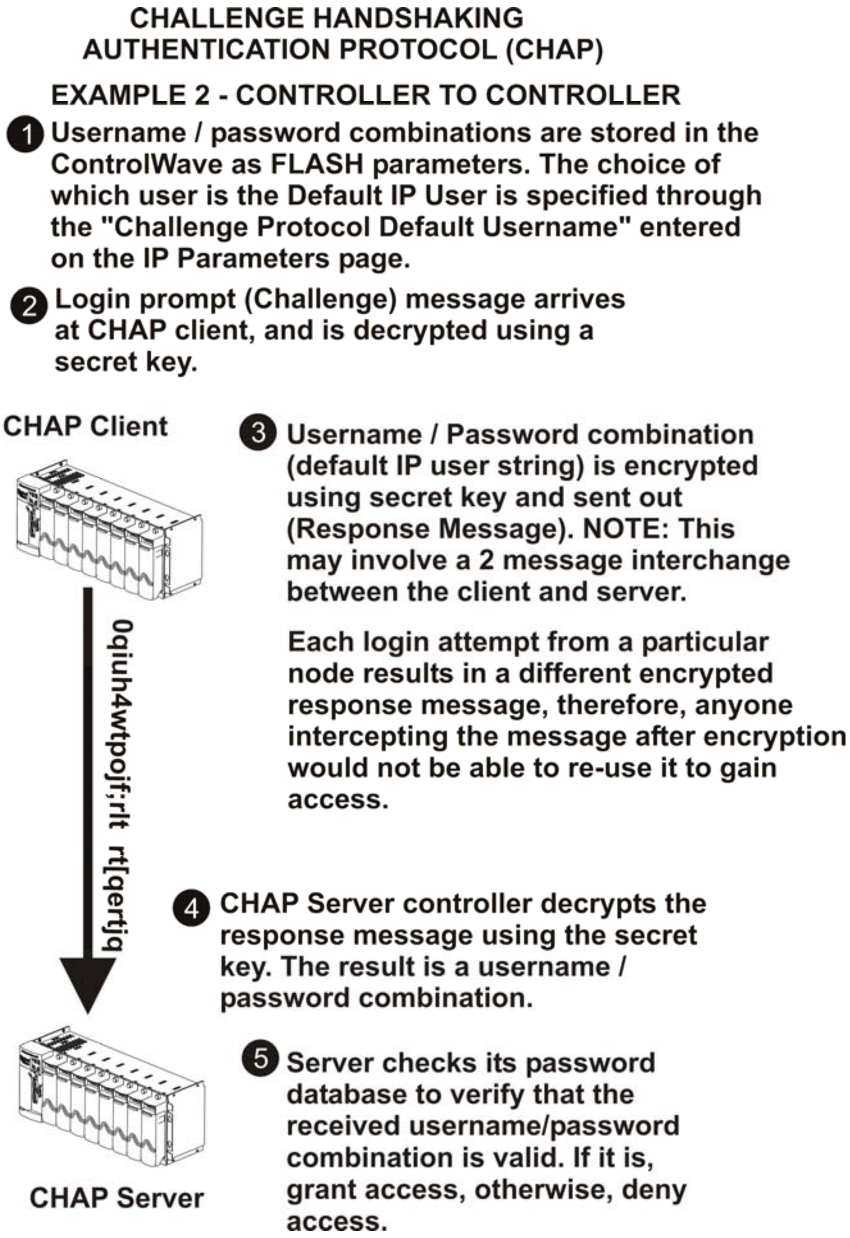
3 CHAP Server controller decrypts the response message using the secret key. The result is a username / password combination.

4 Server checks its password database to verify that the received username/password combination is valid.

Is "JOHN' and 'smartguy' a valid username and password combination? If YES, grant access, otherwise deny access.

Figure 1-17. CHAP – Workstation to Controller

Example 2 - The second CHAP example is very similar, except in this case, the CHAP client is another ControlWave RTU. For this reason, you configure a username/password combination (default IP user) and store it in FLASH memory. You also configure a Challenge Protocol Default Username on the IP parameters page of the Flash Configuration Utility, to reference the default IP user.



CHALLENGE HANDSHAKING AUTHENTICATION PROTOCOL (CHAP)

EXAMPLE 2 - CONTROLLER TO CONTROLLER

1. Username / password combinations are stored in the ControlWave as FLASH parameters. The choice of which user is the Default IP User is specified through the "Challenge Protocol Default Username" entered on the IP Parameters page.
2. Login prompt (Challenge) message arrives at CHAP client, and is decrypted using a secret key.
3. Username / Password combination (default IP user string) is encrypted using secret key and sent out (Response Message). NOTE: This may involve a 2 message interchange between the client and server.

   Each login attempt from a particular node results in a different encrypted response message, therefore, anyone intercepting the message after encryption would not be able to re-use it to gain access.
4. CHAP Server controller decrypts the response message using the secret key. The result is a username / password combination.
5. Server checks its password database to verify that the received username/password combination is valid. If it is, grant access, otherwise, deny access.

Figure 1-18. CHAP – Controller to Controller

1.5.2 Password Authentication Protocol (PAP)

PAP requires a client requesting access to provide a username and password, similar to CHAP. PAP is a simpler method of protection, however, that has certain characteristics which make it less secure than CHAP.

PAP allows clients to send passwords as clear “plain text” unencrypted strings of characters. This could allow an unauthorized person to intercept a password message, and then subsequently use the password to gain access.

PAP also has no safeguards against repeated attempts to log in. For example, an intruder using trial and error to “guess” a password, or someone using software which performs a “brute force” search of all possible passwords could gain access.

Example 1 - In the first PAP example, the PAP client is a PC workstation, and the PAP Server is a ControlWave RTU.

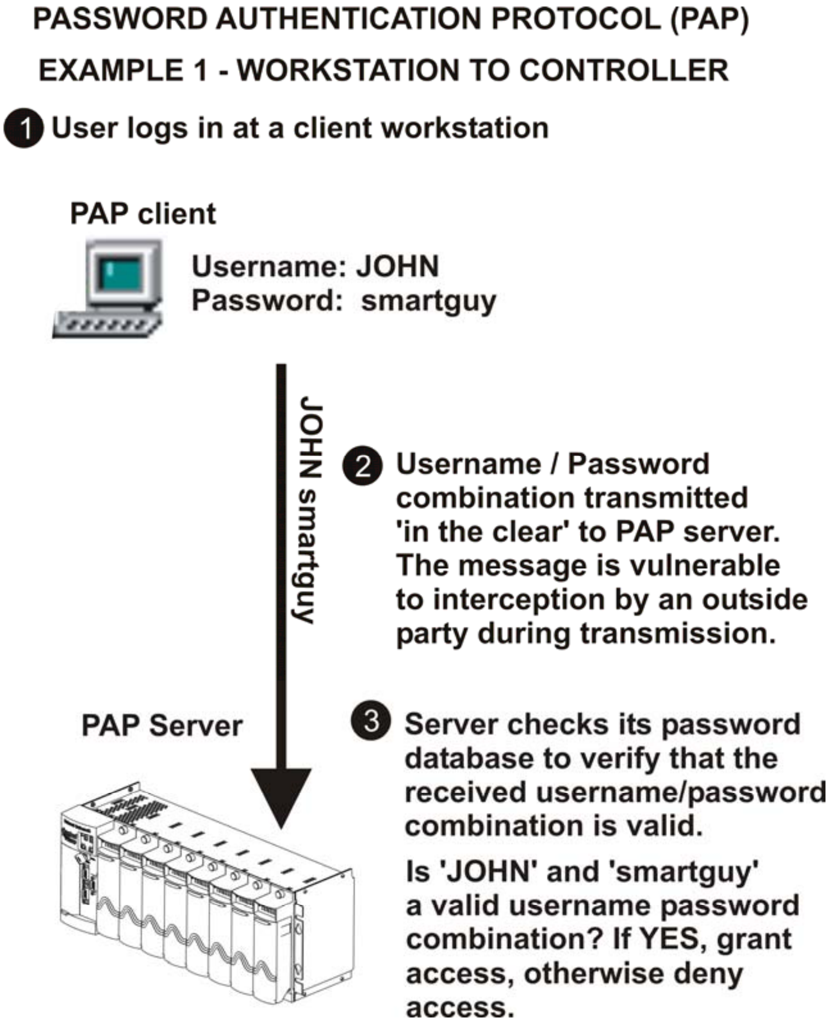
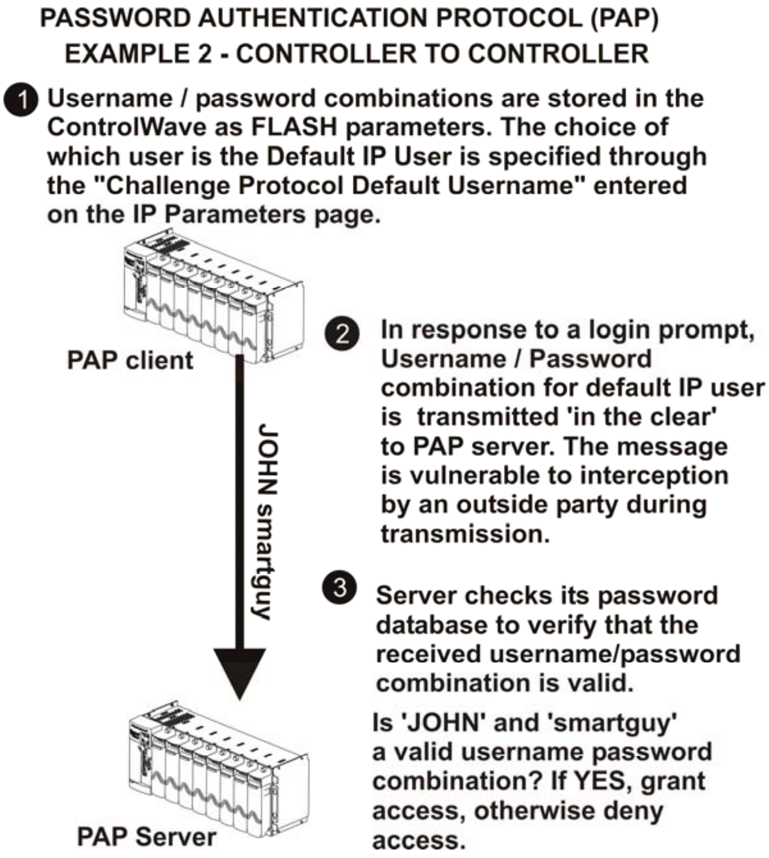

PASSWORD AUTHENTICATION PROTOCOL (PAP)
EXAMPLE 1 - WORKSTATION TO CONTROLLER
1 User logs in at a client workstation
PAP client
Username: JOHN
Password: smartguy
JOHN smartguy
2 Username / Password combination transmitted 'in the clear' to PAP server. The message is vulnerable to interception by an outside party during transmission.
PAP Server
3 Server checks its password database to verify that the received username/password combination is valid.
Is 'JOHN' and 'smartguy' a valid username password combination? If YES, grant access, otherwise deny access.

Figure 1-19. PAP – Workstation to Controller

Example 2 - The second PAP example is very similar, except in this case, the PAP client is another ControlWave RTU. For this reason, you configure a username/password combination (default IP user) and store it in FLASH memory. You also configure a Challenge Protocol Default Username, on the IP parameters page of the Flash Configuration Utility, to reference the default IP user.



PASSWORD AUTHENTICATION PROTOCOL (PAP)
EXAMPLE 2 - CONTROLLER TO CONTROLLER

1 Username / password combinations are stored in the ControlWave as FLASH parameters. The choice of which user is the Default IP User is specified through the "Challenge Protocol Default Username" entered on the IP Parameters page.

2 In response to a login prompt, Username / Password combination for default IP user is transmitted 'in the clear' to PAP server. The message is vulnerable to interception by an outside party during transmission.

3 Server checks its password database to verify that the received username/password combination is valid.

Is 'JOHN' and 'smartguy' a valid username password combination? If YES, grant access, otherwise deny access.

Figure 1-20. PAP – Controller to Controller

Further Information

For further information on PAP and CHAP, see these documents, both of which are available at *www.ietf.org.*

- *PPP Authentication Protocols* by Brian Lloyd and William Simpson, Daydreamer Computer Systems Consulting Services, RFC 1334, October, 1992.
- *The MD5 Message-Digest Algorithm* by Ronald Rivest, MIT Laboratory for Computer Science, and RSA Data Security Inc., RFC 1321, April, 1992.

1.6 Mixed Networks (Both BSAP and IP nodes)

You can configure multiple IP networks for any Network Host PC (NHP). In addition to IP network(s), you can also define multiple BSAP networks, immediately below the NHP. The NHP serves as the BSAP network master computer.

You can also create a BSAP **sub-network** underneath an IP node. In this case, the IP node must be the only BSAP Level 1 node, and the NHP is still the Network Master.

These configurations are useful, for example, if you want to add some IP RTUs to an existing network of BSAP nodes.

Figure 1-21 shows a typical configuration which mixes both IP nodes and BSAP network(s). The BSAP node shown on the left hand side, under the IP node, is a small BSAP sub-network which includes only one node. The large grouping of BSAP nodes on the right is a BSAP network.

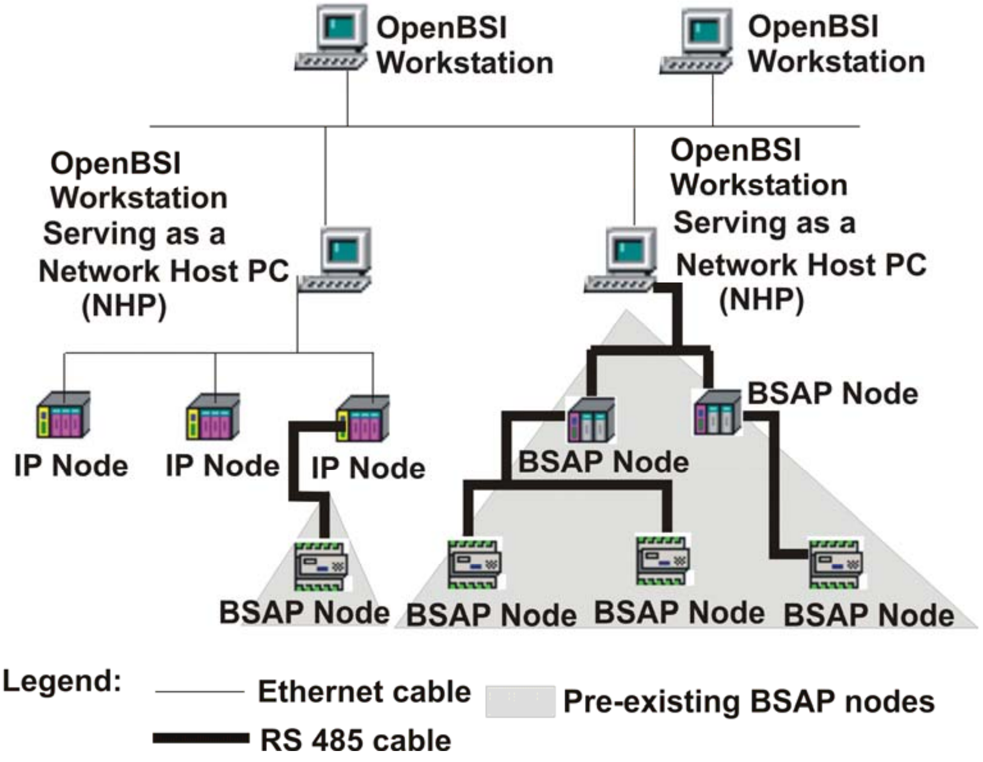


Figure 1-21. Mixed Network – IP and BSAP

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Chapter 2 – Installing OpenBSI

This chapter discusses the hardware and software requirements for OpenBSI installation, installation instructions, and software registration.

In This Chapter

2.1 Hardware and Software Requirements

OpenBSI requires a suitable PC workstation, and collects data from ControlWave and/or Network 3000 controllers.

2.1.1 Controllers used with OpenBSI

OpenBSI requires a network of ControlWave and/or Network 3000-series controllers (RTUs). OpenBSI functions with any ControlWave RTUs as well as any Network 3000 RTU with released firmware created after 1994.

2.1.2 Recommended Hardware/Software for the OpenBSI Workstation:

To run OpenBSI, your PC workstation must meet the following minimum system requirements:

- 1 GHz processor
- at least 200 MB free disk space for use by OpenBSI
- 512 MB RAM (more recommended)
- CD-ROM drive
- VGA Monitor (minimum 256 colors 800x600). Optimal screen resolution for OpenBSI web pages is 1024 x 768.
- Mouse
- Communication cable(s) to connect the PC to the RTU network
- Microsoft® Windows® 2008 Server, Windows® 7.0 Professional, Windows® 10 Professional**, or** Windows® 2012 Server. **OpenBSI supports both 32-bit and 64-bit operating systems.** We recommend you install the latest available service pack for your operating system.
- **Microsoft® Windows® 7.0 Enterprise is <u>not</u> supported.**
- **Note:** Emerson only tests OpenBSI on the following platforms: Windows 7.0 Professional, Windows 10 Professional, and Windows™ 2008 Server including both dual core, and dual-core dual-processor computers.
- Microsoft® Internet Explorer Version 5 or newer (Required for ControlWave web pages).

Note: For older OpenBSI versions, if you use Microsoft® Windows XP Service Pack 2 (or newer), you must change default operating system settings for certain OpenBSI features to work. Please see the *Using OpenBSI with Microsoft® Windows XP Service Pack 2* notes at the end of this chapter for details.

2.2 Installing the OpenBSI Utilities

We recommend you shut down all other programs before you begin to install OpenBSI. OpenBSI includes several different packages – which packages you choose to install depends on your application. You must register some packages to continue using them after the 60-day trial period expires.

⚠ **Caution**

If you install over an existing version of OpenBSI, and you previously added other programs or data to the default OpenBSI installation folder (\Program Files\Bristol\OpenBSI\) or its sub-folders (ControlWave projects, Sixnet I/O definitions, etc.) you must back them up prior to the OpenBSI installation.

If you install OpenBSI Network Edition over an existing version of OpenBSI, data in the \OpenBSI folder is automatically copied to the user files area. The original data is left untouched. The default user files area is \ProgramData\Bristol\OpenBSI. Note: Windows normally hides this folder.

If you install BSI_Config over an existing version of BSI_Config, the installation leaves existing data files in the \OpenBSI area untouched and BSI_Config continues to use the existing \OpenBSI area for new data files.

You <u>cannot</u> install OpenBSI Network Edition or BSI_Config on the same PC as Field Tools software versions prior to 2.0. Field Tools version 2.0 (and newer) can coexist on the same PC with OpenBSI Network Edition or BSI_Config. You also cannot install OpenBSI Network Edition or BSI_Config on the same PC with OpenEnterprise Version 3.1 or newer.

Beginning with OpenBSI 5.8, the older OPC Server is not supported; use Object Server instead. Once you install OpenBSI 5.8, any older version of OPC Server on your PC ceases to function.

If you install OpenBSI on a different drive from a previous installation, you must uninstall the previous version and edit the Windows system path statement to remove the previous OpenBSI path reference, before you install the new version.

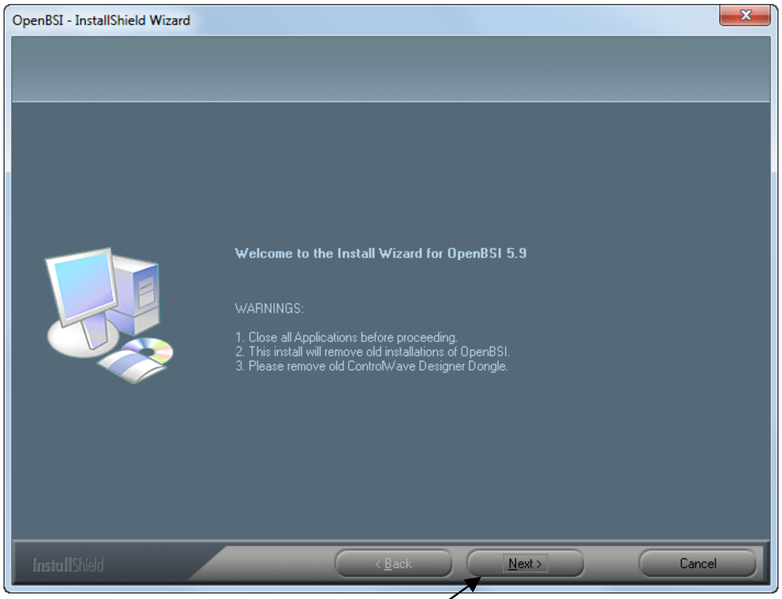
If you use OpenBSI utilities in conjunction with a third-party human-machine interface (HMI) package, you must remove any version of the file BSI32.DLL from the installation directory of the third-party package, and replace it with the newer version from the OpenBSI installation directory. If you don't remove the older version, OpenBSI will function improperly. Although not recommended, if you install OpenBSI and the third-party package in the same installation directory, install OpenBSI after the third-party package to solve the BSI32.DLL problem.

You cannot install ControlWave Designer on the same PC on which you have installed other KW products (for example MULTIPROG or another product which incorporates MULTIPROG) or else you may encounter

licensing issues or other problems.

Please review the release notes (README.DOC, README.TXT) for any late changes not included in this manual.

1. Log into the workstation with administrative privileges.
2. Insert the OpenBSI CD-ROM in your CD-ROM drive.
3. If your CD-ROM drive has autorun enabled, skip to the next step. Otherwise, open a DOS prompt with administrative privileges, then set the folder to the CD root directory, and run the same “open” command that is in the autorun.inf file on the CD, for example “demo32.exe openbsi.dbd”. When the CD browser screen appears, choose the **Install OpenBSI** option.
4. A screen reminds you to close all other programs, and warns you that older OpenBSI versions will be removed. Click **Next**. (See *Figure 2-1*.)



OpenBSI - InstallShield Wizard

Welcome to the Install Wizard for OpenBSI 5.9

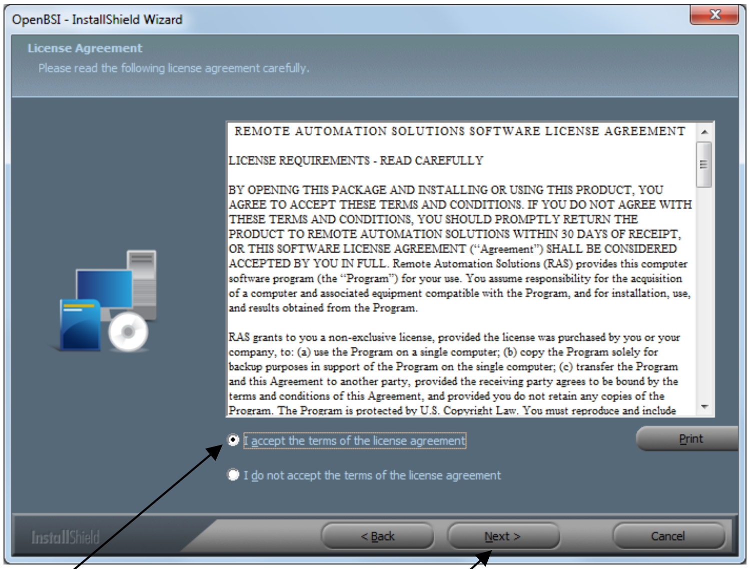
WARNINGS:

1. Close all Applications before proceeding.
2. This install will remove old installations of OpenBSI.
3. Please remove old ControlWave Designer Dongle.

Click **Next**

Figure 2-1. OpenBSI Installer - Welcome Screen

5. A license agreement screen opens (*Figure 2-2*). Review the agreement, using the scroll bar to bring it into view. Click **I accept the terms of the license agreement** to proceed. Then click **Next**.


OpenBSI - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Print
InstallShield
< Back
Next >
Cancel

REMOTE AUTOMATION SOLUTIONS SOFTWARE LICENSE AGREEMENT

LICENSE REQUIREMENTS - READ CAREFULLY

BY OPENING THIS PACKAGE AND INSTALLING OR USING THIS PRODUCT, YOU AGREE TO ACCEPT THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THESE TERMS AND CONDITIONS, YOU SHOULD PROMPTLY RETURN THE PRODUCT TO REMOTE AUTOMATION SOLUTIONS WITHIN 30 DAYS OF RECEIPT, OR THIS SOFTWARE LICENSE AGREEMENT ("Agreement") SHALL BE CONSIDERED ACCEPTED BY YOU IN FULL. Remote Automation Solutions (RAS) provides this computer software program (the "Program") for your use. You assume responsibility for the acquisition of a computer and associated equipment compatible with the Program, and for installation, use, and results obtained from the Program.

RAS grants to you a non-exclusive license, provided the license was purchased by you or your company, to: (a) use the Program on a single computer; (b) copy the Program solely for backup purposes in support of the Program on the single computer; (c) transfer the Program and this Agreement to another party, provided the receiving party agrees to be bound by the terms and conditions of this Agreement, and provided you do not retain any copies of the Program. The Program is protected by U.S. Copyright Law. You must reproduce and include

● I accept the terms of the license agreement

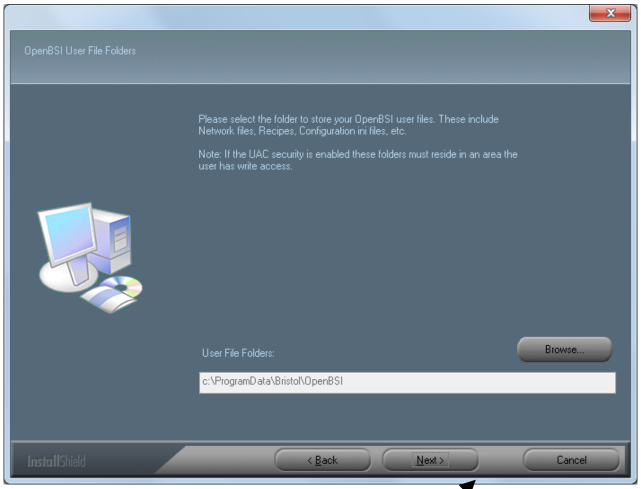
○ I do not accept the terms of the license agreement

Click **here**, then click **Next**

Figure 2-2. OpenBSI Installer - License Agreement

6. On the next screen *(Figure 2-3*), you can specify the user files folder. The system stores user files such as ControlWave projects, ACCOL files, recipes, and network files in sub-folders of this folder. **Note:** If User Account Control (UAC) is enabled in Windows, you must have **modify** access to this folder. The default is **C:\ProgramData\Bristol\Openbsi.** Use the default or use **Browse** to specify a different user files folder. When finished click **Next**.

Note: You can use the **OpenBSI Folders** tab of the Advanced Configuration tool to view/change the names of sub-folders of the OpenBSI user files folder. See *Appendix E* for details.



Please select the folder to store your OpenBSI user files. These include Network files, Recipes, Configuration ini files, etc.

Note: If the UAC security is enabled these folders must reside in an area the user has write access.

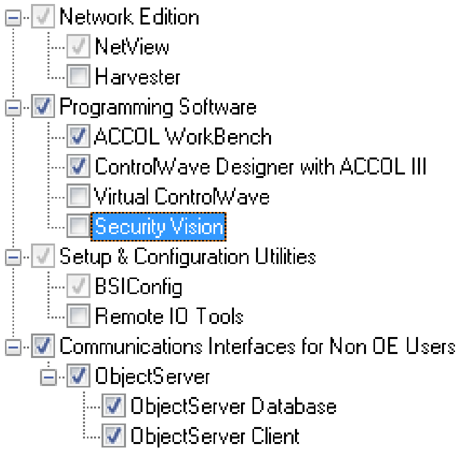
User File Folders:

c:\ProgramData\Bristol\OpenBSI

Click **Next**

Figure 2-3. OpenBSI Installer – User File Folders

7. On the next screen, use the check-boxes to select whichever package(s) you want to install.



- ☑ Network Edition
  - ☑ NetView
  - □ Harvester
- ☑ Programming Software
  - ☑ ACCOL WorkBench
  - ☑ ControlWave Designer with ACCOL III
  - □ Virtual ControlWave
  - □ Security Vision
- ☑ Setup & Configuration Utilities
  - ☑ BSIConfig
  - □ Remote IO Tools
- ☑ Communications Interfaces for Non OE Users
  - ☑ ObjectServer
    - ☑ ObjectServer Database
    - ☑ ObjectServer Client

Figure 2-4. OpenBSI Installer - Choose Packages

Table 2-1. OpenBSI Packages

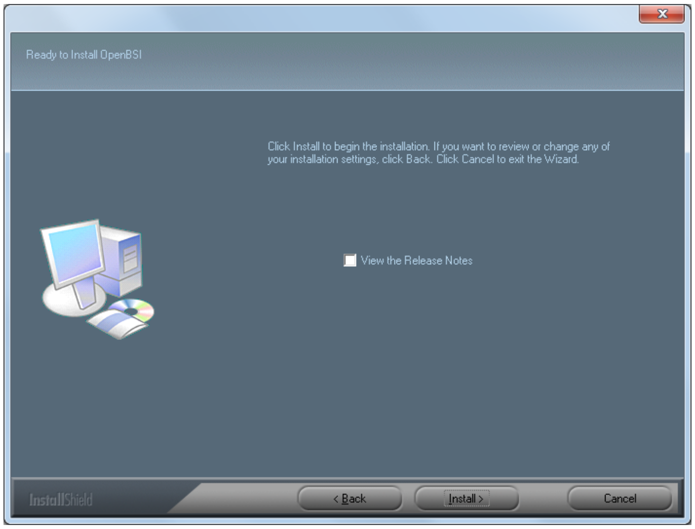
Software Component	Description
Network Edition:	
NetView	You use NetView to configure the OpenBSI Workstation and start OpenBSI communications. This selection also installs several other tools including LocalView, DataView, Alarm Router, BSAP to IP Redirector, Remote Communication Statistics Tool, Data Array Utility, ACCOL and 1131 Downloaders, Off-Line Database Configuration utility, Signal Extractor, Signal Writer, OpenBSI DDE Server, ValScan, ActiveX Controls, Web_BSI web pages.
Harvester	You use the programs in this package to collect array / archive and audit trail data, and export it to data files. This package includes the OpenBSI Harvester and the Data File Conversion Utility. For information on the Harvester software see the *OpenBSI Harvester Manual* (document# D5120). NOTE: In order to use the Harvester, you must also install NetView.
Programming Software:	
ACCOL Workbench	Lets you create, edit, and debug ACCOL files used in a Network 3000 series RTU. See the *ACCOL Workbench User's Manual* (document# D4051) for details. In addition, the ACCOL Downloader and LocalView programs are included.
ControlWave Designer with ACCOL III	This software lets you create, edit, and debug IEC 61131 projects for the ControlWave RTU. For information on using ControlWave Designer, see *Getting Started with ControlWave Designer* (document# D5085). This selection also includes the ACCOL III Function Block Library, ACCOL Translator, and the IEC 61131 Downloader.

Virtual ControlWave	The Virtual ControlWave includes a set of tools that allows you to take real-time signals from the OpenEnterprise Database and bring them into a ControlWave Designer project. Once in ControlWave Designer, you can create calculations using those signals. Then you compile and download the project into the Virtual ControlWave, where it runs like any other project. The Virtual ControlWave then stores results of the calculations back in the OpenEnterprise Database.
Security Vision	The Security Vision application is a package of hardware and software which allows a ControlWave RTU to store images from a remote security camera, and make them available to operators back at the OpenBSI Workstation.
Setup and Configuration Utilities:	
BSIConfig	This free package includes web pages necessary for calibration and configuration of the 3530-series of TeleFlow flow computers, correctors and recorders, as well as the 3808 MVT Transmitter and the 4088B. It also includes LocalView, Diagnostics, WINUOI, and the ControlView file viewer utility. **IMPORTANT: You cannot install the standalone version of BSIConfig on a PC that already has OpenBSI Network Edition installed.**
Remote I/O Tools	This package installs I/O Tools for configuring ControlWave Ethernet I/O. See the on-line help in the Remote I/O Toolkit for information on how to use the Remote I/O Tools.
Communications Interfaces for Non-OE Users:	
ObjectServer	The ObjectServer suite works with OpenBSI to provide OPC clients (such as an HMI package) with real-time access to a network of ControlWave/Network 3000 RTUs.
ObjectServer Database	This uses OpenBSI communications to collect real-time and alarm data from the RTU network and store it in a database.
ObjectServer Client	This transfers data between the ObjectServer database and a third-party HMI that serves as an OPC client.
WebToolkit	This consists of a set of tools that allow you to create a simple HMI using web pages. This HMI retrieves and displays data from ObjectServer.

8. Once you make your choices, click **Next.**

9. This is your last opportunity to make any changes prior to starting the installation. If you want to make changes, you can click **Back** to go back to earlier pages. If you want to read the printed release notes for this version of OpenBSI, check the **View the Release Notes** box. (See *Figure 2-5*.)

10. If you are ready to perform the installation, click **Install**, and the installation process starts. Be patient, as it may take several minutes to install all of the different utilities, depending upon which you choose.



Ready to Install OpenBSI

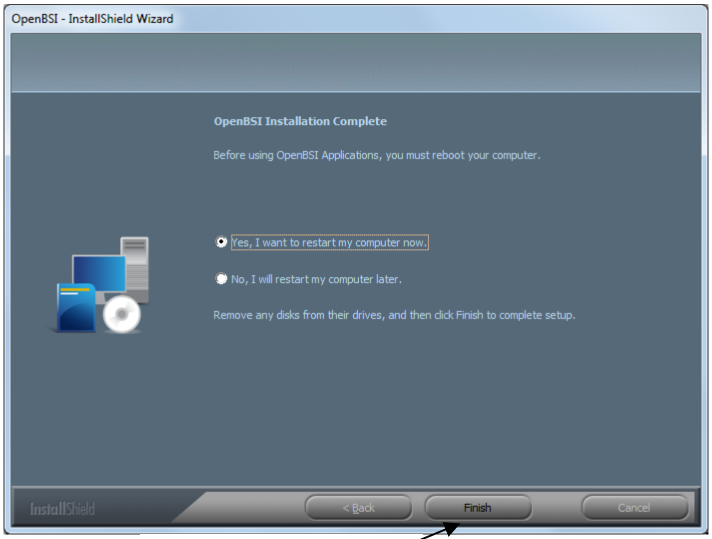
Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the Wizard.

□ View the Release Notes

Click **Install**

Figure 2-5. OpenBSI Installer – Ready to Install

11. When the installation completes, re-boot your computer when prompted (see *Figure 2-6*). This must be done in order for OpenBSI to function properly. If you choose not to re-boot now, you must do so before running OpenBSI. Click F**inish**, and the installation will be complete, and re-boot will proceed, if you chose to do it now.



OpenBSI - InstallShield Wizard

OpenBSI Installation Complete

Before using OpenBSI Applications, you must reboot your computer.

● Yes, I want to restart my computer now.

○ No, I will restart my computer later.

Remove any disks from their drives, and then click Finish to complete setup.

Click **Finish**

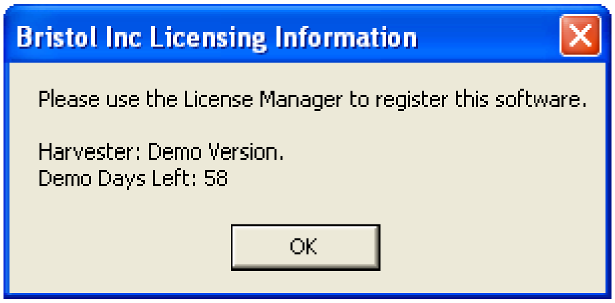
Figure 2-6. OpenBSI Installer – Installation Finished

After re-boot, an “OpenBSI Tools” menu selection is added to your Windows Start Programs menu through which you can access the various OpenBSI utilities. If you prefer, you can create Windows™ shortcuts to the tools to provide access through icons on the desktop. See your Windows™ documentation for information on how to do this.

2.3 Registering Your Software

Upon initial installation, the OpenBSI software packages operate for a 60 day evaluation period. Each time you start the software the system displays a reminder message telling you that the software is not registered (see *Figure 2-7)*, and shows you a count of the number of days remaining in the trial period. During this trial period, you can continue to run the software without registering by clicking **OK**.

⚠ **Caution** **At the conclusion of the 60-day evaluation period, the OpenBSI software packages cease to function. You MUST register the software packages in order to use them after 60 days. Do NOT attempt to set back the date on your computer in order to extend the evaluation period; doing so disables the software and terminates the evaluation period.**



Bristol Inc Licensing Information

Please use the License Manager to register this software.

Harvester: Demo Version.
Demo Days Left: 58

Figure 2-7. Software Not Registered Message

2.3.1 How do I Register My Software?

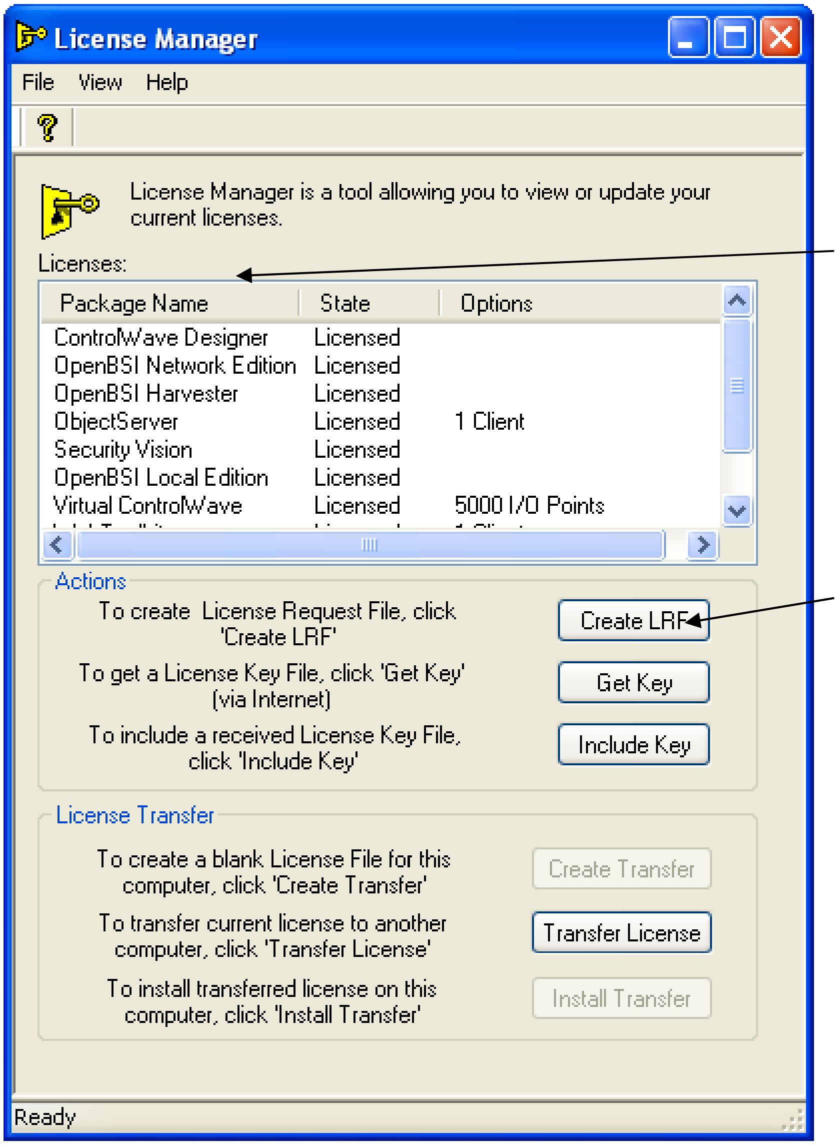
1. Install the desired software package(s) on your computer as described in *Section 2.2.* The computer must have an active Internet connection.

   Note: If this computer does **not** have an active Internet connection, you will need access to a computer which does, and you will need a USB thumb drive (or other method) to transfer the license file between the Internet-connected computer, and the computer on which you have installed the software.

2. Start the License Manager software, on the computer containing the newly installed software packages, using the sequence: **Start** > **Programs** > **Bristol Babcock Licensing**> **License Manager.**

3. The License Manager examines your PC, and identifies in a list, which OpenBSI software packages are installed on this computer (see *Figure 2-8)*. Any package that is not registered shows as **Trial** in the **State** field. Click **Create LRF** to generate a License Request File (*.LRF) and save the file on your PC. **Leave the License Manager session running**.

   Note: Make note of where on this computer you save the LRF file, because you will need it later.



License Manager

File View Help

License Manager is a tool allowing you to view or update your current licenses.

Licenses:

Package Name	State	Options
ControlWave Designer	Licensed	
OpenBSI Network Edition	Licensed	
OpenBSI Harvester	Licensed	
ObjectServer	Licensed	1 Client
Security Vision	Licensed	
OpenBSI Local Edition	Licensed	
Virtual ControlWave	Licensed	5000 I/O Points

Actions

To create License Request File, click 'Create LRF' — Create LRF

To get a License Key File, click 'Get Key' (via Internet) — Get Key

To include a received License Key File, click 'Include Key' — Include Key

License Transfer

To create a blank License File for this computer, click 'Create Transfer' — Create Transfer

To transfer current license to another computer, click 'Transfer License' — Transfer License

To install transferred license on this computer, click 'Install Transfer' — Install Transfer

Ready

This lists the software packages currently installed on this computer.

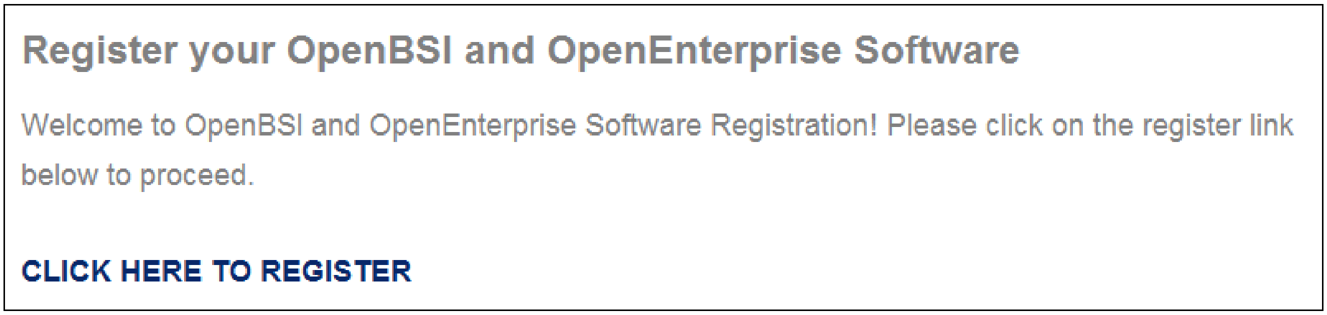
Click **Create LRF**

Figure 2-8. License Manager

4. Click **Get Key**, and your Internet browser brings you to the Software Registration area of the Emerson Remote Automation Solutions website. Alternatively, in your browser, go to:

http://www2.emersonprocess.com/en-US/brands/remote/systems_and_software/supportnet/Pages/license_registration.aspx

Note: If this computer does **not** have internet access, transfer the *.LRF file you just created to a computer which does have internet access. You might need to copy it to a CD, use a USB thumb drive, or transfer it by other means. Once you load it onto the other internet-capable computer, use the URL in step 4 to proceed with the registration.



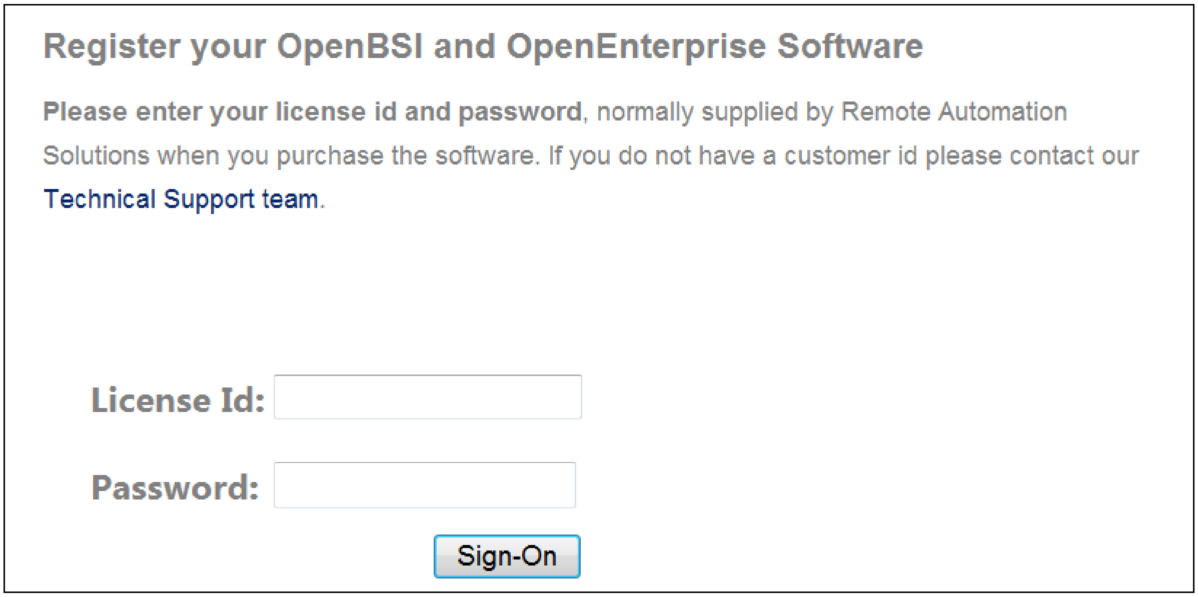
Register your OpenBSI and OpenEnterprise Software

Welcome to OpenBSI and OpenEnterprise Software Registration! Please click on the register link below to proceed.

CLICK HERE TO REGISTER

Figure 2-9. Software Registration Page on Website – Initial Appearance

5. Click **CLICK HERE TO REGISTER**.



Register your OpenBSI and OpenEnterprise Software

Please enter your license id and password, normally supplied by Remote Automation Solutions when you purchase the software. If you do not have a customer id please contact our Technical Support team.

License Id:

Password:

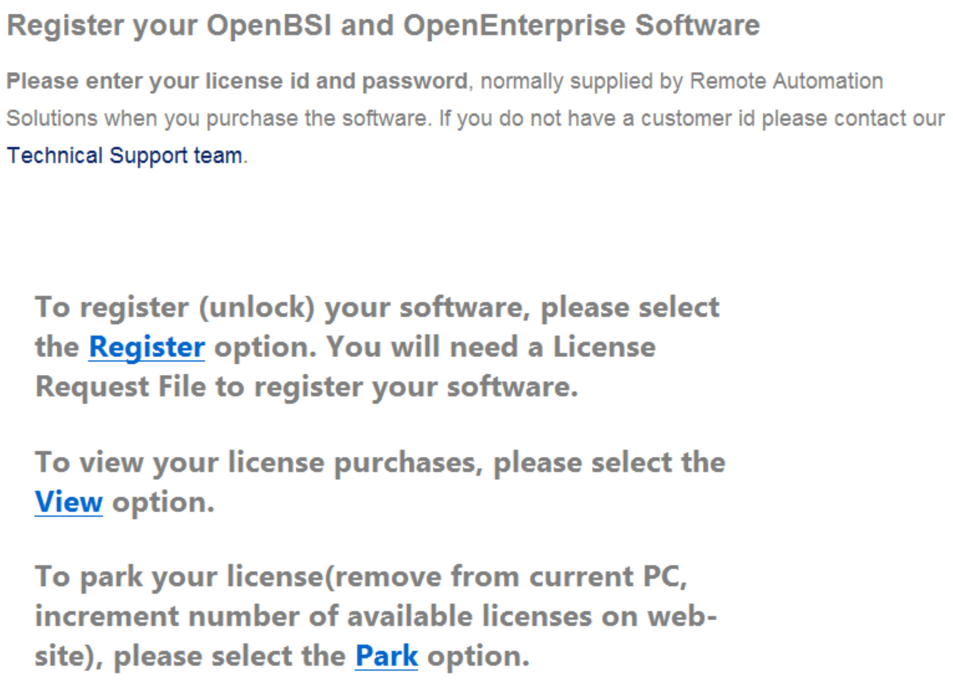
Figure 2-10. Software Registration Page on Website – Expanded Appearance

6. Click the Enter your **License Id** and **Password** and click **Sign-On**.

Note: You can find the **License Id** and Password on a label affixed to the outside of your OpenBSI CD-ROM package.

7. Now you have two options. You can view which licenses have been purchased and are available for you to register, or you can skip that step and proceed to register your software. To view the available licenses, go to step 8. To register the software, skip to step 9.

Note: The Park option shown in *Figure 2-11* does not apply to any OpenBSI related products; use the transfer license option instead.



Register your OpenBSI and OpenEnterprise Software

Please enter your license id and password, normally supplied by Remote Automation Solutions when you purchase the software. If you do not have a customer id please contact our Technical Support team.

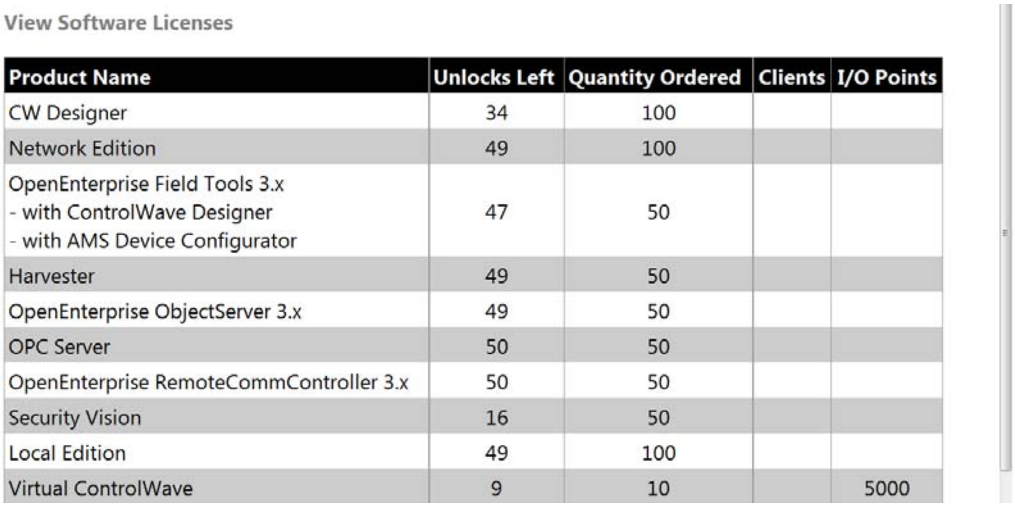
To register (unlock) your software, please select the Register option. You will need a License Request File to register your software.

To view your license purchases, please select the View option.

To park your license(remove from current PC, increment number of available licenses on web-site), please select the Park option.

Figure 2-11. Register or View Licenses

8. To view which software packages have been purchased for this particular **License Id** number, as well as how many of those licenses are already in use, click the **View** link. The View Software Licenses page *(Figure 2-12*) opens. You may need to use the scroll bar to locate the product you want to view.



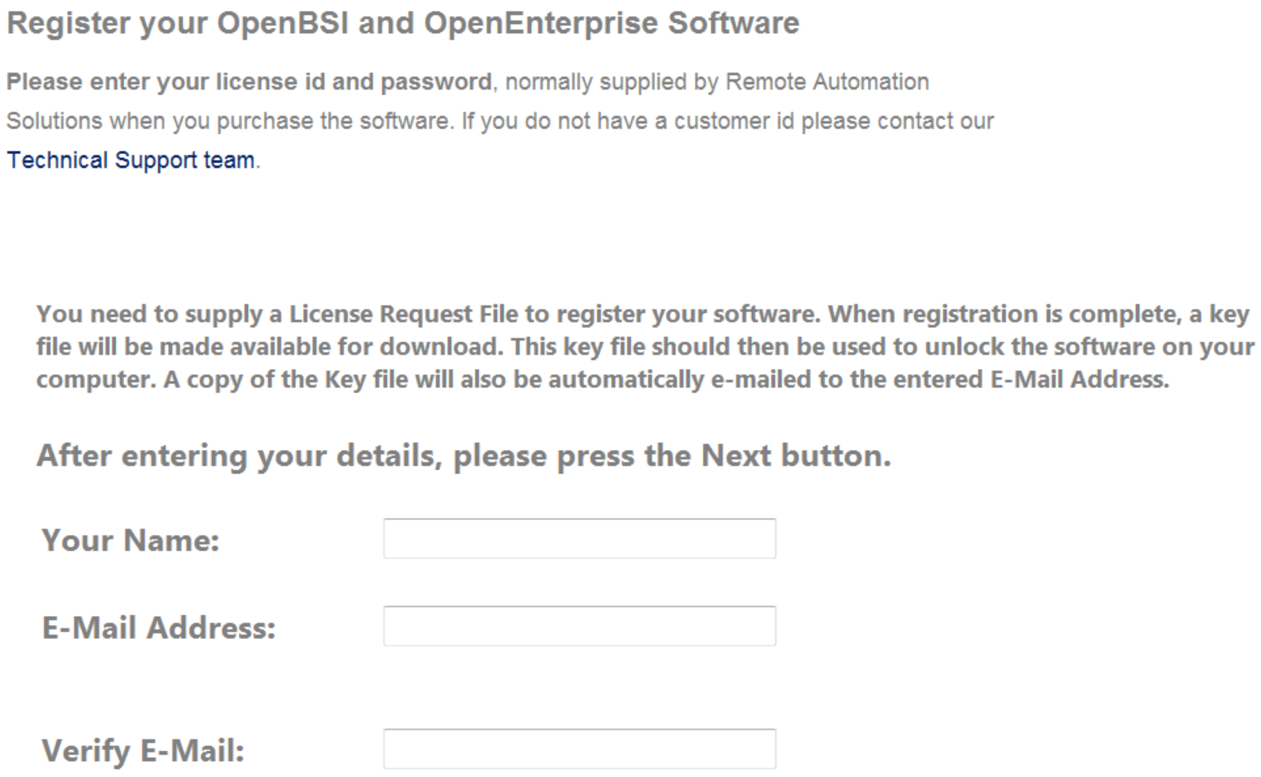
View Software Licenses

Product Name	Unlocks Left	Quantity Ordered	Clients	I/O Points
CW Designer	34	100		
Network Edition	49	100		
OpenEnterprise Field Tools 3.x - with ControlWave Designer - with AMS Device Configurator	47	50		
Harvester	49	50		
OpenEnterprise ObjectServer 3.x	49	50		
OPC Server	50	50		
OpenEnterprise RemoteCommController 3.x	50	50		
Security Vision	16	50		
Local Edition	49	100		
Virtual ControlWave	9	10		5000

Figure 2-12. View Software Licenses Web Page

Field	Description
Product Name	This displays the name of the software packages for which licenses have been purchased using your **Customer Id** number. In addition to OpenBSI packages other software products such as OpenEnterprise packages are displayed.
Available	This displays the number of licenses out of the total number purchased which have not been registered for use. If the **Available** number is **0**, you cannot register a new copy of this particular package.
Quantity Ordered	This displays the total number of licenses purchased using this **Customer Id** number.
Clients	If the particular package includes restrictions on the number of I/O clients, that appears here.
I/O Points	If the particular package includes restrictions on the number of I/O points, that appears here.

9. To register your software, click the Register link. The Registration Information page opens.



Register your OpenBSI and OpenEnterprise Software

Please enter your license id and password, normally supplied by Remote Automation Solutions when you purchase the software. If you do not have a customer id please contact our Technical Support team.

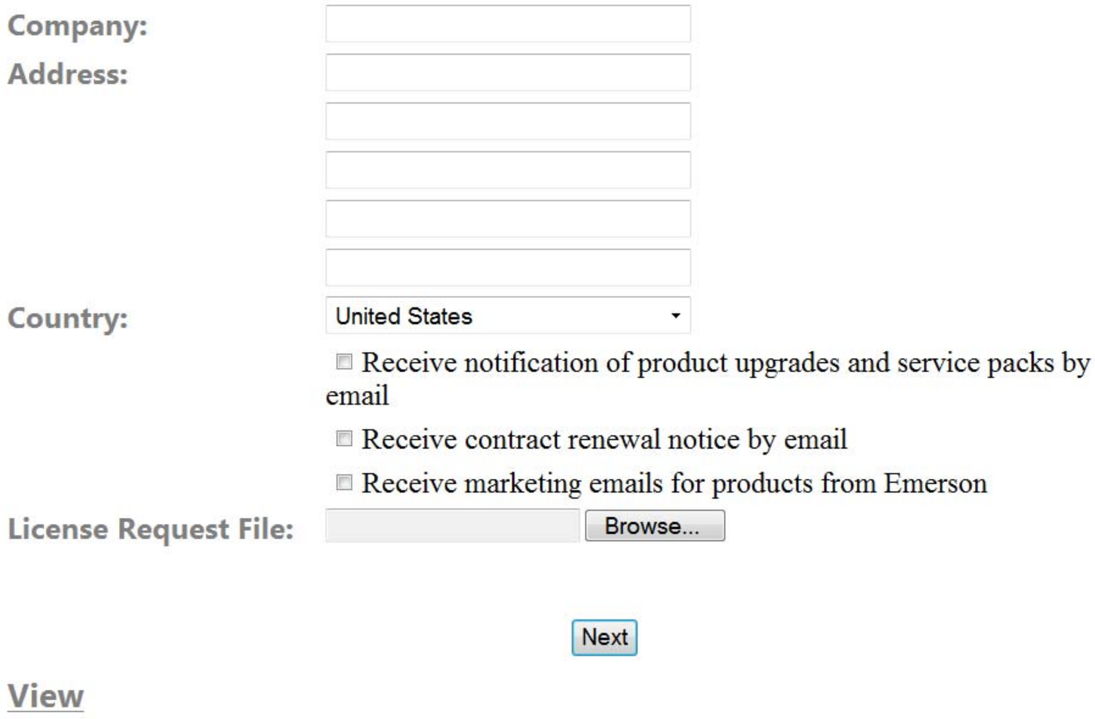
You need to supply a License Request File to register your software. When registration is complete, a key file will be made available for download. This key file should then be used to unlock the software on your computer. A copy of the Key file will also be automatically e-mailed to the entered E-Mail Address.

After entering your details, please press the Next button.

Your Name:

E-Mail Address:

Verify E-Mail:



Company:

Address:

Country: United States

□ Receive notification of product upgrades and service packs by email

□ Receive contract renewal notice by email

□ Receive marketing emails for products from Emerson

License Request File:

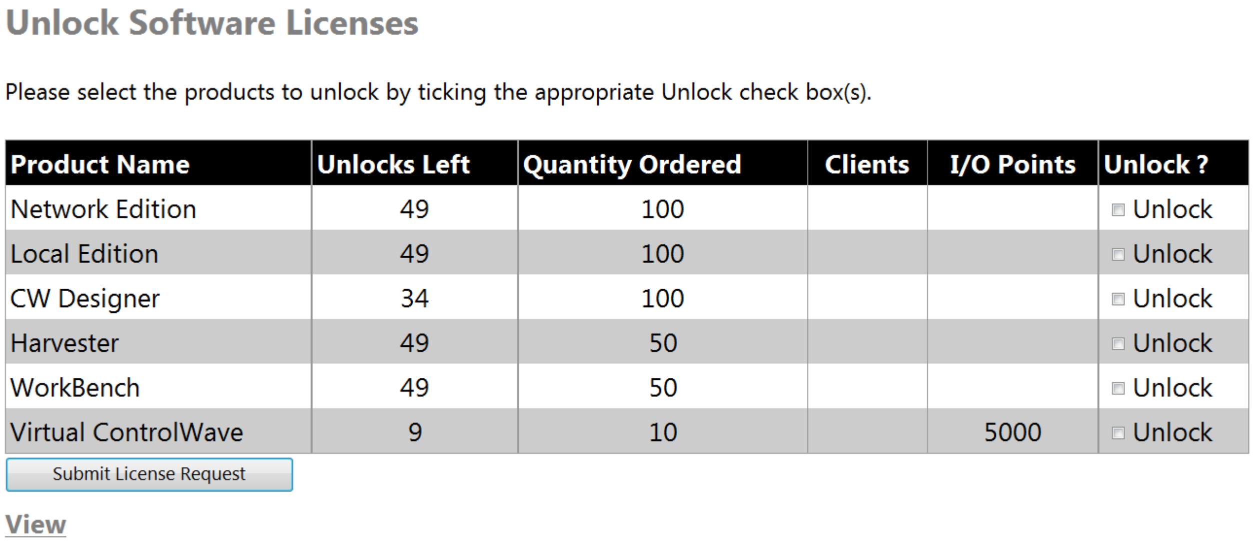
Figure 2-13. Enter Your Information Web Page

10. Enter your name in the **Your Name** field, and your e-mail address in *both* the **E-mail Address** and **Verify E-Mail** fields. Enter your mailing address in the **Company** Address fields then scroll down to specify your **Country** and specify your preferences about receiving notifications of product updates, service packs, contract renewals, and marketing announcements by e-mail.

11. Then use the **Browse** button to locate the license request file you generated previously in Step 3. Finally, click **Next**. The Unlock Software Licenses page opens.

Note: The website will send you an e-mail with an attached unlock key file to the e-mail address you specify here.

12. Click the **Unlock** checkbox for the product(s) you want to register, then click **Submit License Request** to send the license request to the website.



Unlock Software Licenses

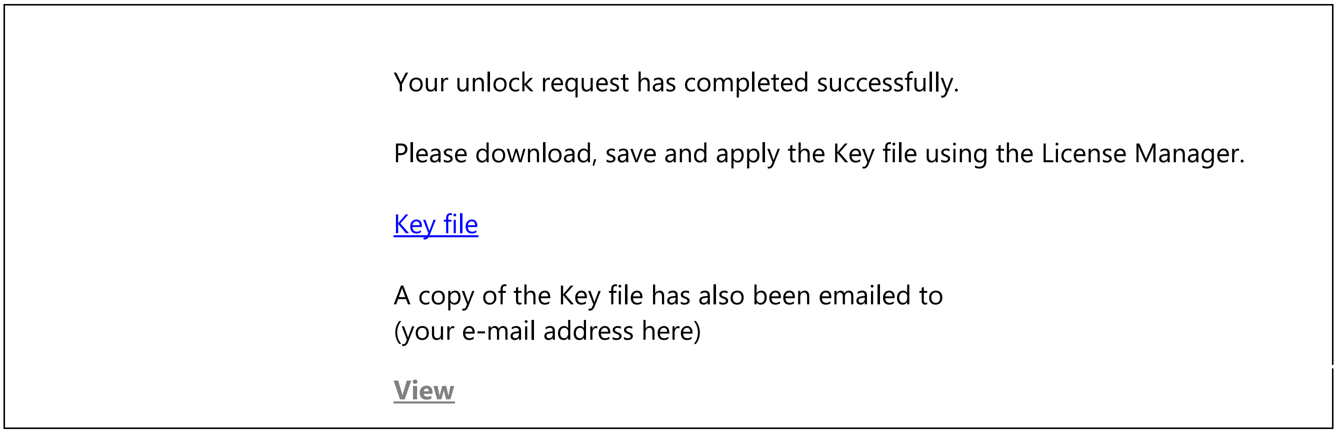
Please select the products to unlock by ticking the appropriate Unlock check box(s).

Product Name	Unlocks Left	Quantity Ordered	Clients	I/O Points	Unlock ?
Network Edition	49	100			□ Unlock
Local Edition	49	100			□ Unlock
CW Designer	34	100			□ Unlock
Harvester	49	50			□ Unlock
WorkBench	49	50			□ Unlock
Virtual ControlWave	9	10		5000	□ Unlock

Figure 2-14. Submit License Request Web Page

13. If the license request is successful, the website generates a key file you can use to unlock your software. Click **Key file** to download a copy of the key file (see *Figure 2-15*). (The website also e-mails you a copy of the key file at the e-mail address you entered in step 9.)

Note: If the computer which contains the locked software does **not** have internet access, you need to transfer the key file back to that computer to complete the registration process.



Your unlock request has completed successfully.

Please download, save and apply the Key file using the License Manager.

Key file

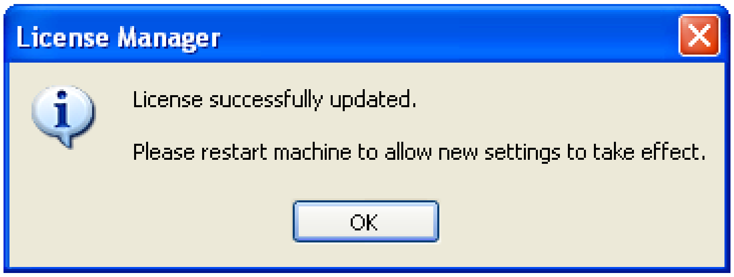
A copy of the Key file has also been emailed to
(your e-mail address here)

Figure 2-15. Download Key File Web Page

14. In order to complete the registration process, the key file you received must reside on the PC containing the newly installed software packages. Go back to the License Manager session you started in Step 3. (If you shut the License Manager down, restart it by clicking **Start** > **Programs** > **Bristol Babcock Licensing> License Manager.**

15. To apply the key file, click the **Include Key** button and specify the location of the key file.

16. If the registration completes successfully, you will see the message box in *Figure 2-16;* just click **OK** and you're done. Reboot your PC for the new licenses to be activated.


License Manager

License successfully updated.

Please restart machine to allow new settings to take effect.

Figure 2-16. License Successfully Updated message box

2.4 How to Transfer a License from One PC to another PC

Occasionally, it may be necessary for you to transfer an OpenBSI software license from one computer, to another computer. This might be necessary, for example, if you are upgrading to a newer computer, and want to shift your OpenBSI license to the newer computer, and remove it from the older computer.

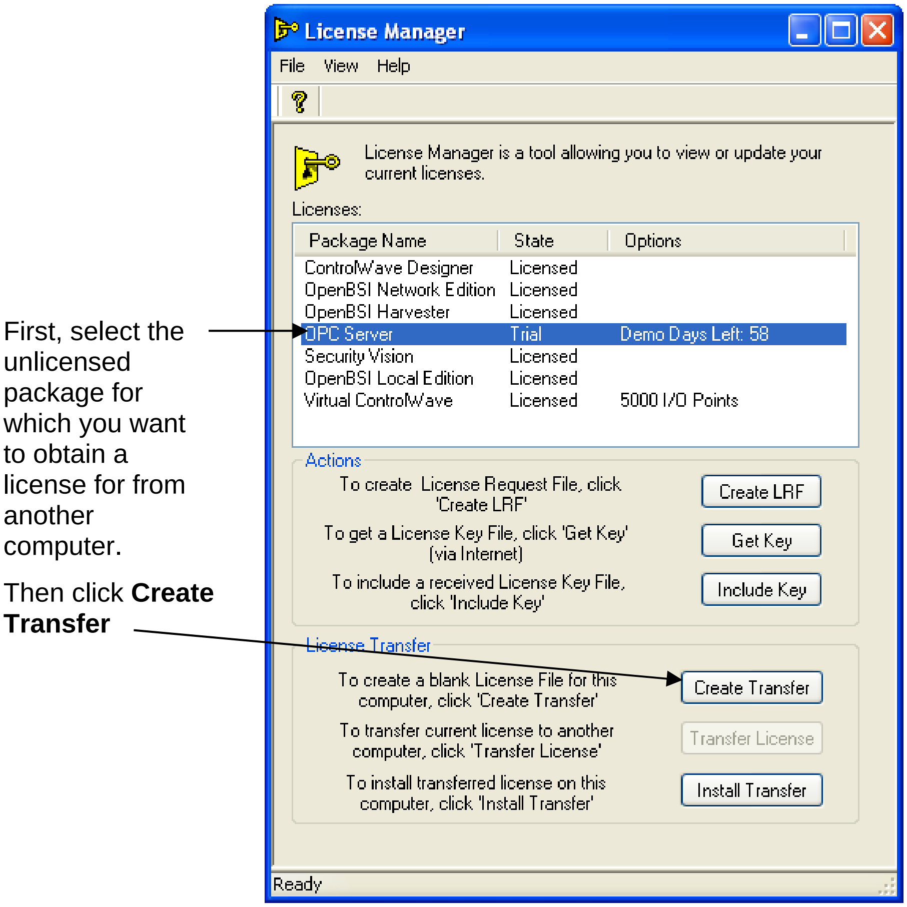
In this explanation, the computer which is giving up its license will be referred to as the **source computer** and the new computer which will receive the transferred license will be referred to as the **destination computer**.

Note: In order to transfer the license, the license on the source computer must already be registered, and the software must have already been installed on the destination computer.

1. Start the License Manager software, on the destination computer, using the sequence: **Start > Programs > Bristol Babcock Licensing> License Manager.**

2. Select the unlicensed package you want to change from a trial / demo package, into a licensed package, and generate an empty transfer request file.

Note: The transfer request file you create must be read-write. It cannot be a read-only file.



License Manager is a tool allowing you to view or update your current licenses.

Licenses:

Package Name	State	Options
ControlWave Designer	Licensed	
OpenBSI Network Edition	Licensed	
OpenBSI Harvester	Licensed	
OPC Server	Trial	Demo Days Left: 58
Security Vision	Licensed	
OpenBSI Local Edition	Licensed	
Virtual ControlWave	Licensed	5000 I/O Points

Actions

To create License Request File, click 'Create LRF' — Create LRF

To get a License Key File, click 'Get Key' (via Internet) — Get Key

To include a received License Key File, click 'Include Key' — Include Key

License Transfer

To create a blank License File for this computer, click 'Create Transfer' — Create Transfer

To transfer current license to another computer, click 'Transfer License' — Transfer License

To install transferred license on this computer, click 'Install Transfer' — Install Transfer

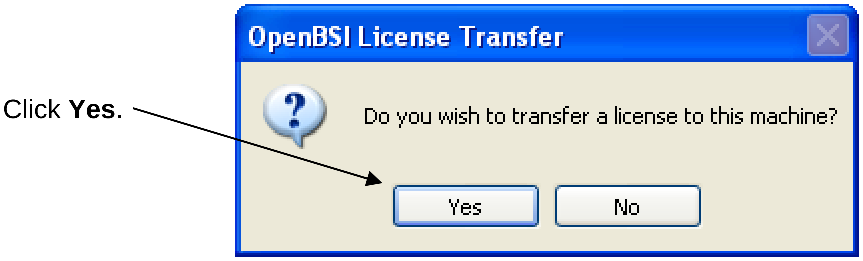
Ready

First, select the unlicensed package for which you want to obtain a license for from another computer.

Then click **Create Transfer**

Figure 2-17. Generate a License Transfer Request File

3. Answer **Yes** to the prompt. (See *Figure 2-18.*)



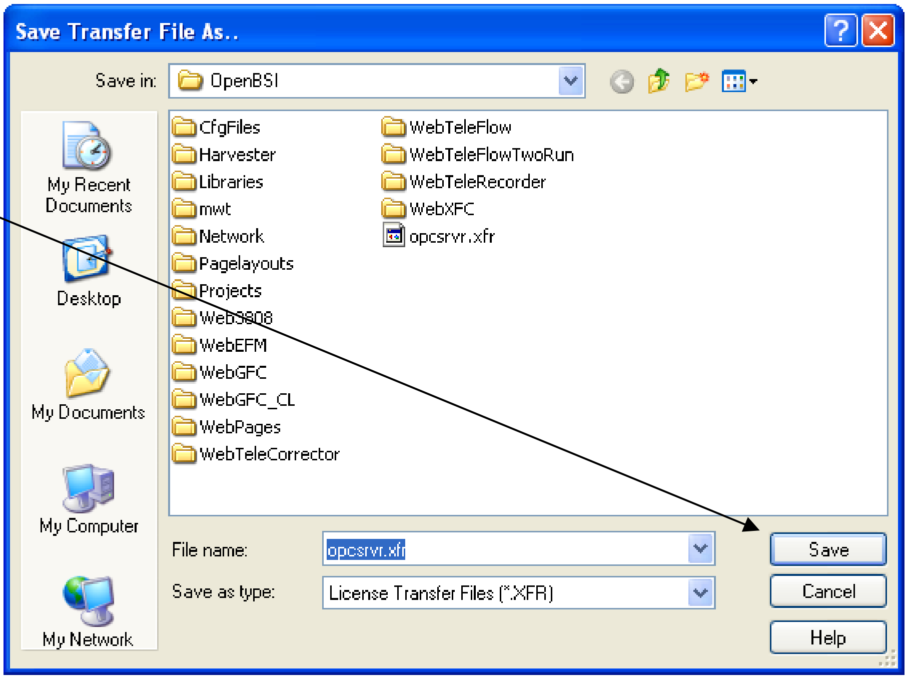
Do you wish to transfer a license to this machine?

Click **Yes**.

Figure 2-18. Confirm Transfer Request message box

4. Save the empty transfer (*.XFR) file. (See *Figure 2-19.*)

Click **Save** to create the empty transfer file.



Save Transfer File As..

Save in: OpenBSI

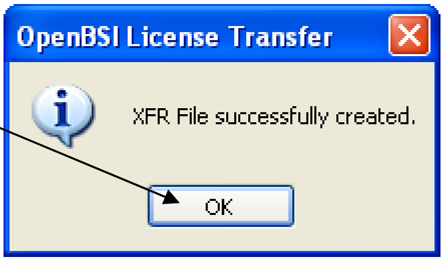
File name: opcsrvr.xfr

Save as type: License Transfer Files (*.XFR)

Figure 2-19. Save Transfer Request File

5. Click **OK** when the file is created.

Click **OK**.



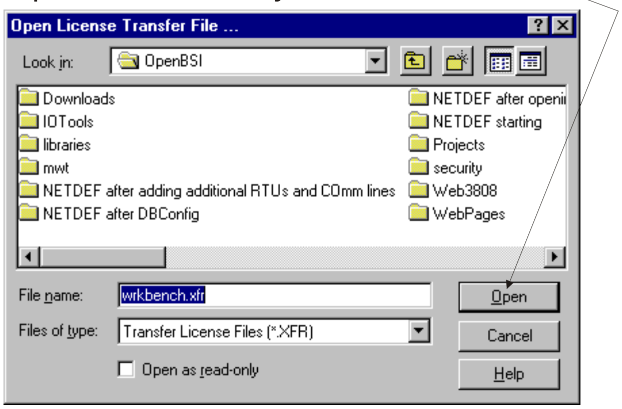
OpenBSI License Transfer

XFR File successfully created.

Figure 2-20. XFR File Created Successfully

6. Copy the XFR File you just saved onto the **source** (licensed) computer. You can transfer it via a USB thumb drive, e-mail, etc.
7. Start the License Manager software, *on the destination computer*, using the sequence: **Start** > **Programs** > **Bristol Babcock Licensing> License Manager.**
8. Now, you must transfer the license of the software package, into the transfer (*.XFR) file you created in Step 5. In the License Manager, select the license you want to transfer and click **Transfer License**.
9. Now locate the XFR file you created earlier and click **Open**.

Open the XFR file you created earlier



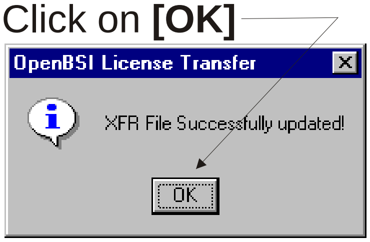
File name: wrkbench.xfr

Files of type: Transfer License Files (*.XFR)

Figure 2-21. Open XFR File on Source Machine

10. When the License Manager completes the update of the XFR file, click **OK**. You now have successfully removed the license from the source computer, and stored it in a file. Notice now that the State field in the License Manager on the source computer no longer shows “Licensed” for this software package.

Click on **[OK]**

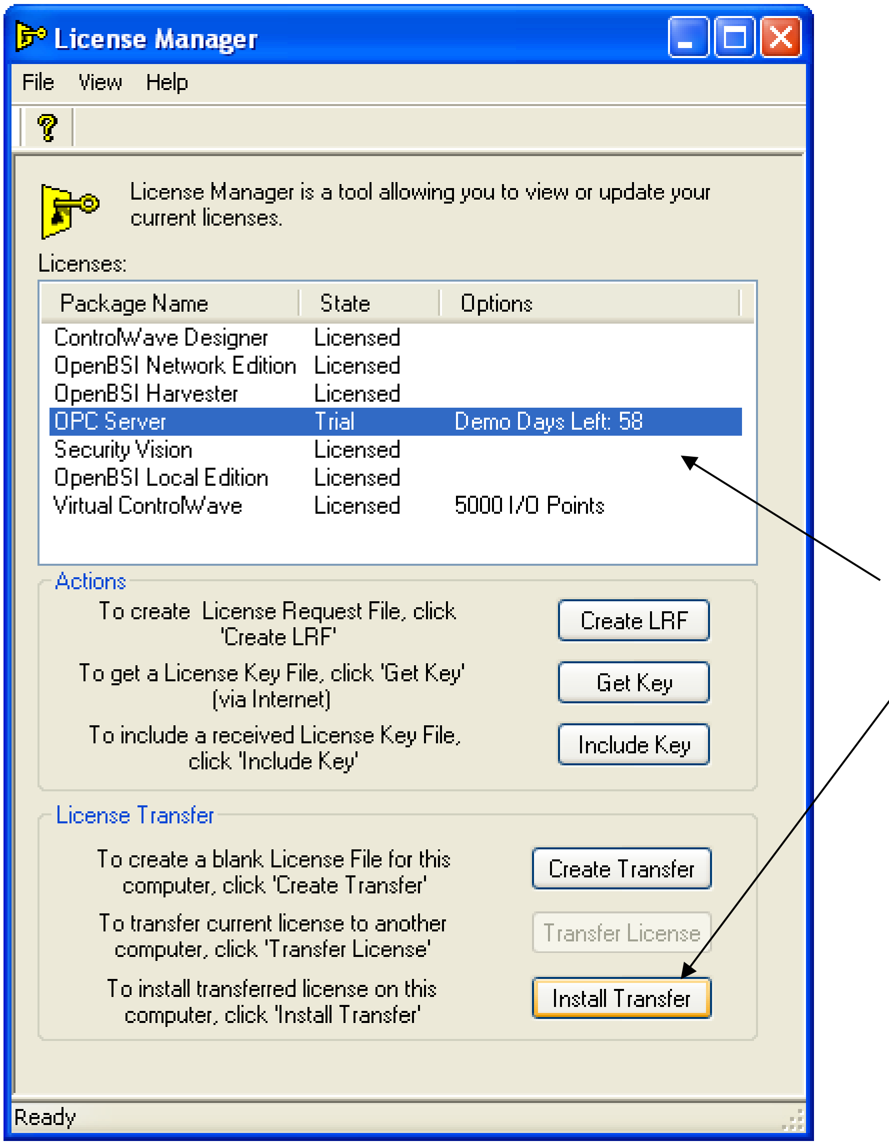


XFR File Successfully updated!

Figure 2-22. License Transferred Into File

11. You can now copy the XFR file onto the destination computer. (You can transfer it via a USB thumb drive, e-mail, etc.)

12. Once you copy the XFR file to the destination computer, you can install, and complete the transfer. To do this, select the package which needs to be licensed, then click **Install Transfer**. (See *Figure 2-23*.)



License Manager is a tool allowing you to view or update your current licenses.

Licenses:

Package Name	State	Options
ControlWave Designer	Licensed	
OpenBSI Network Edition	Licensed	
OpenBSI Harvester	Licensed	
OPC Server	Trial	Demo Days Left: 58
Security Vision	Licensed	
OpenBSI Local Edition	Licensed	
Virtual ControlWave	Licensed	5000 I/O Points

To create License Request File, click 'Create LRF'

To get a License Key File, click 'Get Key' (via Internet)

To include a received License Key File, click 'Include Key'

To create a blank License File for this computer, click 'Create Transfer'

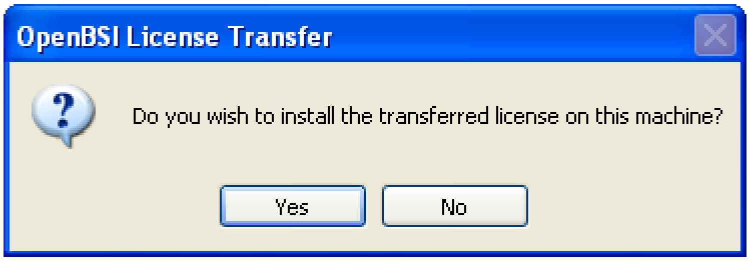
To transfer current license to another computer, click 'Transfer License'

To install transferred license on this computer, click 'Install Transfer'

Select the package you want to license, then click **Install Transfer**

Figure 2-23. Install Transferred License

13. The License Manager prompts you to confirm you want to install the transferred license. Click **Yes**. (See *Figure* 2-24.)



Do you wish to install the transferred license on this machine?

Figure 2-24. Confirm Transferred License

14. Specify the location of the updated XFR file on the destination computer and click **Open**. This completes the transfer.

2.4.1 Using the software…

Most users can begin with one of the "Quickstart" chapters, listed below.

- *Chapter 3 - Quickstart (OpenBSI BSAP Communication)*
- *Chapter 4 - Quickstart (OpenBSI IP Communication)'*

Detailed information on each option in NetView is included in *Chapter 6 - Using NetView.*

Information on programming configuration parameters at the controller using the Flash Configuration utility is included in *Chapter 5 - Using LocalView*.

Once the configuration activities described in these chapters are complete, you can proceed to use the other tools (Downloader, DataView, Signal Writer, etc.) The remaining chapters of this manual describe these tools.

As you are becoming familiar with a particular utility, you should also consult the Help Windows integrated with it. These are accessed from the **Help** menu bar selection in each individual utility, or by pressing the **[F1]** key.

Some utilities also include context-sensitive help, in which you point at the item for which you need help. Context-sensitive help is accessible through the icon shown at left.

2.5 Using OpenBSI with Newer Microsoft® Windows Operating Systems

Microsoft$^{®}$ Windows operating systems in recent years (XP and newer) include security enhancements designed to prevent unauthorized communication with other computers. If you have installed these operating systems on your computer, any application which Windows is unfamiliar with, and performs communications, may either be automatically prevented from working, or its operation may be restricted by the Windows operating system.

Like any other communications application, these security enhancements affect OpenBSI. Certain *default* Windows settings will disable some OpenBSI features. In order to remedy this situation, these OpenBSI application programs need to be identified for Windows, as authorized communicators. Once this is done, OpenBSI is recognized by Windows, and can operate normally.

2.5.1 Which OpenBSI Features are affected?

- **Proxy communication** – If your system incorporates proxy OpenBSI Workstations, that is, OpenBSI Workstations that are *not* Network Host PCs, but that nonetheless communicate with RTUs through *other* OpenBSI Workstations, they will no longer communicate, either directly, or indirectly.
- **Bristol IP Driver – BSIPDRV** - If your system communicates with controllers using IP, both IP communications and time synchronization messages will be blocked by the firewall.
- **Object Server** - This application uses OPC (OLE for Process Control), an industry-standard communication method which is disabled by the operating system upgrade.
- **ActiveX Controls**– The OpenBSI ActiveX controls (used in web pages, for example) will still operate; however, users are required to perform extra steps to access them following the operating system upgrade. In addition, certain items, such as grid controls for signal lists, etc. may require a particular OpenBSI Service Pack, or Microsoft® Windows patch to work correctly.

2.5.2 How do I make these applications work properly with Windows?

In order for these OpenBSI applications to work properly again, you need to:

- Re-configure the Windows Firewall software (if you’re using it).
- Re-configure the DCOM and RTRSERVC software on your computer.

What is a Firewall?

A firewall is either a software program or a hardware device, which blocks unauthorized communications. It is used to block malicious communications (spam e-mail, viruses, hacker intrusions, etc.) In order for communications to be allowed through the firewall, they must be authorized. Windows operating systems have a built-in firewall, which, beginning with Windows XP Service Pack 2, is turned **ON** by default.

What is DCOM?

DCOM stands for Distributed Component Object Model. It’s just a communication protocol that allows different applications to talk to each other over networks. The Object Server requires DCOM in order to function.

What is RTRSERVC?

RTRSERVC is a router service that allows OpenBSI proxy communication.

The next several sections details steps you need to take to allow OpenBSI applications to work with various Windows operating systems.

2.6 Using OpenBSI with Microsoft® Windows XP Service Pack 2

For OpenBSI to function with XP Service Pack 2, you need to re-configure the Windows Firewall software, and re-configure DCOM software.

2.6.1 Reconfiguring the Windows XP Firewall

Reconfiguring the Windows XP Firewall involves either disabling it (not recommended in most cases) or making certain OpenBSI applications exceptions to the firewall, to let them through.

Note: Portions of these sections reproduced, with permission, from the OPC™ Foundation white paper *Using OPC via DCOM with Microsoft Windows XP Service Pack 2* by Karl-Heinz Deiretsbacher, Jim Luth, and Rashesh Mody 2004.

Note: If Object Server is currently running, you must shut it down during this configuration.

2.6.2 Disabling the Windows XP Firewall

If the Windows XP Firewall is the only firewall protection you have, we recommend you leave it enabled, and skip to *Section 2.6.3*. If, however, you have a corporate firewall, already installed, and it is operating correctly, you may decide that the Windows XP Firewall is unnecessary. If this is the case, you can disable the Windows XP firewall.

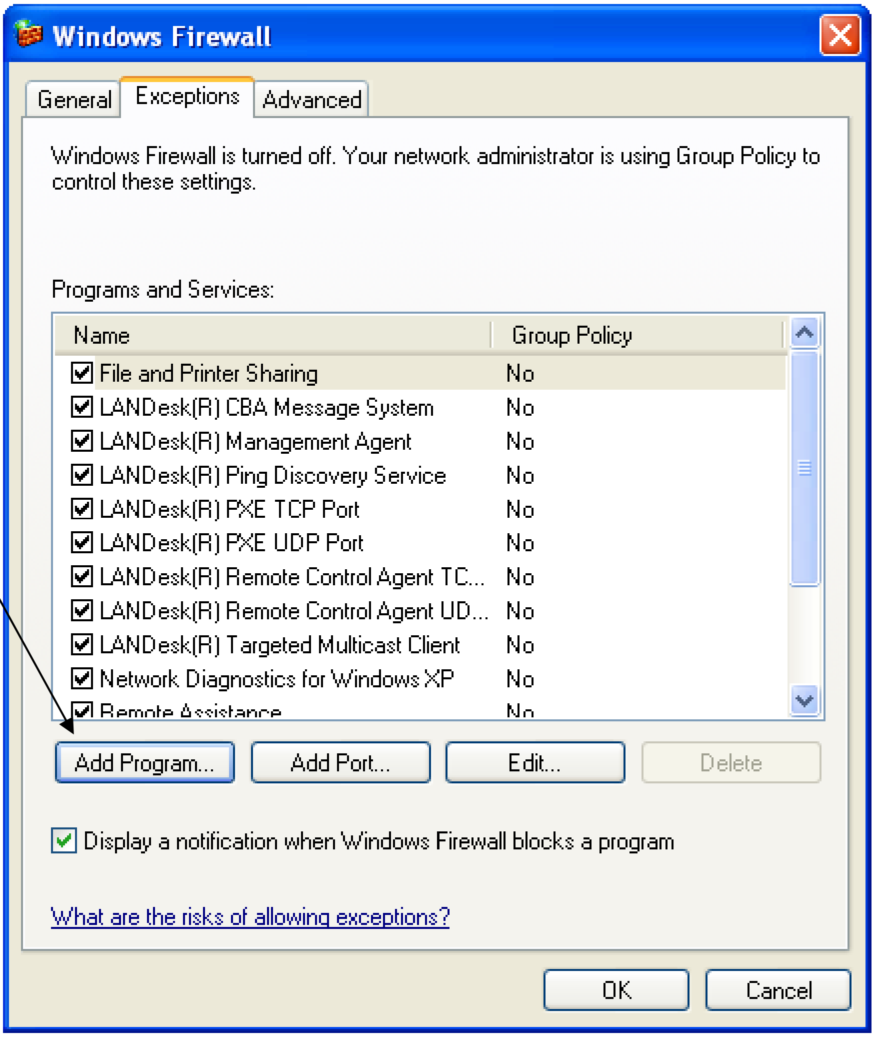
⚠ **Caution** **Only perform these next three steps if you have a separate corporate firewall which renders the XP firewall unnecessary.**

1. From the Windows™ Control Panel, double-click on **Windows Firewall**.
2. On the **General** page of the Windows Firewall dialog box, select the **Off (not recommended)** button, then click on **OK**.
3. Skip the remaining steps in this sub-section, and continue with the section *“Reconfiguring the DCOM Software*.”

2.6.3 Making Object Server an Exception to the Windows XP Firewall

If you install Object Server, you need to grant it as an exception to the Windows XP Firewall.

1. From the Windows™ Control Panel, double-click **Windows Firewall**.
2. On the **Exceptions** tab of the Windows Firewall dialog box, click **Add Program** (see *Figure 2-25*.)



Windows Firewall is turned off. Your network administrator is using Group Policy to control these settings.

Programs and Services:

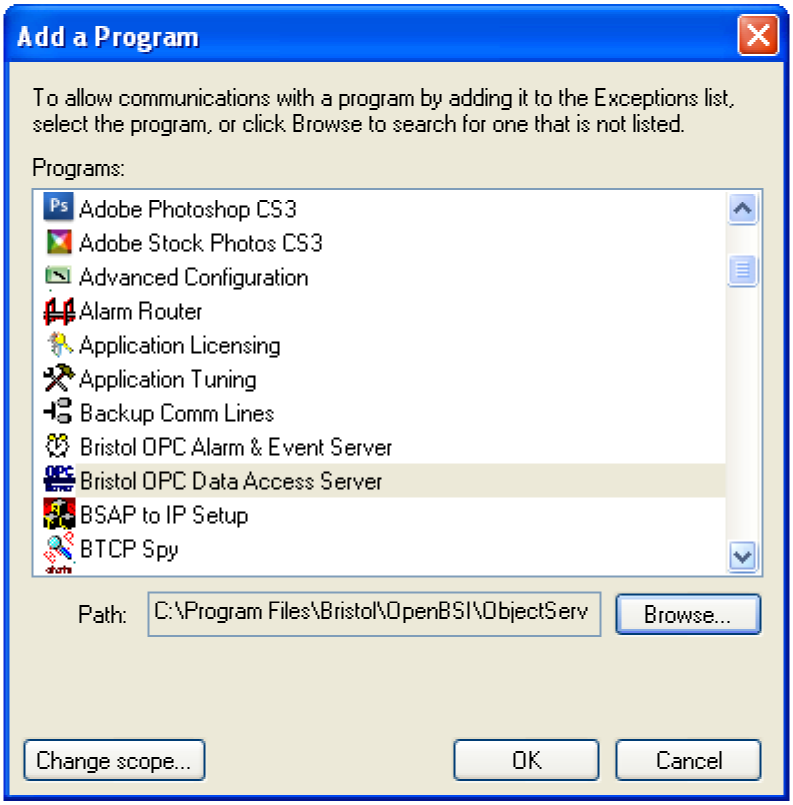
Name	Group Policy
☑ File and Printer Sharing	No
☑ LANDesk(R) CBA Message System	No
☑ LANDesk(R) Management Agent	No
☑ LANDesk(R) Ping Discovery Service	No
☑ LANDesk(R) PXE TCP Port	No
☑ LANDesk(R) PXE UDP Port	No
☑ LANDesk(R) Remote Control Agent TC...	No
☑ LANDesk(R) Remote Control Agent UD...	No
☑ LANDesk(R) Targeted Multicast Client	No
☑ Network Diagnostics for Windows XP	No
☑ Remote Assistance	No

☑ Display a notification when Windows Firewall blocks a program

What are the risks of allowing exceptions?

Figure 2-25. Windows Firewall Exception tab

3. To add Object Server to the list of authorized communicators through the Windows XP Firewall, choose Object Server's OPC server (**BristolOPCServer.exe)** from the list, or use the **Browse** button to locate it. Select it, and then click **OK**.



To allow communications with a program by adding it to the Exceptions list, select the program, or click Browse to search for one that is not listed.

- Adobe Photoshop CS3
- Adobe Stock Photos CS3
- Advanced Configuration
- Alarm Router
- Application Licensing
- Application Tuning
- Backup Comm Lines
- Bristol OPC Alarm & Event Server
- Bristol OPC Data Access Server
- BSAP to IP Setup
- BTCP Spy

Path: C:\Program Files\Bristol\OpenBSI\ObjectServ

Figure 2-26. Windows Firewall Add Program dialog box

2.6.4 Add Ports for DCOM and RTRSERVC for the XP firewall

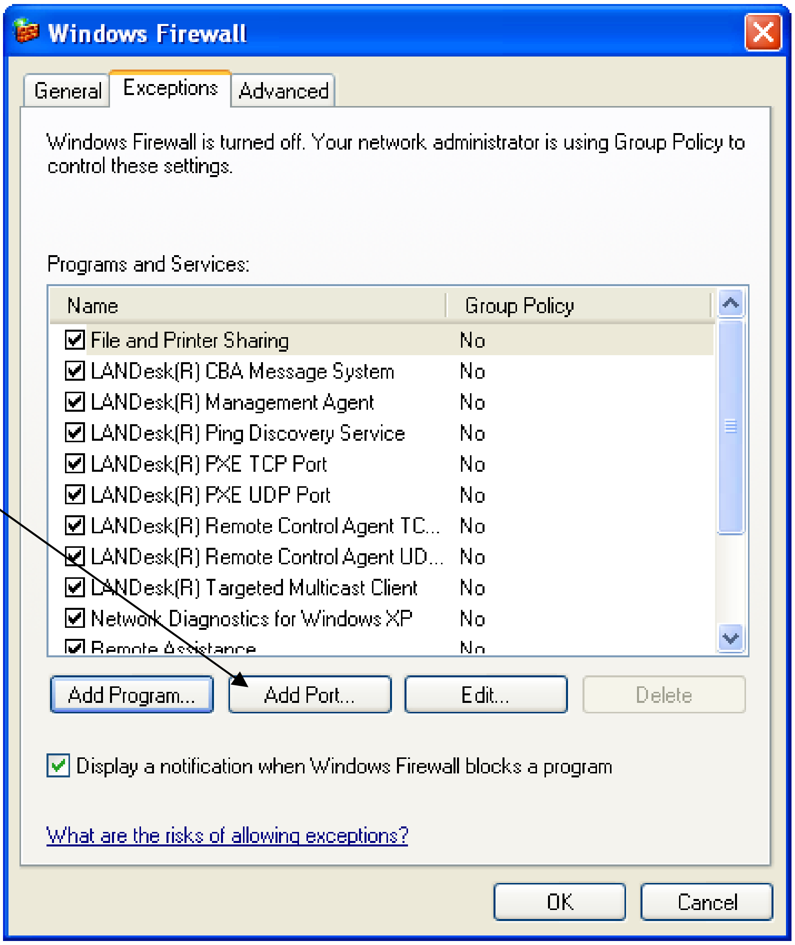
In the previous section, we specified programs that the Firewall needed to know about. Now we have to identify which ports these programs use.

Note: When we say ports, we're not talking about physical communication ports; we're talking about software connections into the system.

To add the ports, follow these steps:

1. From the **Exceptions** tab of the Windows Firewall dialog box, click **Add Port**.

Click **Add Port**



Windows Firewall is turned off. Your network administrator is using Group Policy to control these settings.

Programs and Services:

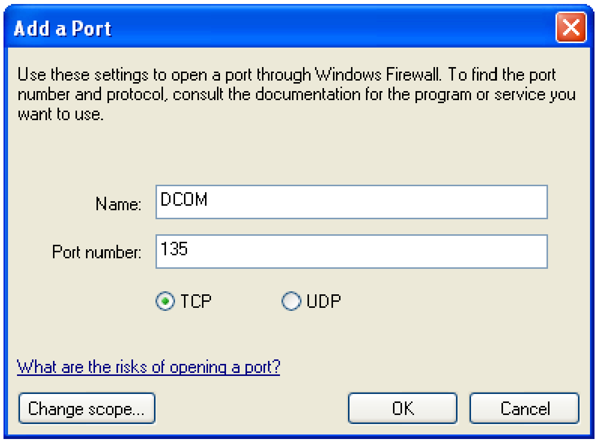
Name	Group Policy
☑ File and Printer Sharing	No
☑ LANDesk(R) CBA Message System	No
☑ LANDesk(R) Management Agent	No
☑ LANDesk(R) Ping Discovery Service	No
☑ LANDesk(R) PXE TCP Port	No
☑ LANDesk(R) PXE UDP Port	No
☑ LANDesk(R) Remote Control Agent TC...	No
☑ LANDesk(R) Remote Control Agent UD...	No
☑ LANDesk(R) Targeted Multicast Client	No
☑ Network Diagnostics for Windows XP	No
☑ Remote Assistance	No

☑ Display a notification when Windows Firewall blocks a program

What are the risks of allowing exceptions?

Figure 2-27. Windows Firewall Add Port

2. First, you need to add the port for DCOM. In the Add Port dialog box, enter **DCOM** for the port's **Name**, **135** for the **Port Number** and choose **TCP**. Then click **OK**.



Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name: DCOM

Port number: 135

● TCP ○ UDP

What are the risks of opening a port?

Figure 2-28. Windows Firewall Add a Port dialog box

3. Now add the port for **RTRSERVC**. Click **Add Port** again, and in the Add Port dialog box, enter **rtrservc** for the port's **Name**, **1236** for the **Port number** and choose **TCP**. Then click **OK**.

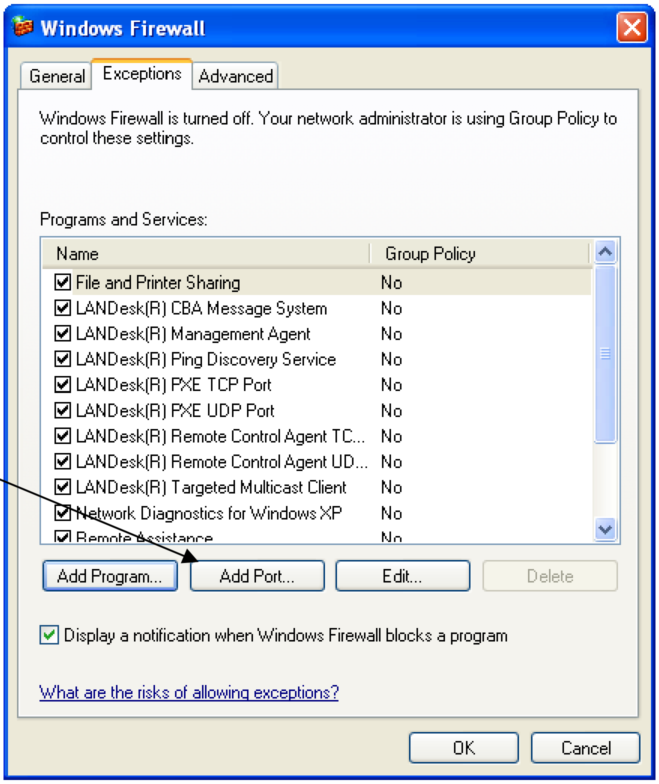
Note: The reason we say "1236" is that "1236" is the default port number used by RTRSERVC. That number is initially set in the **TCP Port Number for Router Process** field of the IP Parameters dialog box in NetView's System Wizard. If you originally set it to something *different* than 1236, you should use *that* number here, instead of 1236.

2.6.5 Add Ports for the Bristol IP Driver (BSIPDRV) for the XP firewall

This section is *almost* identical to *Section 2.6.4*. We are adding two additional ports for the Bristol IP Driver (BSIPDRV). One is for the driver itself, and the other is for Time Synchronization messages. The main difference from the previous step is the port numbers and the port type, which is UDP, instead of TCP.

1. From the **Exceptions** tab of the Windows Firewall dialog box, click **Add Port**.

Click **Add Port**



Windows Firewall is turned off. Your network administrator is using Group Policy to control these settings.

Programs and Services:

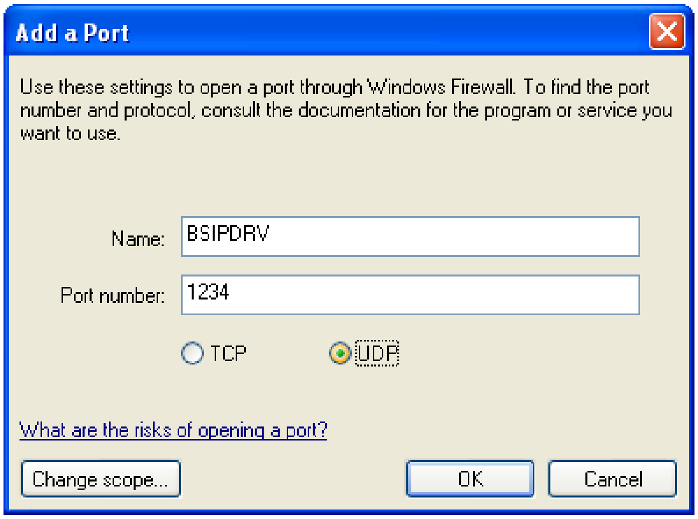
Name	Group Policy
☑ File and Printer Sharing	No
☑ LANDesk(R) CBA Message System	No
☑ LANDesk(R) Management Agent	No
☑ LANDesk(R) Ping Discovery Service	No
☑ LANDesk(R) PXE TCP Port	No
☑ LANDesk(R) PXE UDP Port	No
☑ LANDesk(R) Remote Control Agent TC...	No
☑ LANDesk(R) Remote Control Agent UD...	No
☑ LANDesk(R) Targeted Multicast Client	No
☑ Network Diagnostics for Windows XP	No
☑ Remote Assistance	No

☑ Display a notification when Windows Firewall blocks a program

What are the risks of allowing exceptions?

Figure 2-29. Windows Firewall – Add Port for BSIPDRV

2. Add the first port for **BSIPDRV**. In the Add Port dialog box, enter **BSIPDRV** for the port's **Name**, **1234** for the **Port Number** and choose **UDP**. Then click **OK**.



Add a Port

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name: BSIPDRV

Port number: 1234

○ TCP ● UDP

What are the risks of opening a port?

Figure 2-30. Windows Firewall Add Port for BSIPDRV

3. Repeat Step 2 to add the second port for **BSIPDRV** except enter **1235** for the **Port Number**.

Note: Again, we’re saying “1234” and “1235” because those are the default port numbers used by BSIPDRV. Those numbers are initially set in the **UDP Port Number for IP Driver** and **UDP Port Number for Time Synch** fields of the IP Parameters dialog box in NetView’s System Wizard. If you originally set them to something *different* than 1234 and 1235, you should use *those* numbers here, instead.

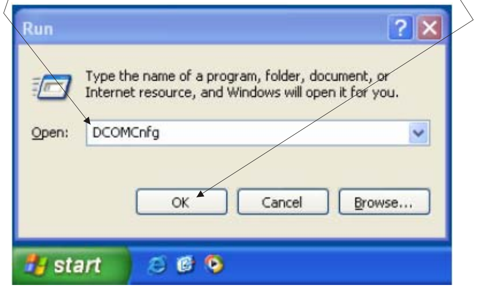
2.6.6 Reconfiguring the DCOM Software for the XP firewall

You must reconfigure the DCOM software for the Object Server to function correctly.

1. Click Start > Run.

2. Type **DCOMCnfg** in the Run dialog box and click **OK**. This opens the **Component Services** page.

Type ‘DCOMCnfig’ then click [OK].

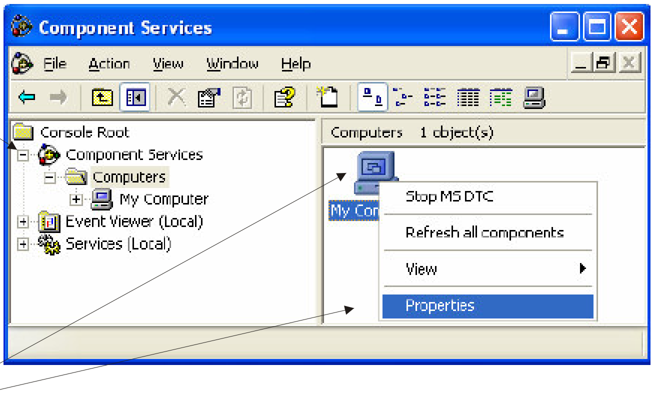


Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: DCOMCnfg

Figure 2-31. Run dialog box

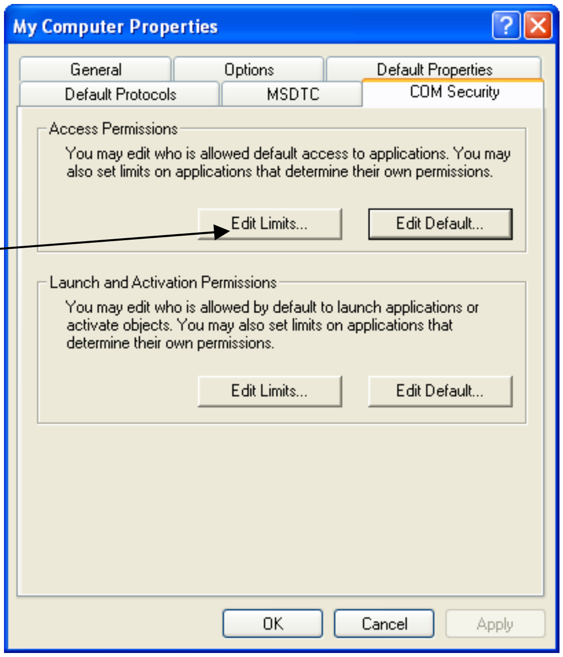
First, click on ‘Component Services’



Then *right*-click on the ‘My Computer’ icon, and choose **“Properties”** from the pop-up menu.

Figure 2-32. Component Services page

3. In the Component Services page, locate **Console Root** in the file tree of the left window pane.
4. Under Console Root, click **Component Services** to expand the folder.
5. In the right window pane, **right**-click the **My Computer** icon, and select **Properties** from the pop-up window. This opens the My Computer Properties dialog box.
6. In the My Computer Properties dialog box, click the **COM Security** tab.



You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

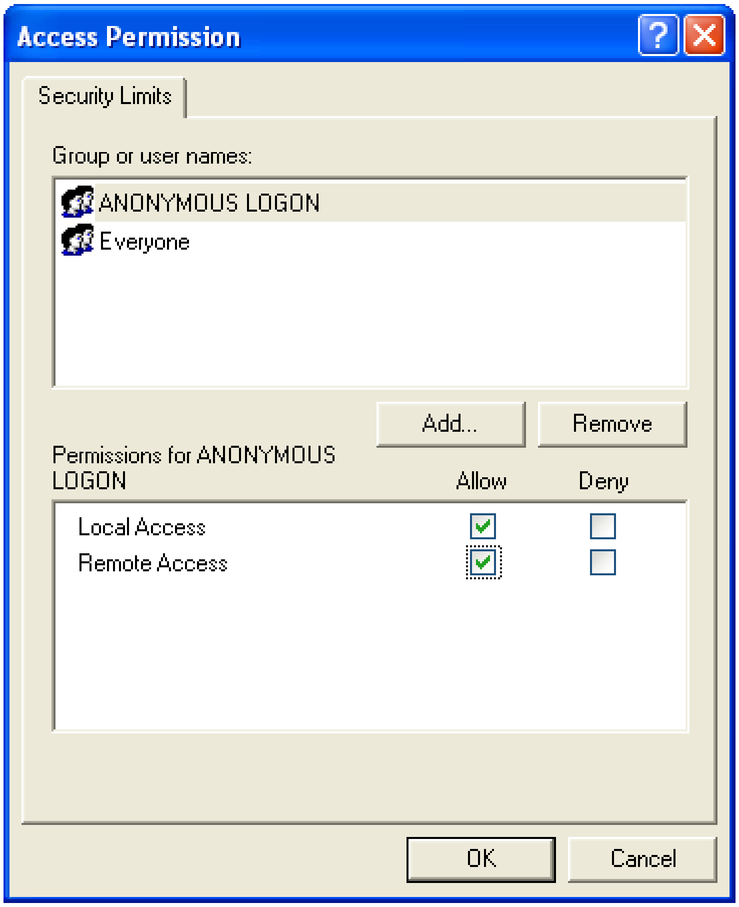
You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

Click **Edit Limits**

Figure 2-33. Access Permissions

7. In the “Access Permissions” box (top part of the page) click **Edit Limits.**

8. In the **Group or user names** box (top part of the Access Permissions dialog box) click the **ANONYMOUS LOGIN** icon.



Group or user names:

ANONYMOUS LOGON
Everyone

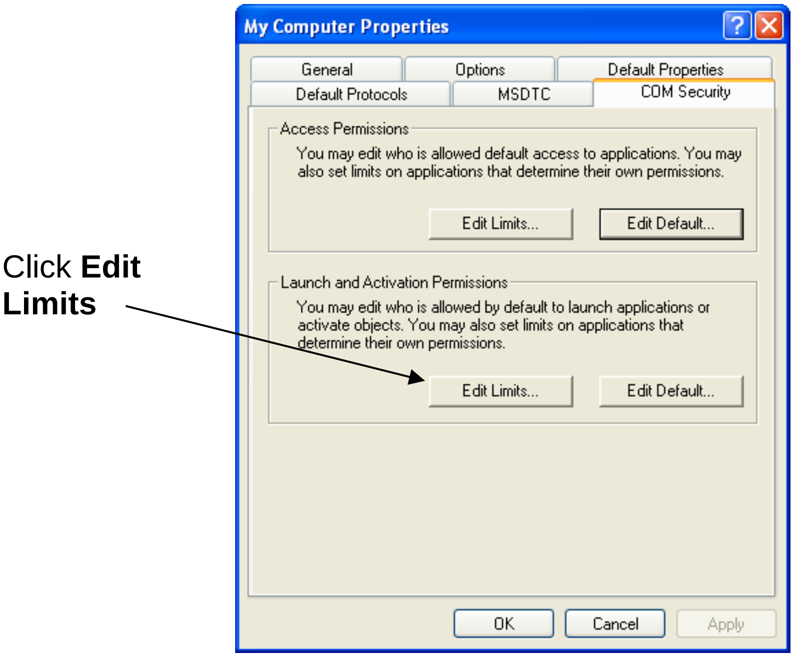
Permissions for ANONYMOUS LOGON	Allow	Deny
Local Access	☑	□
Remote Access	☑	□

Figure 2-34. Access Permissions dialog box

9. In the bottom part of the dialog box, select the **Allow Local Access** and **Remote Access** permission items. They must be checked for OPC to function.

10. Repeat this process for the **Everyone** icon.

11. Click **OK** and the My Computer Properties dialog box re-opens. Click **Edit Limits** in the Launch and Activation Parameters (bottom part of the dialog box).



Access Permissions

You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

Launch and Activation Permissions

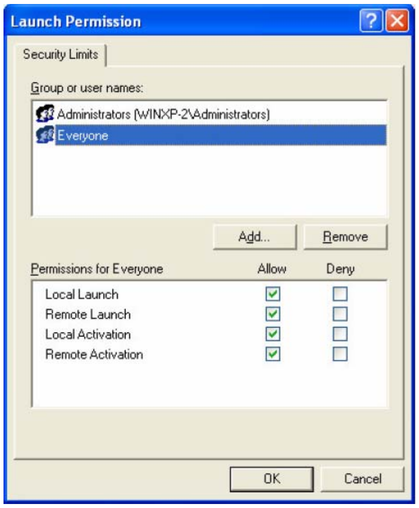
You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

Click **Edit Limits**

Figure 2-35. Launch and Activation Permissions

12. In the Launch and Activations Permissions box (bottom part of the My Computer Properties **COM Security** tab) click **Edit Limits**.

13. In the Launch Permissions dialog box, click the **Everyone** icon in the **Group or user names** box (top part of the dialog box).



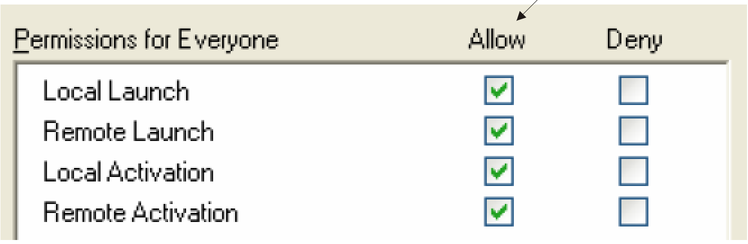
Group or user names:

- Administrators (WINXP-2\Administrators)
- Everyone

Permissions for Everyone	Allow	Deny
Local Launch	☑	□
Remote Launch	☑	□
Local Activation	☑	□
Remote Activation	☑	□

Figure 2-36. Launch Permissions dialog box

14. In the bottom part of the dialog box, select the **Allow** permission items for all the options shown (Local Launch, Remote Launch, Local Activation, and Remote Activation.). It must be checked for OPC to function.



Choose 'Allow' for all the items

Permissions for Everyone	Allow	Deny
Local Launch	☑	□
Remote Launch	☑	□
Local Activation	☑	□
Remote Activation	☑	□

Figure 2-37. Grant Permissions for Everyone

15. Click **OK**.

Note: If you are concerned about granting "everyone" these permissions, where "everyone" in this context refers to every user account on this computer, you can create a special group with these permissions. To restrict it to only some users, you should create a group of users called, for example, "OPC Users", and then give launch permissions only to the "OPC Users" group, instead of "everyone." In this case, you would substitute "OPC Users" for "everyone" in these instructions.

2.7 Using OpenBSI with Microsoft® Windows 2008 Server

For OpenBSI to function with Windows 2008 Server you need to re-configure the Windows Firewall software, and re-configure DCOM software.

2.7.1 Reconfiguring the Windows 2008 Server Firewall

Reconfiguring the firewall involves either disabling it (not recommended in most cases) or making certain OpenBSI applications exceptions to the firewall, to let them through.

Note: If Object Server is currently running, you must shut it down during this configuration.

2.7.2 Disabling the Windows 2008 Server Firewall

If the Windows firewall is the only firewall protection you have, we recommend you leave it enabled, and skip to *Section 2.7.3*. If, however, you have a corporate firewall, already installed, and it is operating correctly, you may decide that the Windows firewall is unnecessary. If this is the case, you can disable the Windows firewall.

⚠ **Caution** **Only perform these next four steps if you have a separate corporate firewall which renders the Windows firewall unnecessary.**

1. From the Windows™ Control Panel, double-click on **Windows Firewall**.

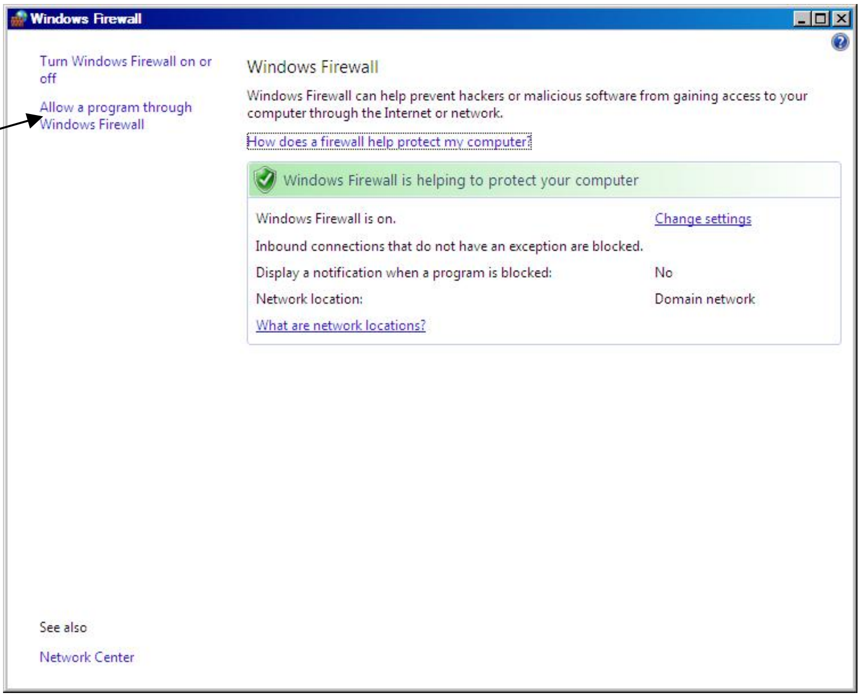
2. Click on the **Turn Windows Firewall on or off** link.

3. On the **General** page of the Windows Firewall dialog box, select the **Off** button, then click on **OK**.
4. Skip the remaining steps in this sub-section, and continue with the section *“Reconfiguring the DCOM Software*.”

2.7.3 Making Object Server an Exception to the Windows 2008 Server Firewall

If you install Object Server, you need to grant it as an exception to the Windows Firewall.

1. From the Windows™ Control Panel, double-click **Windows Firewall**.


Windows Firewall
Turn Windows Firewall on or off
Allow a program through Windows Firewall
How does a firewall help protect my computer?
Change settings
What are network locations?
See also
Network Center

Windows Firewall

Windows Firewall can help prevent hackers or malicious software from gaining access to your computer through the Internet or network.

Windows Firewall is helping to protect your computer

Windows Firewall is on.

Inbound connections that do not have an exception are blocked.

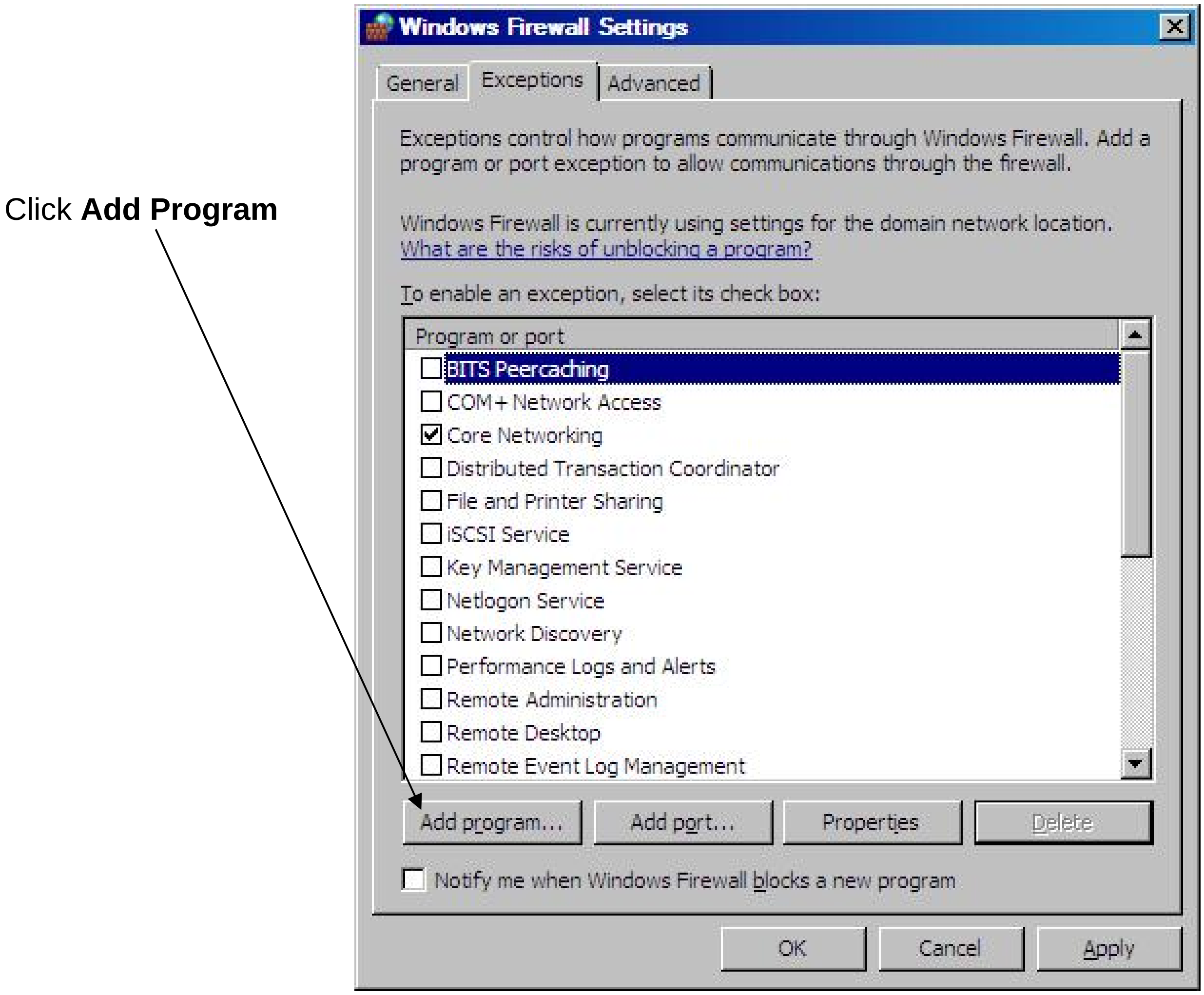
Display a notification when a program is blocked: No

Network location: Domain network

Click here

Figure 2-38. Allow a Program Through the Firewall

2. Click **Allow a program through Windows Firewall**.
3. On the **Exceptions** tab of the Windows Firewall dialog box, click **Add Program** (see *Figure 2-39*.)



Click **Add Program**

Windows Firewall Settings

Exceptions control how programs communicate through Windows Firewall. Add a program or port exception to allow communications through the firewall.

Windows Firewall is currently using settings for the domain network location.
What are the risks of unblocking a program?

To enable an exception, select its check box:

Program or port

- ☐ BITS Peercaching
- ☐ COM+ Network Access
- ☑ Core Networking
- ☐ Distributed Transaction Coordinator
- ☐ File and Printer Sharing
- ☐ iSCSI Service
- ☐ Key Management Service
- ☐ Netlogon Service
- ☐ Network Discovery
- ☐ Performance Logs and Alerts
- ☐ Remote Administration
- ☐ Remote Desktop
- ☐ Remote Event Log Management

☐ Notify me when Windows Firewall blocks a new program

Figure 2-39. Windows Firewall Exception tab

4. To add Object Server to the list of authorized communicators through the Windows Firewall, choose Bristol OPC Alarm & Event Server (**BristolOPCServer.exe)** from the list, or use the **Browse** button to locate it. Select it, and then click **OK**. Repeat this process for Bristol OPC Data Access Server.

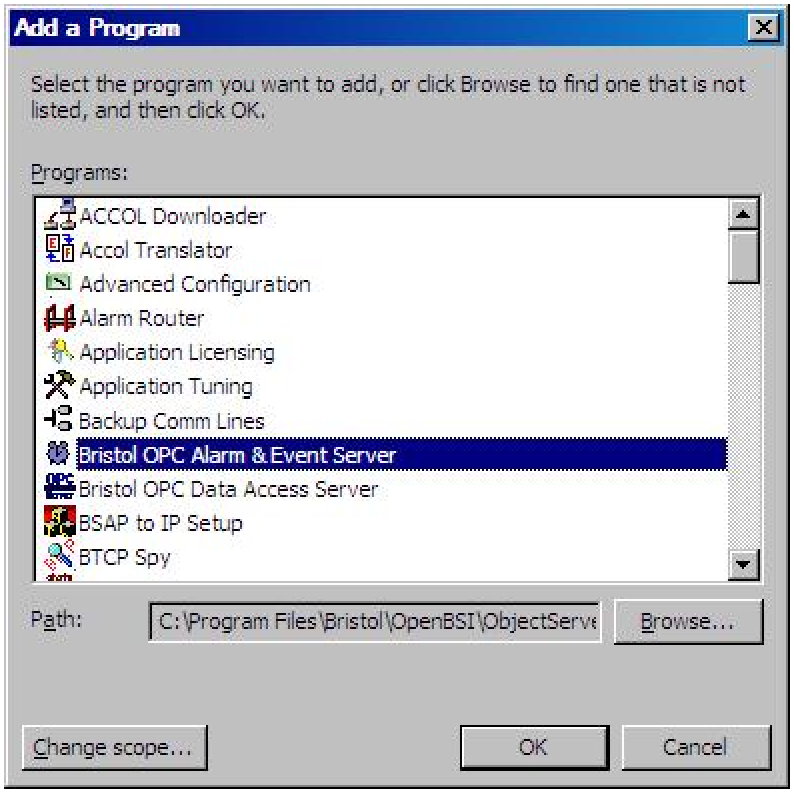

Add a Program
Select the program you want to add, or click Browse to find one that is not listed, and then click OK.
Programs:
ACCOL Downloader
Accol Translator
Advanced Configuration
Alarm Router
Application Licensing
Application Tuning
Backup Comm Lines
Bristol OPC Alarm & Event Server
Bristol OPC Data Access Server
BSAP to IP Setup
BTCP Spy
Path:
C:\Program Files\Bristol\OpenBSI\ObjectServe
Browse...
Change scope...
OK
Cancel

Figure 2-40. Windows Firewall Add Program dialog box

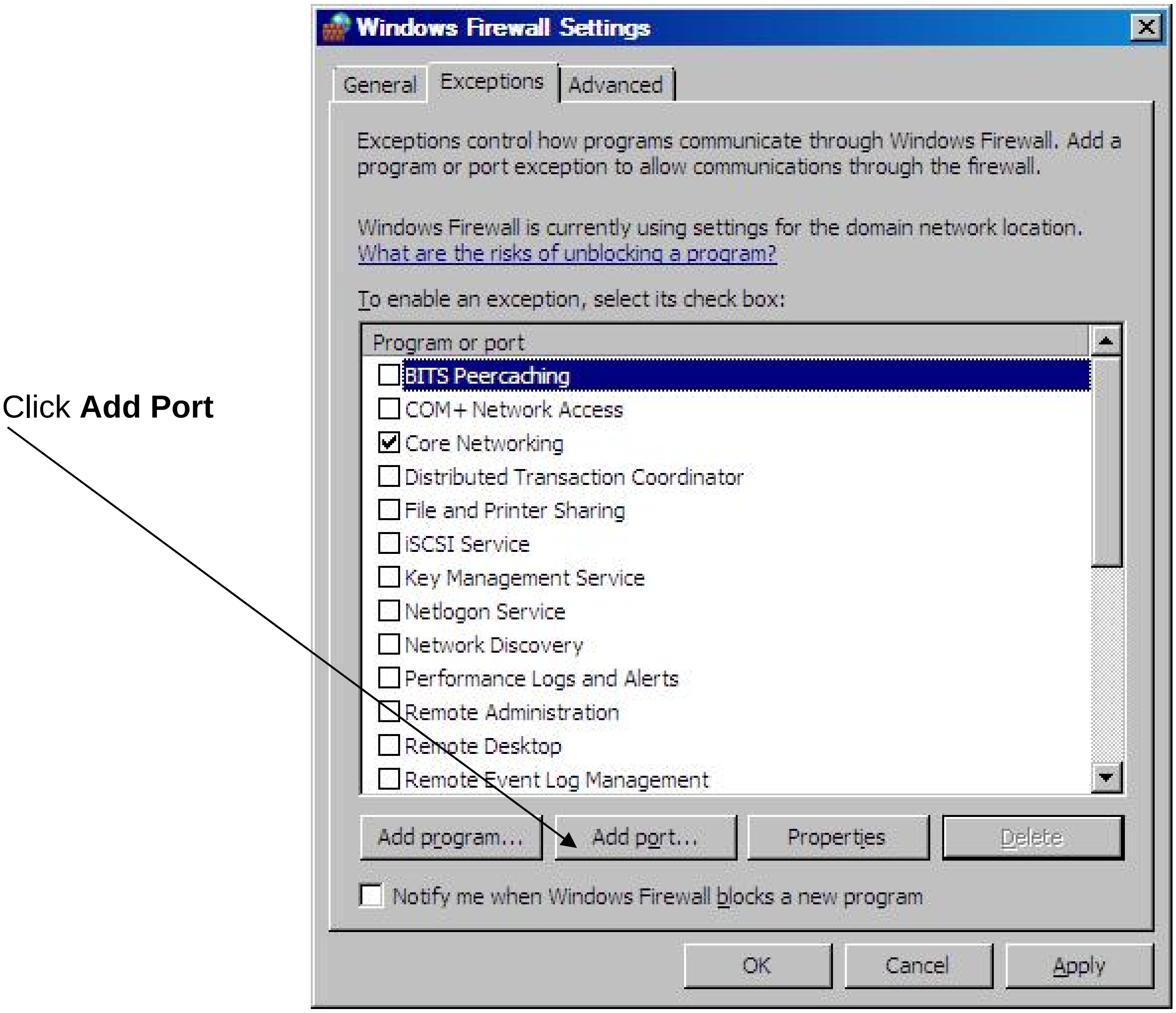
2.7.4 Add Ports for DCOM and RTRSERVC for the Windows 2008 Firewall

In the previous section, we specified programs that the firewall needed to know about. Now we have to identify which ports these programs use.

Note: When we say ports, we’re not talking about physical communication ports; we’re talking about software connections into the system.

To add the ports, follow these steps:

1. From the **Exceptions** tab of the Windows Firewall dialog box, click **Add Port**.



Click **Add Port**

Exceptions control how programs communicate through Windows Firewall. Add a program or port exception to allow communications through the firewall.

Windows Firewall is currently using settings for the domain network location.
What are the risks of unblocking a program?

To enable an exception, select its check box:

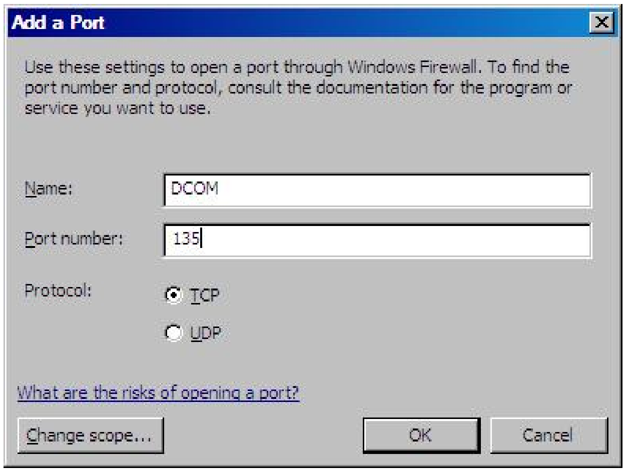
Program or port

- □ BITS Peercaching
- □ COM+ Network Access
- ☑ Core Networking
- □ Distributed Transaction Coordinator
- □ File and Printer Sharing
- □ iSCSI Service
- □ Key Management Service
- □ Netlogon Service
- □ Network Discovery
- □ Performance Logs and Alerts
- □ Remote Administration
- □ Remote Desktop
- □ Remote Event Log Management

□ Notify me when Windows Firewall blocks a new program

Figure 2-41. Windows Firewall Add Port

2. First, you need to add the port for DCOM. In the Add Port dialog box, enter **DCOM** for the port’s **Name**, **135** for the **Port Number** and choose **TCP**. Then click **OK**.



Add a Port

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name: DCOM

Port number: 135

Protocol: ● TCP ○ UDP

Figure 2-42. Windows Firewall Add a Port dialog box

3. Now add the port for **RTRSERVC**. Click **Add Port** again, and in the Add Port dialog box, enter **rtrservc** for the port’s **Name**, **1236** for the **Port number** and choose **TCP**. Then click **OK**.

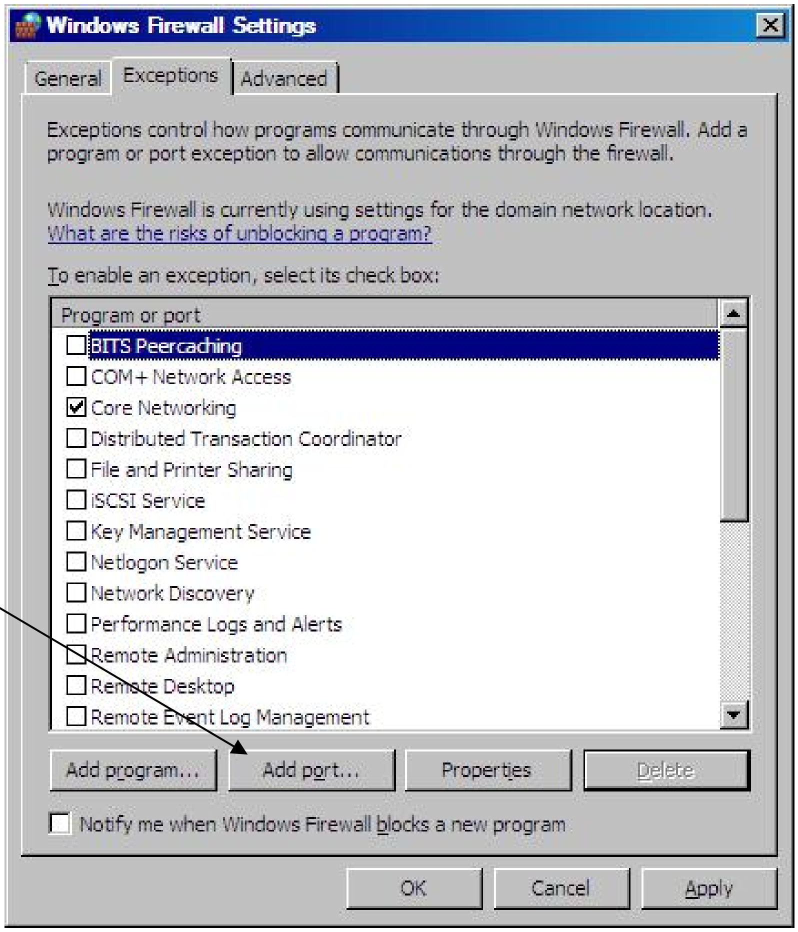
Note: The reason we say “1236” is that “1236” is the default port number used by RTRSERVC. That number is initially set in the **TCP Port Number for Router Process** field of the IP Parameters dialog box in NetView’s System Wizard. If you originally set it to something *different* than 1236, you should use *that* number here, instead of 1236.

2.7.5 Add Ports for the Bristol IP Driver (BSIPDRV) for the Windows 2008 Server Firewall

This section is *almost* identical to *Section 2.7.4*. We are adding two additional ports for the Bristol IP Driver (BSIPDRV). One is for the driver itself, and the other is for Time Synchronization messages. The main difference from the previous step is the port numbers and the port type, which is UDP, instead of TCP.

1. From the **Exceptions** tab of the Windows Firewall dialog box, click **Add Port**.

Click **Add Port**



Windows Firewall Settings

General | Exceptions | Advanced

Exceptions control how programs communicate through Windows Firewall. Add a program or port exception to allow communications through the firewall.

Windows Firewall is currently using settings for the domain network location.
What are the risks of unblocking a program?

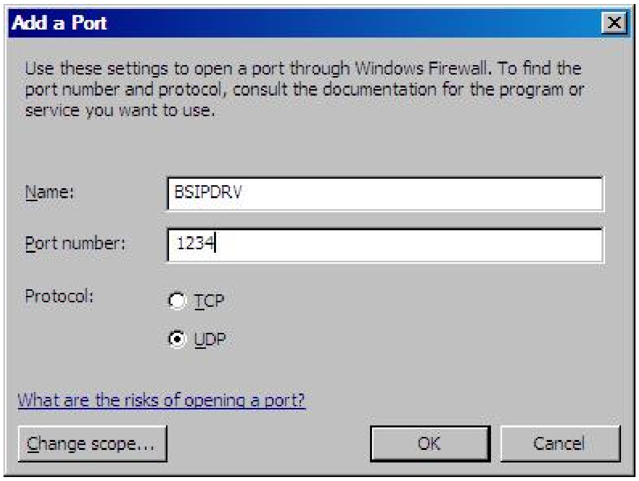
To enable an exception, select its check box:

Program or port
□ BITS Peercaching
□ COM+ Network Access
☑ Core Networking
□ Distributed Transaction Coordinator
□ File and Printer Sharing
□ iSCSI Service
□ Key Management Service
□ Netlogon Service
□ Network Discovery
□ Performance Logs and Alerts
□ Remote Administration
□ Remote Desktop
□ Remote Event Log Management

□ Notify me when Windows Firewall blocks a new program

Figure 2-43. Windows Firewall – Add Port for BSIPDRV

2. Add the first port for **BSIPDRV**. In the Add Port dialog box, enter **BSIPDRV** for the port's **Name**, **1234** for the **Port Number** and choose **UDP**. Then click **OK**.



Add a Port

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name: BSIPDRV

Port number: 1234

Protocol: ○ TCP ● UDP

What are the risks of opening a port?

Figure 2-44. Windows Firewall Add Port for BSIPDRV

3. Repeat Step 2 to add the second port for **BSIPDRV** except enter **123<u>5</u>** for the **Port Number**.

Note: Again, we're saying "1234" and "1235" because those are the default port numbers used by BSIPDRV. Those numbers are initially set in the **UDP Port Number for IP Driver** and **UDP Port Number for Time Synch** fields of the IP Parameters dialog box in NetView's System Wizard. If you originally set them to something *different* than 1234 and 1235, you should use *those* numbers here, instead.

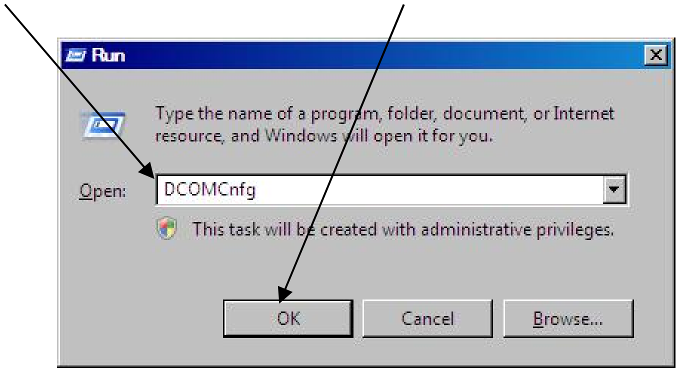
2.7.6 Reconfiguring the DCOM Software for the Windows 2008 Server Firewall

You must reconfigure the DCOM software for the Object Server to function correctly.

Note: This same procedure applies for Windows 7.

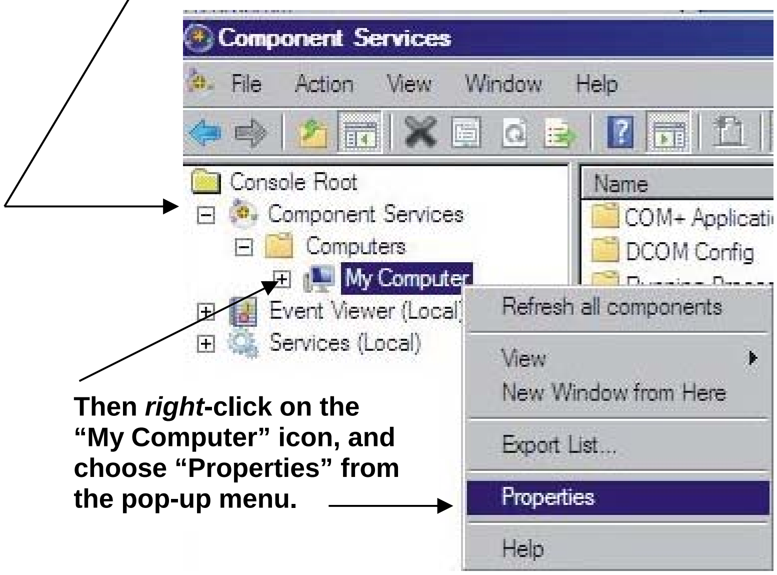
1. Click Start > Run.
2. Type **DCOMCnfg** in the Run dialog box and click **OK**. This opens the **Component Services** page.

Type "DCOMCnfig" then click OK.


Run
Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:
This task will be created with administrative privileges.
OK
Cancel
Browse...

DCOMCnfg

Figure 2-45. Run dialog box

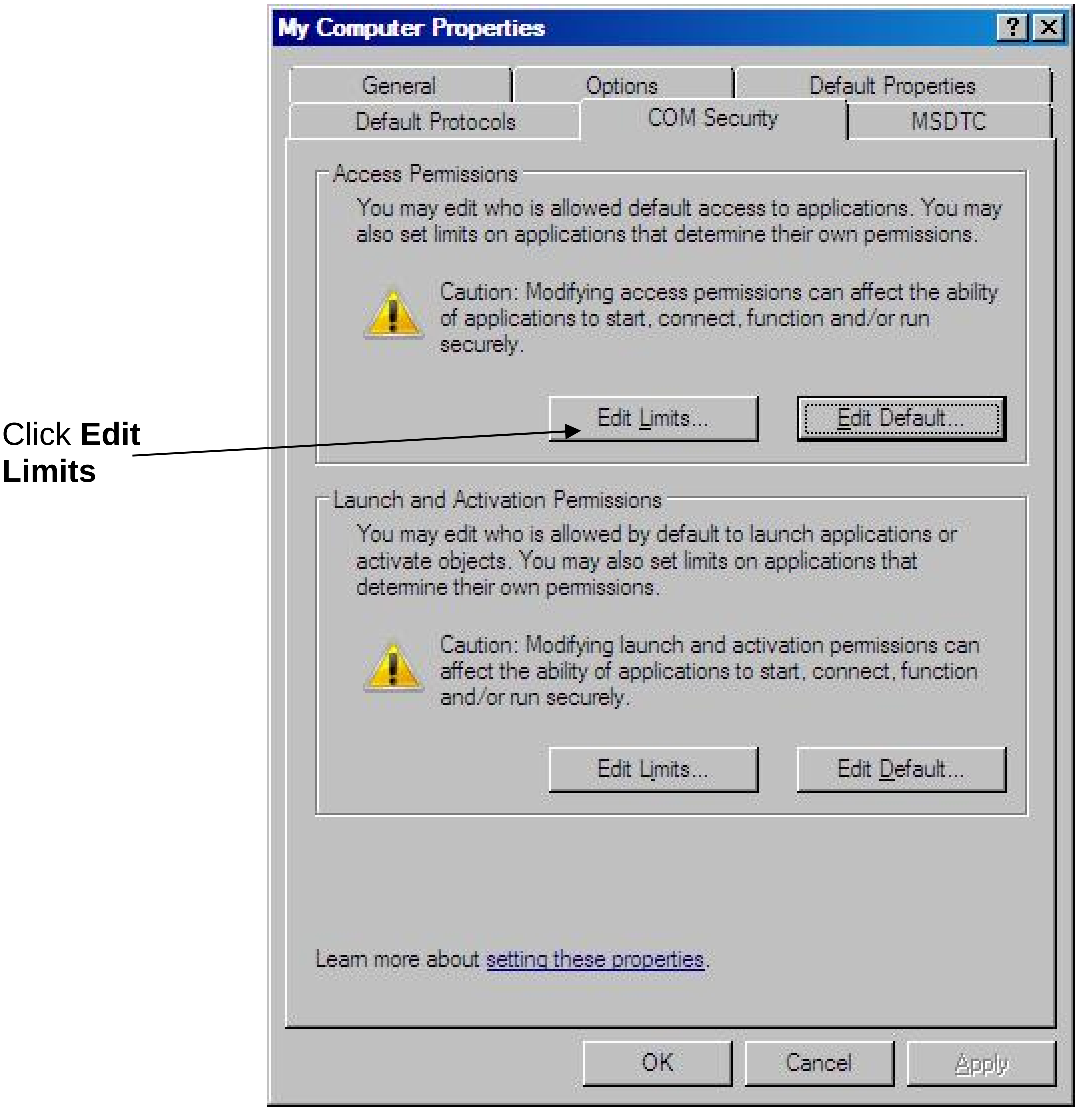


First, click on “Component Services”

Then *right*-click on the “My Computer” icon, and choose “Properties” from the pop-up menu.

Figure 2-46. Component Services page

3. In the Component Services page, locate **Console Root** in the file tree of the left window pane.
4. Under Console Root, click **Component Services** to expand the folder.
5. In the right window pane, **right**-click the **My Computer** icon, and select **Properties** from the pop-up window. This opens the My Computer Properties dialog box.
6. In the My Computer Properties dialog box, click the **COM Security** tab.



You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

Caution: Modifying access permissions can affect the ability of applications to start, connect, function and/or run securely.

You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

Caution: Modifying launch and activation permissions can affect the ability of applications to start, connect, function and/or run securely.

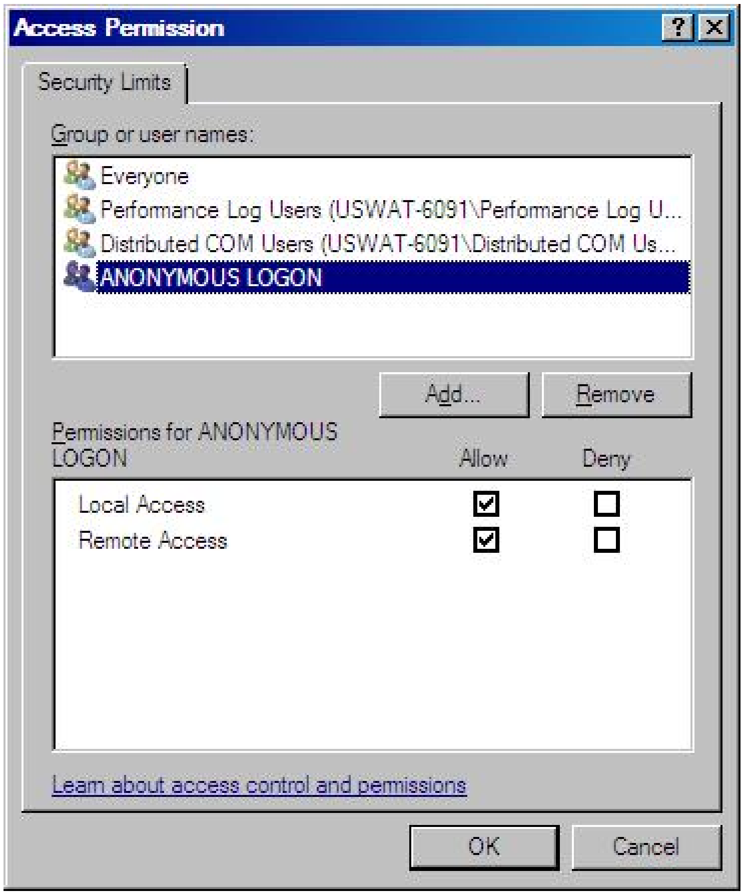
Learn more about setting these properties.

Click **Edit Limits**

Figure 2-47. Access Permissions

7. In the “Access Permissions” box (top part of the page) click **Edit Limits.**

8. In the **Group or user names** box (top part of the Access Permissions dialog box) click the **ANONYMOUS LOGIN** icon.



Group or user names:

- Everyone
- Performance Log Users (USWAT-6091\Performance Log U...
- Distributed COM Users (USWAT-6091\Distributed COM Us...
- ANONYMOUS LOGON

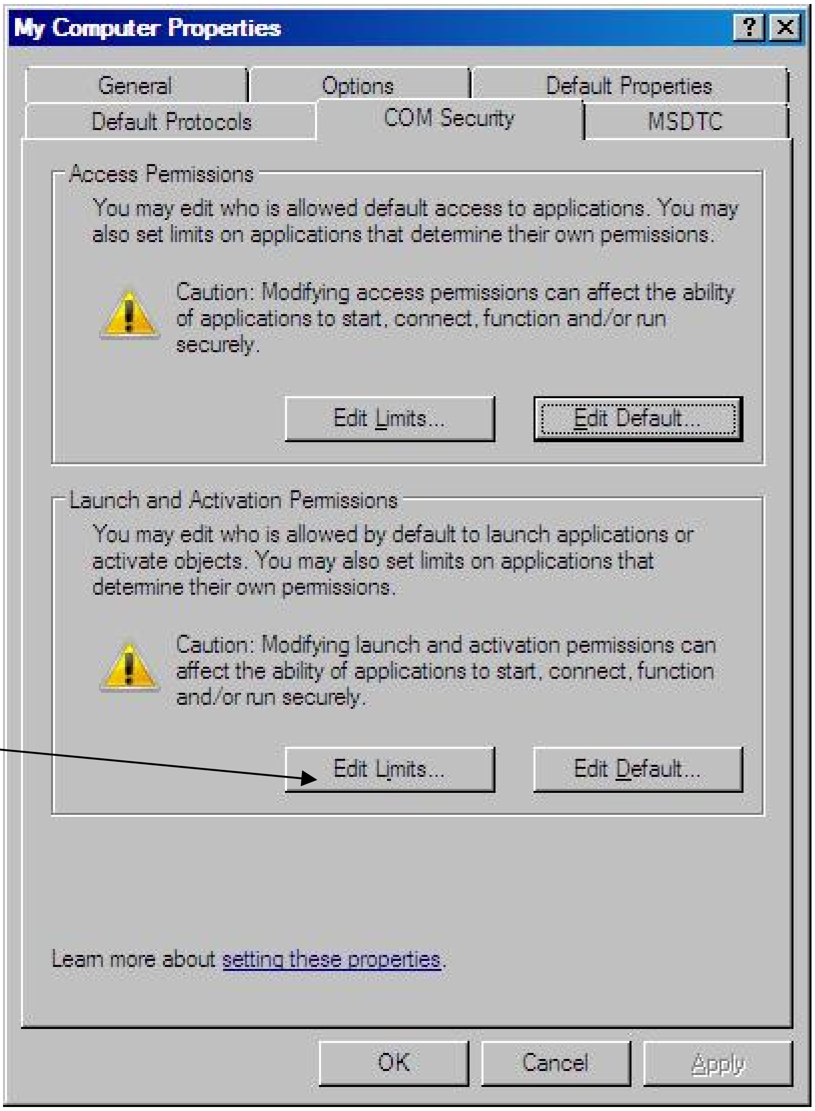
Permissions for ANONYMOUS LOGON	Allow	Deny
Local Access	☑	□
Remote Access	☑	□

Figure 2-48. Access Permissions dialog box

9. In the bottom part of the dialog box, select the **Allow Local Access** and **Remote Access** permission items. They must be checked for OPC to function.

10. Repeat this process for the **Everyone** icon.

11. Click **OK** and the My Computer Properties dialog box re-opens. Click **Edit Limits** in the Launch and Activation Parameters (bottom part of the dialog box).



Access Permissions

You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

Caution: Modifying access permissions can affect the ability of applications to start, connect, function and/or run securely.

Launch and Activation Permissions

You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

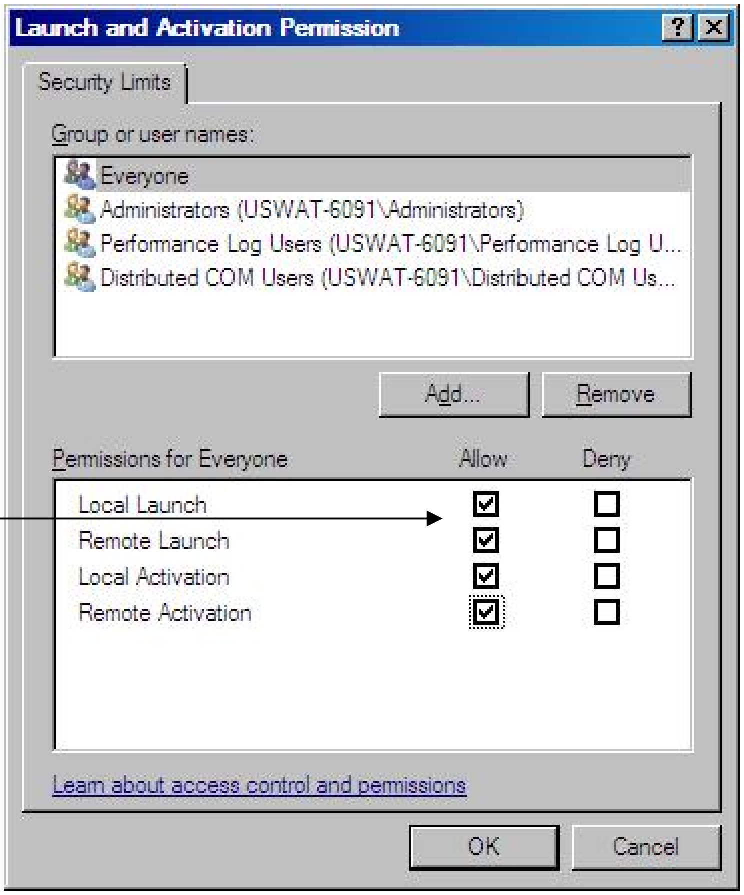
Caution: Modifying launch and activation permissions can affect the ability of applications to start, connect, function and/or run securely.

Learn more about setting these properties.

Click **Edit Limits**

Figure 2-49. Launch and Activation Permissions

12. In the Launch Permissions dialog box, click the **Everyone** icon in the **Group or user names** box (top part of the dialog box).



Launch and Activation Permission

Security Limits

Group or user names:

- Everyone
- Administrators (USWAT-6091\Administrators)
- Perfomance Log Users (USWAT-6091\Perfomance Log U...
- Distributed COM Users (USWAT-6091\Distributed COM Us...

Permissions for Everyone	Allow	Deny
Local Launch	☑	□
Remote Launch	☑	□
Local Activation	☑	□
Remote Activation	☑	□

Click "Allow" for all the items.

Figure 2-50. Grant Permissions for Everyone

13. In the bottom part of the dialog box, select the **Allow** permission items for all the options shown (Local Launch, Remote Launch, Local Activation, and Remote Activation.). It must be checked for OPC to function.

14. Click **OK**.

Note: If you are concerned about granting "everyone" these permissions, where "everyone" in this context refers to every user account on this computer, you can create a special group with these permissions. To restrict it to only some users, you should create a group of users called, for example, "OPC Users", and then give launch permissions only to the "OPC Users" group, instead of "everyone." In this case, you would substitute "OPC Users" for "everyone" in these instructions.

2.8 Using OpenBSI with Microsoft® Windows 7

For OpenBSI to function with Windows 7 you need to re-configure the Windows Firewall software, and re-configure DCOM software.

2.8.1 Reconfiguring the Windows 7 Firewall

Reconfiguring the firewall involves either disabling it (not recommended in most cases) or making certain OpenBSI applications exceptions to the firewall, to let them through.

Note: If Object Server is currently running, you must shut it down during this configuration.

2.8.2 Disabling the Windows 7 Firewall

If the Windows firewall is the only firewall protection you have, we recommend you leave it enabled, and skip to *Section 2.8.3*. If, however, you have a corporate firewall, already installed, and it is operating correctly, you may decide that the Windows firewall is unnecessary. If this is the case, you can disable the Windows firewall.

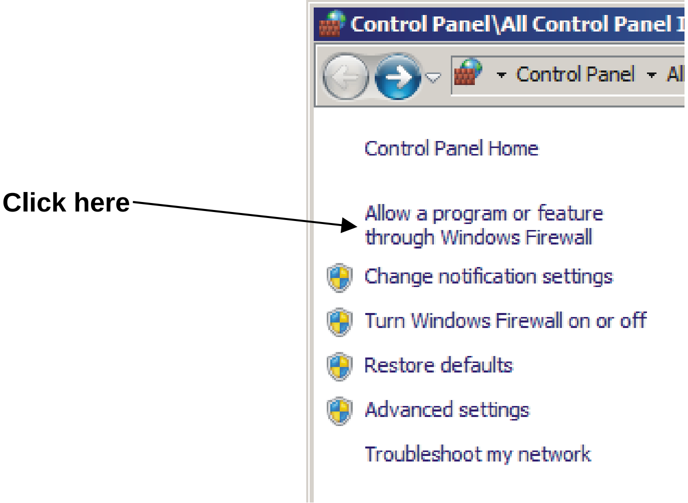
⚠ **Caution** **Only perform these next four steps if you have a separate corporate firewall which renders the Windows firewall unnecessary.**

1. From the Windows™ Control Panel, double-click on **Windows Firewall**.
2. Click on the **Turn Windows Firewall on or off** link.
3. On the **General** page of the Windows Firewall dialog box, select the **Off** button, then click on **OK**.
4. Skip the remaining steps in this sub-section, and continue with the section *“Reconfiguring the DCOM Software*.”

2.8.3 Making Object Server an Exception to the Windows 7 Firewall

If you install Object Server, you need to grant it as an exception to the Windows Firewall.

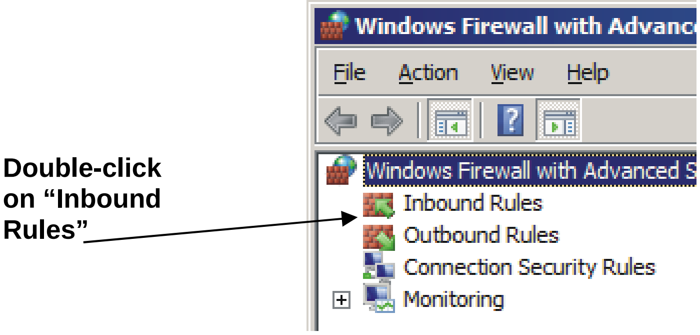
1. From the Windows™ Control Panel, double-click **Windows Firewall**.


Control Panel\All Control Panel I
Control Panel
All
Control Panel Home
Allow a program or feature through Windows Firewall
Change notification settings
Turn Windows Firewall on or off
Restore defaults
Advanced settings
Troubleshoot my network

Click here

Figure 2-51. Allow a Program Through the Firewall

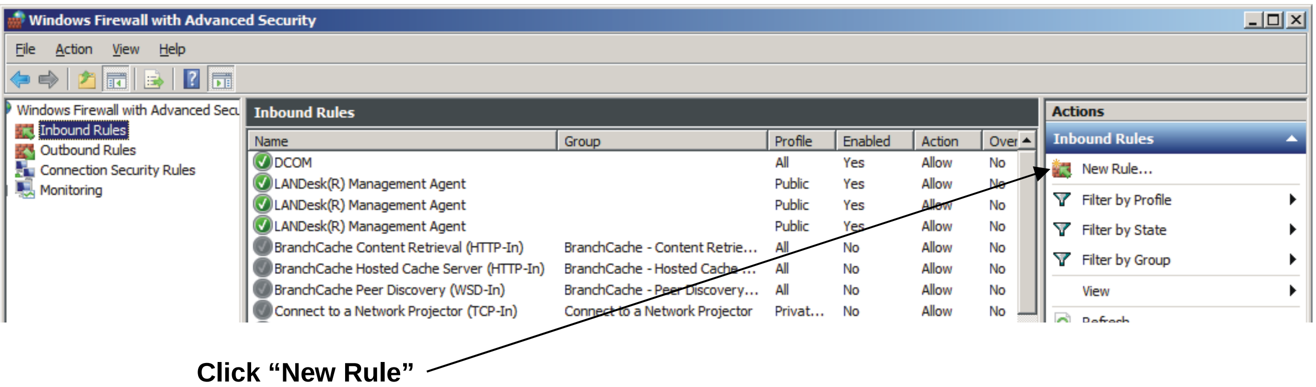
2. Click **Allow a program or feature through Windows Firewall**.
3. In the Windows Firewall with Advanced Security page, double-click on **Inbound Rules**.


Windows Firewall with Advanc
File
Action
View
Help
Windows Firewall with Advanced S
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring

Double-click on "Inbound Rules"

Figure 2-52. Defining an Inbound Rule

4. On the **Inbound Rules** page click **New Rule.**

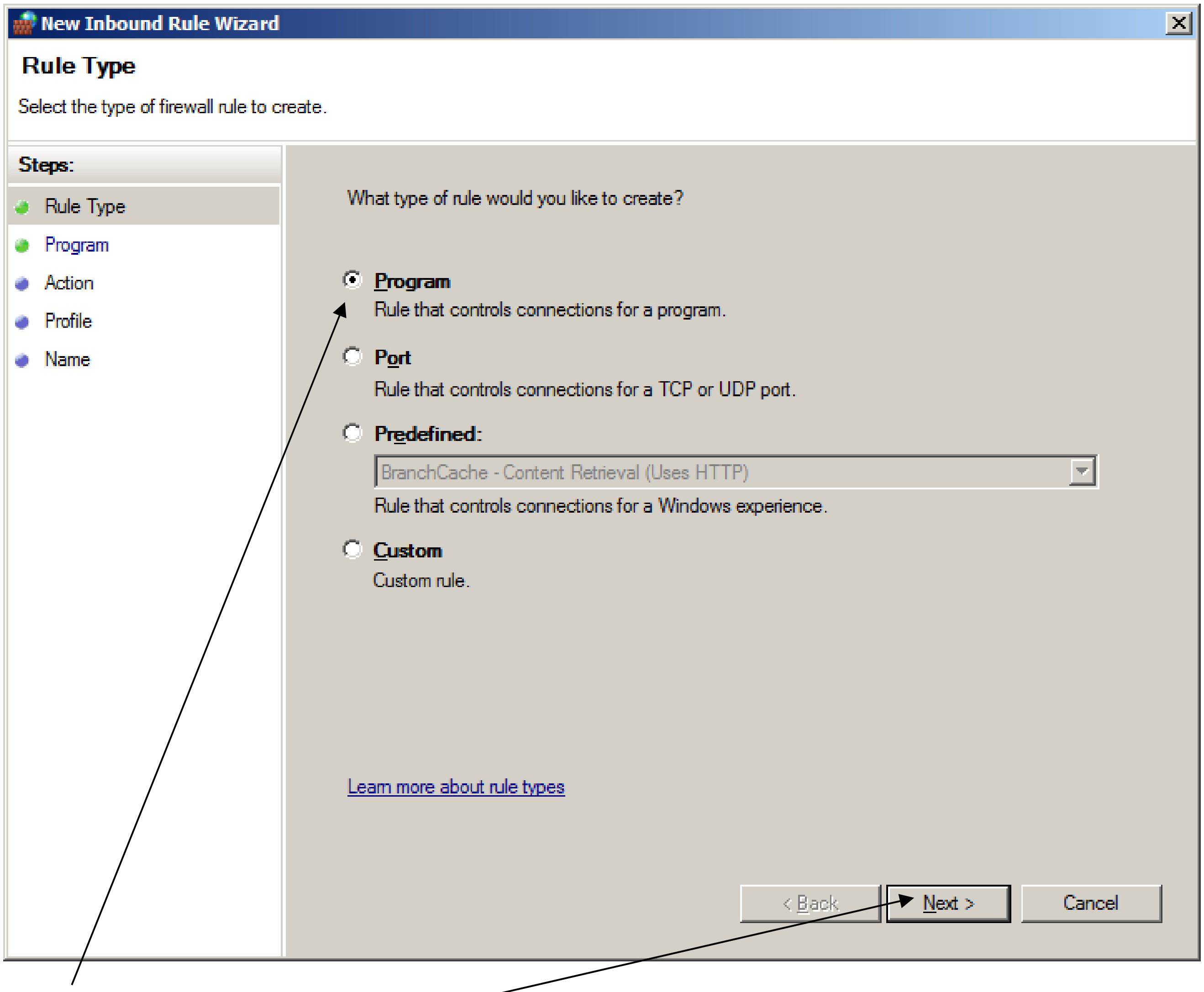


Name	Group	Profile	Enabled	Action	Over
DCOM		All	Yes	Allow	No
LANDesk(R) Management Agent		Public	Yes	Allow	No
LANDesk(R) Management Agent		Public	Yes	Allow	No
LANDesk(R) Management Agent		Public	Yes	Allow	No
BranchCache Content Retrieval (HTTP-In)	BranchCache - Content Retrie…	All	No	Allow	No
BranchCache Hosted Cache Server (HTTP-In)	BranchCache - Hosted Cache …	All	No	Allow	No
BranchCache Peer Discovery (WSD-In)	BranchCache - Peer Discovery…	All	No	Allow	No
Connect to a Network Projector (TCP-In)	Connect to a Network Projector	Privat…	No	Allow	No

Click "New Rule"

Figure 2-53. Defining a New Inbound Rule

5. In the Rule Type page of the New Inbound Rule Wizard, click **Program**. Then click **Next**.



Rule Type

Select the type of firewall rule to create.

What type of rule would you like to create?

● Program
Rule that controls connections for a program.

○ Port
Rule that controls connections for a TCP or UDP port.

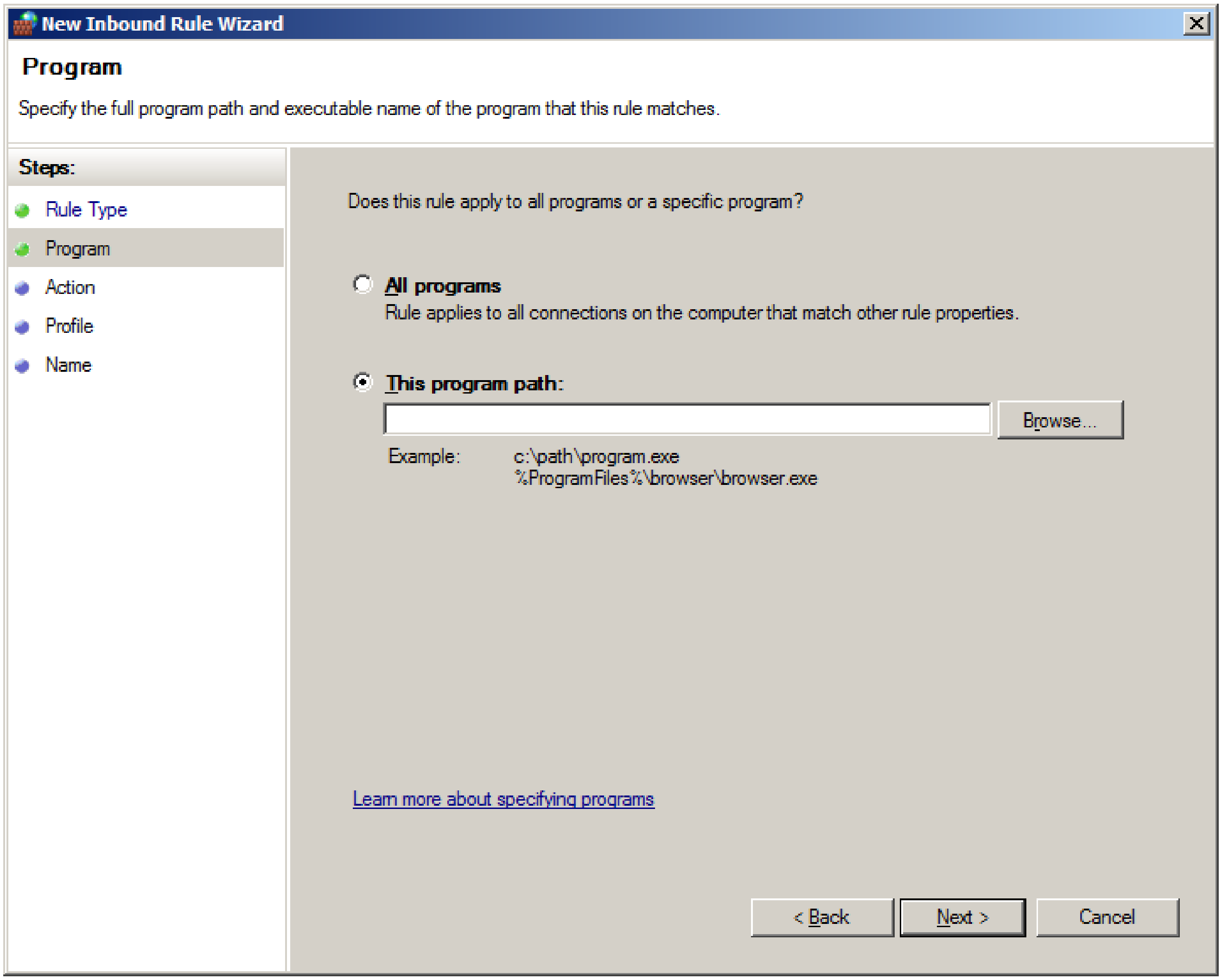
○ Predefined:
BranchCache - Content Retrieval (Uses HTTP)
Rule that controls connections for a Windows experience.

○ Custom
Custom rule.

Click “Program.”
Then click “Next.”

Figure 2-54. New Inbound Rule Wizard – Rule Type page

6. On the Program page (see *Figure 2-55*), you can add Object Server to the list of authorized communicators through the Windows Firewall. Click the **Browse** button next to the **This Program Path** field to locate the Bristol OPC Server (**BristolOPCServer.exe)**.



New Inbound Rule Wizard

Program

Specify the full program path and executable name of the program that this rule matches.

Steps:
- Rule Type
- Program
- Action
- Profile
- Name

Does this rule apply to all programs or a specific program?

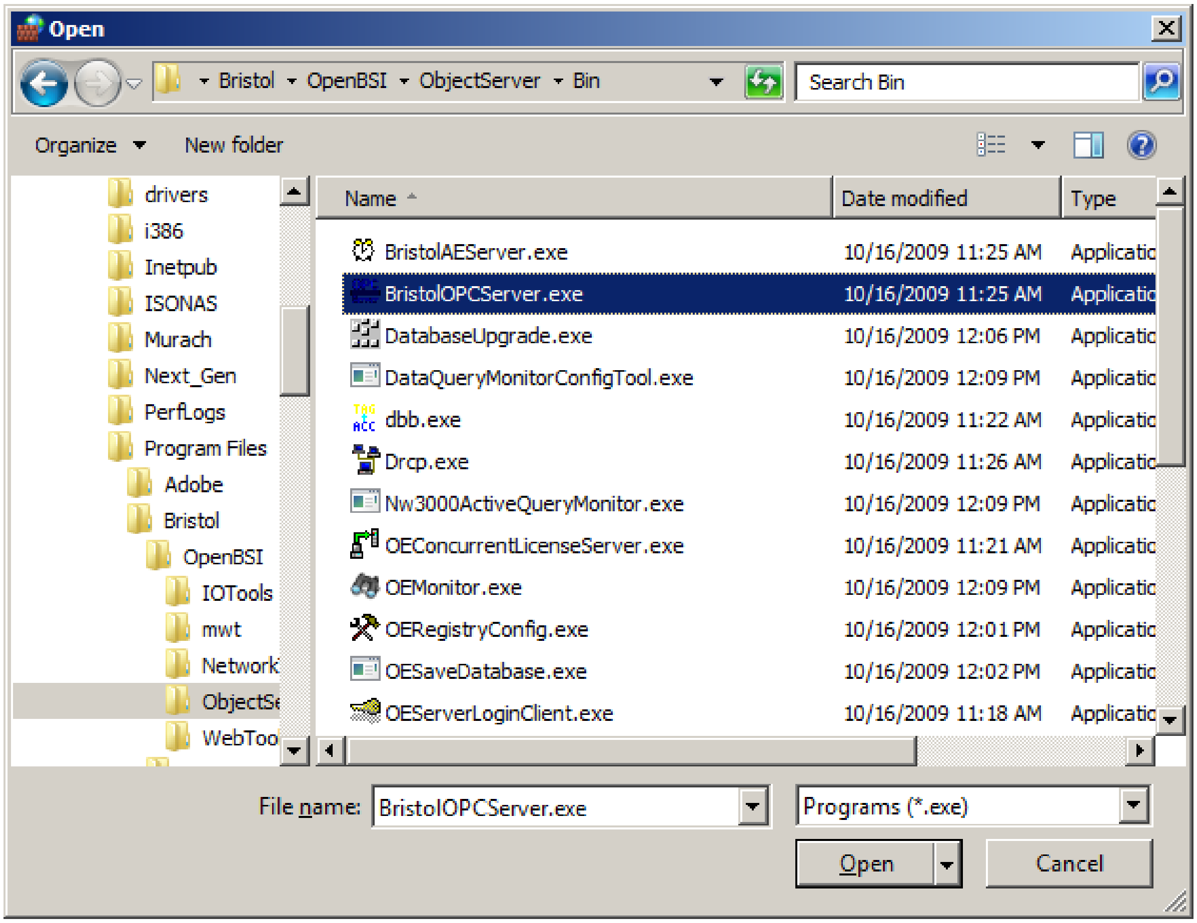
○ **All programs**
Rule applies to all connections on the computer that match other rule properties.

● **This program path:**

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Figure 2-55. New Inbound Rule Wizard – Program page

7. Select BristolOPCServer.exe, as shown in *Figure 2-56* then click **Open.**



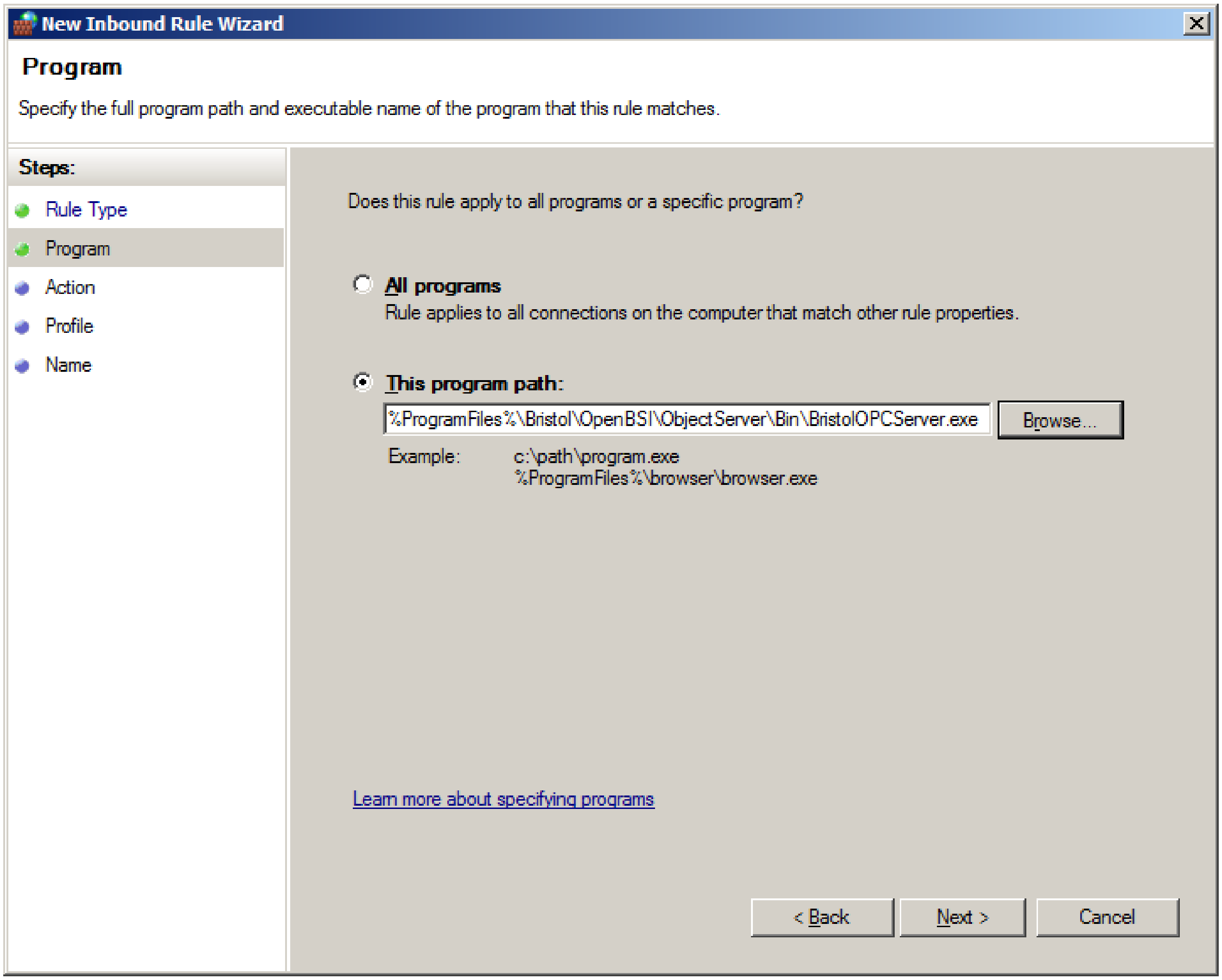
Name	Date modified	Type
BristolAEServer.exe	10/16/2009 11:25 AM	Applicatio
BristolOPCServer.exe	10/16/2009 11:25 AM	Applicatio
DatabaseUpgrade.exe	10/16/2009 12:06 PM	Applicatio
DataQueryMonitorConfigTool.exe	10/16/2009 12:09 PM	Applicatio
dbb.exe	10/16/2009 11:22 AM	Applicatio
Drcp.exe	10/16/2009 11:26 AM	Applicatio
Nw3000ActiveQueryMonitor.exe	10/16/2009 12:09 PM	Applicatio
OEConcurrentLicenseServer.exe	10/16/2009 11:21 AM	Applicatio
OEMonitor.exe	10/16/2009 12:09 PM	Applicatio
OERegistryConfig.exe	10/16/2009 12:01 PM	Applicatio
OESaveDatabase.exe	10/16/2009 12:02 PM	Applicatio
OEServerLoginClient.exe	10/16/2009 11:18 AM	Applicatio

File name: BristolOPCServer.exe

Programs (*.exe)

Figure 2-56. Selecting BristolOPCServer

8. The path for the item you just selected shows in the **This program path** field on the Program page of the New Inbound Rule Wizard (*Figure 2-57*). Click **Next**.



New Inbound Rule Wizard

Program

Specify the full program path and executable name of the program that this rule matches.

Steps:

- Rule Type
- Program
- Action
- Profile
- Name

Does this rule apply to all programs or a specific program?

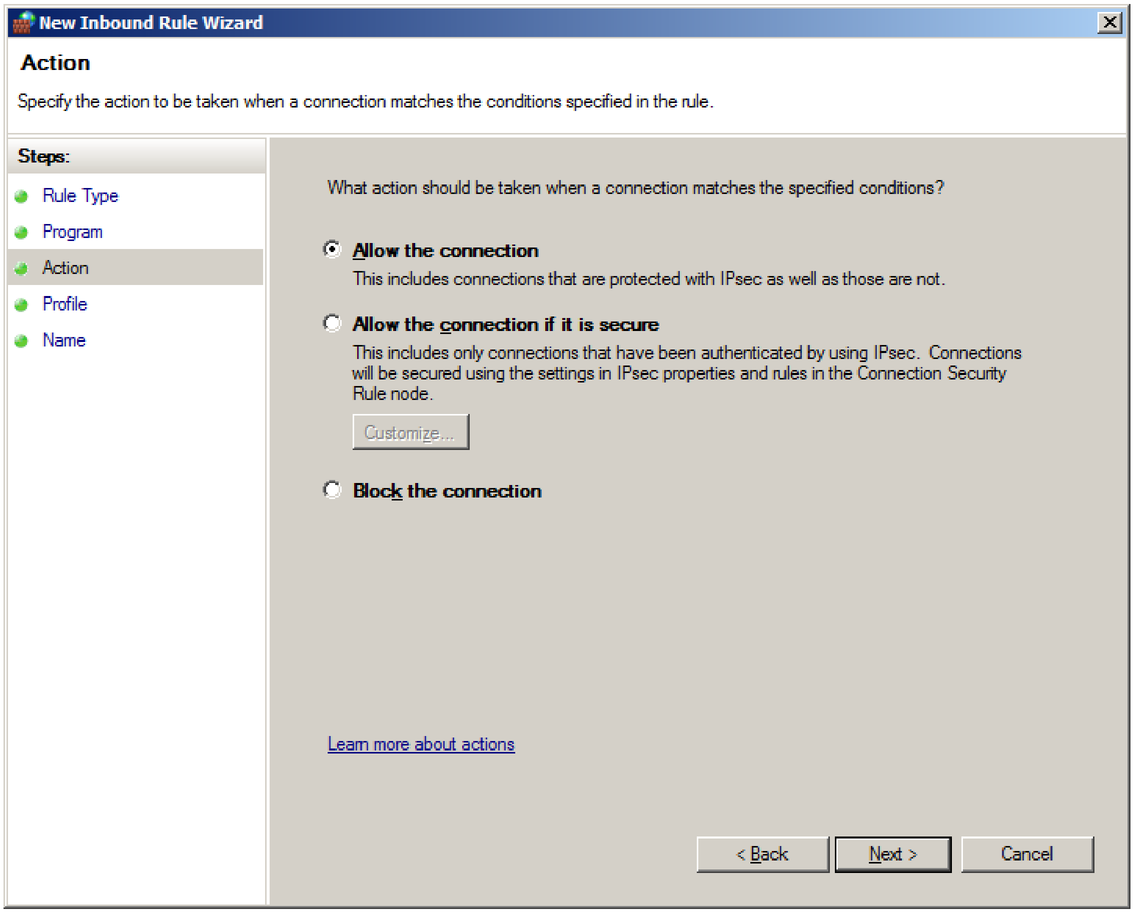
○ **All programs**
Rule applies to all connections on the computer that match other rule properties.

● **This program path:**
%ProgramFiles%\Bristol\OpenBSI\ObjectServer\Bin\BristolOPCServer.exe

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Figure 2-57. Program Path for the Exception

9. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**.



New Inbound Rule Wizard

Action

Specify the action to be taken when a connection matches the conditions specified in the rule.

Steps:

- Rule Type
- Program
- Action
- Profile
- Name

What action should be taken when a connection matches the specified conditions?

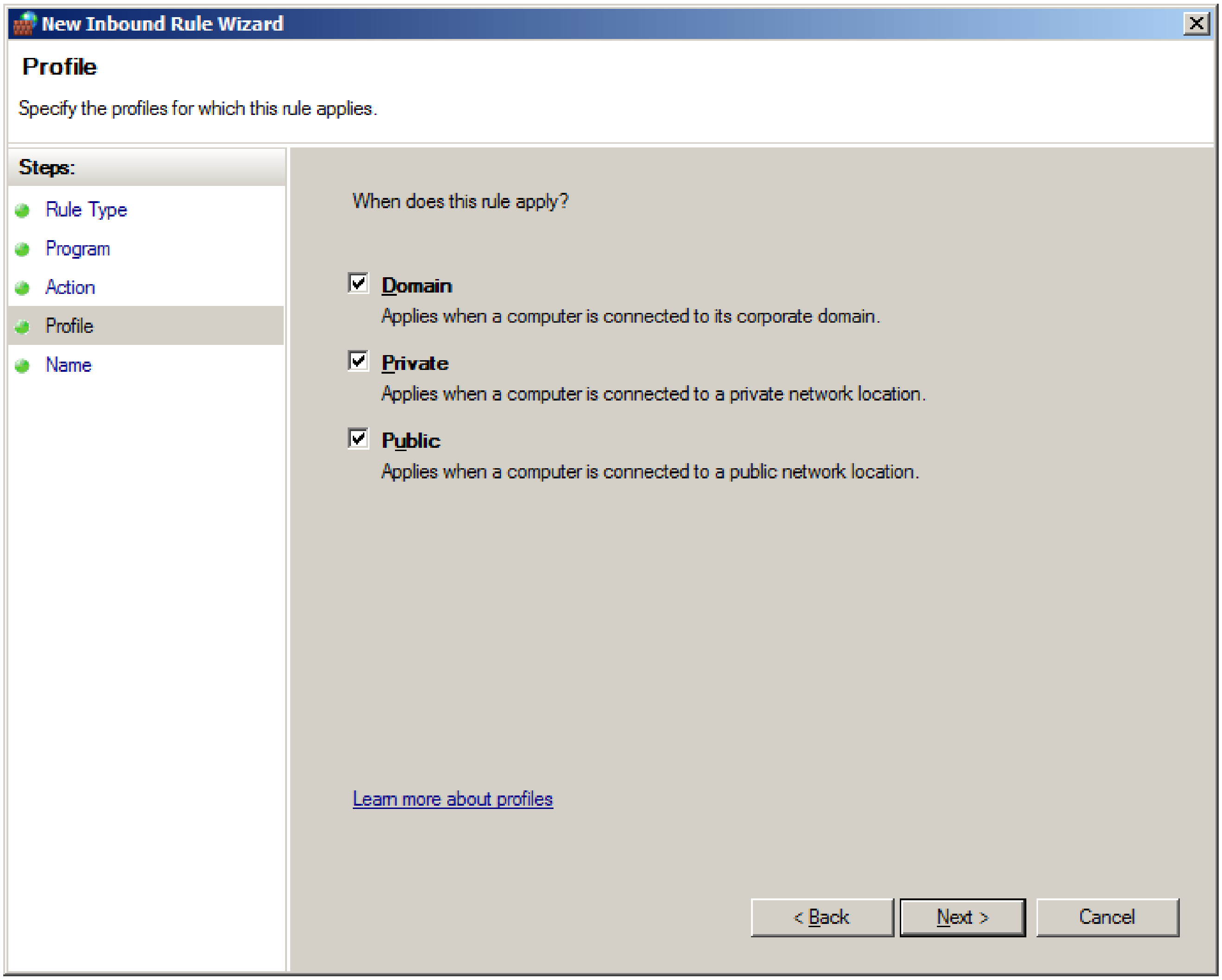
● **Allow the connection**
This includes connections that are protected with IPsec as well as those are not.

○ **Allow the connection if it is secure**
This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

○ **Block the connection**

Figure 2-58. Allowing the Connection

10. On the Profile page of the New Inbound Rule wizard, specify the cases where the ObjectServer inbound rule applies.



New Inbound Rule Wizard

Profile

Specify the profiles for which this rule applies.

Steps:
- Rule Type
- Program
- Action
- Profile
- Name

When does this rule apply?

☑ **Domain**
Applies when a computer is connected to its corporate domain.

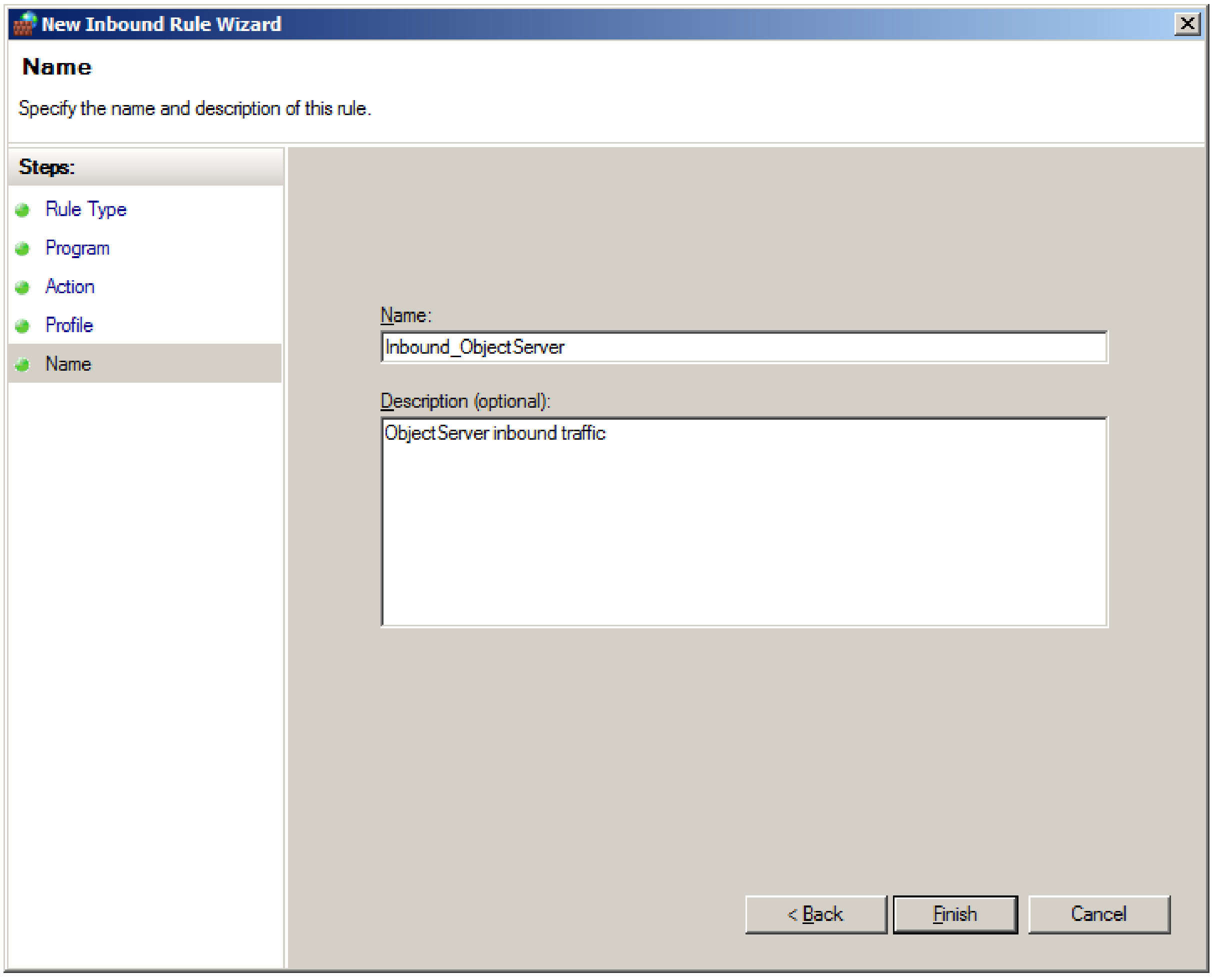
☑ **Private**
Applies when a computer is connected to a private network location.

☑ **Public**
Applies when a computer is connected to a public network location.

Learn more about profiles

Figure 2-59. Choosing Where the Exception Applies

11. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**.



Name

Specify the name and description of this rule.

Name: Inbound_ObjectServer

Description (optional): ObjectServer inbound traffic

Figure 2-60. Name the Rule

12. If you use the Object Server Alarm and Event Server (BristolAEServer.exe), repeat this entire procedure for that executable.

13. Now repeat the entire procedure *again* but instead of creating inbound rules, double-click on Outbound Rules first and create outbound rules for these programs following the same basic steps.

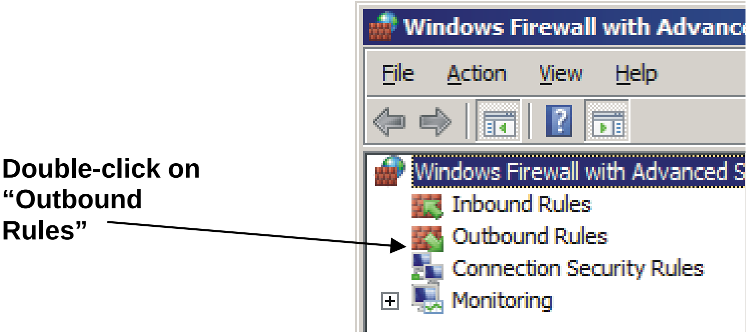

Windows Firewall with Advanc
File
Action
View
Help
Windows Firewall with Advanced S
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring
Double-click on “Outbound Rules”

Figure 2-61. Defining an Outbound Rule

2.8.4 Add Ports for DCOM and RTRSERVC for the Windows 7 Firewall

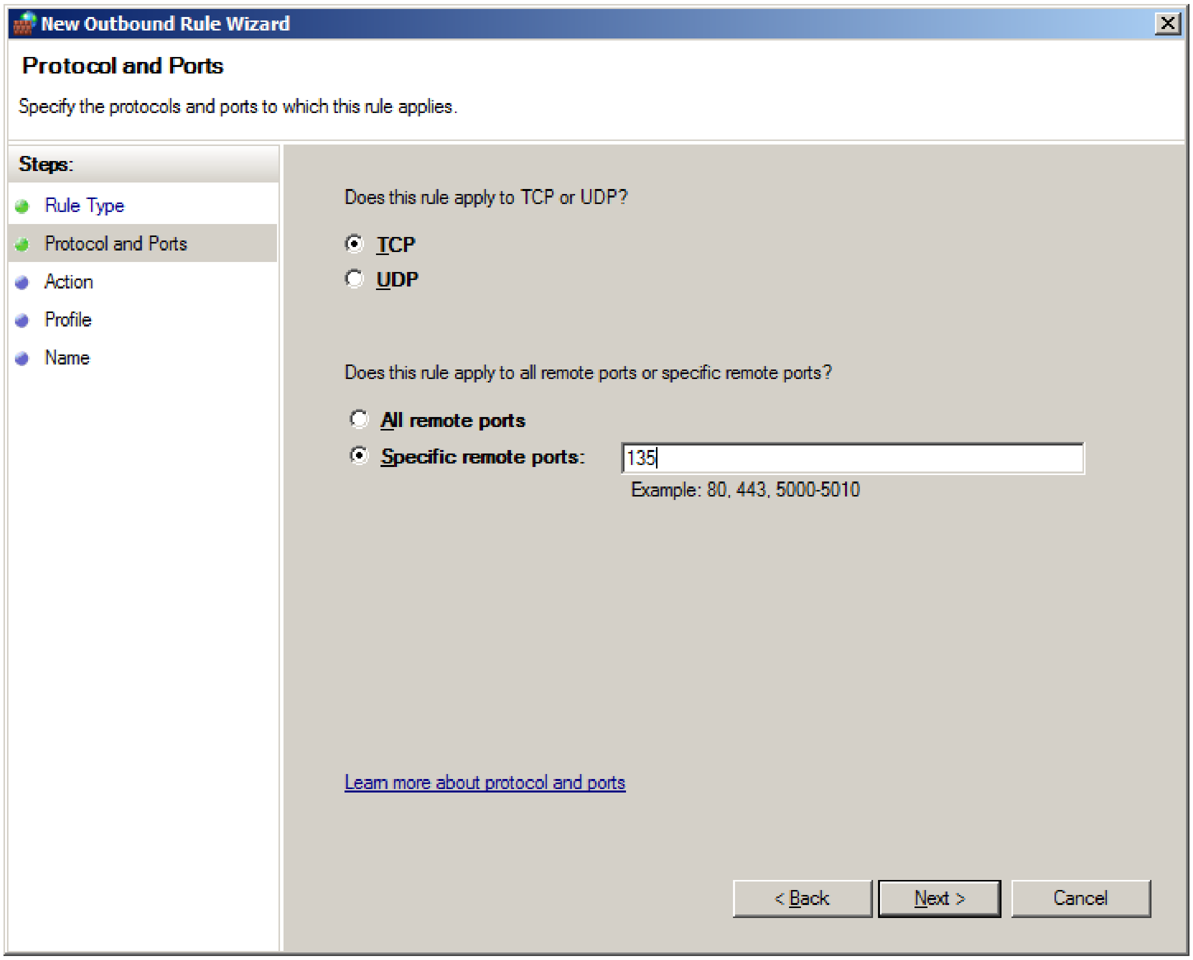
In the previous section, we specified programs that the firewall needed to know about. Now we have to identify which ports these programs use.

Note: When we say ports, we're not talking about physical communication ports; we're talking about software connections into the system.

To add the ports, follow these steps:

1. Start defining a new rule following the procedure discussed in *Section 2.8.3* except when you get to the Rule Type page (see *Figure 2-54)* choose **Port** *instead of* "Program."

2. On the Protocol and Ports page, choose **TCP** and enter **135** in the **Specific remote ports** field. Then click **Next**.



Protocol and Ports

Specify the protocols and ports to which this rule applies.

Does this rule apply to TCP or UDP?

● TCP
○ UDP

Does this rule apply to all remote ports or specific remote ports?

○ All remote ports
● Specific remote ports: 135

Example: 80, 443, 5000-5010

Figure 2-62. Defining a Port Exception

3. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-58*.

4. On the Profile page of the New Inbound Rule wizard, specify the cases where the DCOM port inbound rule applies. This is the same as *Figure 2-59*.
5. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-60.*
6. **Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the DCOM port following the same basic steps.**
7. **Now create both inbound and outbound rules for RTRSERVC. Choose Port on the Rule Type page and on the Protocol and Ports page, enter 1236 for the specific remote ports and choose TCP. Then click Next.**

Note: The reason we say "1236" is that "1236" is the default port number used by RTRSERVC. That number is initially set in the **TCP Port Number for Router Process** field of the IP Parameters dialog box in NetView's System Wizard. If you originally set it to something *different* than 1236, you should use *that* number here, instead of 1236.

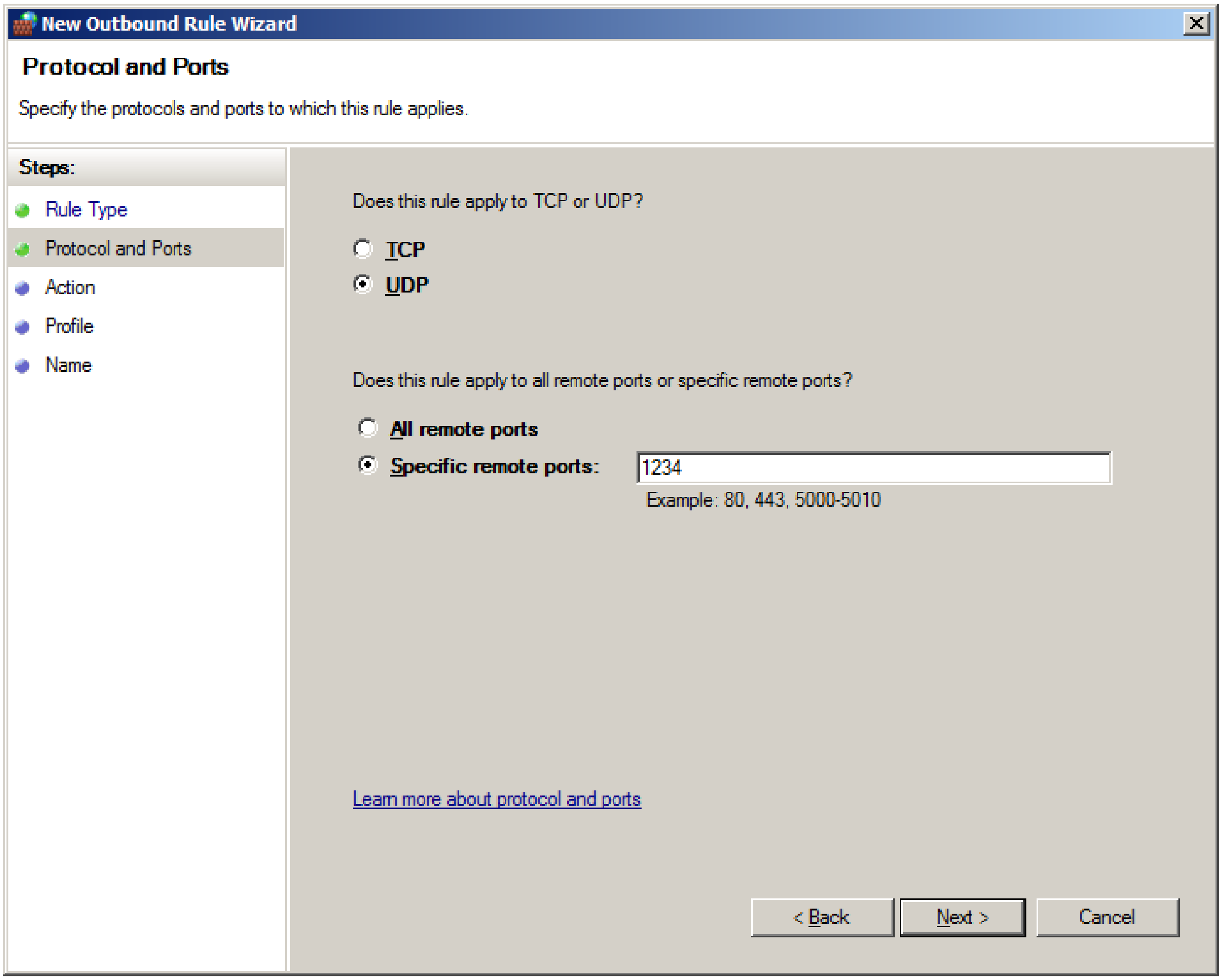
8. On the Name page enter **rtrservc** for the port's **Name** and click **Finish.**

2.8.5 Add Ports for the Bristol IP Driver (BSIPDRV) for the Windows 7 Firewall

This procedure is *almost* identical to previous sections. We are adding two additional ports for the Bristol IP Driver (BSIPDRV). One is for the driver itself, and the other is for Time Synchronization messages. The main difference from the previous step is the port numbers and the port type, which is UDP, instead of TCP.

To add the ports, follow these steps:

1. Start defining a new rule following the procedure discussed in *Section 2.8.3* except when you get to the Rule Type page (see *Figure 2-54)* choose **Port** *instead of* "Program."
2. On the Protocol and Ports page, choose **UDP** and enter **1234** in the **Specific remote ports** field. Then click **Next**.



New Outbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Does this rule apply to TCP or UDP?

○ TCP

● UDP

Does this rule apply to all remote ports or specific remote ports?

○ All remote ports

● Specific remote ports: 1234

Example: 80, 443, 5000-5010

Figure 2-63. Defining a Port Exception for BSIPDRV

3. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-58*.
4. On the Profile page of the New Inbound Rule wizard, specify the cases where the BSIPDRV port inbound rule applies. This is the same as *Figure 2-59*.
5. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-60.*
6. **Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the BSIPDRV port following the same basic steps.**
7. **Now repeat the entire procedure** to add the second port for **BSIPDRV** except enter **1235** for the **Specific remote ports**. You must create both inbound and outbound rules.

Note: Again, we're saying "1234" and "1235" because those are the default port numbers used by BSIPDRV. Those numbers are initially set in the **UDP Port Number for IP Driver** and **UDP Port Number for Time Synch** fields of the IP Parameters dialog box in NetView's System Wizard. If you originally set them to something *different* than 1234 and 1235, you should use *those* numbers here, instead.

2.8.6 Reconfiguring the DCOM Software for the Windows 7 Firewall

You must reconfigure the DCOM software for the Object Server to function correctly. This process is similar to that for the Windows 2008 Server software. See *Section 2.7.6.*

2.9 Using OpenBSI with Microsoft® Windows 10 Professional

For OpenBSI to function with Windows 10 Professional you need to re-configure the Windows Firewall software, and re-configure DCOM software.

2.9.1 Reconfiguring the Windows 10 Firewall

Reconfiguring the firewall involves either disabling it (not recommended in most cases) or making certain OpenBSI applications exceptions to the firewall, to let them through.

Note: If Object Server is currently running, you must shut it down during this configuration.

2.9.2 Disabling the Windows 10 Firewall

If the Windows firewall is the only firewall protection you have, we recommend you leave it enabled, and skip to *Section 2.9.3.* If, however, you have a corporate firewall already installed and it is operating correctly, you may decide that the Windows firewall is unnecessary. If this is the case, you can disable the Windows firewall.

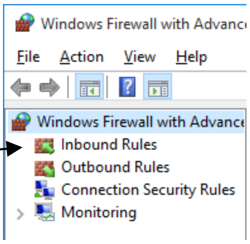
⚠ **Caution** **Only perform these next four steps if you have a separate corporate firewall which renders the Windows firewall unnecessary.**

1. From the Windows™ Control Panel, double-click on **System and Security** and then select **Windows Firewall**.
2. Click on the **Turn Windows Firewall on or off** link.
3. On the **General** page of the Windows Firewall dialog box, select the **Off** button, then click on **OK**.
4. Skip the remaining steps in this sub-section, and continue with the section *"Reconfiguring the DCOM Software*."

2.9.3 Making Object Server an Exception to the Windows 10 Firewall

If you install Object Server, you need to grant it as an exception to the Windows Firewall.

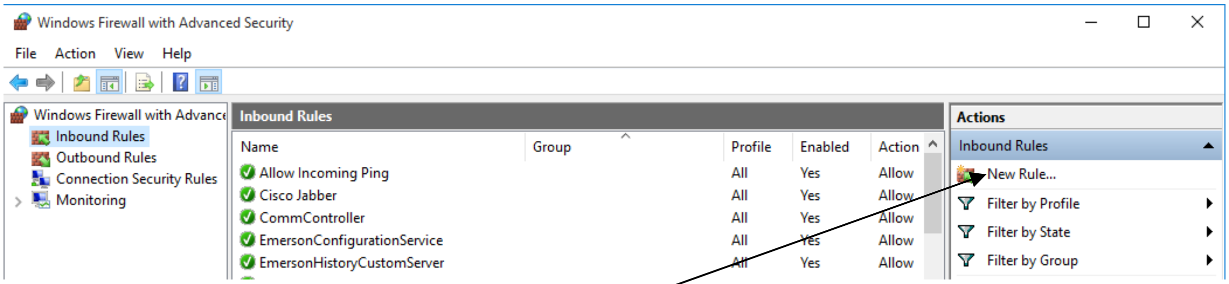
1. From the Windows™ Control Panel, double-click on **System and Security** then choose **Windows Firewall**.
2. Click **Allow an app or feature through Windows Firewall**.
3. In the Windows Firewall with Advanced Security page, double-click on **Inbound Rules**.


Windows Firewall with Advanc
File
Action
View
Help
Windows Firewall with Advance
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring

Double-click on “Inbound Rules”

Figure 2-64. Defining an Inbound Rule

4. On the **Inbound Rules** page click **New Rule.**

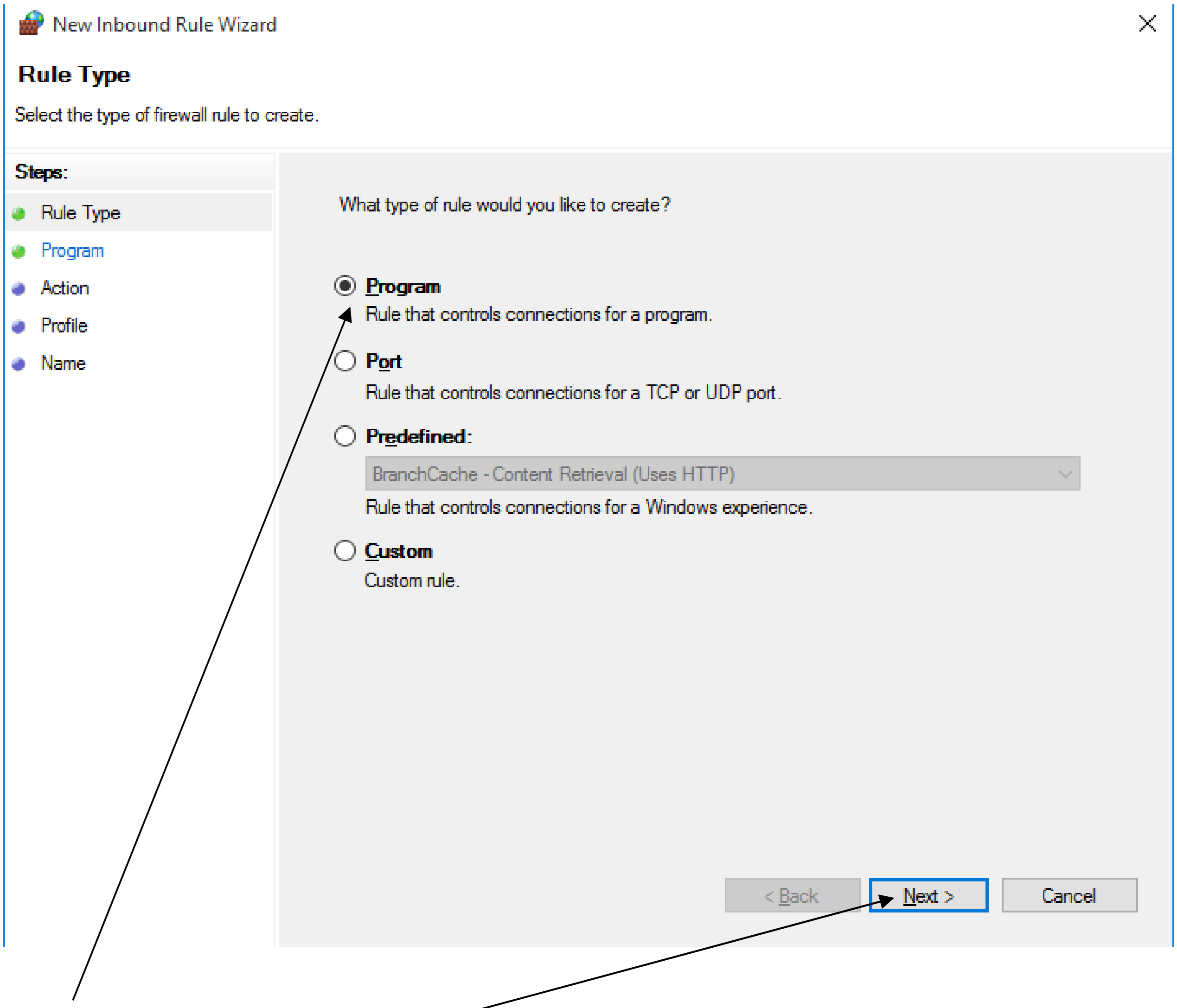


Name	Group	Profile	Enabled	Action
Allow Incoming Ping		All	Yes	Allow
Cisco Jabber		All	Yes	Allow
CommController		All	Yes	Allow
EmersonConfigurationService		All	Yes	Allow
EmersonHistoryCustomServer		All	Yes	Allow

Click “New Rule”

Figure 2-65. Defining a New Inbound Rule

5. In the Rule Type page of the New Inbound Rule Wizard, click **Program**. Then click **Next**.



New Inbound Rule Wizard

Rule Type

Select the type of firewall rule to create.

What type of rule would you like to create?

● **Program**
Rule that controls connections for a program.

○ **Port**
Rule that controls connections for a TCP or UDP port.

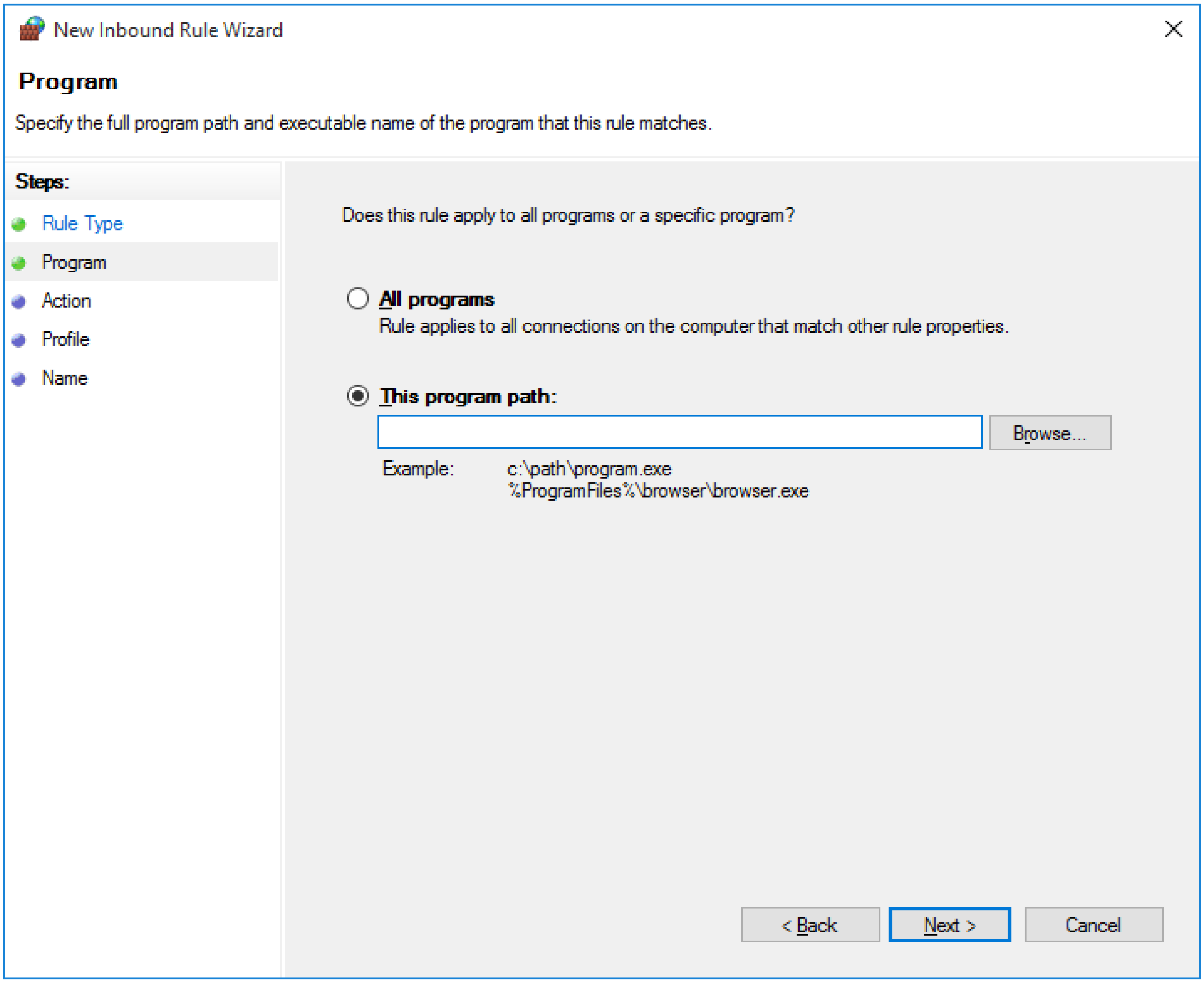
○ **Predefined:**
BranchCache - Content Retrieval (Uses HTTP)
Rule that controls connections for a Windows experience.

○ **Custom**
Custom rule.

Click “Program.”
Then click “Next.”

Figure 2-66. New Inbound Rule Wizard – Rule Type page

6. On the Program page (see *Figure 2-67*), you can add Object Server to the list of authorized communicators through the Windows Firewall. Click the **Browse** button next to the **This Program Path** field to locate the Bristol OPC Server (**BristolOPCServer.exe)**.



New Inbound Rule Wizard

Program

Specify the full program path and executable name of the program that this rule matches.

Does this rule apply to all programs or a specific program?

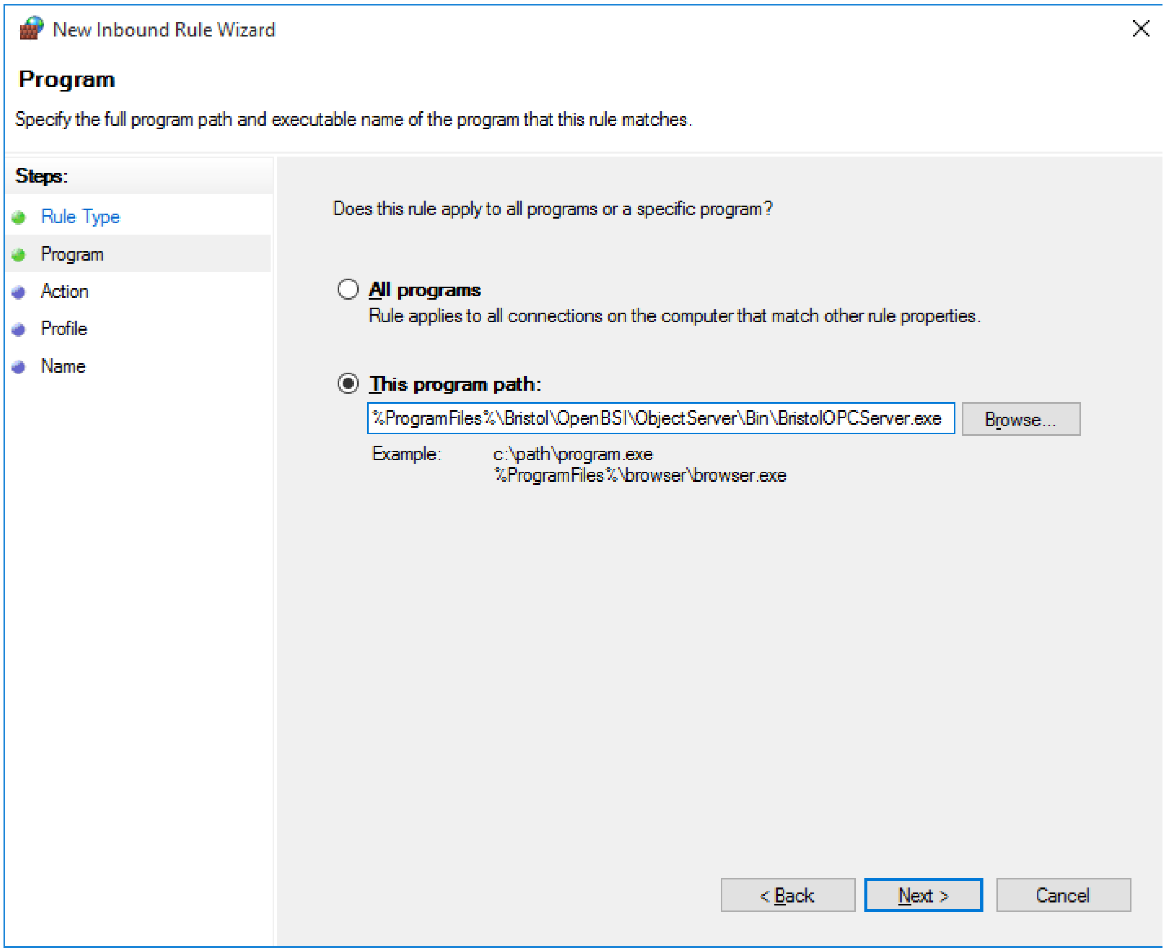
○ **All programs**
Rule applies to all connections on the computer that match other rule properties.

● **This program path:**

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Figure 2-67. New Inbound Rule Wizard – Program page

7. Select BristolOPCServer.exe, then click **Open.**
8. The path for the item you just selected shows in the **This program path** field on the Program page of the New Inbound Rule Wizard (*Figure 2-68*). Click **Next**.



New Inbound Rule Wizard

Program

Specify the full program path and executable name of the program that this rule matches.

Does this rule apply to all programs or a specific program?

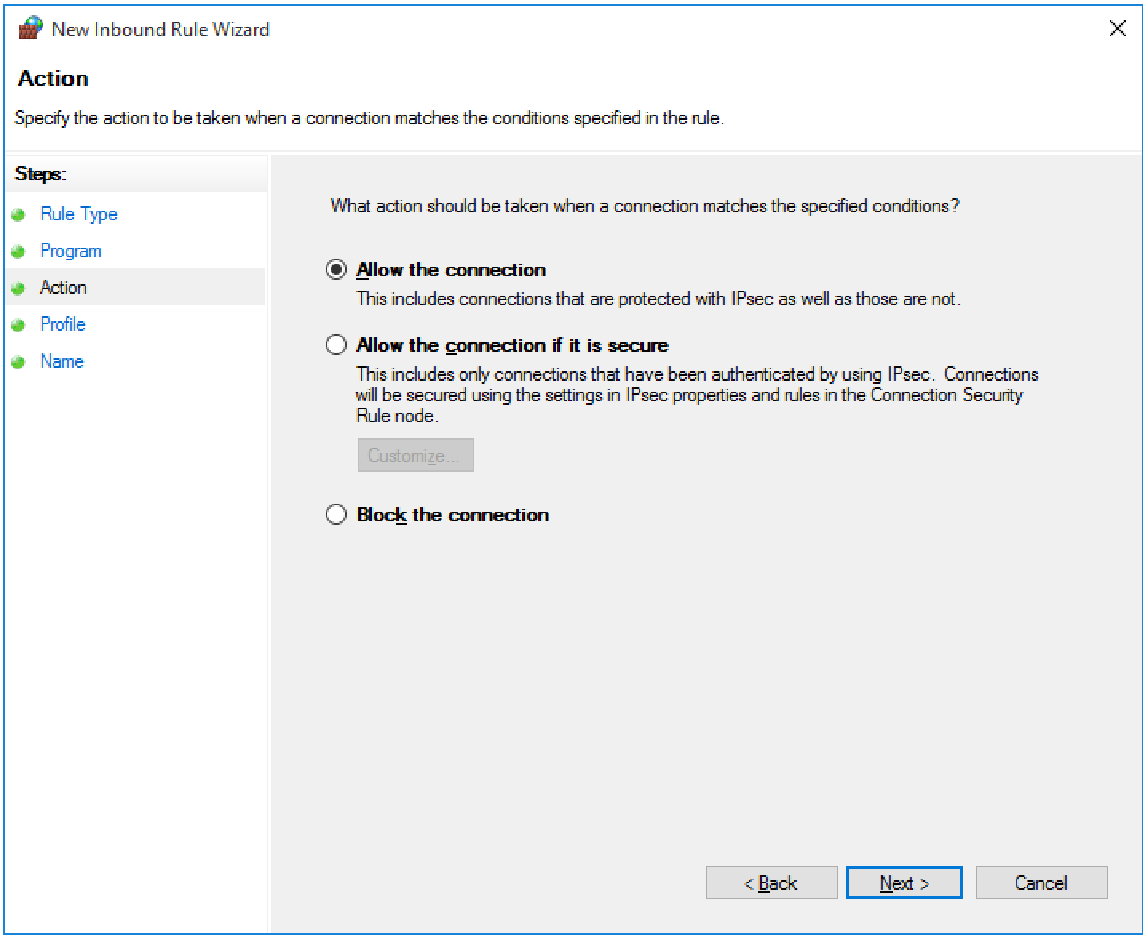
○ **All programs**
Rule applies to all connections on the computer that match other rule properties.

● **This program path:**
%ProgramFiles%\Bristol\OpenBSI\ObjectServer\Bin\BristolOPCServer.exe

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Figure 2-68. Program Path for the Exception

9. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**.



New Inbound Rule Wizard

Action

Specify the action to be taken when a connection matches the conditions specified in the rule.

What action should be taken when a connection matches the specified conditions?

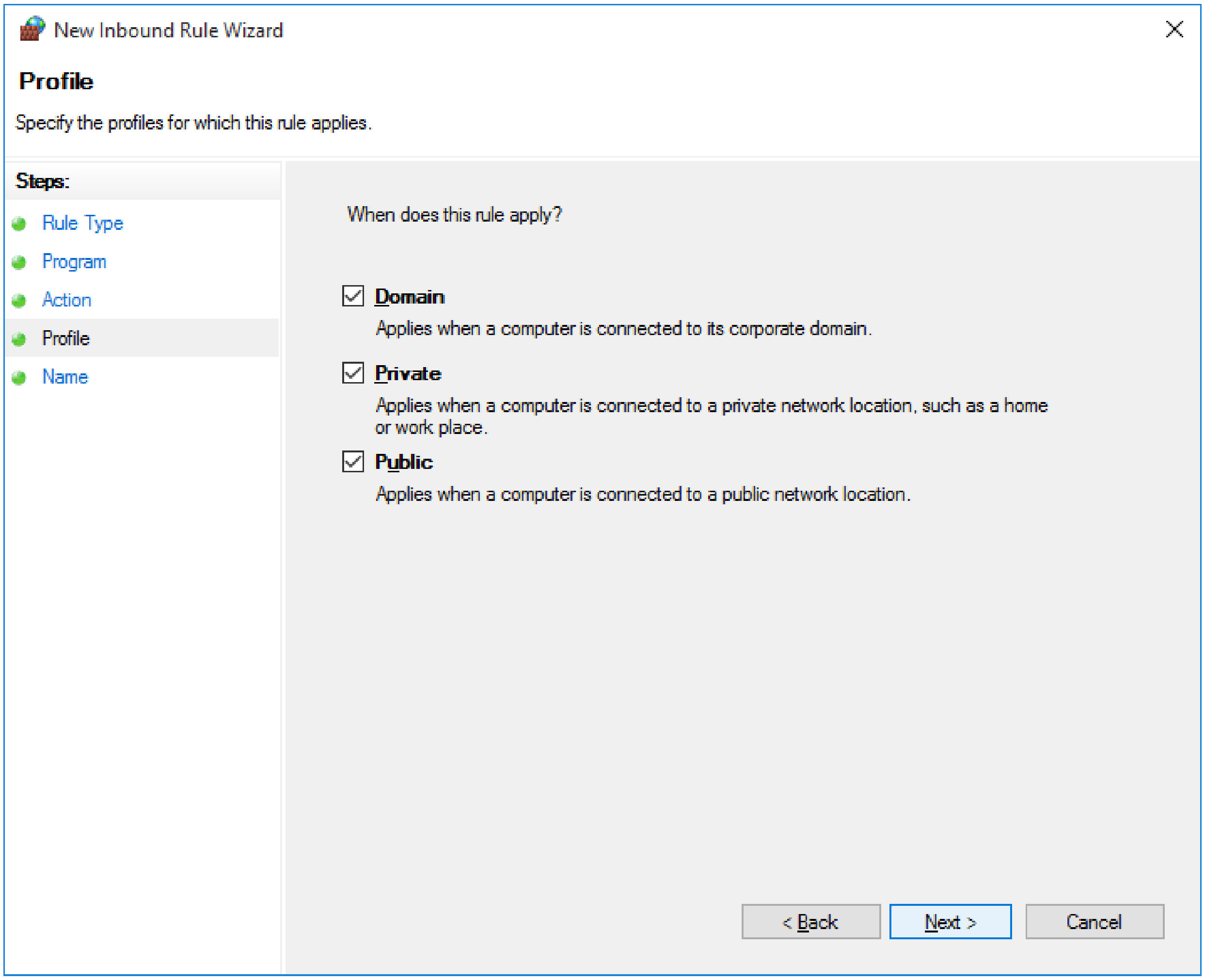
● **Allow the connection**
This includes connections that are protected with IPsec as well as those are not.

○ **Allow the connection if it is secure**
This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

○ **Block the connection**

Figure 2-69. Allowing the Connection

10. On the Profile page of the New Inbound Rule wizard, specify the cases where the ObjectServer inbound rule applies.



Profile

Specify the profiles for which this rule applies.

When does this rule apply?

☑ Domain

Applies when a computer is connected to its corporate domain.

☑ Private

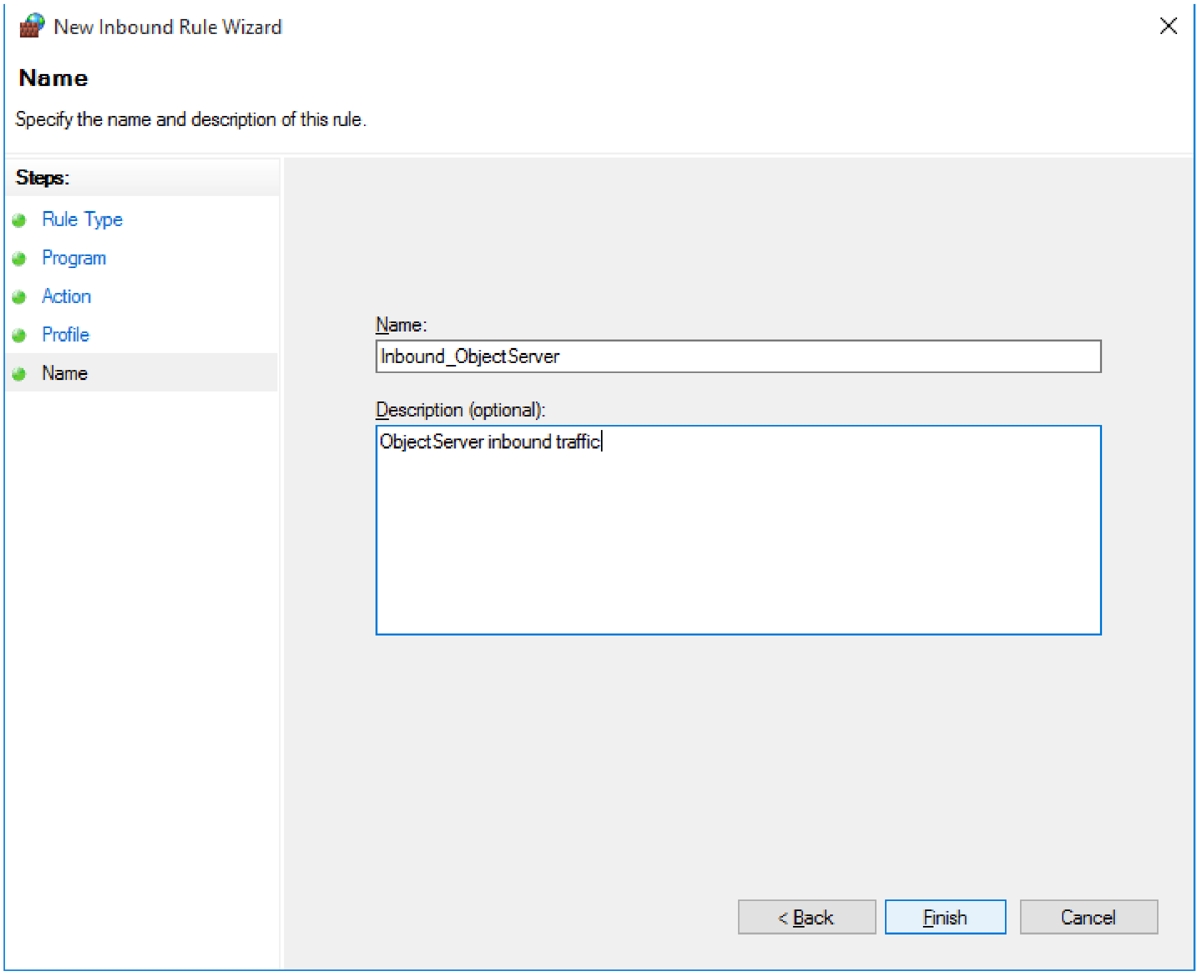
Applies when a computer is connected to a private network location, such as a home or work place.

☑ Public

Applies when a computer is connected to a public network location.

Figure 2-70. Choosing Where the Exception Applies

11. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**.



New Inbound Rule Wizard

Name

Specify the name and description of this rule.

Steps:

- Rule Type
- Program
- Action
- Profile
- Name

Name:

Inbound_ObjectServer

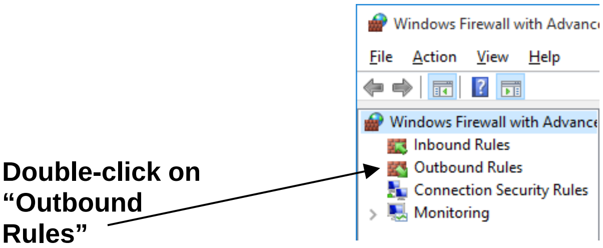
Description (optional):

ObjectServer inbound traffic

Figure 2-71. Name the Rule

12. If you use the Object Server Alarm and Event Server (BristolAEServer.exe), repeat this entire procedure for that executable.

13. **Now repeat the entire procedure *again* but instead of creating inbound rules, double-click on Outbound Rules first and create outbound rules for these programs following the same basic steps.**



Windows Firewall with Advanc
File
Action
View
Help
Windows Firewall with Advance
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring
Double-click on “Outbound Rules”

Figure 2-72. Defining an Outbound Rule

2.9.4 Add Ports for DCOM and RTRSERVC for the Windows 10 Firewall

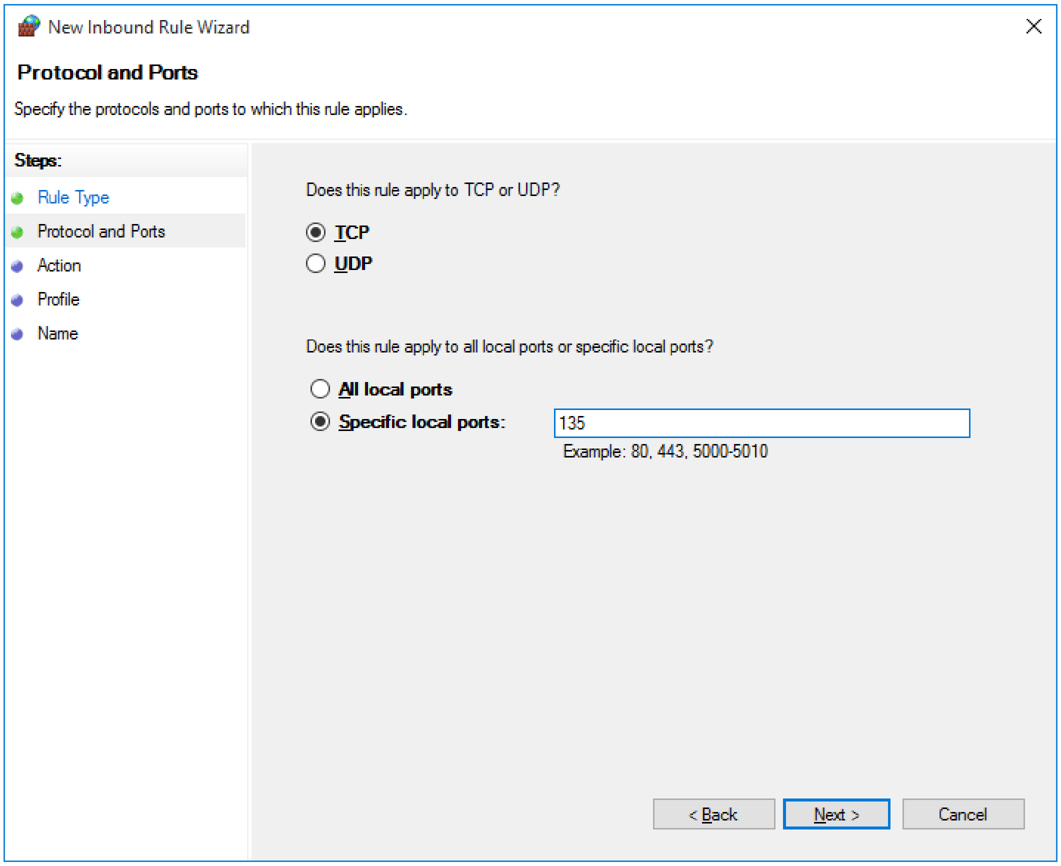
In the previous section, we specified programs that the firewall needed to know about. Now we have to identify which ports these programs use.

Note: When we say ports, we’re not talking about physical communication ports; we’re talking about software connections into the system.

To add the ports, follow these steps:

1. Start defining a new rule following the procedure discussed in *Section 2.9.3* except when you get to the Rule Type page (see *Figure 2-66*) choose **Port** *instead of* “Program.”

2. On the Protocol and Ports page, choose **TCP** and enter **135** in the **Specific remote ports** field. Then click **Next**.



New Inbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Does this rule apply to TCP or UDP?

● TCP
○ UDP

Does this rule apply to all local ports or specific local ports?

○ All local ports
● Specific local ports: 135

Example: 80, 443, 5000-5010

Figure 2-73. Defining a Port Exception

3. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-69*.

4. On the Profile page of the New Inbound Rule wizard, specify the cases where the DCOM port inbound rule applies. This is the same as *Figure 2-70*.

5. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-71*.

6. **Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the DCOM port following the same basic steps.**

7. **Now create both inbound and outbound rules for RTRSERVC. Choose Port on the Rule Type page and on the Protocol and Ports page, enter 1236 for the specific remote ports and choose TCP. Then click Next.**

Note: The reason we say “1236” is that “1236” is the default port number used by RTRSERVC. That number is initially set in the **TCP Port Number for Router Process** field of the IP Parameters dialog box in NetView’s System Wizard. If you originally set it to something *different* than 1236, you should use *that* number here, instead of 1236.

8. On the Name page enter **rtrservc** for the port’s **Name** and click **Finish.**

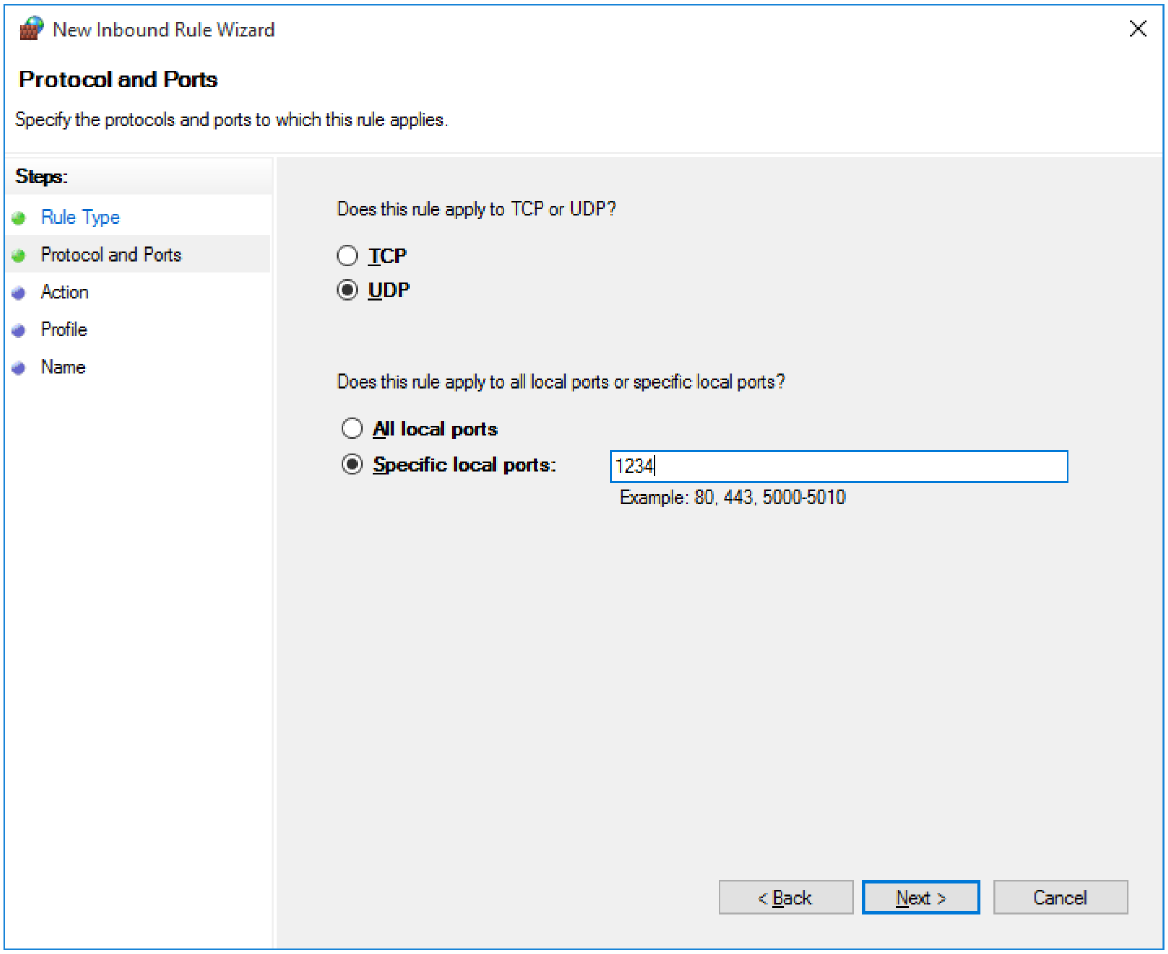
2.9.5 Add Ports for the Bristol IP Driver (BSIPDRV) for the Windows 10 Firewall

This procedure is *almost* identical to previous sections. We are adding two additional ports for the Bristol IP Driver (BSIPDRV). One is for the driver itself, and the other is for Time Synchronization messages. The main difference from the previous step is the port numbers and the port type, which is UDP, instead of TCP.

To add the ports, follow these steps:

1. Start defining a new rule following the procedure discussed in *Section 2.9.3* except when you get to the Rule Type page (see *Figure 2-66*) choose **Port** *instead of* “Program.”

2. On the Protocol and Ports page, choose **UDP** and enter **1234** in the **Specific remote ports** field. Then click **Next**.



New Inbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Does this rule apply to TCP or UDP?

○ TCP

● UDP

Does this rule apply to all local ports or specific local ports?

○ All local ports

● Specific local ports: 1234

Example: 80, 443, 5000-5010

Figure 2-74. Defining a Port Exception for BSIPDRV

3. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-69*.
4. On the Profile page of the New Inbound Rule wizard, specify the cases where the BSIPDRV port inbound rule applies. This is the same as *Figure 2-70*.
5. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-71*.
6. **Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the BSIPDRV port following the same basic steps.**
7. **Now repeat the entire procedure** to add the second port for **BSIPDRV** except enter **123<u>5</u>** for the **Specific remote ports**. You must create both inbound and outbound rules.

Note: Again, we're saying "1234" and "1235" because those are the default port numbers used by BSIPDRV. Those numbers are initially set in the **UDP Port Number for IP Driver** and **UDP Port Number for Time Synch** fields of the IP Parameters dialog box in NetView's System Wizard. If you originally set them to something *different* than 1234 and 1235, you should use *those* numbers here, instead.

2.9.6 Reconfiguring the DCOM Software for the Windows 10 Firewall

You must reconfigure the DCOM software for the Object Server to function correctly. This process is similar to that for other Windows operating systems. See *Section 2.7.6.*

2.10 Using OpenBSI with Microsoft® Windows 2012 Server

For OpenBSI to function with Windows 2012 Server need to re-configure the Windows Firewall software, and re-configure DCOM software.

2.10.1 Reconfiguring the Windows 2012 Server Firewall

Reconfiguring the firewall involves either disabling it (not recommended in most cases) or making certain OpenBSI applications exceptions to the firewall, to let them through.

Note: If Object Server is currently running, you must shut it down during this configuration.

2.10.2 Disabling the Windows 2012 Server Firewall

If the Windows firewall is the only firewall protection you have, we recommend you leave it enabled, and skip to *Section 2.10.3*. If, however, you have a corporate firewall already installed and it is operating correctly, you may decide that the Windows firewall is unnecessary. If this is the case, you can disable the Windows firewall.

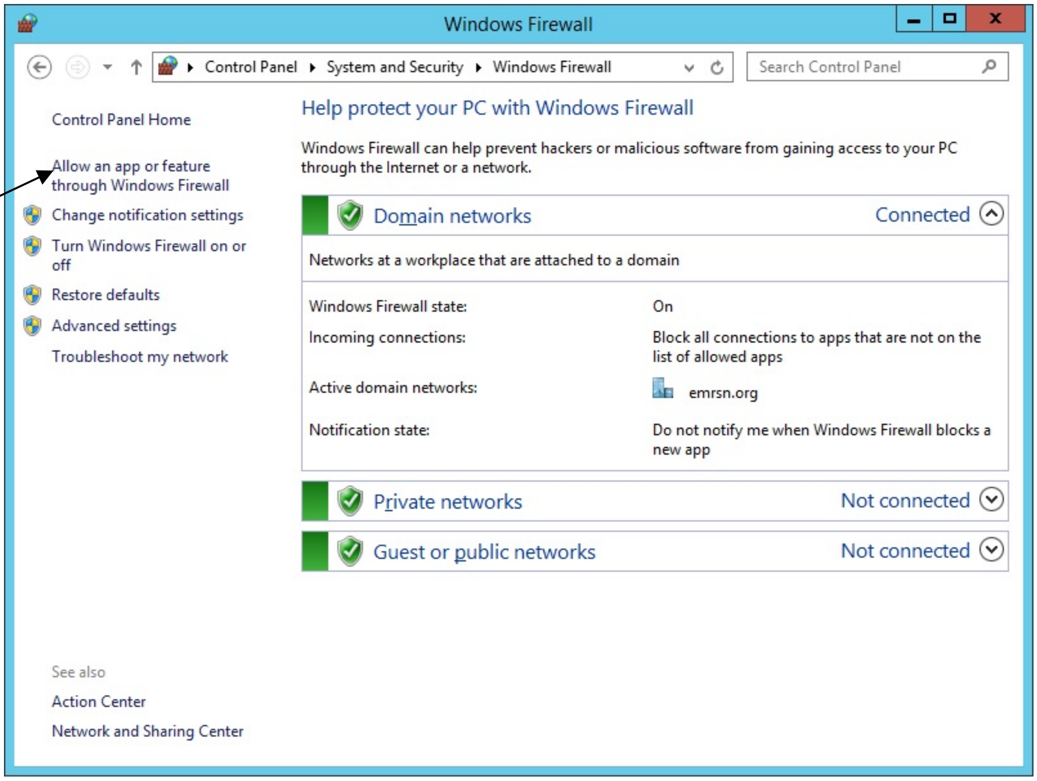
⚠ **Caution** **Only perform these next four steps if you have a separate corporate firewall which renders the Windows firewall unnecessary.**

1. From the Windows™ Control Panel, double-click on **System and Security** and then select **Windows Firewall**.
2. Click on the **Turn Windows Firewall on or off** link.
3. On the **General** page of the Windows Firewall dialog box, select the **Off** button, then click on **OK**.
4. Skip the remaining steps in this sub-section, and continue with the section *"Reconfiguring the DCOM Software."*

2.10.3 Making Object Server an Exception to the Windows 2012 Server Firewall

If you install Object Server, you need to grant it as an exception to the Windows Firewall.

1. From the Windows™ Control Panel, double-click on **System and Security** then choose **Windows Firewall**.
2. Click **Allow an app or feature through Windows Firewall**.


Windows Firewall
Control Panel ▸ System and Security ▸ Windows Firewall
Search Control Panel
Control Panel Home
Allow an app or feature through Windows Firewall
Change notification settings
Turn Windows Firewall on or off
Restore defaults
Advanced settings
Troubleshoot my network
See also
Action Center
Network and Sharing Center

Help protect your PC with Windows Firewall

Windows Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

Domain networks — Connected

Networks at a workplace that are attached to a domain

Windows Firewall state:	On
Incoming connections:	Block all connections to apps that are not on the list of allowed apps
Active domain networks:	emrsn.org
Notification state:	Do not notify me when Windows Firewall blocks a new app

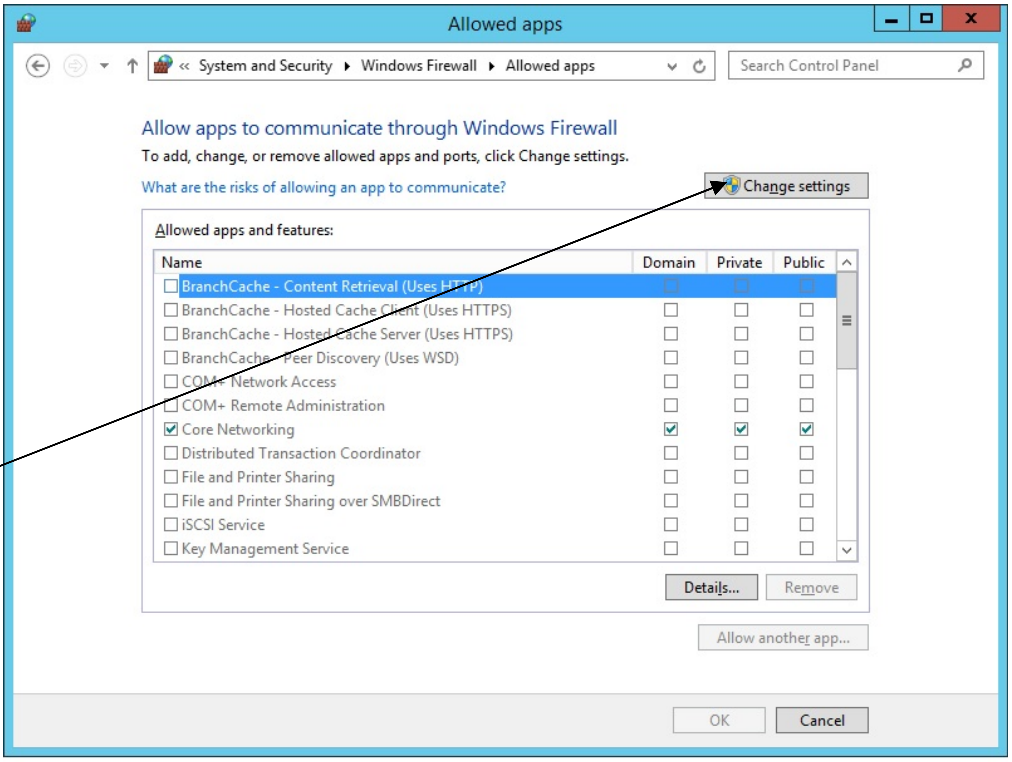
Private networks — Not connected

Guest or public networks — Not connected

Click "Allow an app or feature through Windows Firewall"

Figure 2-75. Allow a Program Through the Firewall

3. On the Allowed Apps page, click **Change Settings**.



Allowed apps

« System and Security ▸ Windows Firewall ▸ Allowed apps

Search Control Panel

Allow apps to communicate through Windows Firewall

To add, change, or remove allowed apps and ports, click Change settings.

What are the risks of allowing an app to communicate?

Change settings

Allowed apps and features:

Name	Domain	Private	Public
□ BranchCache - Content Retrieval (Uses HTTP)	□	□	□
□ BranchCache - Hosted Cache Client (Uses HTTPS)	□	□	□
□ BranchCache - Hosted Cache Server (Uses HTTPS)	□	□	□
□ BranchCache - Peer Discovery (Uses WSD)	□	□	□
□ COM+ Network Access	□	□	□
□ COM+ Remote Administration	□	□	□
☑ Core Networking	☑	☑	☑
□ Distributed Transaction Coordinator	□	□	□
□ File and Printer Sharing	□	□	□
□ File and Printer Sharing over SMBDirect	□	□	□
□ iSCSI Service	□	□	□
□ Key Management Service	□	□	□

Details... Remove

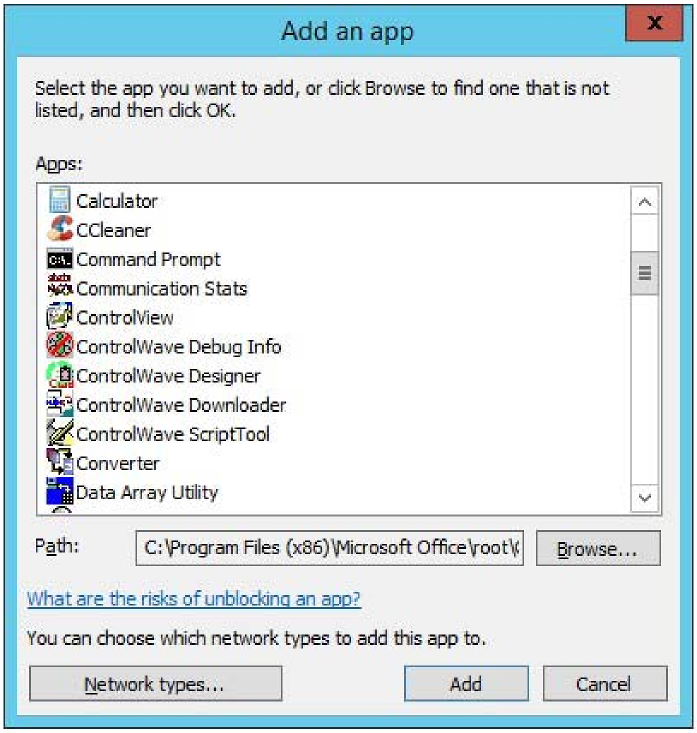
Allow another app...

OK Cancel

Click "Change Settings"

Figure 2-76. Defining an Inbound Rule

4. In the Add an app page, select the Object Server app and click **Add**.



Add an app

Select the app you want to add, or click Browse to find one that is not listed, and then click OK.

Apps:

- Calculator
- CCleaner
- Command Prompt
- Communication Stats
- ControlView
- ControlWave Debug Info
- ControlWave Designer
- ControlWave Downloader
- ControlWave ScriptTool
- Converter
- Data Array Utility

Path: C:\Program Files (x86)\Microsoft Office\root\(Browse...

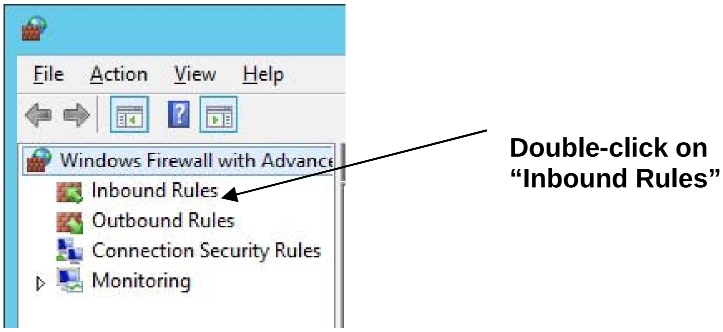
What are the risks of unblocking an app?

You can choose which network types to add this app to.

Network types... Add Cancel

Figure 2-77. Add an app dialog box

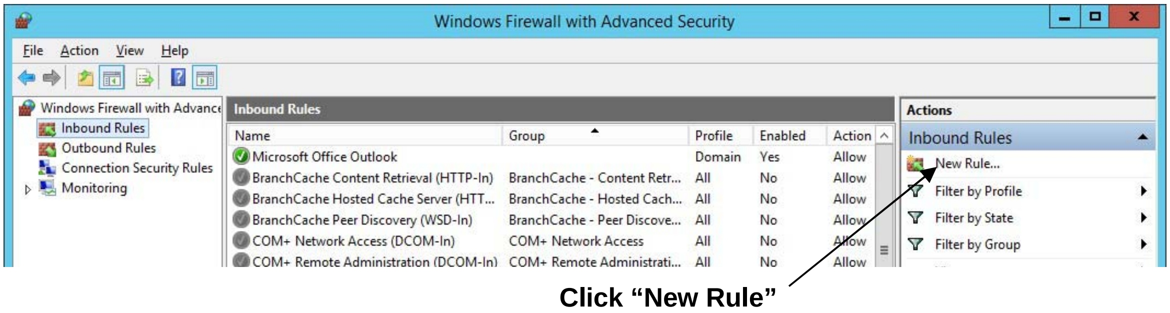
5. In the Windows Firewall with Advanced Security page, double-click on **Inbound Rules**.



Double-click on “Inbound Rules”

Figure 2-78. Defining an Inbound Rule

6. On the **Inbound Rules** page click **New Rule.**



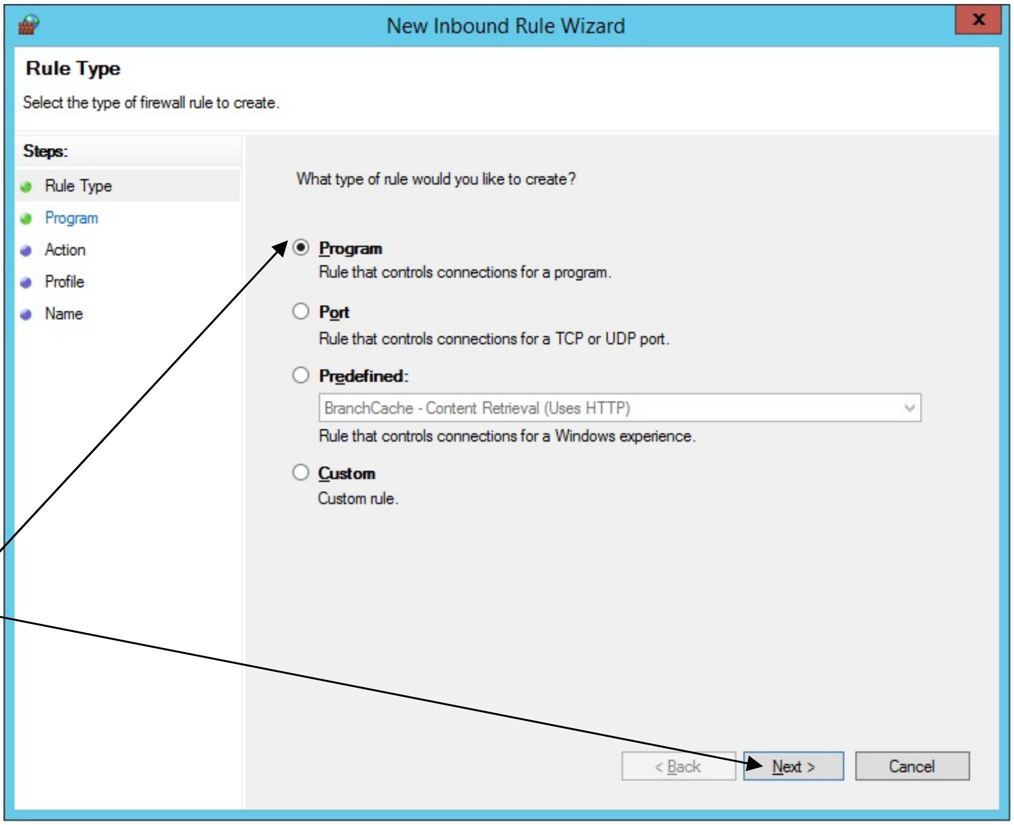
Inbound Rules

Name	Group	Profile	Enabled	Action
Microsoft Office Outlook		Domain	Yes	Allow
BranchCache Content Retrieval (HTTP-In)	BranchCache - Content Retr...	All	No	Allow
BranchCache Hosted Cache Server (HTT...	BranchCache - Hosted Cach...	All	No	Allow
BranchCache Peer Discovery (WSD-In)	BranchCache - Peer Discove...	All	No	Allow
COM+ Network Access (DCOM-In)	COM+ Network Access	All	No	Allow
COM+ Remote Administration (DCOM-In)	COM+ Remote Administrati...	All	No	Allow

Click “New Rule”

Figure 2-79. Defining a New Inbound Rule

7. In the Rule Type page of the New Inbound Rule Wizard, click **Program**. Then click **Next**.



Rule Type

Select the type of firewall rule to create.

What type of rule would you like to create?

● **Program**
Rule that controls connections for a program.

○ **Port**
Rule that controls connections for a TCP or UDP port.

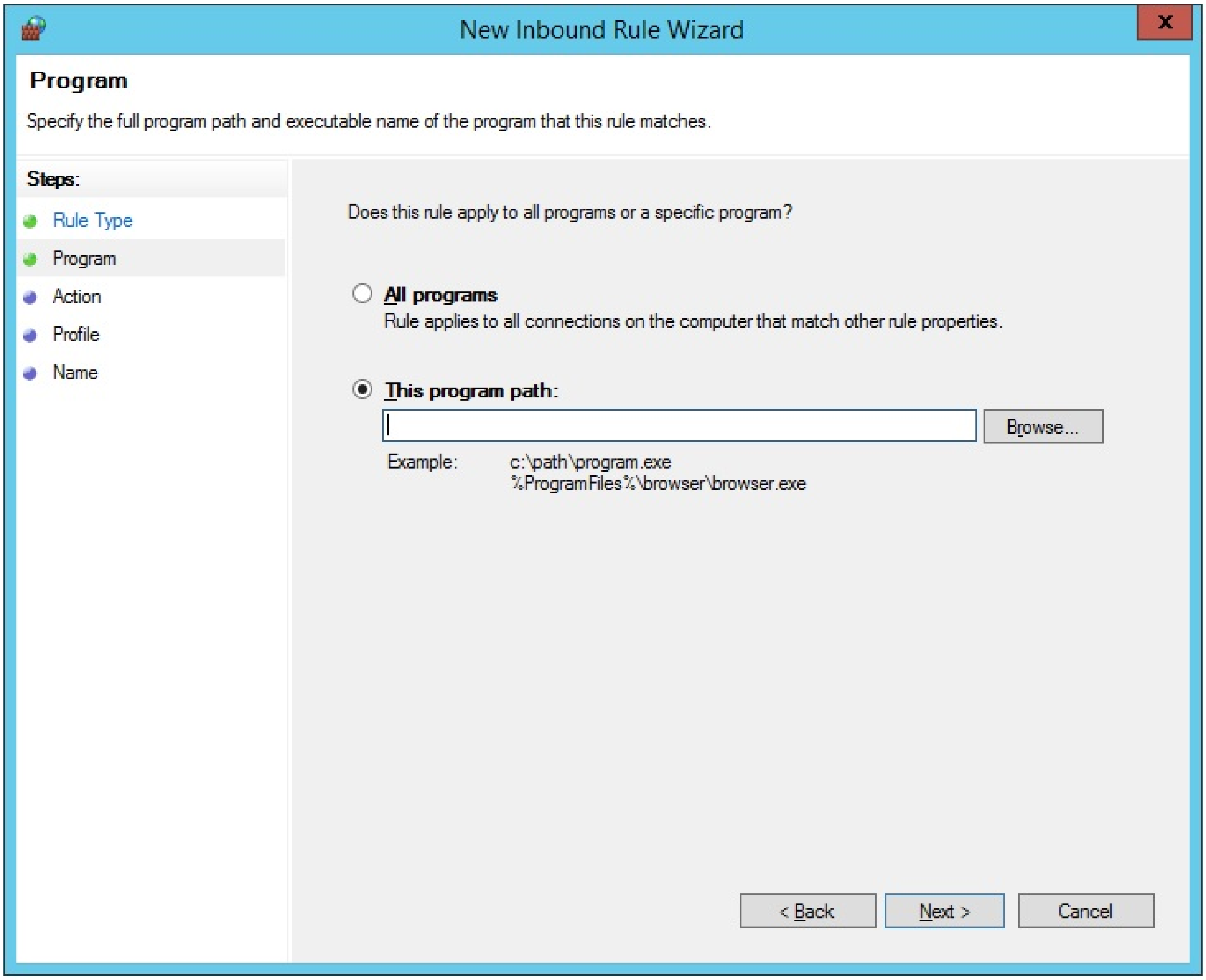
○ **Predefined:**
BranchCache - Content Retrieval (Uses HTTP)
Rule that controls connections for a Windows experience.

○ **Custom**
Custom rule.

Click “Program” then click “Next”

Figure 2-80. New Inbound Rule Wizard – Rule Type page

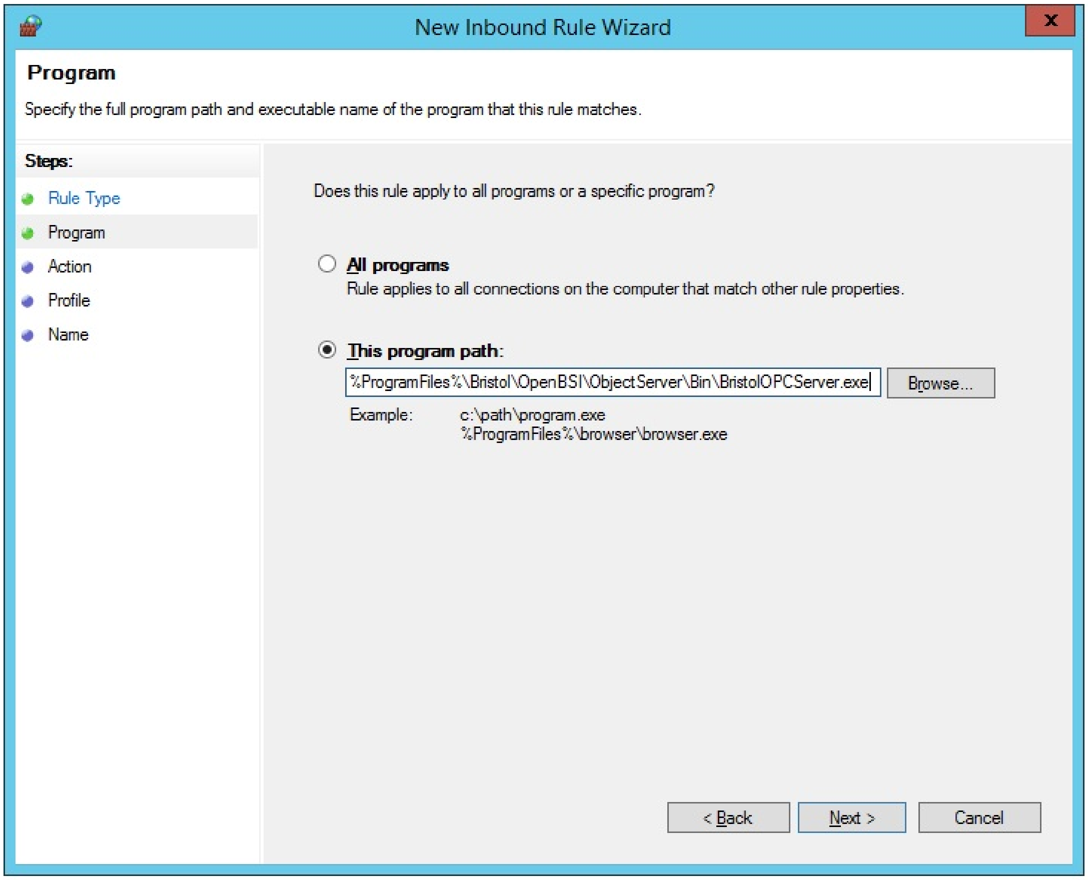
8. On the Program page (see *Figure 2-81*.), you can add Object Server to the list of authorized communicators through the Windows Firewall. Click the **Browse** button next to the **This Program Path** field to locate the Bristol OPC Server (**BristolOPCServer.exe)**.



New Inbound Rule Wizard
Program
Specify the full program path and executable name of the program that this rule matches.
Steps:
Rule Type
Program
Action
Profile
Name
Does this rule apply to all programs or a specific program?
○ All programs
Rule applies to all connections on the computer that match other rule properties.
● This program path:
Browse...
Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe
< Back
Next >
Cancel

Figure 2-81. New Inbound Rule Wizard – Program page

9. Select BristolOPCServer.exe, then click **Open.**
10. The path for the item you just selected shows in the **This program path** field on the Program page of the New Inbound Rule Wizard (*Figure 2-83*). Click **Next**.



New Inbound Rule Wizard

Program

Specify the full program path and executable name of the program that this rule matches.

Does this rule apply to all programs or a specific program?

○ **All programs**

Rule applies to all connections on the computer that match other rule properties.

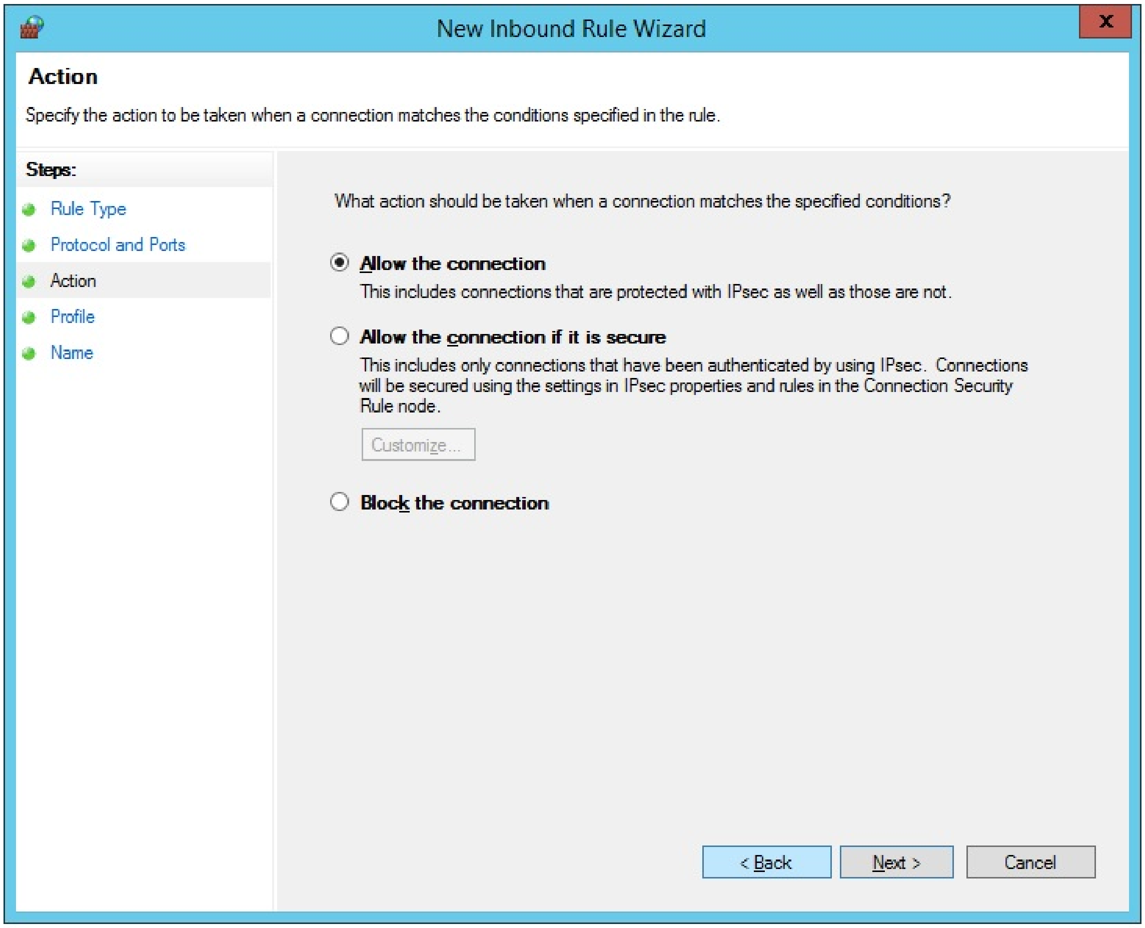
● **This program path:**

%ProgramFiles%\Bristol\OpenBSI\ObjectServer\Bin\BristolOPCServer.exe

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Figure 2-82. New Inbound Rule Wizard – Program page

11. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**.



New Inbound Rule Wizard

Action

Specify the action to be taken when a connection matches the conditions specified in the rule.

What action should be taken when a connection matches the specified conditions?

● **Allow the connection**

This includes connections that are protected with IPsec as well as those are not.

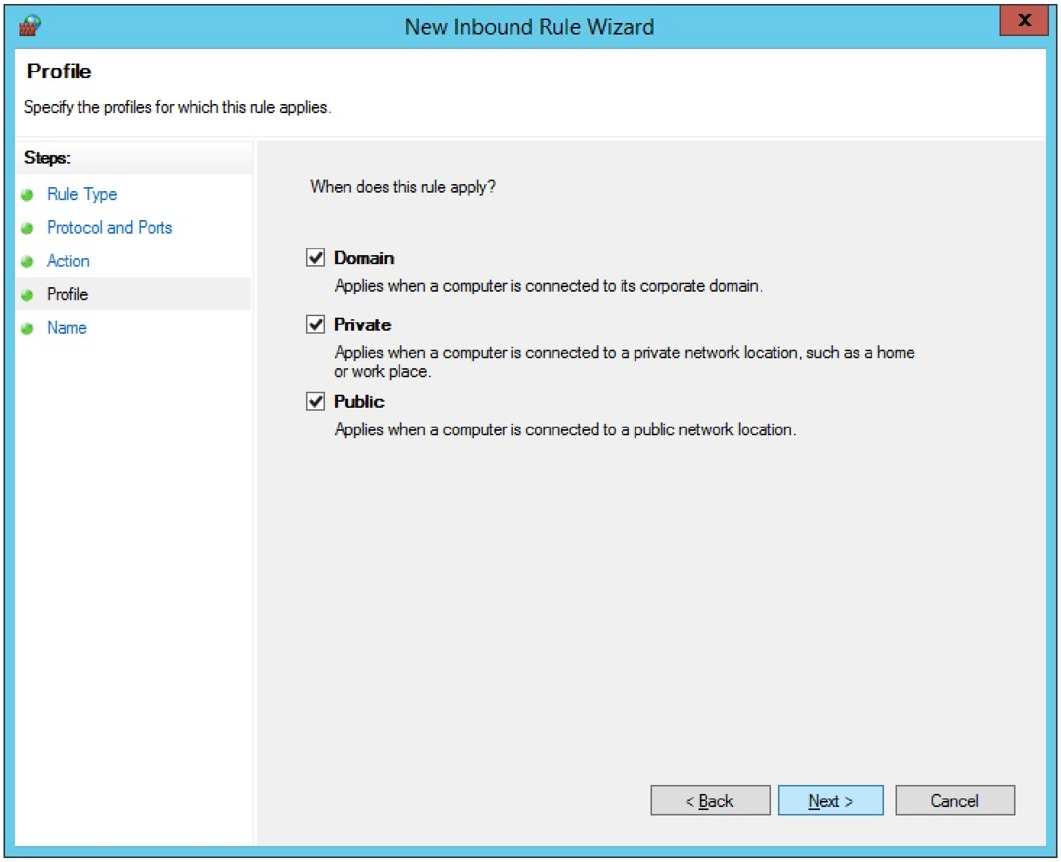
○ **Allow the connection if it is secure**

This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

○ **Block the connection**

Figure 2-83. Program Path for the Exception

12. On the Profile page of the New Inbound Rule wizard, specify the cases where the ObjectServer inbound rule applies.



New Inbound Rule Wizard

Profile

Specify the profiles for which this rule applies.

When does this rule apply?

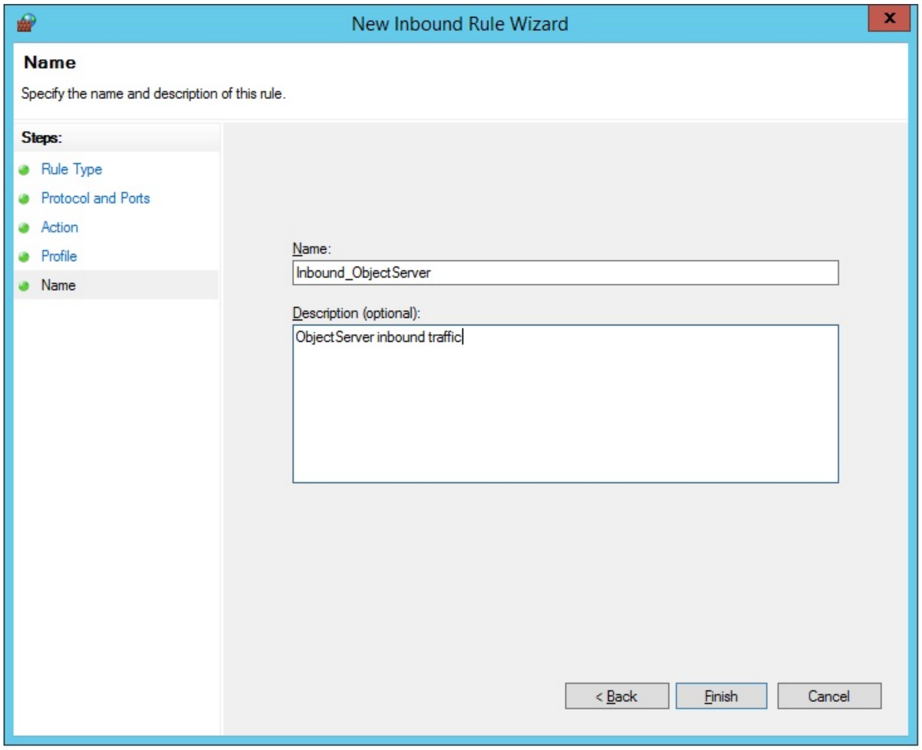
☑ **Domain**
Applies when a computer is connected to its corporate domain.

☑ **Private**
Applies when a computer is connected to a private network location, such as a home or work place.

☑ **Public**
Applies when a computer is connected to a public network location.

Figure 2-84. Choosing Where the Exception Applies

13. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**.



New Inbound Rule Wizard

Name

Specify the name and description of this rule.

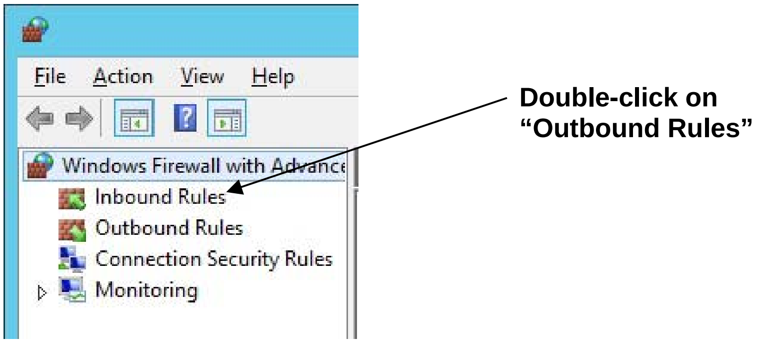
Name: Inbound_ObjectServer

Description (optional): ObjectServer inbound traffic

Figure 2-85. Name the Rule

14. If you use the Object Server Alarm and Event Server (BristolAEServer.exe), repeat this entire procedure for that executable.

15. **Now repeat the entire procedure *again* but instead of creating inbound rules, double-click on Outbound Rules first and create outbound rules for these programs following the same basic steps.**



File
Action
View
Help
Windows Firewall with Advance
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring
Double-click on "Outbound Rules"

Figure 2-86. Defining an Outbound Rule

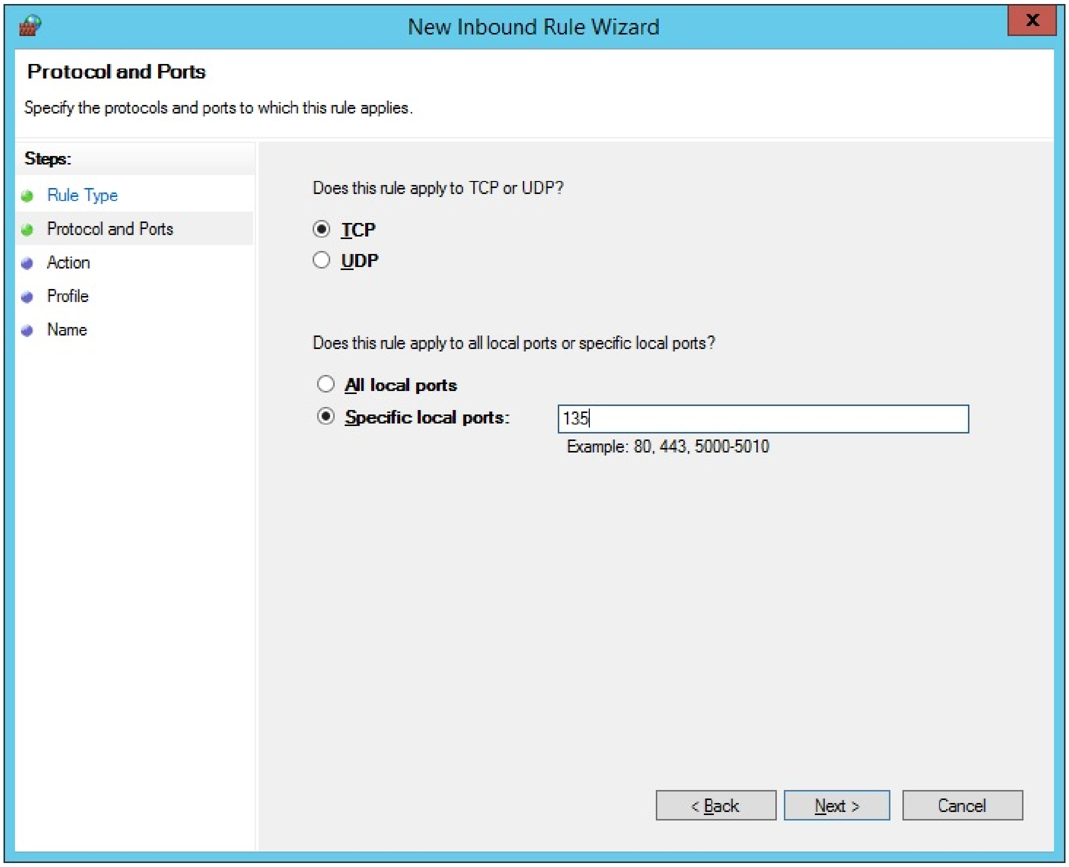
2.10.4 Add Ports for DCOM and RTRSERVC for the Windows 2012 Server Firewall

In the previous section, we specified programs that the firewall needed to know about. Now we have to identify which ports these programs use.

Note: When we say ports, we're not talking about physical communication ports; we're talking about software connections into the system.

To add the ports, follow these steps:

1. Start defining a new rule following the procedure discussed in *Section 2.10.3* except when you get to the Rule Type page (see *Figure 2-66*) choose **Port** *instead of* "Program."
2. On the Protocol and Ports page, choose **TCP** and enter **135** in the **Specific remote ports** field. Then click **Next**.



New Inbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Steps:

- Rule Type
- Protocol and Ports
- Action
- Profile
- Name

Does this rule apply to TCP or UDP?

● TCP
○ UDP

Does this rule apply to all local ports or specific local ports?

○ All local ports
● Specific local ports: 135

Example: 80, 443, 5000-5010

Figure 2-87. Defining a Port Exception

3. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-69*.

4. On the Profile page of the New Inbound Rule wizard, specify the cases where the DCOM port inbound rule applies. This is the same as *Figure 2-70*.

5. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-71*.

6. **Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the DCOM port following the same basic steps.**

7. **Now create both inbound and outbound rules for RTRSERVC. Choose Port on the Rule Type page and on the Protocol and Ports page, enter 1236 for the specific remote ports and choose TCP. Then click Next.**

Note: The reason we say "1236" is that "1236" is the default port number used by RTRSERVC. That number is initially set in the **TCP Port Number for Router Process** field of the IP Parameters dialog box in NetView's System Wizard. If you originally set it to something *different* than 1236, you should use *that* number here, instead of 1236.

8. On the Name page enter **rtrservc** for the port's **Name** and click **Finish.**

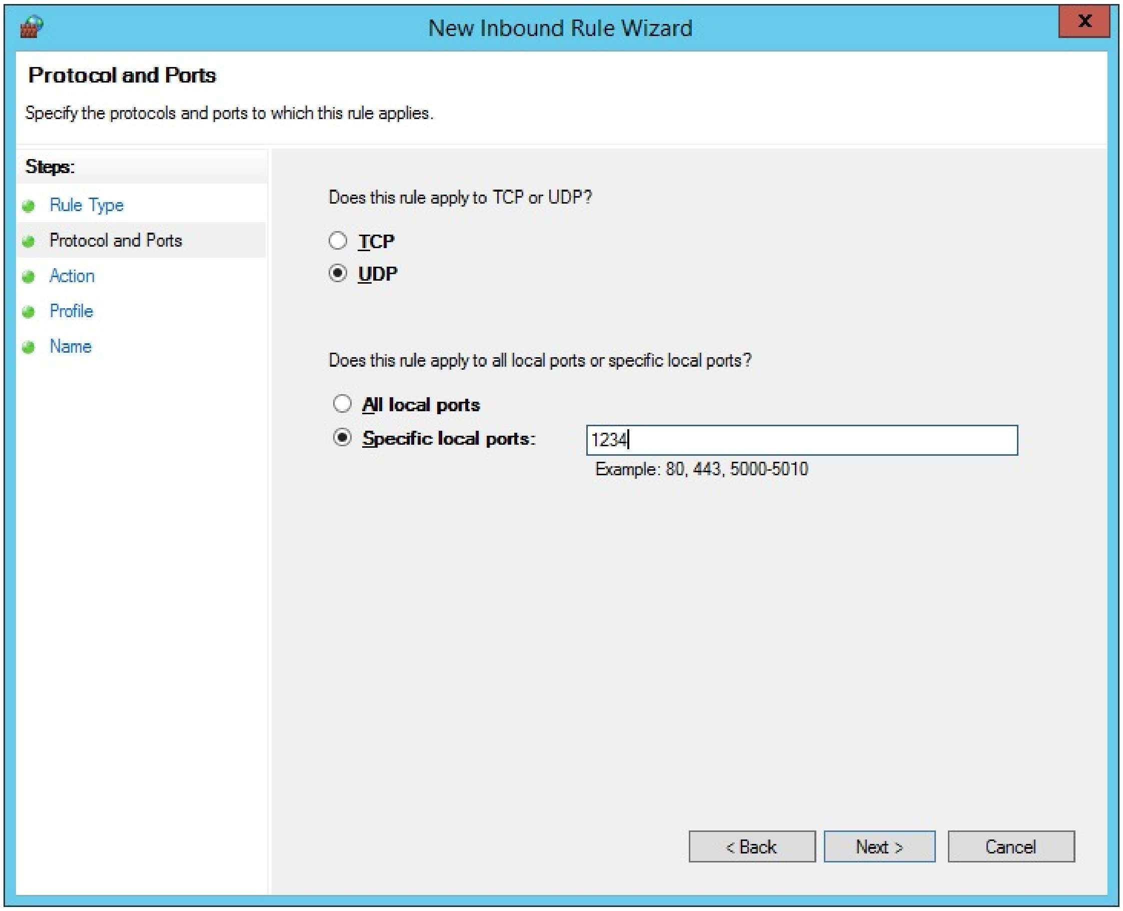
2.10.5 Add Ports for the Bristol IP Driver (BSIPDRV) for the Windows 2012 Server Firewall

This procedure is *almost* identical to previous sections. We are adding two additional ports for the Bristol IP Driver (BSIPDRV). One is for the driver itself, and the other is for Time Synchronization messages. The main difference from the previous step is the port numbers and the port type, which is UDP, instead of TCP.

To add the ports, follow these steps:

9. Start defining a new rule following the procedure discussed in *Section 2.9.3* except when you get to the Rule Type page (see *Figure 2-80*) choose **Port** *instead of* "Program."

10. On the Protocol and Ports page, choose **UDP** and enter **1234** in the **Specific remote ports** field. Then click **Next**.



New Inbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Does this rule apply to TCP or UDP?

○ TCP

● UDP

Does this rule apply to all local ports or specific local ports?

○ All local ports

● Specific local ports: 1234

Example: 80, 443, 5000-5010

Figure 2-88. Defining a Port Exception for BSIPDRV

11. On the Action page of the New Inbound Rule Wizard, click **Allow the Connection**. Then click **Next**. This is the same as *Figure 2-83*.

12. On the Profile page of the New Inbound Rule wizard, specify the cases where the BSIPDRV port inbound rule applies. This is the same as *Figure 2-84*.

13. On the Name page of the New Inbound Rule Wizard, specify a **Name** for the rule, and optionally enter a description. Then click **Finish**. This is similar to *Figure 2-85*.

14. Now repeat the entire procedure but instead of creating an inbound rule, double-click on Outbound Rules first and create outbound rules for the BSIPDRV port following the same basic steps.

15. Now repeat the entire procedure to add the second port for **BSIPDRV** except enter **1235** for the **Specific remote ports**. You must create both inbound and outbound rules.

Note: Again, we're saying "1234" and "1235" because those are the default port numbers used by BSIPDRV. Those numbers are initially set in the **UDP Port Number for IP Driver** and **UDP Port Number for Time Synch** fields of the IP Parameters dialog box in NetView’s System Wizard. If you originally set them to something *different* than 1234 and 1235, you should use *those* numbers here, instead.

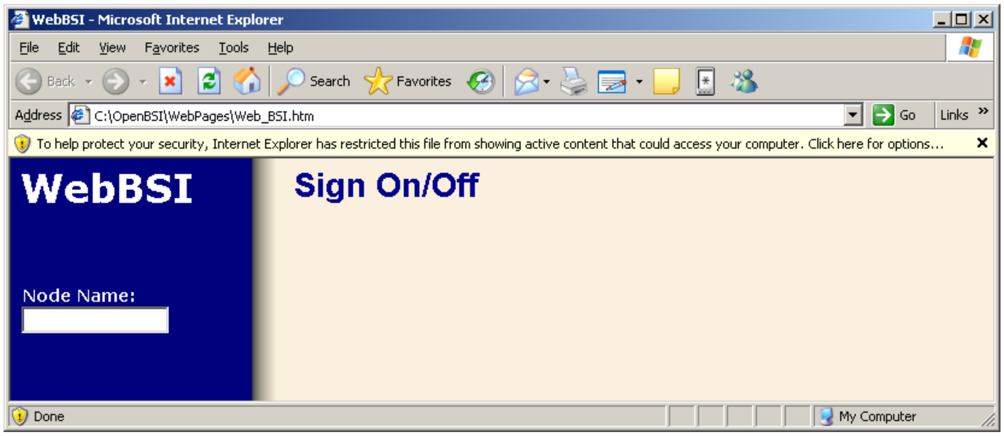
2.10.6 Reconfiguring the DCOM Software for the Windows 2012 Server Firewall

You must reconfigure the DCOM software for the Object Server to function correctly. This process is similar to that for other Windows operating systems. See *Section 2.7.6.*

2.11 Recommendations for Using OpenBSI ActiveX Controls

You may encounter problems using some OpenBSI ActiveX controls (for example, in web pages) in some Windows platforms. Some portions of controls may not be displayed, for example. (See security message displayed below):

Note: Depending upon the version of Windows you are using, the screens shown in this section may vary somewhat.



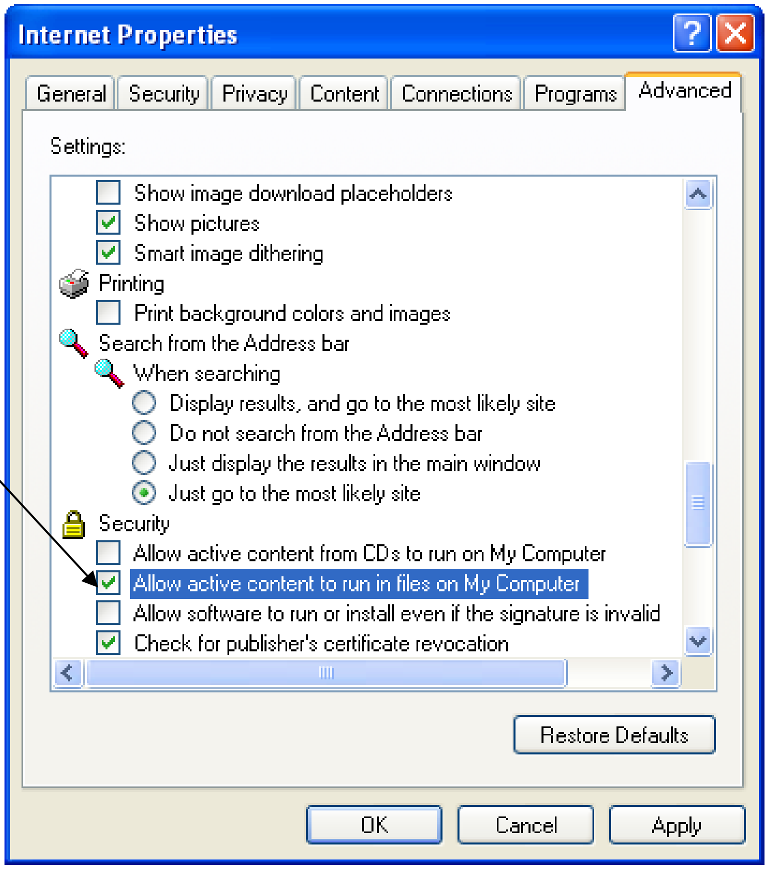
Address: C:\OpenBSI\WebPages\Web_BSI.htm

To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer. Click here for options...

Figure 2-89. Internet Explorer warning

To prevent these restrictions from affecting the operation of ActiveX controls, do the following:

1. Open the Windows Control Panel.
2. Select **Internet Options**.
3. Click the **Advanced** tab.
4. Under the **Settings** for Security, make sure **“Allow active content to run in files on My Computer”** is checked.



Internet Properties

Settings:

- □ Show image download placeholders
- ☑ Show pictures
- ☑ Smart image dithering
- Printing
  - □ Print background colors and images
- Search from the Address bar
  - When searching
    - ○ Display results, and go to the most likely site
    - ○ Do not search from the Address bar
    - ○ Just display the results in the main window
    - ● Just go to the most likely site
- Security
  - □ Allow active content from CDs to run on My Computer
  - ☑ Allow active content to run in files on My Computer
  - □ Allow software to run or install even if the signature is invalid
  - ☑ Check for publisher's certificate revocation

Make sure this is checked.

Figure 2-90. Internet Options – Advanced tab

5. You may need to reboot your PC to ensure the new settings take effect.

Note: In addition, Microsoft® has changed Windows XP so that ActiveX controls are disabled, by default, in Internet Explorer. Because this affects the OpenBSI controls, you may, instead, want to make use of the simple browser option, by removing the BBIWebBrowser option in the DATASERV.INI file, or by setting it to 1. See *Appendix E.*

Chapter 3 – Quickstart (OpenBSI BSAP Communications)

This section describes the minimum steps necessary to start communications between an OpenBSI workstation and a network of ControlWave / Network 3000 (RTUs). It assumes that:

- You installed your RTUs and configured them for BSAP communications.
- You connected and tested the cables to the RTU network.
- You installed OpenBSI Network Edition on your PC.

In This Chapter

We divided this chapter into six sections; each section contains multiple steps:

Section 3.1 describes how to start **NetView** and open a new set of **Network Definition Files** (also known as **NETDEF** files). NetView controls OpenBSI communications, and operates according to user-specified parameters in the NETDEF files. You must complete this section first.

Section 3.2 describes how to use the **System Wizard** to define a **Network Host PC**. For BSAP networks, the Network Host PC is the Network Master (Level 0) node.

Section 3.3 describes how to use the **Network Wizard** to define the type of network, and the maximum number of slave nodes of master nodes on various levels of the network.

Section 3.4 describes how to use the **RTU Wizard** to define the individual RTUs which make up the network defined in *Section 3.3*.

Section 3.5 describes how to use the **Comm Line Wizard** to define the communication line characteristics for the network created in *Section*

3.3. These characteristics include the name of the communication line (COM1 or COM2), the baud rate, and the valid slave address range.

Section 3.6 describes how to use **DataView** to verify communications.

3.1 Start NetView and Open a New Set of NETDEF Files

Note: If you have not registered your copy of OpenBSI Network Edition, the system prompts you to do so. Unregistered software only runs for a maximum of 60 days; after that time, you must complete the registration to continue to use it. For more information on the registration process, see *Chapter 2*.

1. Click **Start > Programs > OpenBSI Tools > NetView** and NetView starts. (See *Figure 3-1*.)

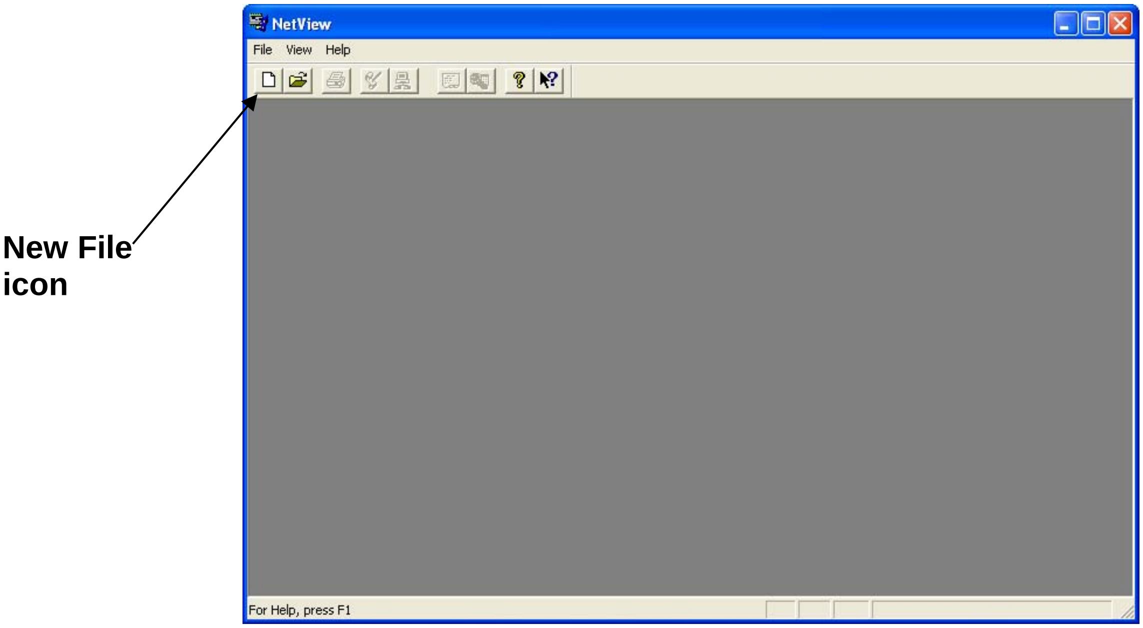
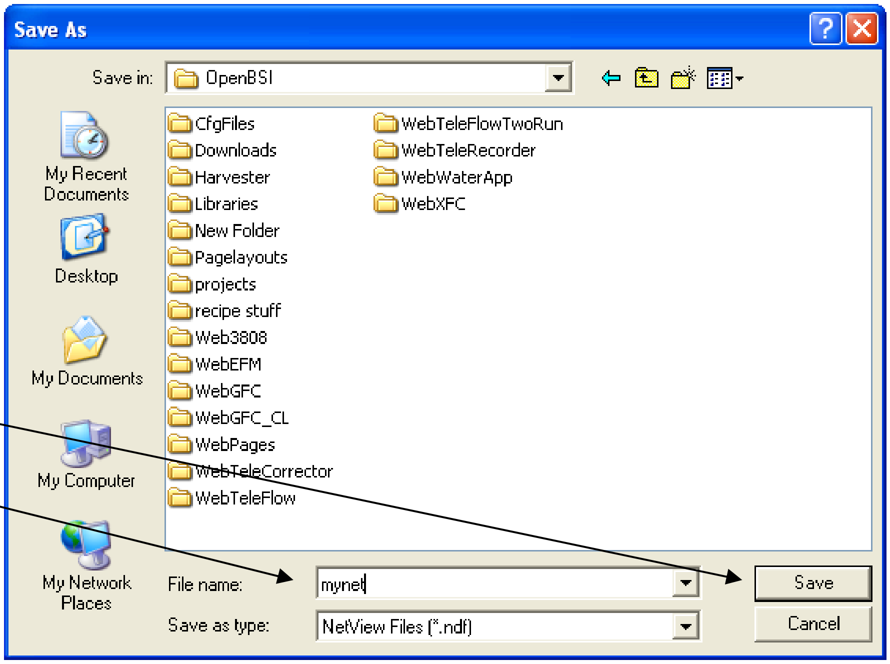


Figure 3-1. NetView Main Window

2. To open a new NETDEF file, click on the New File icon, or click **File>New**. This calls up the “Save As” dialog box.


Save As

Save in: OpenBSI

File name: mynet

Save as type: NetView Files (*.ndf)

First enter a name, then click "Save."

Figure 3-2. Save As dialog box

3. In the "Save As" dialog box, enter a name for your NETDEF file, and click **Save.** In addition to the NDF file, this also automatically saves a set of database files (*.MDB, *.DSN, and *.LDB) which share the same file basename as the NDF file. We call these the **Network Definition (NETDEF) files**. After the save operation completes, the System Wizard starts. Proceed to *Section 3.2*.

3.2 Use the System Wizard to Define Your Network Host PC (NHP)

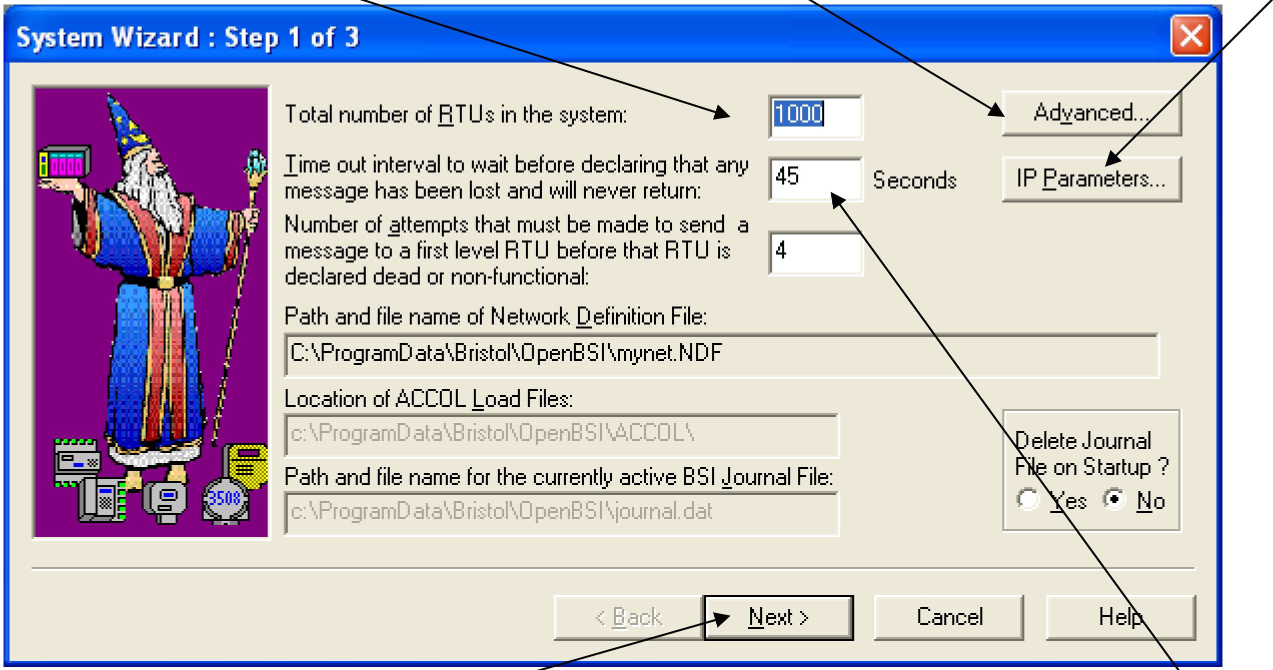
After you save your NETDEF files (see the previous section), the System Wizard activates, so you can define a Network Host PC (NHP). The NHP serves as your BSAP Network Master.

3.2.1 System Wizard – Page 1

This number defines the maximum number of RTUs your system can support. This must be at least "100."

Most users can leave the "Advanced Parameters" at their default values.

Ignore the "IP Parameters." They don't apply when defining a purely BSAP network.



System Wizard : Step 1 of 3

Total number of RTUs in the system: 1000

Time out interval to wait before declaring that any message has been lost and will never return: 45 Seconds

Number of attempts that must be made to send a message to a first level RTU before that RTU is declared dead or non-functional: 4

Path and file name of Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet.NDF

Location of ACCOL Load Files: c:\ProgramData\Bristol\OpenBSI\ACCOL\

Path and file name for the currently active BSI Journal File: c:\ProgramData\Bristol\OpenBSI\journal.dat

Delete Journal File on Startup ? ○ Yes ● No

Click here to go to page 2.

A controller (node) must respond to a program (such as DataView) within this time period. If no response is received, that node is said to have "timed out." In specifying this value, the baud rate, number of network levels, and the poll periods must all be taken into consideration. This value MUST NOT be less than the sum of the poll periods for each level of the network, but should not be too large, since that would delay the initiation of a retry, if an attempt to send a message fails.

Figure 3-3. System Wizard – Step 1 of 3

On the first page of the System Wizard (*Figure 3-3*) define the following items, or use the defaults provided.

- The maximum number of RTUs in your system. The default is 1000. The minimum value for this is 100, if you have less than 100 RTUs, set the value to 100. **Note:** This number must include all RTU's on all levels; not just level 1 RTUs.
- The maximum amount of time it takes for any RTU to respond to a message from a program. (A program could be DataView, NetView, OpenEnterprise, etc.)
- The total number of attempts OpenBSI makes to communicate with top-level (level 1) RTUs.
- The file paths where the system stores ACCOL load files, and the OpenBSI journal file.

To advance to the next page of the System Wizard, click **Next**. To return to a previous page, click **Back**.

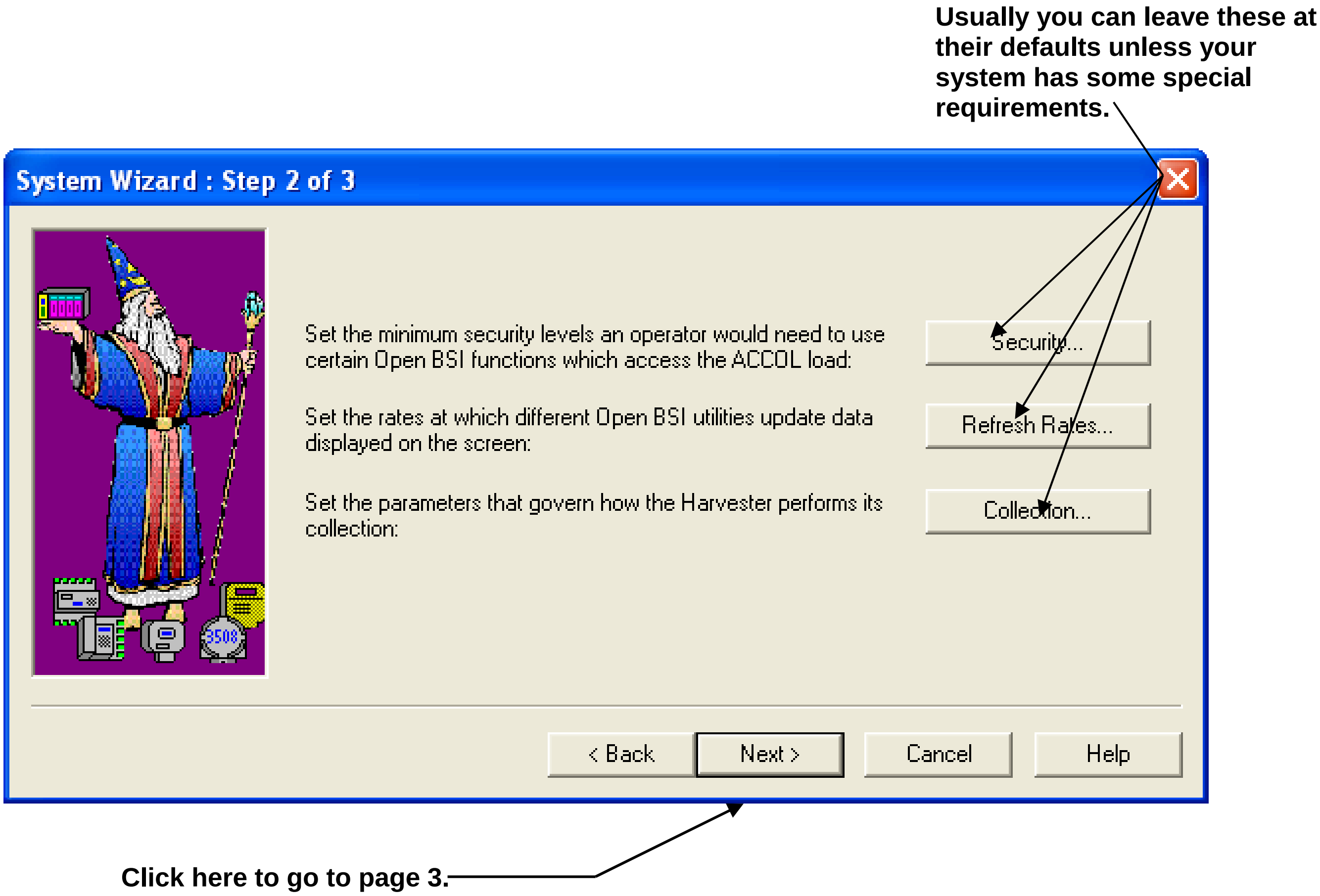
⚠ **Caution** **Once you exit the System Wizard, you cannot change many of the defined items on-line within NetView. You can change certain items, however, through the off-line Database Config Utility. You can also edit system constants in the NDF file, directly, using any ASCII text editor. See *Appendix B* for more information.**

3.2.2 System Wizard: Page 2

You define additional system parameters from the second page of the System Wizard:

- From the **Security** button, you can specify the minimum security levels an operator needs to change the inhibit/enable status of a signal, or to alter DataView lists (*.DVL) or DataView recipes (*.RCP). Also, you can specify whether you want to use the username/password method of security (which requires additional configuration in your ACCOL load) instead of passwords-only (which is the default).
- From the **Refresh Rates** button, you can specify the rate at which signal, data array, and communication statistics update on the screen.
- From the **Collection** push button, you can specify certain communication parameters for the legacy OpenBSI Data Collector program.

When you finish with the entries on Page 2 of the System Wizard, click **Next** to go to Page 3.



Usually you can leave these at their defaults unless your system has some special requirements.

System Wizard : Step 2 of 3

Set the minimum security levels an operator would need to use certain Open BSI functions which access the ACCOL load:

Set the rates at which different Open BSI utilities update data displayed on the screen:

Set the parameters that govern how the Harvester performs its collection:

Click here to go to page 3.

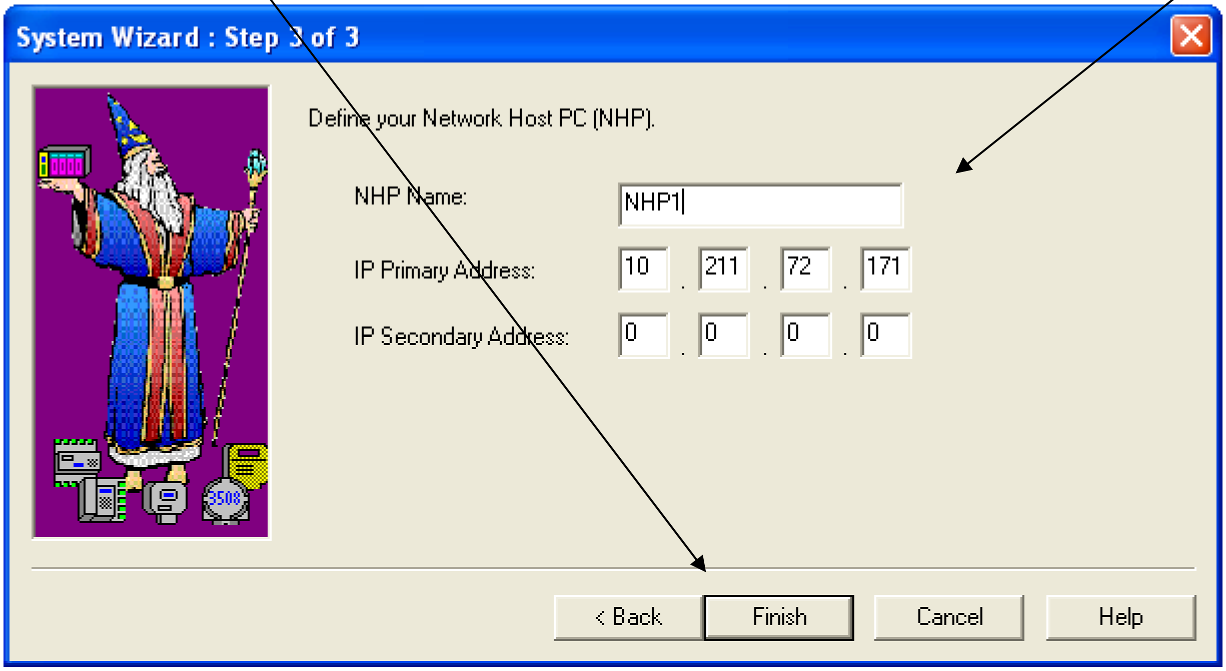
Figure 3-4. System Wizard – Step 2 of 3

3.2.3 System Wizard: Page 3

You can use the third page of the System Wizard to define parameters specific to this Network Host PC, including a name for the NHP, and the IP address(es) for the NHP. If available, NetView obtains default information from your configured PC TCP/IP information. NOTE: Since this is a purely BSAP network, leave these entries at their default values and click **Finish** to exit the System Wizard.

Click “Finish” to exit the System Wizard.

These parameters are not important in a pure BSAP network, and you may leave them at their defaults. If, however, you ever connect this PC to an IP network, you MUST change these parameters to reflect the conventions of the network.



System Wizard : Step 3 of 3

Define your Network Host PC (NHP).

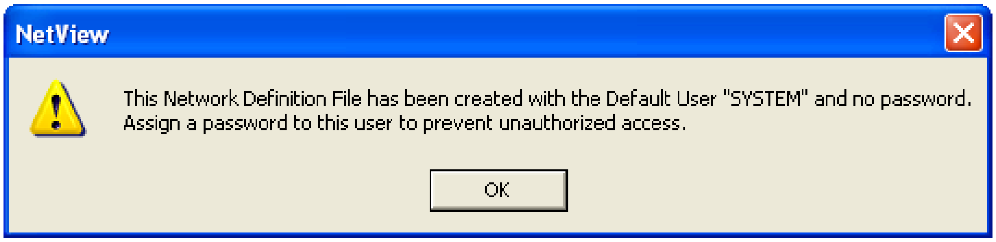
NHP Name: NHP1

IP Primary Address: 10 . 211 . 72 . 171

IP Secondary Address: 0 . 0 . 0 . 0

Figure 3-5. System Wizard – Step 3 of 3

After NetView processes your System Wizard data, it presents the following message box (See *Figure 3-6.*)



NetView

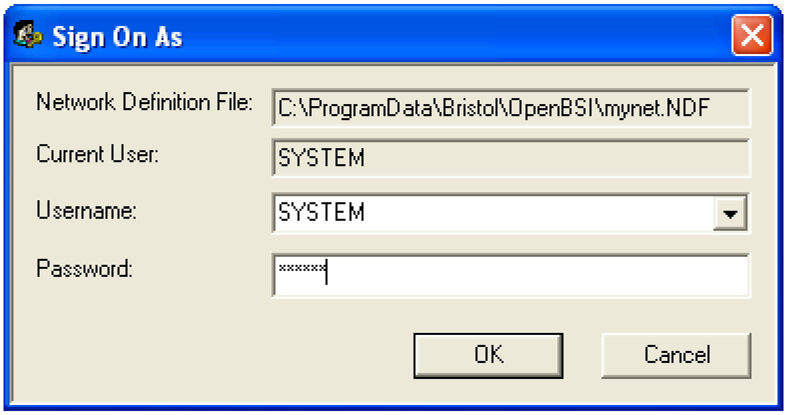
This Network Definition File has been created with the Default User "SYSTEM" and no password. Assign a password to this user to prevent unauthorized access.

Figure 3-6. Default User “SYSTEM” message box

This message box tells you that this new set of NETDEF files has a single user who can access it for editing purposes. That user has the name “SYSTEM”, and does not require a password. When you click **OK** OpenBSI automatically logs you on as the SYSTEM user.

When signing on, you can leave the “SYSTEM” user with the “Password” field blank to **disable** OpenBSI security; allowing you to avoid the requirement to log on repeatedly during initial configuration activities.

⚠ **Caution** **We strongly recommend that when you complete installation and configuration activities that you assign a password for the SYSTEM user. (See *Chapter 6* for details.)**



Sign On As

Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet.NDF

Current User: SYSTEM

Username: SYSTEM

Password: ******

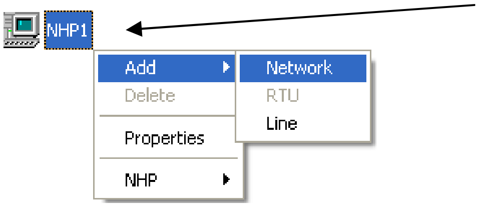
Figure 3-7. Sign On dialog box

3.3 Define Your BSAP Network Using the Network Wizard

After you complete *Section 3.2*, an icon of a PC (that represents your NHP) appears on the left-hand side of the NetView window. You now can define a BSAP network underneath it with the Network Wizard.

There are two ways to activate the Network Wizard:

- One way is to **right** click on the NHP, and select **Add>Network** from the pop-up menu.



Right-click on the NHP, then choose Add>Network

Figure 3-8. Starting the Network Wizard – Method 1

- The other way to activate the Network Wizard is to first click **View>Toolbox** from the menu bar. This activates the Toolbox. From the Toolbox (see *Figure 3-9*). Now drag the BSAP network symbol over to the NHP icon. This activates the Network Wizard.

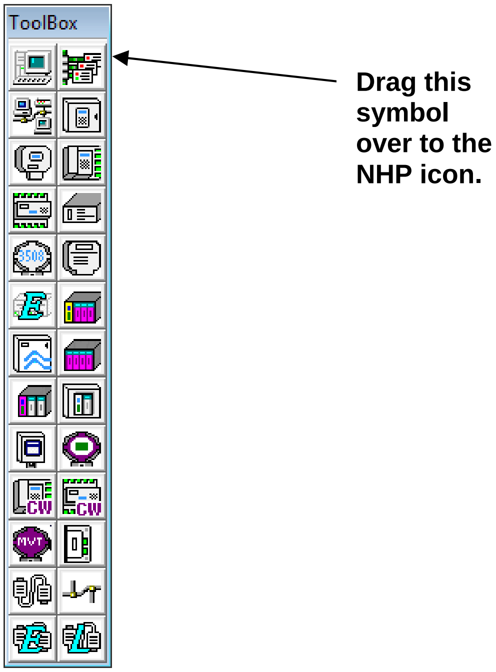


Figure 3-9. Starting the Network Wizard – Method 2

Either of these methods starts the Network Wizard.

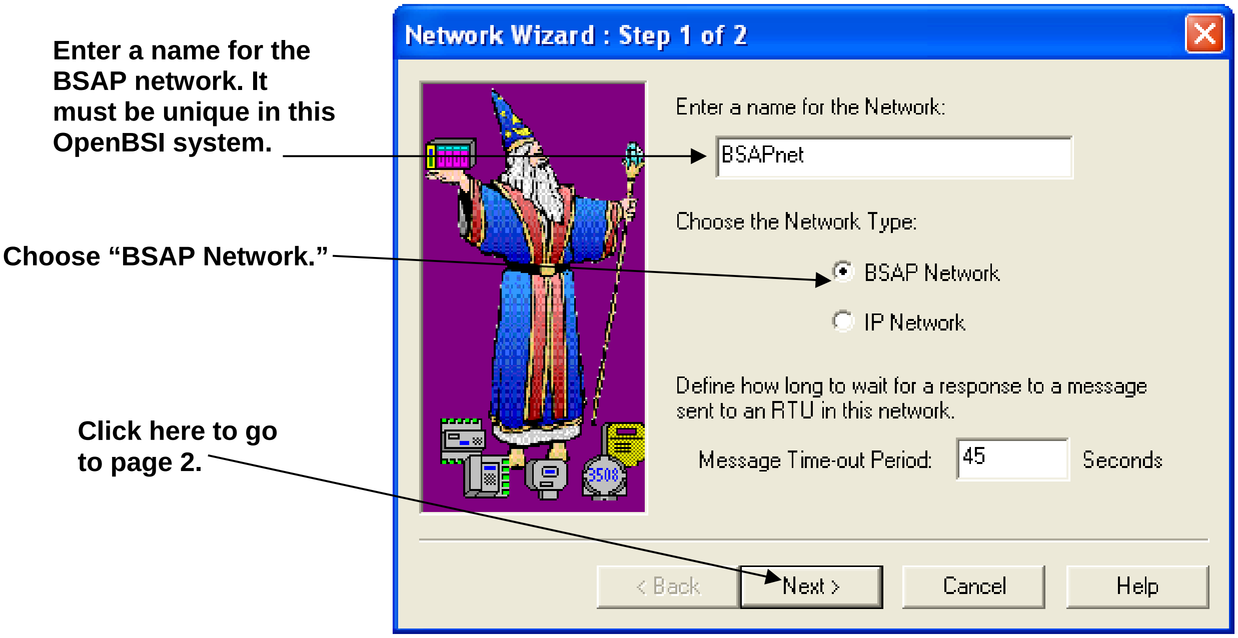
3.3.1 Network Wizard: Page 1

On the first page of the Network Wizard, you need to:

- Provide a name for the network. It doesn't really matter what you name it, so long as the name is unique in the system.
- Choose **BSAP Network** for the Network Type. **Note**: If you activate the Network Wizard using the Toolbox, and choose the BSAP network symbol, you automatically choose BSAP.

If you want to, you can also alter the default time out period.

When you finish with the first page of the Network Wizard, click **Next**.



Enter a name for the BSAP network. It must be unique in this OpenBSI system.

Choose “BSAP Network.”

Click here to go to page 2.

Network Wizard : Step 1 of 2

Enter a name for the Network: BSAPnet

Choose the Network Type:

● BSAP Network

○ IP Network

Define how long to wait for a response to a message sent to an RTU in this network.

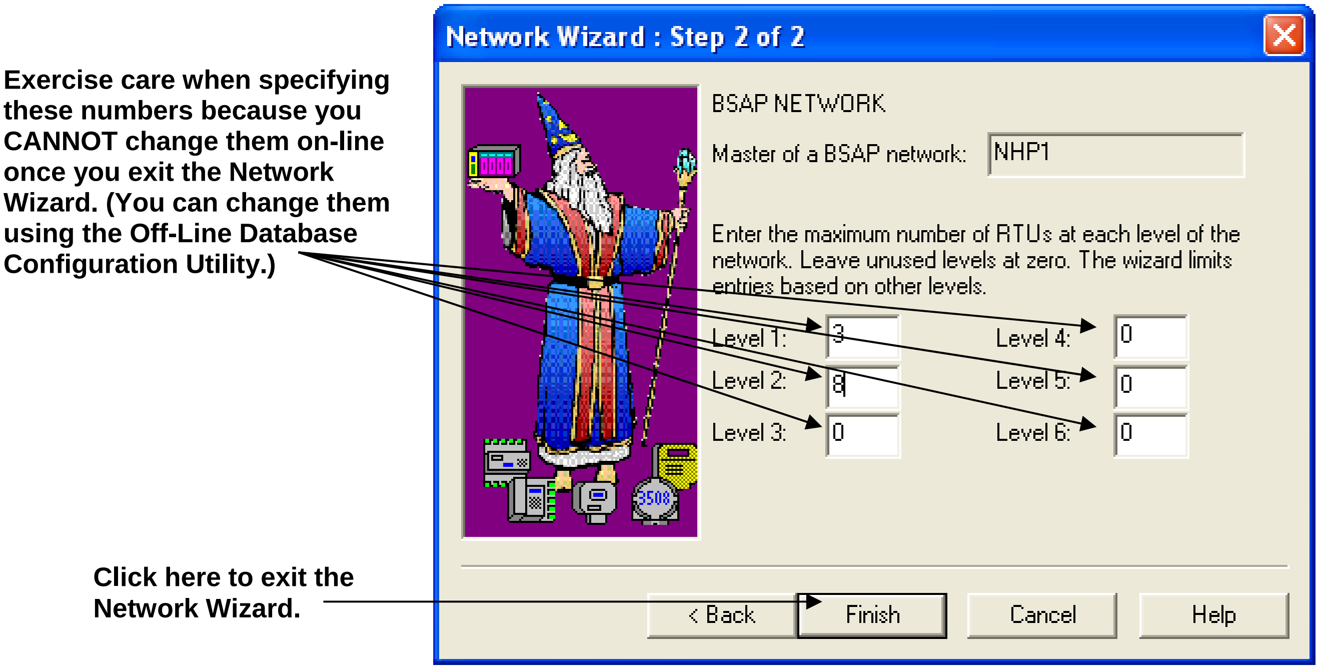
Message Time-out Period: 45 Seconds

Figure 3-10. Network Wizard – Step 1 of 2

3.3.2 Network Wizard: Page 2

On the second page of the Network Wizard, you need to:

- Specify the maximum number of RTUs under a given master node, on each level of your BSAP network. BSAP networks support from one to six network levels.
- Click **Finish** to exit the Network Wizard.



Exercise care when specifying these numbers because you CANNOT change them on-line once you exit the Network Wizard. (You can change them using the Off-Line Database Configuration Utility.)

Click here to exit the Network Wizard.

Network Wizard : Step 2 of 2

BSAP NETWORK

Master of a BSAP network: NHP1

Enter the maximum number of RTUs at each level of the network. Leave unused levels at zero. The wizard limits entries based on other levels.

Level 1: 3

Level 2: 8

Level 3: 0

Level 4: 0

Level 5: 0

Level 6: 0

Figure 3-11. Network Wizard – Step 2 of 2

3.4 Add Controllers to the BSAP Network Using the RTU Wizard

Now you can add the actual RTUs to the network using the RTU Wizard. There are two ways to activate the RTU Wizard:

- One way is to right click once on the location in the network where you want to add the RTU (when you start a new network, this is just the network name) then select **Add>RTU** from the pop-up menu.

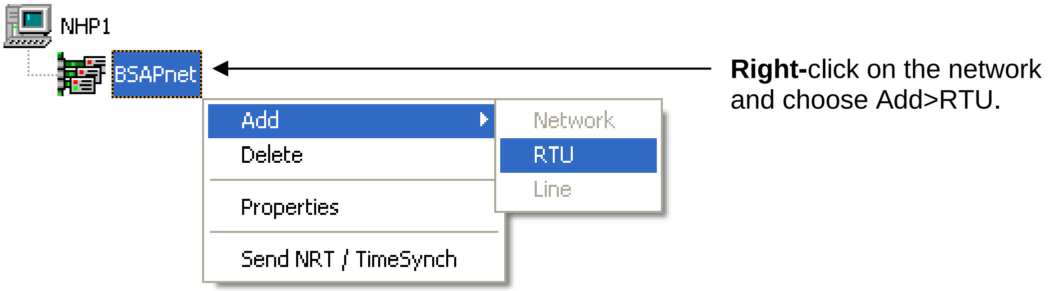


Figure 3-12. Starting the RTU Wizard – Method 1

- The other way to start the RTU Wizard is to drag the icon for the RTU you want to add from the Toolbox, over to the place in the network where you want to add it.

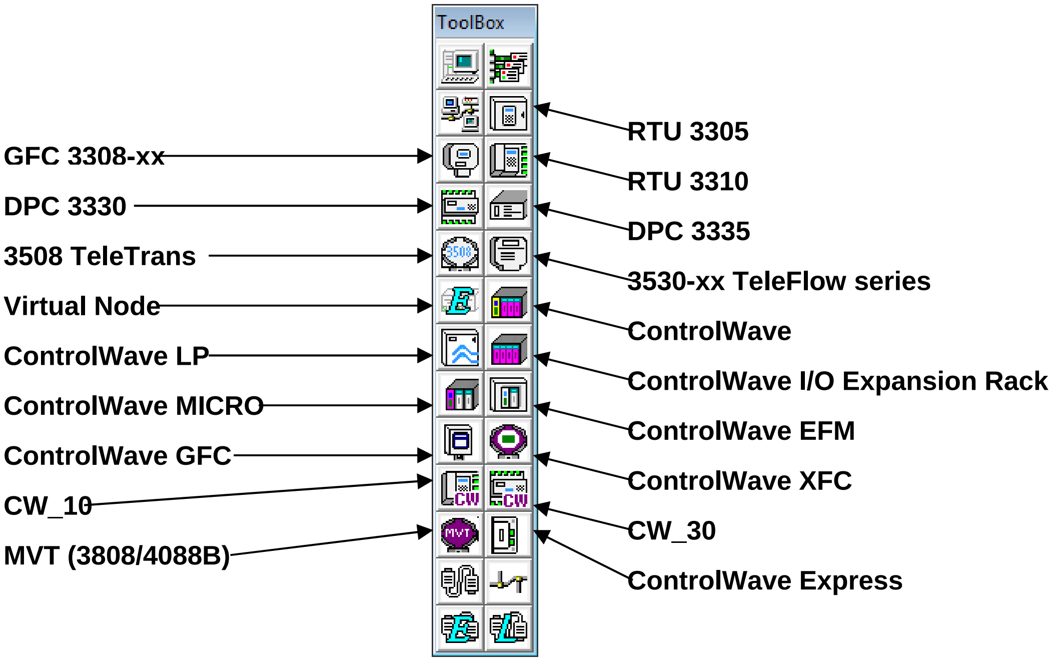


Figure 3-13. Starting the Network Wizard – Method 2

Notes:

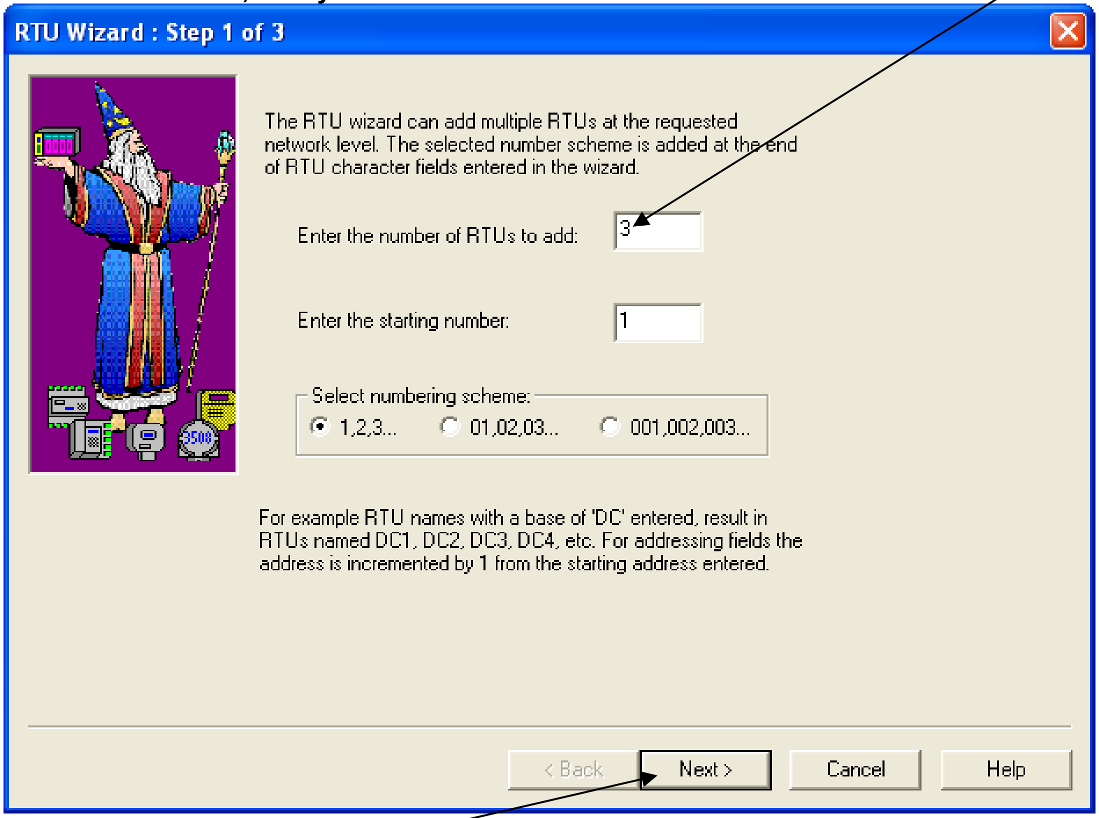
- Certain types of RTUs **cannot** support slave nodes, therefore, you must place them at the bottom (terminal) level of the network.
- If you use expanded node addressing (also known as expanded BSAP or EBSAP), **NetView requires that you define virtual nodes on level 1** of the network. This thereby requires you to define the expanded addressing slave nodes on level 2. You define virtual nodes like any other RTU in NetView. See the *Expanded Node Addressing* section of the *ACCOL II Reference Manual* (document# D4044) or the *ControlWave Designer Programmer's Handbook* (document# D5125) for more information on expanded node addressing.

3.4.1 RTU Wizard Page 1

On the first page of the RTU Wizard, you need to:

- Specify how many RTUs you want to add at a given network level, under a single master (NHP is the master for level 1 RTUs). If desired, you can enter “1” to add just one RTU at a time, but then you must invoke the RTU Wizard separately for each RTU you want to add.
- If you enter multiple RTUs, choose a numbering scheme, and a starting number. The RTU Wizard uses these values (along with a text string you enter on page 2 of the RTU Wizard) to assign node names for each of the new RTUs. (You can easily change the names later by right-clicking on an RTU, and selecting **"Properties"** from the pop-up menu.)

You can add controllers (RTUs) one at a time, invoking the RTU Wizard for each one you add, or you can add multiple RTUs all at the same time, if they are on the same network level.



RTU Wizard : Step 1 of 3

The RTU wizard can add multiple RTUs at the requested network level. The selected number scheme is added at the end of RTU character fields entered in the wizard.

Enter the number of RTUs to add: 3

Enter the starting number: 1

Select numbering scheme: ● 1,2,3... ○ 01,02,03... ○ 001,002,003...

For example RTU names with a base of 'DC' entered, result in RTUs named DC1, DC2, DC3, DC4, etc. For addressing fields the address is incremented by 1 from the starting address entered.

Click here to go to page 2.

Figure 3-14. RTU Wizard – Step 1 of 3

Click **Next** to go to the second page of the RTU Wizard.

3.4.2 RTU Wizard Page 2

On the second page of the RTU Wizard, you need to:

- Specify the name of the RTU. If you define only a single RTU, enter the complete name. If you want to define multiple RTUs on the same level, specify only the beginning portion of the name; the RTU Wizard appends numbers to the RTU name (based on the numbering scheme specified on page 1 of the RTU Wizard). The complete name must not exceed 16 characters. In general, we recommend you create names that only use alpha-numeric characters (letters, numbers) plus the underscore. The RTU Wizard does not support spaces in RTU names, but you can use punctuation marks.

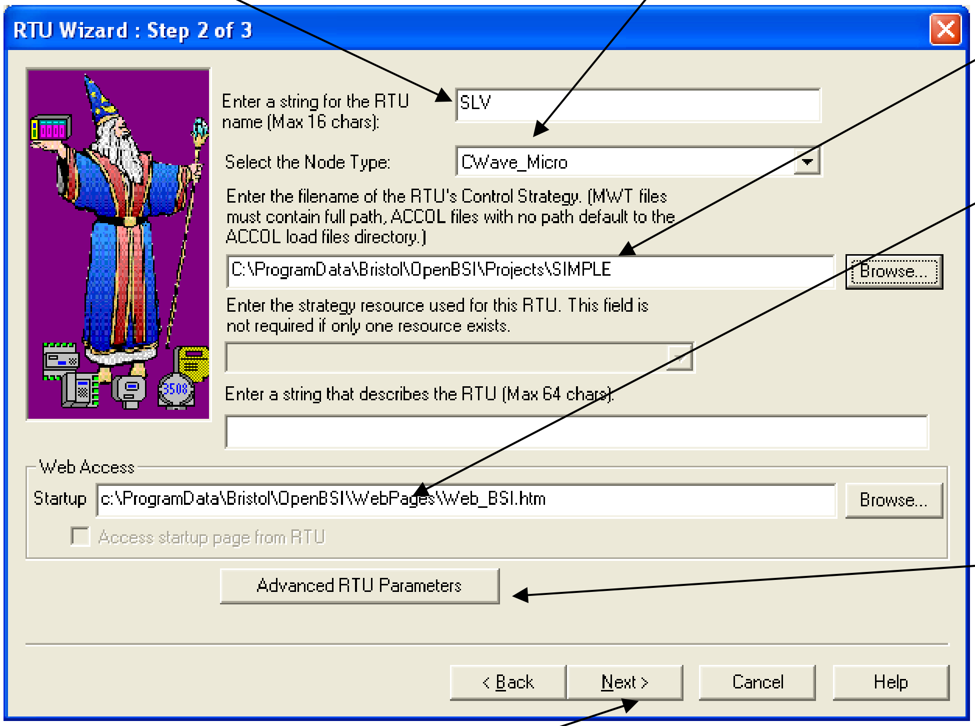
Note: If you use any old DOS-based ACCOL tools, they only support RTU names of four characters or less.

- Specify the type of controller (RTU).
- Specify the control strategy file name for the RTU (this defaults to the RTU name).
- If your ControlWave file includes multiple resources, specify which resource you want to use with this RTU.
- Specify a description of the RTU. (Optional) NOTE: If you define multiple RTUs, each RTU shares the same description; it may be easier to edit this information, on a per-RTU basis, later.
- Specify a startup web page you want to associate with this RTU. Any RTU supports a startup web page, stored on the PC, which receives data through OpenBSI.

If you are adding a single RTU, enter the compete name here. If you are adding multiple RTUs, enter only the portion of the name which is combined with the numbers specified on page 1. The complete RTU name cannot exceed 16 characters.

Choose the type of controller (RTU).

By default the RTU name is used for the control strategy filename. For ControlWave, specify a full path in addition to the filename. For Network 3000, the system assumes that the file resides in the ACCOL directory.



Enter a string for the RTU name (Max 16 chars): SLV

Select the Node Type: CWave_Micro

Enter the filename of the RTU's Control Strategy. (MWT files must contain full path, ACCOL files with no path default to the ACCOL load files directory.)

C:\ProgramData\Bristol\OpenBSI\Projects\SIMPLE

Enter the strategy resource used for this RTU. This field is not required if only one resource exists.

Enter a string that describes the RTU (Max 64 chars).

Web Access

Startup c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

□ Access startup page from RTU

This defines the optional startup HTML page used with this RTU. Specify the full path and filename of the HTML file stored on your workstation.

Most users can ignore the Advanced Parameters.

Click here to go to page 3.

Figure 3-15. RTU Wizard – Step 2 of 3

Click **Next** to go to page 3 of the RTU Wizard.

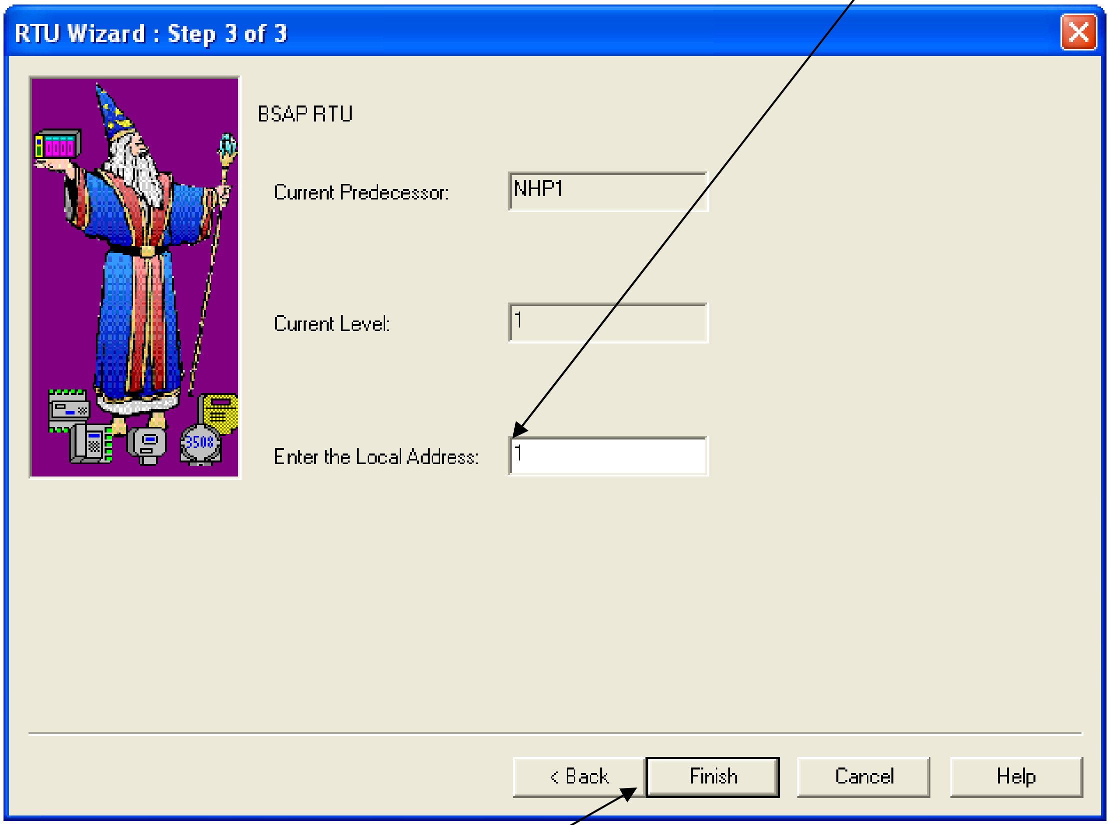
3.4.3 RTU Wizard Page 3

On the third page of the RTU Wizard, you need to:

- Specify the BSAP local address of the RTU (which must range from 1 to 127). If you define multiple RTUs, specify the address of the first RTU; the RTU Wizard assigns the address of each additional RTU sequentially in ascending order.

The third page of the RTU Wizard also displays the network level, and the predecessor node (the master of this slave node).

The BSAP local address you enter here must match the address configured at the RTU (either through the Flash Configuration utility or switch/jumper settings.



Current Predecessor: NHP1

Current Level: 1

Enter the Local Address: 1

Click here to exit the RTU Wizard.

Figure 3-16. RTU Wizard – Step 3 of 3

Click **Finish** to exit the RTU Wizard.

Once you define your RTUs, if necessary, you can edit their properties if you right click on the RTU icon, and select **"Properties"** from the pull down menu.

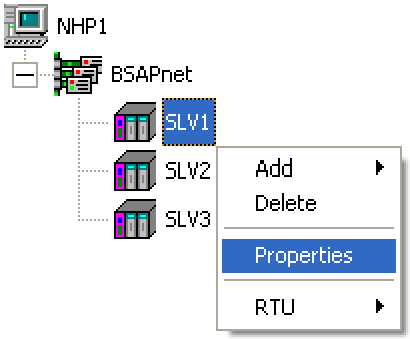


Figure 3-17. Modifying RTU Properties

3.5 Define Your Communication Line using the Comm Line Wizard

Now that your RTU network exists, the last important thing you have to do is define the characteristics of the communication line which the RTUs use.

There are two ways to activate the Comm Line Wizard:

- One way is to right click on the NHP icon, and select **Add**>**Line** from the pop-up menu to start the Comm Line Wizard.

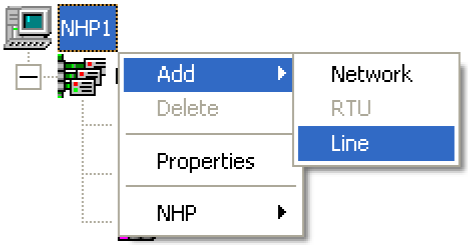
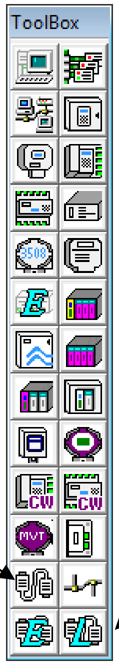


Figure 3-18. Starting the Comm Line Wizard – Method 1

The other way to start the Comm Line Wizard is to drag the BSAP comm line icon from the Toolbox, over to the NHP icon.



Drag the BSAP Line icon over to the NHP.

(Use this ONLY for an EBSAP Line)

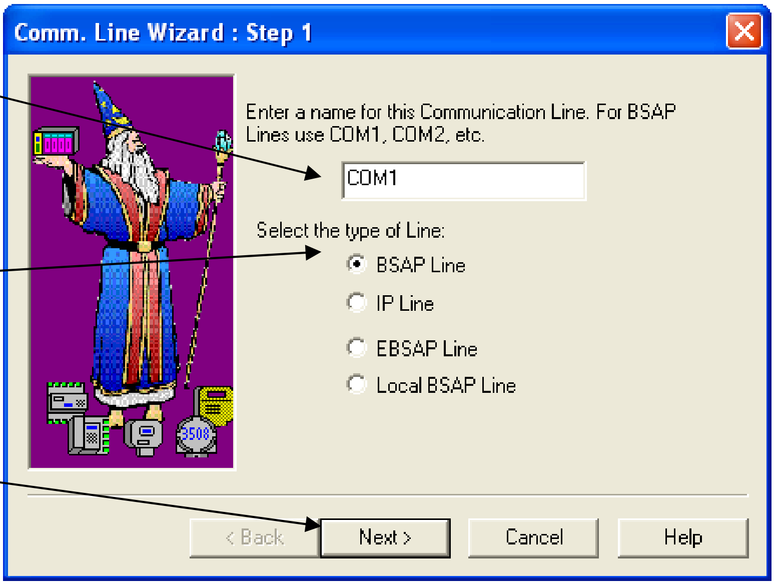
(Use this only for a BSAP Local Line)

Figure 3-19. Starting the Comm Line Wizard – Method 2

3.5.1 Comm Line Wizard Page 1

On the first page of the Comm Line Wizard, you need to:

- Specify the name of the Communication Line. For BSAP users, this is typically **COM1** or **COM2**.
- Specify the type of Communication Line. For purposes of this example, you must choose **BSAP Line**.



Enter a name for this Communication Line. For BSAP Lines use COM1, COM2, etc.

COM1

Select the type of Line:

● BSAP Line

○ IP Line

○ EBSAP Line

○ Local BSAP Line

For BSAP networks, you typically choose “COM1”

Choose “BSAP LIne”

Click here to go to page 2

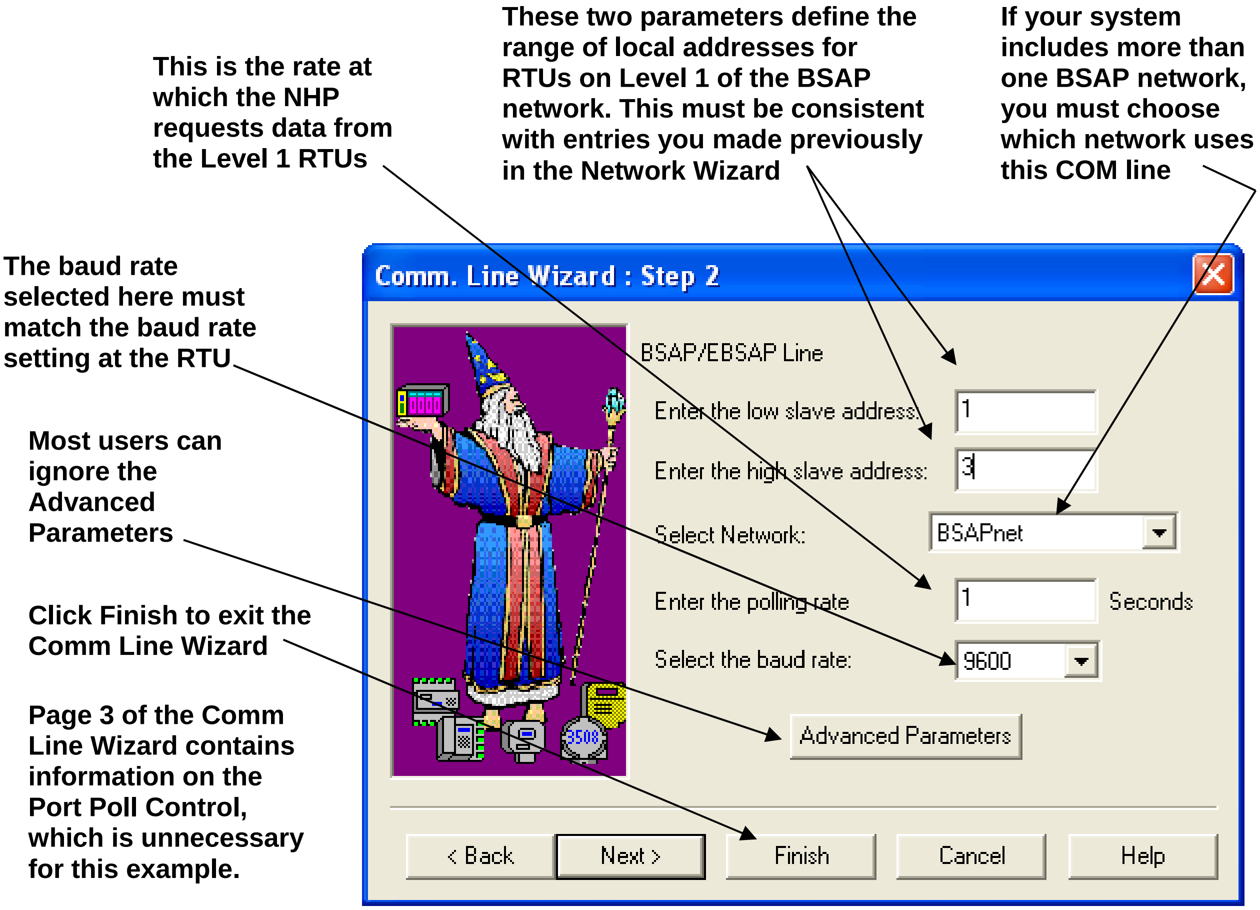
Figure 3-20. Comm Line Wizard – Step 1

Click **Next** to go to Page 2 of the Comm Line Wizard.

3.5.2 Comm Line Wizard Page 2

On the second page of the Comm Line Wizard, you need to:

- Specify the range of local addresses for level 1 RTUs.
- Specify the baud rate for the communication line.
- Specify which BSAP network uses this COM line. (Not required in this case, since we only have one BSAP network right now.)
- Specify the rate at which NetView polls level 1 RTUs for data.



Comm. Line Wizard : Step 2

BSAP/EBSAP Line

Enter the low slave address: 1

Enter the high slave address: 3

Select Network: BSAPnet

Enter the polling rate 1 Seconds

Select the baud rate: 9600

This is the rate at which the NHP requests data from the Level 1 RTUs

These two parameters define the range of local addresses for RTUs on Level 1 of the BSAP network. This must be consistent with entries you made previously in the Network Wizard

If your system includes more than one BSAP network, you must choose which network uses this COM line

The baud rate selected here must match the baud rate setting at the RTU

Most users can ignore the Advanced Parameters

Click Finish to exit the Comm Line Wizard

Page 3 of the Comm Line Wizard contains information on the Port Poll Control, which is unnecessary for this example.

Figure 3-21. Comm Line Wizard – Step 2

Click **Finish** to exit the Comm Line Wizard.

NetView should now automatically begin to poll the nodes for data. To verify this, follow the steps in *Section 3.6.*

3.6 Verify Communications Are Active Using DataView

Choose one of your RTUs which has a running control strategy. (If you don't have an RTU running a control strategy, you need to download a control strategy.)

⚠ **Warning**

Never attempt to download an *untested* program into an RTU currently running an industrial process or plant. Prior to downloading, isolate the RTU from the process and disconnect I/O. Failure to take such precautions could result in injury to persons or damage to property.

To download a control strategy, right click on the icon for that RTU and select **RTU>Download** (*Figure 3-22)* to download the appropriate control strategy file into the unit.)

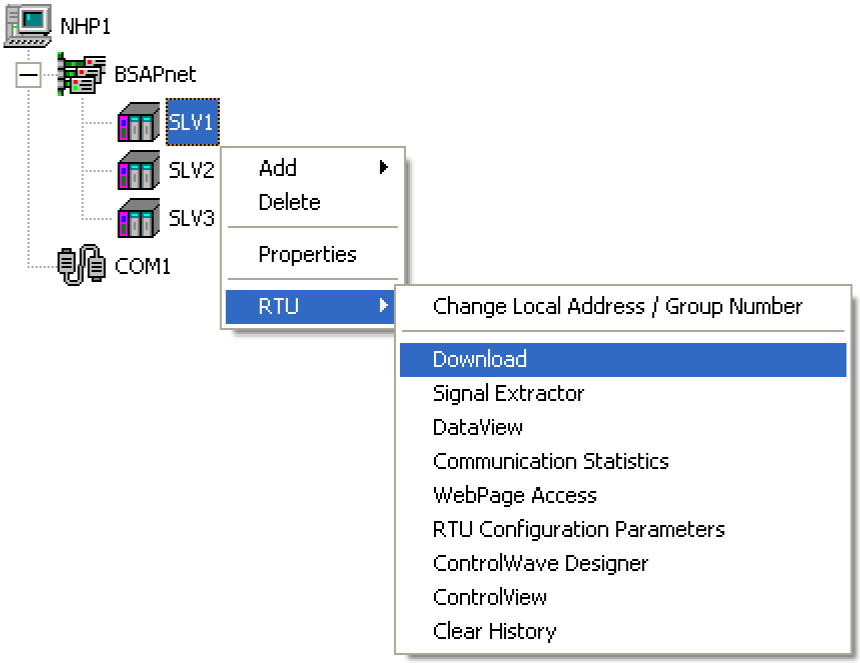


Figure 3-22. Downloading a Control Strategy

When any necessary download completes, right click on the icon for the same RTU, again, and select **RTU>DataView** to start the DataView utility. Click **Security> Sign On** from the DataView menu bar. If not already selected, choose the name of the RTU you want to communicate with from the Select New Node dialog box. These node names come directly from the information you entered, previously, in NetView. Enter the appropriate password or the username/ password combination for that RTU and click **OK**.

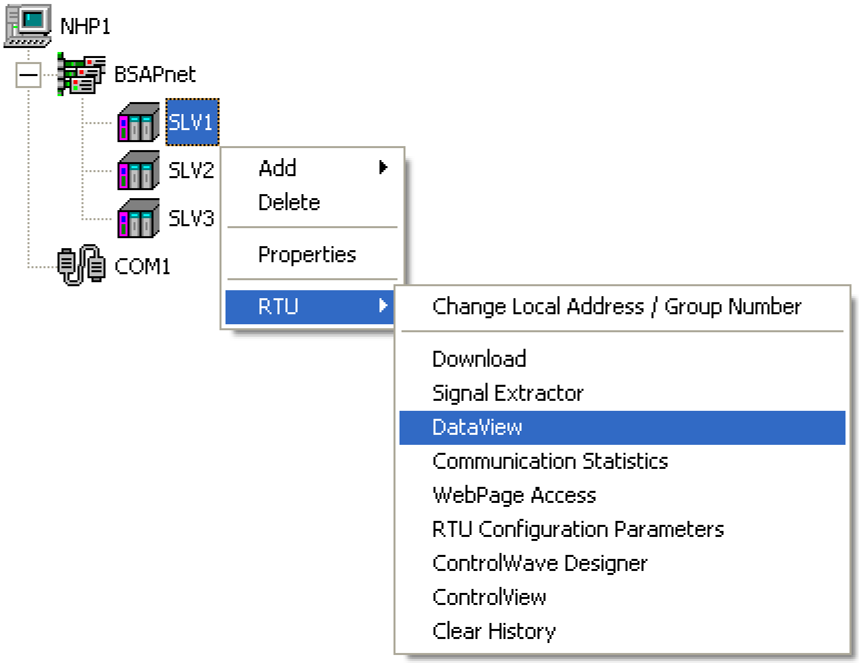


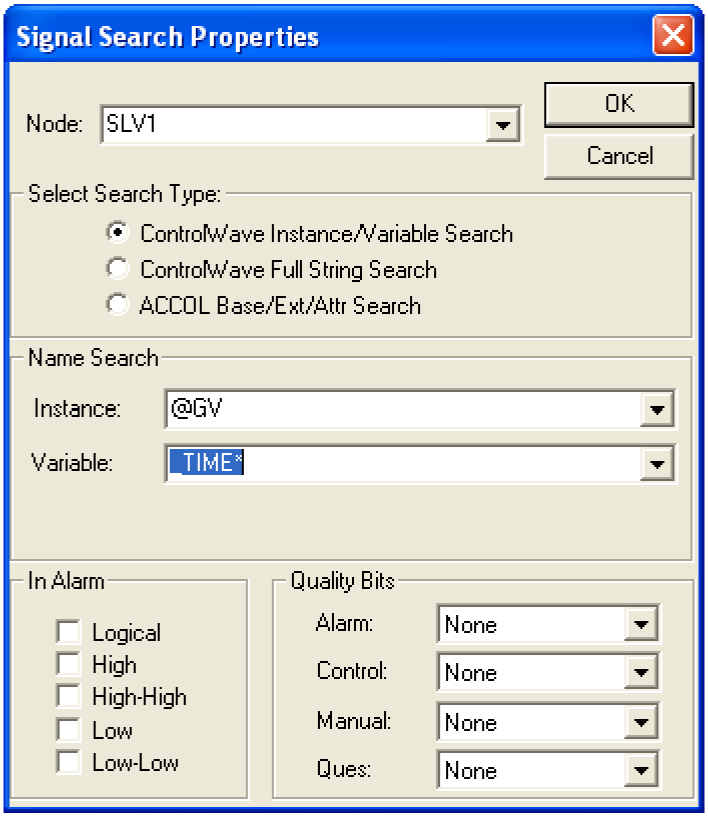
Figure 3-23. Collecting Data from the RTU Using DataView

If the message “Signed on to remote at level *n*” appears in the status bar, communications are active. Click the Signal Search icon (shown at left).

The desired node name should appear in the **Node** field of the Signal Search dialog box.

For ControlWave users: If you know of a specific global variable, enter the text “@GV” (for global variables) in the **Instance** field and the variable name in the **Variable** field, or a portion of the variable name with a wildcard, such as “_TIME*” (see *Figure 3-24)*. Otherwise, just leave the **Instance** and **Variable** fields blank, and then click **OK**; DataView displays all variables it can find.

For Network 3000 users: Enter the name #TIME in the **Base** field, and click **OK**.



Signal Search Properties

Node: SLV1

Select Search Type:

● ControlWave Instance/Variable Search
○ ControlWave Full String Search
○ ACCOL Base/Ext/Attr Search

Name Search

Instance: @GV

Variable: _TIME*

In Alarm

□ Logical
□ High
□ High-High
□ Low
□ Low-Low

Quality Bits

Alarm: None

Control: None

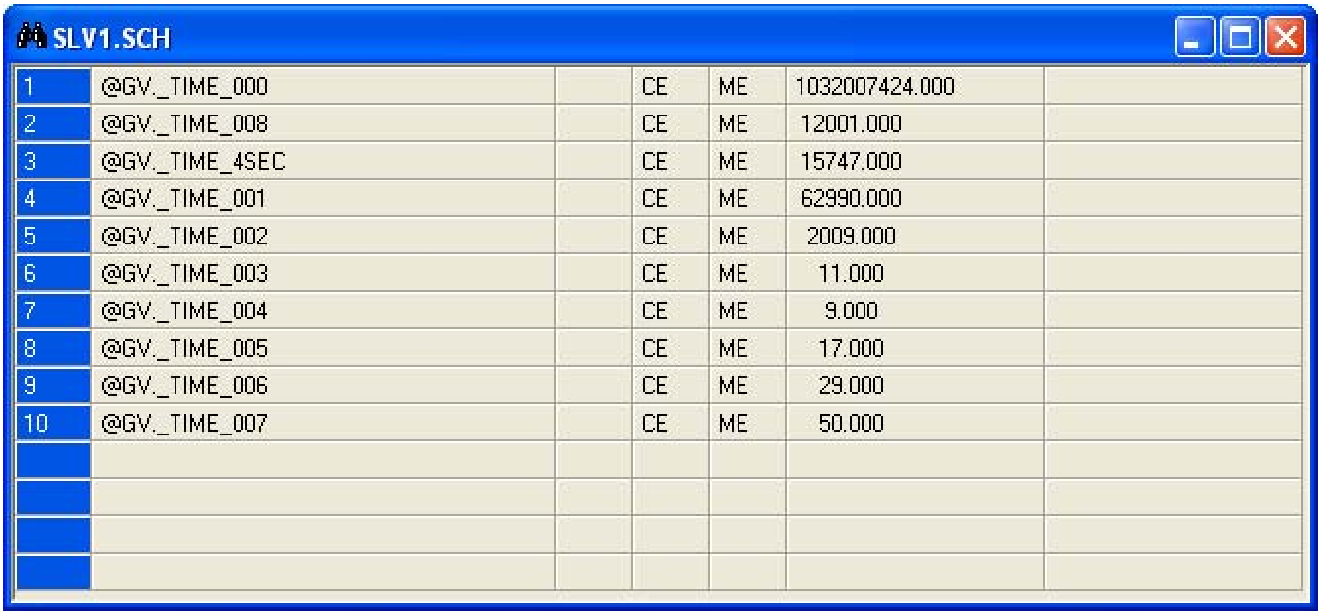
Manual: None

Ques: None

Figure 3-24. Signal Search dialog box

3.6.1 If NetView communicates….

If communications function properly, a screen of variables or signals with “live” data values should appear. If you see that, congratulations! You’ve successfully created your first BSAP network!



SLV1.SCH

1	@GV._TIME_000		CE	ME	1032007424.000	
2	@GV._TIME_008		CE	ME	12001.000	
3	@GV._TIME_4SEC		CE	ME	15747.000	
4	@GV._TIME_001		CE	ME	62990.000	
5	@GV._TIME_002		CE	ME	2009.000	
6	@GV._TIME_003		CE	ME	11.000	
7	@GV._TIME_004		CE	ME	9.000	
8	@GV._TIME_005		CE	ME	17.000	
9	@GV._TIME_006		CE	ME	29.000	
10	@GV._TIME_007		CE	ME	50.000	

Figure 3-25. Signal Search Results Screen

Now that you have a working network, you can optionally set these NETDEF files to start automatically every time you start NetView. To do this, change the file base name for all four files (*.NDF, *.MDB, *.DSN, and *.LDB) to “CURRENT”.

3.6.2 If NetView fails to communicate…

If these tests fail, and you see other messages, such as “Node Currently Off-Line,” this indicates an error in one of the previous steps, or some other configuration problem. Try the following:

- Re-trace the steps throughout this Quickstart, and check each parameter carefully.
- Check for port activity by examining the LEDs associated with the RTU port.
- Check for typographical errors in node names.
- For ACCOL Users: Check your ACCOL source file for errors in the communication port configuration. If necessary, correct any errors then recompile the load, reset the unit, and then try to re-download the ACCOL load.
- Check for hardware problems such as improper switch settings (wrong local address, wrong baud rate) at the RTU, or bad or disconnected cables. If you suspect a problem with a modem or other device, try to connect cables locally to see if you can isolate the problem.
- If some communication between NetView and the RTUs occurs, but you are unsure of proper data transmission, call up the Monitor window of NetView, and check the communication statistics for errors.

If problems persist, contact our Technical Support Group for help.

Chapter 4 – Quickstart (OpenBSI IP Communications)

This section describes the minimum steps necessary to start communications between an OpenBSI workstation and a network of ControlWave/Network 3000 RTUs running Internet Protocol (IP).

It assumes that:

- You installed your RTUs and configured them for IP communications.
- You connected Ethernet cables to the RTUs.
- Your PC supports TCP/IP and the PC has a valid IP address and sub-net mask. See the Windows help files on your system for information about TCP/IP setup.
- You installed OpenBSI Network Edition on your PC.

In This Chapter

We divided this chapter into eight sections; most sections contain multiple steps:

Section 4.1 provides certain notes concerning our implementation of IP, and summarizes certain concepts which you need to understand in order to properly configure communications.

Section 4.2 describes how to start **NetView**, and create a new set of **Network Definition Files** (also known as NETDEF files). NetView controls OpenBSI communications, and operates according to user-specified parameters in the NETDEF files. You must complete this section before you proceed to the other parts.

Section 4.3 describes how to use the **System Wizard** to define a **Network Host PC** (NHP).

Section 4.4 describes how to use the **Network Wizard** to define the type of network.

Section 4.5 describes how to use the **RTU Wizard** to define the individual RTUs which make up the network defined in *Section 4.4*.

Section 4.6. See *Chapter 5* for details on running the Flash Configuration Utility.

Section 4.7 describes how to use the **Comm Line Wizard** to define the communication line characteristics for the network created in *Section 4.4*. These characteristics include definitions of the valid IP address range for nodes on the line.

Section 4.8 describes how to use **DataView** to verify communications.

4.1 Using IP with ControlWave and Network 3000 RTUs

- This manual discusses **Internet Protocol (IP)** only for use in communication between OpenBSI and ControlWave/Network 3000 RTUs. The normal intended application is for a "closed circuit" internet (LAN) of RTUs and workstations in a company plant or industrial site.

⚠ **Warning** **While, there is no built-in restriction against connecting an IP network of RTUs to the world-wide Internet, remember that any external IP connection (no matter what brand of RTUs and software you choose) poses potential risks. We urge you to change default passwords, as well as default UDP/TCP socket numbers, to lessen the possibility that an unauthorized intruder could gain access to your internal company process control data. These security features help prevent accidental access by plant operators or other internal personnel. Don't consider them protection against intentional malicious activity by a sophisticated intruder, i.e. professional "hacker". Consider purchasing commercially-available "firewall" software to gain a further degree of protection against such malicious intrusion.**

- In order to use IP communication, your RTU must be an **IP node**. All ControlWave RTUs are IP nodes. The only Network 3000 IP nodes are 386EX Protected Mode versions of the DPC 3330 and DPC 3335 with PES03 / PEX03 or newer firmware with Ethernet ports or serial IP (PPP) ports.
- Your IP network must include a PC workstation which serves as the **Network Host PC** (NHP). The **NHP** stores information on the composition of the network. The NHP runs the **NetView** program which lets you configure, start, monitor, control and stop network communications. NetView stores configuration information about the network in **Network Definition (NETDEF) Files.**
- **NetView** simplifies configuration activities through a series of "wizards". These wizards separate the system into four basic

components, each of which you must configure. The **System Wizard** lets you define the Network Host PC (NHP). The **Network Wizard** lets you define the network characteristics. The **RTU Wizard** lets you define the characteristics of individual RTUs, and the **Comm Line Wizard** lets you define the characteristics of the communication line.

- For Network 3000 users: To use peer-to-peer communication (sending signal or array data between IP RTU's) you must configure IP_Client and IP_Server Modules in ACCOL. (See the *ACCOL II Reference Manual* (document# D4044) for details.)
- For ControlWave users: To use peer-to-peer communication you must configure Client and Server function blocks. (See the on-line help in ControlWave Designer for details.)
- IP nodes can communicate with BSAP-only nodes (RTUs which DO NOT support IP communication) if you set up Master and Slave communication ports. You define the BSAP nodes in NetView either as part of a BSAP network; with the NHP serving as the network master, or as a BSAP sub-network directly underneath an IP RTU (with the IP RTU serving as the only level 1 node).

4.2 Start NetView and Open a New Set of NETDEF Files

Note: If you have not registered your copy of OpenBSI Network Edition, the system prompts you to do so. Unregistered software only runs for a maximum of 30 days; after that time, you must complete the registration to continue to use it. For more information on the registration process, see *Chapter 2*.

1. Click **Start** > **Programs** > **OpenBSI Tools** > **NetView** and NetView starts. (See *Figure 4-1*.)

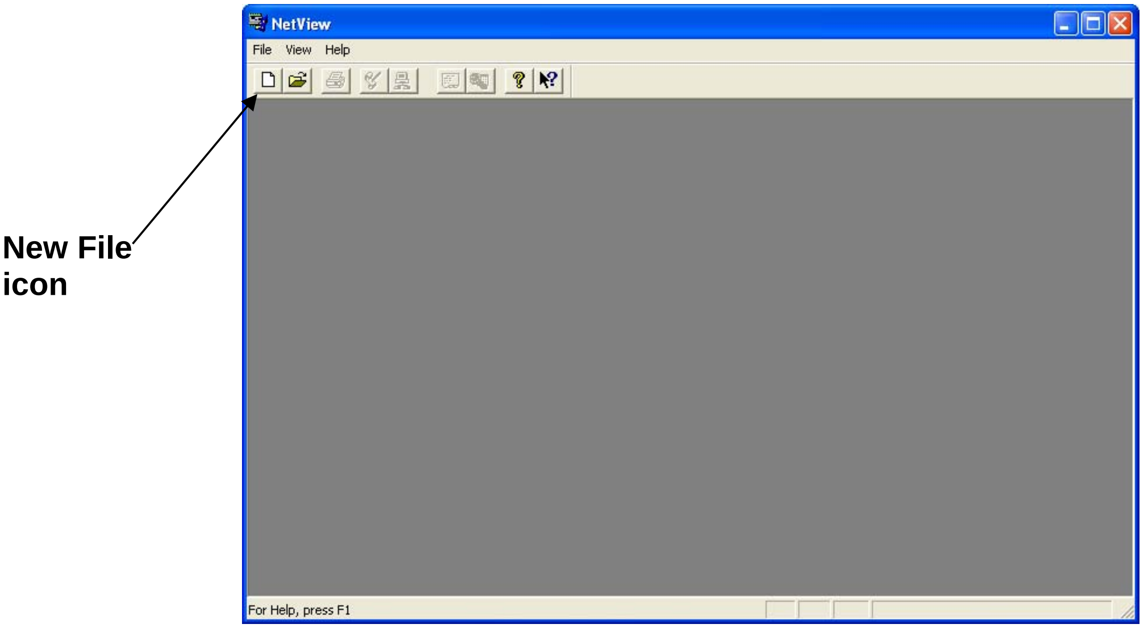
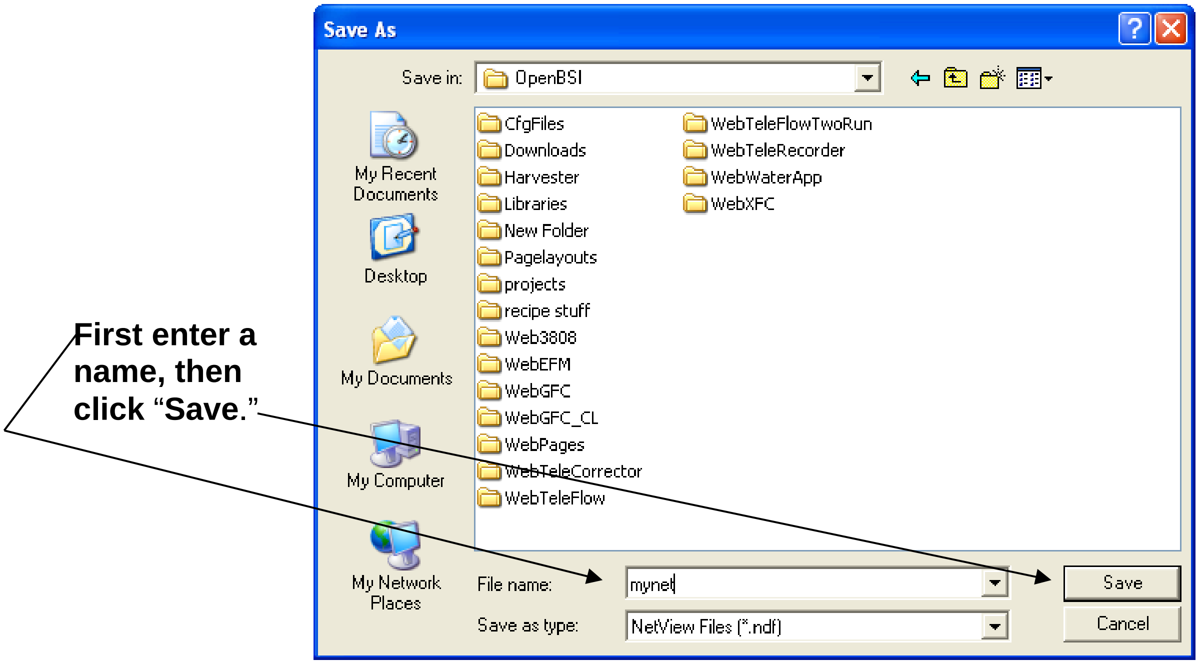


Figure 4-1. NetView Main Window

2. To open a new NETDEF file, click on the New File icon, or click **File>New**. This calls up the “Save As” dialog box.



Save As

Save in: OpenBSI

File name: mynet

Save as type: NetView Files (*.ndf)

First enter a name, then click “Save.”

Figure 4-2. Save As dialog box

3. In the “Save As” dialog box, enter a name for your NETDEF file, and click **Save.** In addition to the NDF file, this also automatically saves a set of database files (*.MDB, *.DSN, and *.LDB) which share the same file basename as the NDF file. We call these the **Network Definition (NETDEF) files**. After the save operation completes, the System Wizard starts. Proceed to *Section 4.3*.

4.3 Use the System Wizard to Define Your Network Host PC (NHP)

After you save your NETDEF files (see the previous section), the System Wizard activates, so you can define a Network Host PC (NHP).

4.3.1 Function of the NHP in an IP Network

If an IP node or an OpenBSI workstation needs to communicate with another IP node or OpenBSI workstation, and it doesn't know the address of the IP Port for that node or workstation, it obtains the necessary addresses and routing information from the NETDEF files at the Network Host PC (NHP).

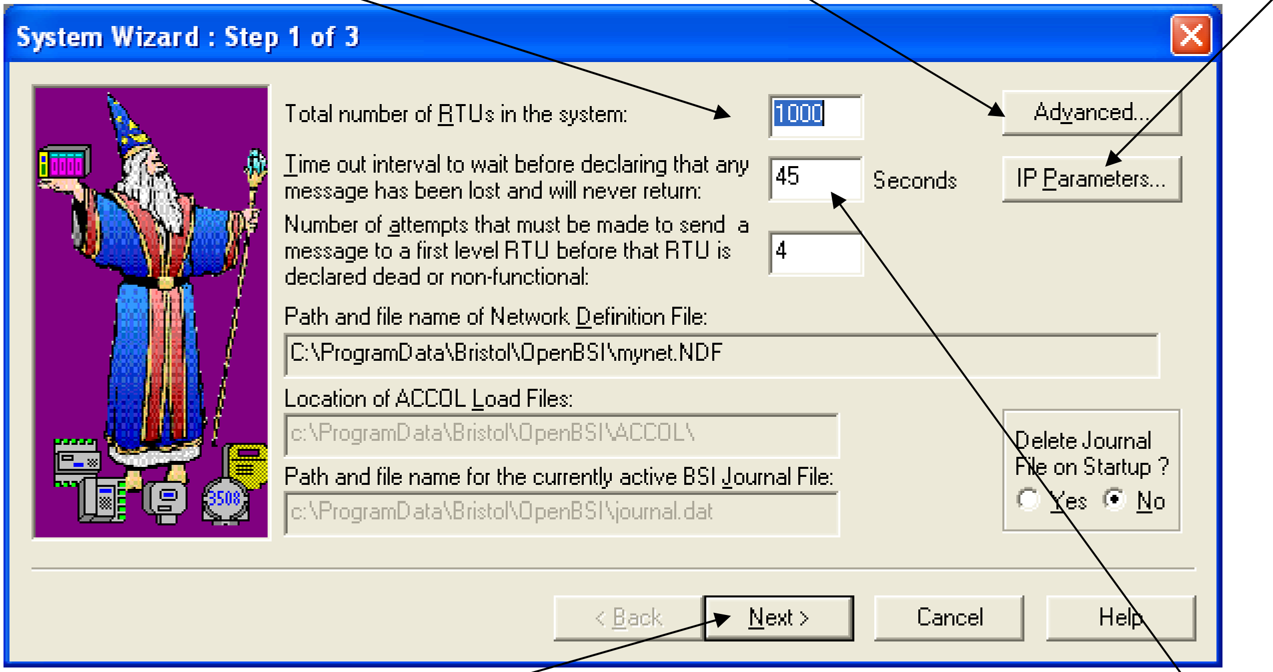
The concept of the NHP is easier to understand if you consider an analogy to the public telephone system. Most people remember a certain set of phone numbers for people they call frequently, but occasionally, they need to call someone whose number they don't know, so they call directory assistance or use a search engine to obtain the correct phone number. The NHP performs the exact same function as the directory assistance operator or search engine except instead of giving out phone numbers, it provides address information, on request, for connections to any node in its section of the network.

4.3.2 System Wizard – Page 1

This number defines the maximum number of RTUs your system can support. This must be at least "100."

Most users can leave the "Advanced Parameters" at their default values.

These parameters relate to IP security.



System Wizard : Step 1 of 3

Total number of RTUs in the system: 1000

Time out interval to wait before declaring that any message has been lost and will never return: 45 Seconds

Number of attempts that must be made to send a message to a first level RTU before that RTU is declared dead or non-functional: 4

Path and file name of Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet.NDF

Location of ACCOL Load Files: c:\ProgramData\Bristol\OpenBSI\ACCOL\

Path and file name for the currently active BSI Journal File: c:\ProgramData\Bristol\OpenBSI\journal.dat

Delete Journal File on Startup ? ○ Yes ● No

Click here to go to page 2.

A controller (node) must respond to a program (such as DataView) within this time period. If no response is received, that node is said to have "timed out

Figure 4-3. System Wizard – Step 1 of 3

On the first page of the System Wizard (*Figure 4-3*) define the following items, or use the defaults provided.

- The maximum number of RTUs in your system. The default is 1000. The minimum value for this is 100, if you have less than 100 RTUs, set the value to 100. **Note:** This number must include all RTU's on all levels; not just level 1 RTUs.
- The maximum amount of time it takes for any RTU to respond to a message from a program. (A program could be DataView, NetView, OpenEnterprise, etc.)
- The total number of attempts OpenBSI makes to communicate with top-level (level 1) RTUs.

- IP security and time out parameters. You access these from the **IP Parameters** button. Although you can leave these values at their defaults, if you later decide you want to change these items from their defaults, you will need to modify RTU Configuration Parameters (described in *Chapter 5*) for each and every RTU, or communications with those RTUs will not work. Details on these parameters appear later in this manual. For ControlWave RTUs, you set these parameters using the Flash Configuration Utility.

To advance to the next page of the System Wizard, click **Next**. To return to a previous page, click **Back**.

⚠ **Caution** **Once you exit the System Wizard, you cannot change many of the defined items on-line within NetView. You can change certain items, however, through the off-line Database Config Utility. You can also edit system constants in the NDF file, directly, using any ASCII text editor. See *Appendix B* for more information.**

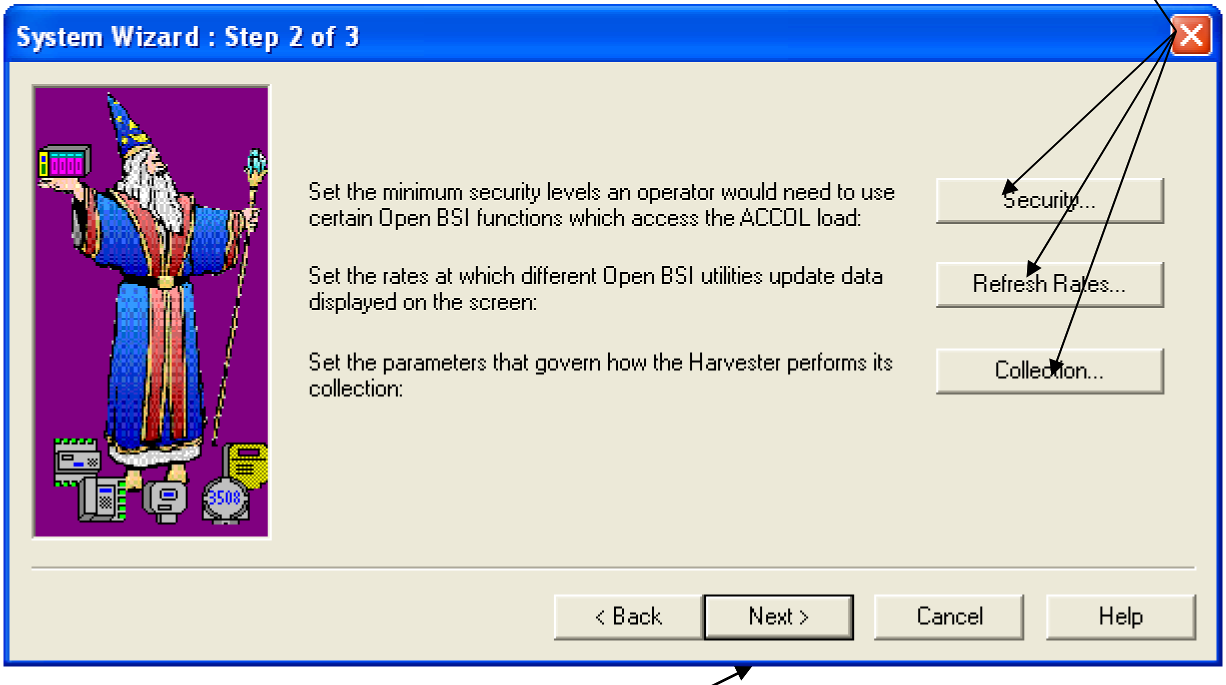
4.3.3 System Wizard: Page 2

You define additional system parameters from the second page of the System Wizard:

- From the **Security** button, you can specify the minimum security levels an operator needs to change the inhibit/enable status of a signal, or to alter DataView lists (*.DVL) or DataView recipes (*.RCP). Also, you can specify whether you want to use the username/password method of security (which requires additional configuration in your ACCOL load) instead of passwords-only (which is the default).
- From the **Refresh Rates** button, you can specify the rate at which signal, data array, and communication statistics update on the screen.
- From the **Collection** push button, you can specify certain communication parameters for the Harvester program.

When you finish with the entries on Page 2 of the System Wizard, click **Next** to go to Page 3.

Usually you can leave these at their defaults unless your system has some special requirements.



System Wizard : Step 2 of 3

Set the minimum security levels an operator would need to use certain Open BSI functions which access the ACCOL load:

Set the rates at which different Open BSI utilities update data displayed on the screen:

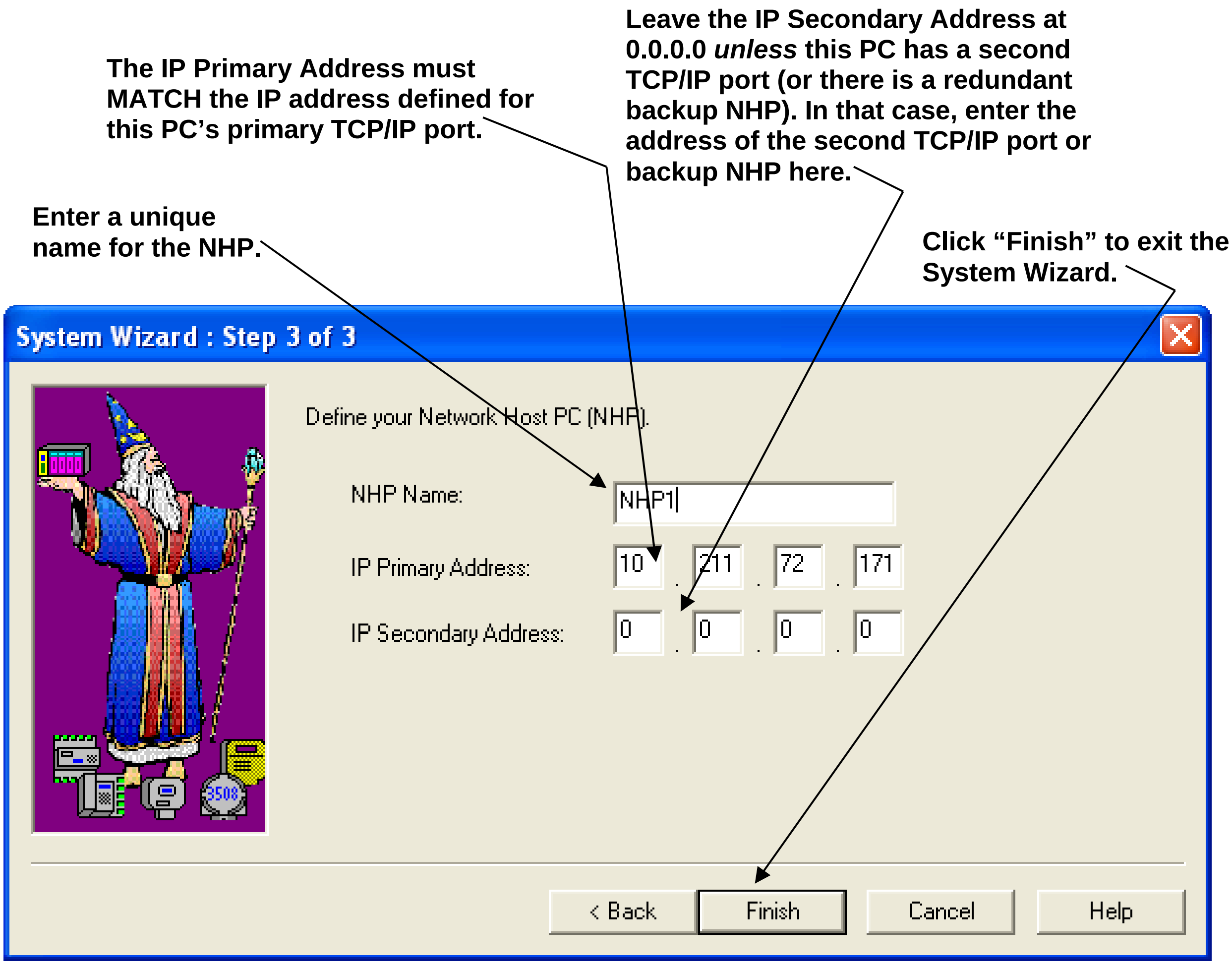
Set the parameters that govern how the Harvester performs its collection:

Click here to go to page 3.

Figure 4-4. System Wizard – Step 2 of 3

4.3.4 System Wizard: Page 3

You can use the third page of the System Wizard to define parameters specific to this Network Host PC, including a name for the NHP, and the IP address(es) for the NHP's IP port(s). If available, NetView obtains default information from your configured PC TCP/IP information.



Leave the IP Secondary Address at 0.0.0.0 ***unless*** **this PC has a second TCP/IP port (or there is a redundant backup NHP). In that case, enter the address of the second TCP/IP port or backup NHP here.**

The IP Primary Address must MATCH the IP address defined for this PC's primary TCP/IP port.

Enter a unique name for the NHP.

Click "Finish" to exit the System Wizard.

System Wizard : Step 3 of 3

Define your Network Host PC (NHP).

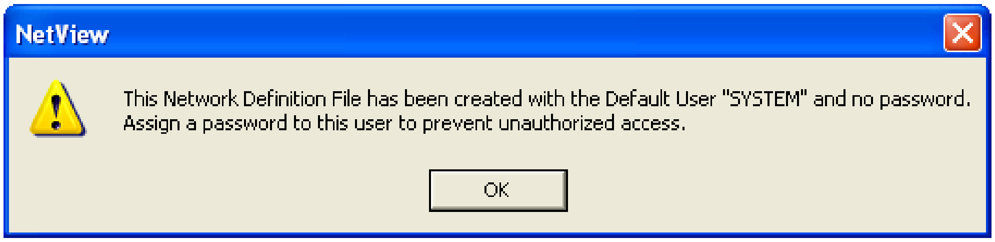
NHP Name: NHP1

IP Primary Address: 10 . 211 . 72 . 171

IP Secondary Address: 0 . 0 . 0 . 0

Figure 4-5. System Wizard – Step 3 of 3

After NetView processes your System Wizard data, it presents the following message box (See *Figure 4-6*.)



NetView

This Network Definition File has been created with the Default User "SYSTEM" and no password. Assign a password to this user to prevent unauthorized access.

Figure 4-6. Default User "SYSTEM" message box

This message box tells you that this new set of NETDEF files has a single user who can access it for editing purposes. That user has the name "SYSTEM", and does not require a password. When you click **OK** OpenBSI automatically logs you on as the SYSTEM user.

When signing on, you can leave the “SYSTEM” user with the “Password” field blank to **disable** OpenBSI security; allowing you to avoid the requirement to log on repeatedly during initial configuration activities.

⚠ **Caution** **We strongly recommend that when you complete installation and configuration activities that you assign a password for the SYSTEM user. (See *Chapter 6* for details.)**

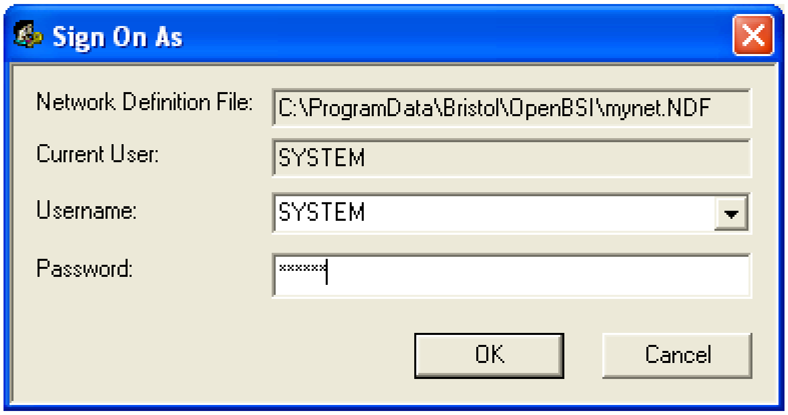


Figure 4-7. Sign On dialog box

4.4 Define Your IP Network Using the Network Wizard

After you complete *Section 4.3*, an icon of a PC (that represents your NHP) appears on the left-hand side of the NetView window. You now can define a IP network underneath it with the Network Wizard.

There are two ways to activate the Network Wizard:

- One way is to **right** click on the NHP, and select **Add>Network** from the pop-up menu.

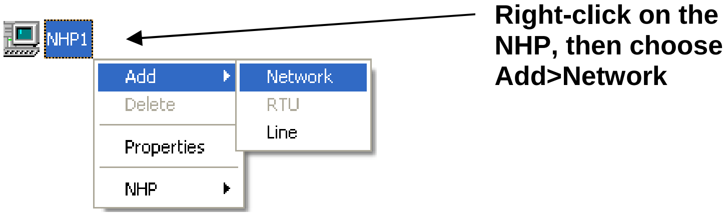


Figure 4-8. Starting the Network Wizard – Method 1

- The other way to activate the Network Wizard is to first click **View>Toolbox** from the menu bar. This activates the Toolbox. (see *Figure 4-9*). Now drag the IP network symbol over to the NHP icon. This activates the Network Wizard.

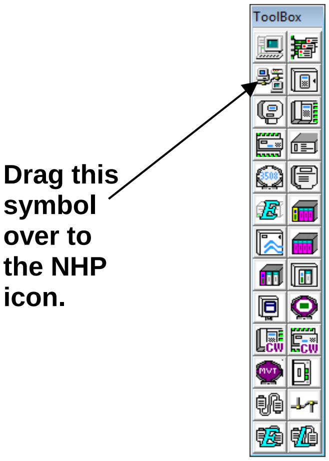


Figure 4-9. Starting the Network Wizard – Method 2

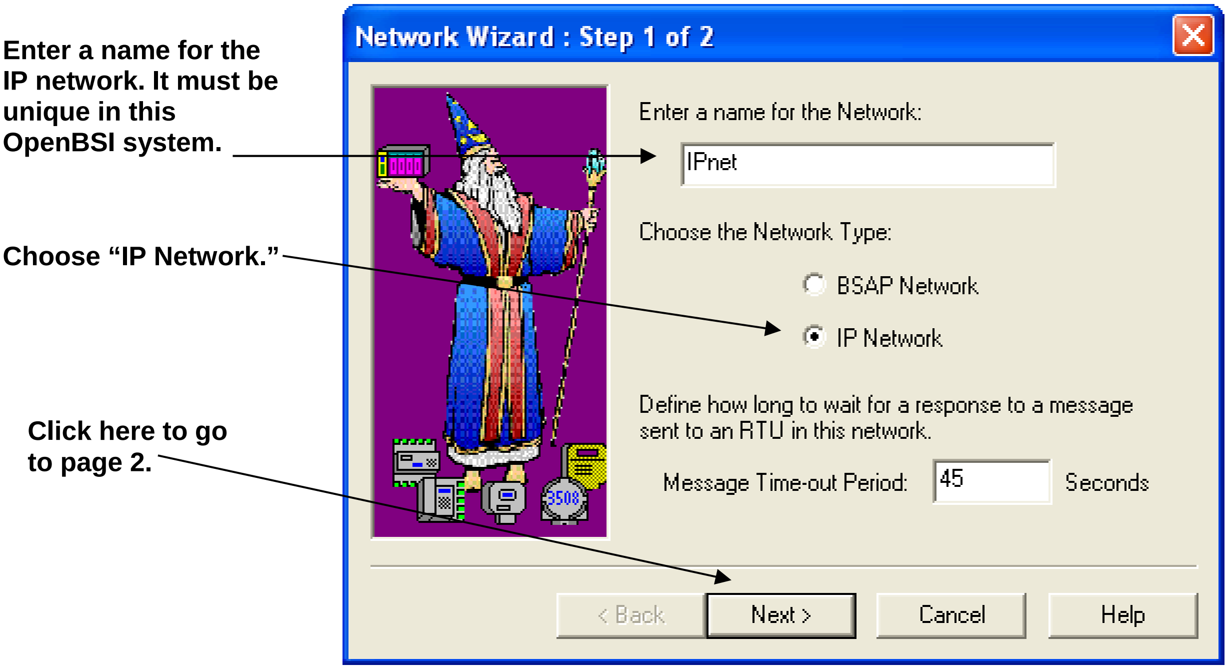
Either of these methods starts the Network Wizard.

4.4.1 Network Wizard: Page 1

On the first page of the Network Wizard, you need to:

- Provide a name for the network. It doesn't really matter what you name it, so long as the name is unique in the system.
- Choose **"IP"** for the Network Type. **Note**: If you activate the Network Wizard using the Toolbox, and choose the IP network symbol, you automatically choose IP.

If you want to, you can also alter the default time out period.


Enter a name for the IP network. It must be unique in this OpenBSI system.
Choose "IP Network."
Click here to go to page 2.
< Back
Next >
Cancel
Help

Network Wizard : Step 1 of 2

Enter a name for the Network: IPnet

Choose the Network Type:

○ BSAP Network

● IP Network

Define how long to wait for a response to a message sent to an RTU in this network.

Message Time-out Period: 45 Seconds

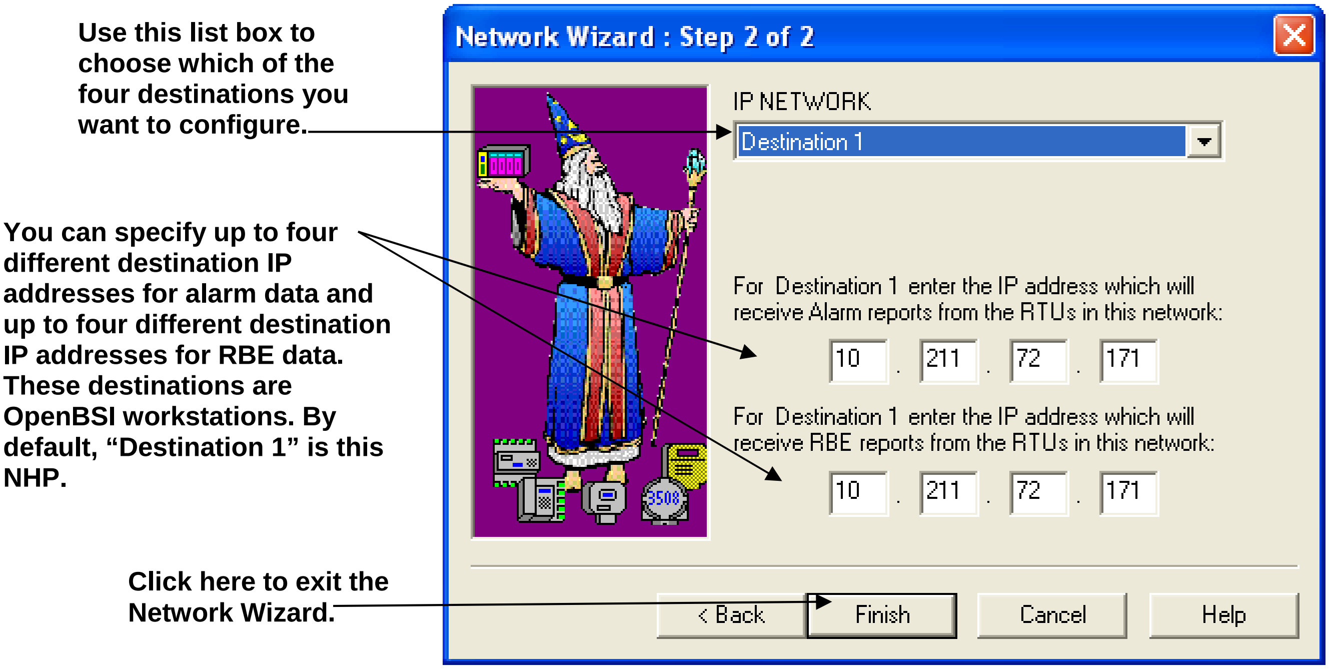
Figure 4-10. Network Wizard – Step 1 of 2

When you finish with the first page of the Network Wizard, click **Next**.

4.4.2 Network Wizard: Page 2

On the second page of the Network Wizard, you need to:

- Specify up to four different destinations each, for alarm and RBE data from the RTUs in this network. Each destination must be an OpenBSI workstation. You specify a destination in the form of its IP address. Destination 1 defaults to the address of this NHP.
- Click **Finish** to exit the Network Wizard.



Use this list box to choose which of the four destinations you want to configure.

You can specify up to four different destination IP addresses for alarm data and up to four different destination IP addresses for RBE data. These destinations are OpenBSI workstations. By default, "Destination 1" is this NHP.

Click here to exit the Network Wizard.

Network Wizard : Step 2 of 2

IP NETWORK

Destination 1

For Destination 1 enter the IP address which will receive Alarm reports from the RTUs in this network:

10 . 211 . 72 . 171

For Destination 1 enter the IP address which will receive RBE reports from the RTUs in this network:

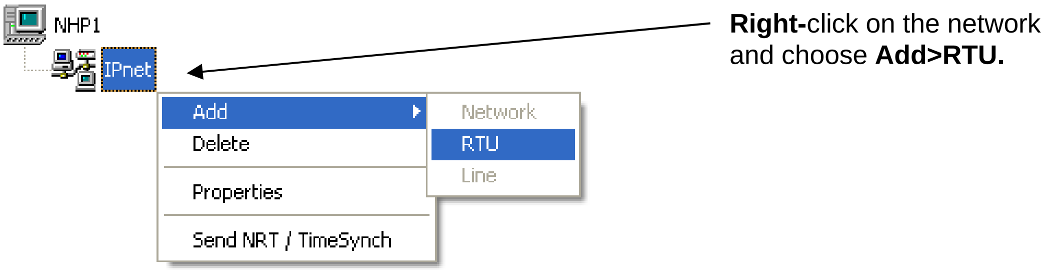
10 . 211 . 72 . 171

Figure 4-11. Network Wizard – Step 2 of 2

4.5 Add Controllers to the IP Network Using the RTU Wizard

Now you can add the actual RTUs to the network using the RTU Wizard. There are two ways to activate the RTU Wizard:

- One way is to right click once on the location in the network where you want to add the RTU (when you start a new network, this is just the network name) then select **Add>RTU** from the pop-up menu.



Right-click on the network and choose **Add>RTU.**

Figure 4-12. Starting the RTU Wizard – Method 1

- The other way to start the RTU Wizard is to drag the icon for the RTU you want to add from the Toolbox, over to the place in the network where you want to add it.

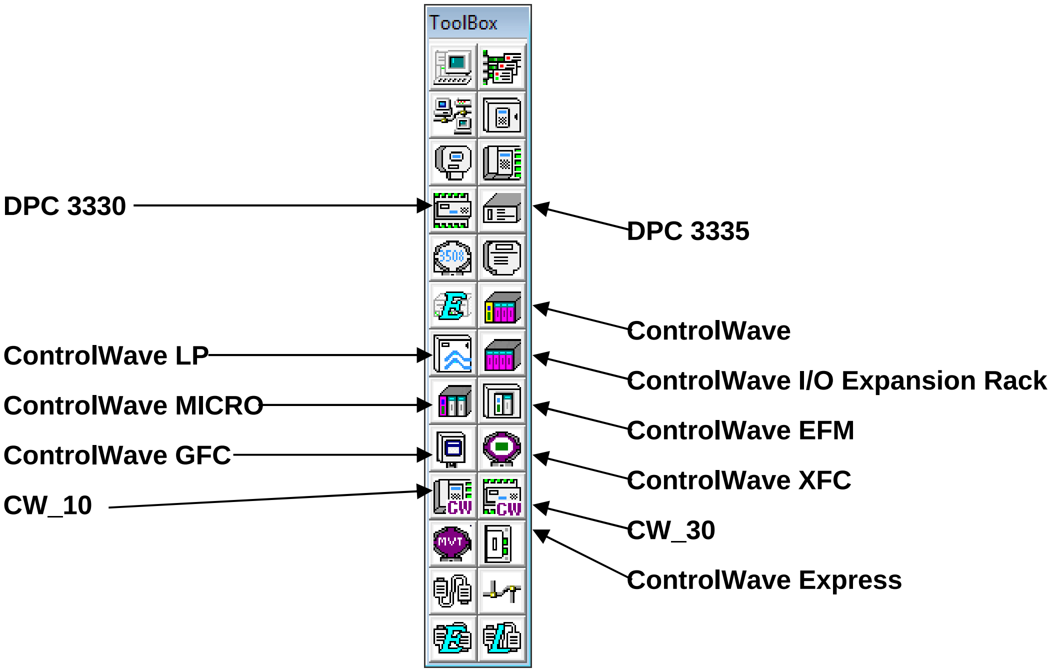


Figure 4-13. Starting the Network Wizard – Method 2

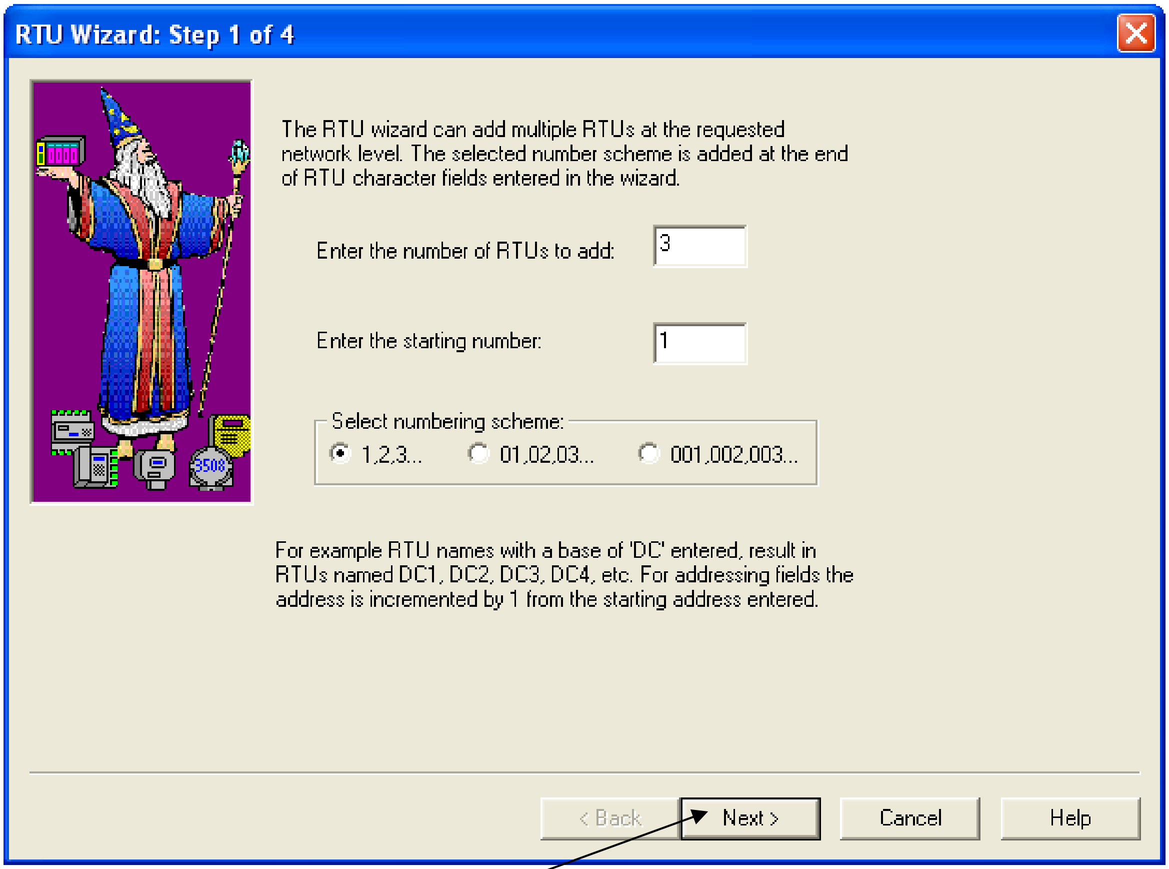
Note: DPC 3330 and DPC 3335 controllers require PES03 / PEX03 (or newer) firmware to support IP communication through OpenBSI.

4.5.1 RTU Wizard Page 1

On the first page of the RTU Wizard, you need to:

- Specify how many RTUs you want to add at a given network level, under a single master (NHP is the master for level 1 RTUs). If desired, you can enter “1” to add just one RTU at a time, but then you must invoke the RTU Wizard separately for each RTU you want to add.
- If you enter multiple RTUs, choose a numbering scheme, and a starting number. The RTU Wizard uses these values (along with a text string you enter on page 2 of the RTU Wizard) to assign node names for each of the new RTUs. (You can easily change the names later by right-clicking on an RTU, and selecting **"Properties"** from the pop-up menu.)

You can add controllers (RTUs) one at a time, invoking the RTU Wizard for each one you add, or you can add multiple RTUs all at the same time. You can also specify a numbering scheme and starting number if you add multiple RTUs.



RTU Wizard: Step 1 of 4

The RTU wizard can add multiple RTUs at the requested network level. The selected number scheme is added at the end of RTU character fields entered in the wizard.

Enter the number of RTUs to add: 3

Enter the starting number: 1

Select numbering scheme:
● 1,2,3... ○ 01,02,03... ○ 001,002,003...

For example RTU names with a base of 'DC' entered, result in RTUs named DC1, DC2, DC3, DC4, etc. For addressing fields the address is incremented by 1 from the starting address entered.

Click **Next** to go to the next page.

Figure 4-14. RTU Wizard – Step 1 of 4

Click **Next** to go to the second page of the RTU Wizard.

4.5.2 RTU Wizard Page 2

On the second page of the RTU Wizard, you need to:

- Specify the name of the RTU. If you define only a single RTU, enter the complete name. If you want to define multiple RTUs on the same level, specify only the beginning portion of the name; the RTU Wizard appends numbers to the RTU name (based on the numbering scheme specified on page 1 of the RTU Wizard). The complete name must not exceed 16 characters. In general, we recommend you create names that only use alpha-numeric characters (letters, numbers) plus the underscore. The RTU Wizard does not support spaces in RTU names, but you can use punctuation marks.

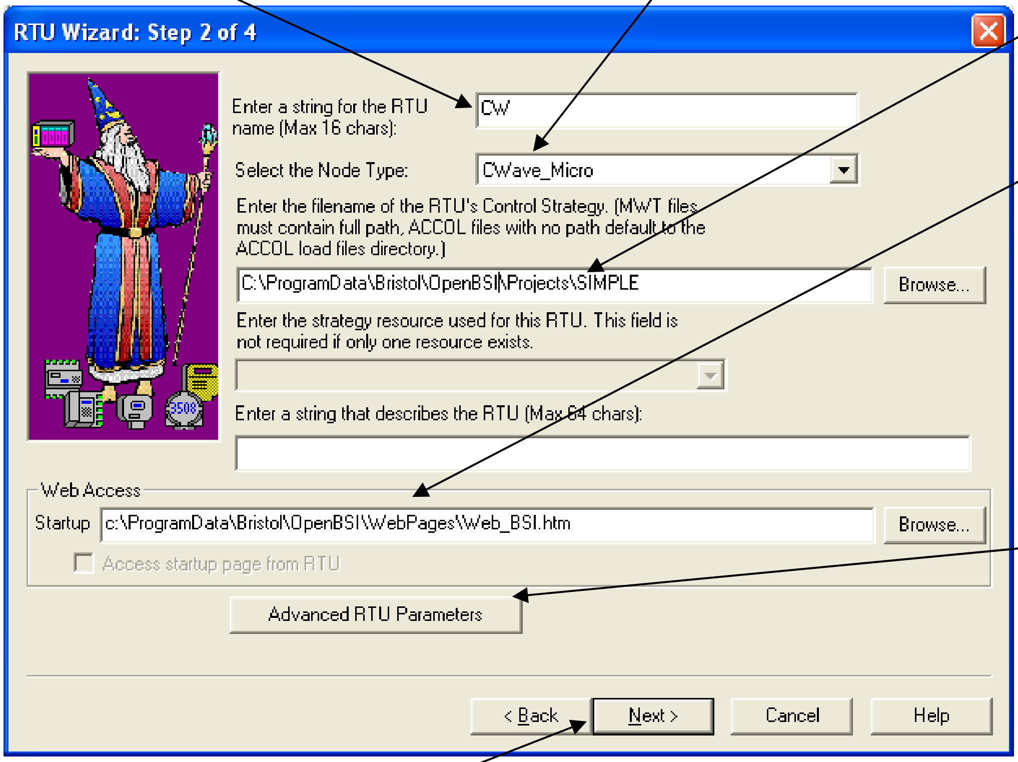
  Note: If you use any old DOS-based ACCOL tools, they only support RTU names of four characters or less.

- Specify the type of controller (RTU).
- Specify the control strategy file name for the RTU (this defaults to the RTU name).
- If your ControlWave file includes multiple resources, specify which resource you want to use with this RTU.
- Specify a description of the RTU. (Optional) NOTE: If you define multiple RTUs, each RTU shares the same description; it may be easier to edit this information, on a per-RTU basis, later.
- Specify a startup web page you want to associate with this RTU. Any RTU supports a startup web page, stored on the PC, which receives data through OpenBSI.

If you are adding a single RTU, enter the compete name here. If you are adding multiple RTUs, enter only the portion of the name which is combined with the numbers specified on page 1. The complete RTU name cannot exceed 16 characters.

Choose the type of controller (RTU).

By default the RTU name is used for the control strategy filename. For ControlWave, specify a full path in addition to the filename. For Network 3000, the system assumes that the file resides in the ACCOL directory.



RTU Wizard: Step 2 of 4

Enter a string for the RTU name (Max 16 chars): CW

Select the Node Type: CWave_Micro

Enter the filename of the RTU's Control Strategy. (MWT files must contain full path, ACCOL files with no path default to the ACCOL load files directory.)

C:\ProgramData\Bristol\OpenBSI\Projects\SIMPLE

Enter the strategy resource used for this RTU. This field is not required if only one resource exists.

Enter a string that describes the RTU (Max 64 chars):

Web Access

Startup c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

☐ Access startup page from RTU

This defines the optional startup HTML page used with this RTU. Specify the full path and filename of the HTML file stored on your workstation.

Most users can ignore the Advanced Parameters.

Click here to go to page 3.

Figure 4-15. RTU Wizard – Step 2 of 4

Click **Next** to go to page 3 of the RTU Wizard.

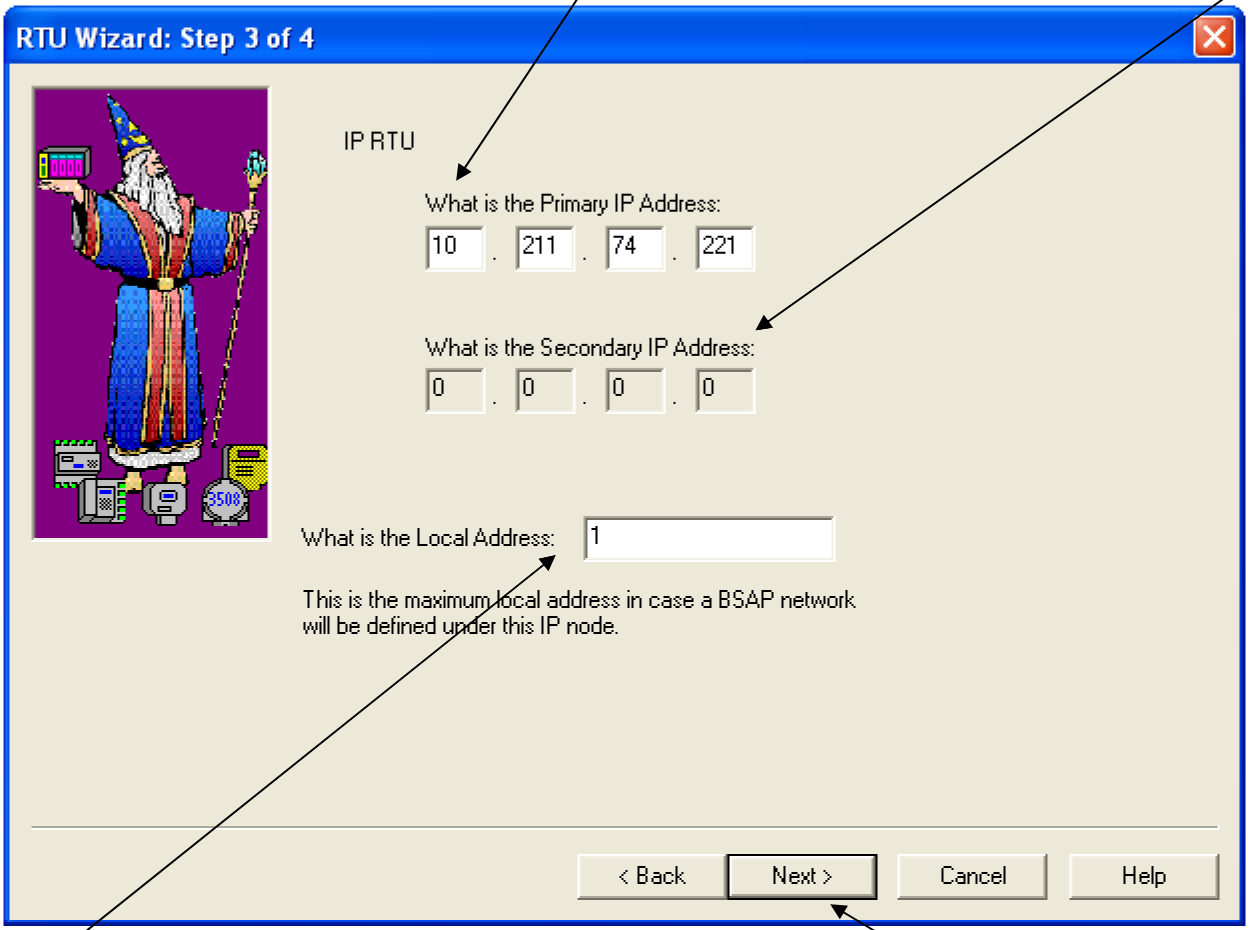
4.5.3 RTU Wizard Page 3

On the third page of the RTU Wizard, you need to:

- Specify the IP address of the RTU as the **Primary IP Address**. If you define multiple RTUs, specify the address of the first RTU; the RTU Wizard assigns the IP address of each additional RTU sequentially in ascending order based on the last part of the IP address.
- Specify the BSAP **Local Address**. This is necessary even in an IP network because the local address helps route alarm and RBE messages.

Define the IP address for this RTU's IP port as the Primary IP Address. This must match the address defined during RTU communications configuration. If you are defining multiple RTUs, enter the address of the first RTU here, addresses of the remaining RTUs are assigned sequentially based on the first address.

If this RTU is part of a redundant pair, enter the "A" unit's address for the Primary IP Address, and the "B" unit's address for the Secondary IP Address.



RTU Wizard: Step 3 of 4

IP RTU

What is the Primary IP Address: 10 . 211 . 74 . 221

What is the Secondary IP Address: 0 . 0 . 0 . 0

What is the Local Address: 1

This is the maximum local address in case a BSAP network will be defined under this IP node.

The BSAP local address you enter here must match the address configured at the RTU (either through the Flash Configuration utility or switch/jumper settings). Even though this isn't a BSAP network, this address is used for routing of alarms and RBE messages.

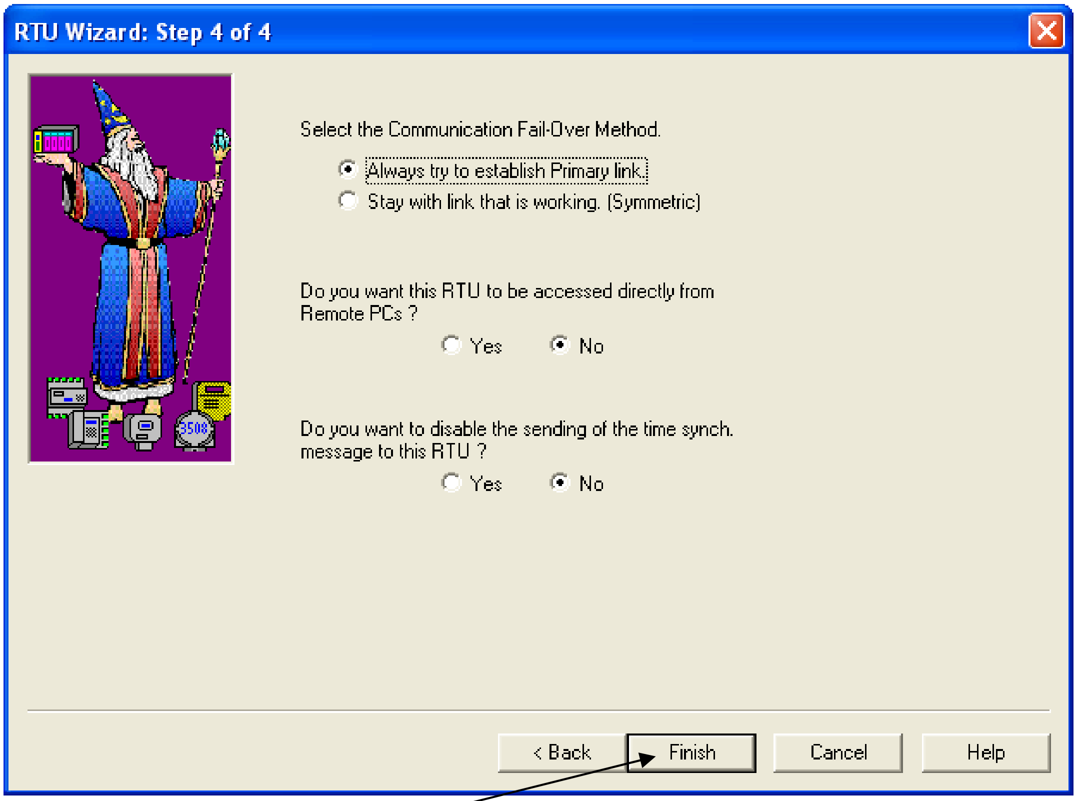
Click here to go to page 4.

Figure 4-16. RTU Wizard – Step 3 of 4

- Click **Next** to go to page 4 of the RTU Wizard.

4.5.4 RTU Wizard Page 4

The fourth page of the RTU Wizard allows you to specify communication fail-over information, and whether to allow proxy direct access.



RTU Wizard: Step 4 of 4

Select the Communication Fail-Over Method.

● Always try to establish Primary link.

○ Stay with link that is working. (Symmetric)

Do you want this RTU to be accessed directly from Remote PCs ?

○ Yes ● No

Do you want to disable the sending of the time synch. message to this RTU ?

○ Yes ● No

Click here to exit the RTU Wizard

Figure 4-17. RTU Wizard – Step 4 of 4

- For non-redundant RTUs, choose **Always try to establish Primary link** (default). If the RTU is part of a redundant pair choose **Stay with link that is working. (Symmetric)**. If you choose this option, OpenBSI always attempts to use the current working communication link (either Primary or Secondary) and then if that link fails, fails over to the alternate link.
- if you want to allow other OpenBSI workstations direct access to this RTU (without sending messages through this RTU's NHP) choose **Yes** to the question about access from remote PCs.
- if you have a special application-specific reason to disable time synchs to this RTU, you can choose **Yes** here.

Click **Finish** to exit the RTU Wizard.

Once you define your RTUs, if necessary, you can edit their properties if you right click on the RTU icon, and select **"Properties"** from the pull down menu.

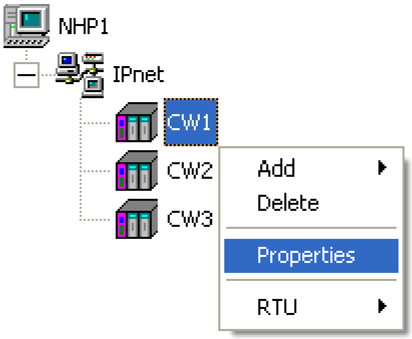


Figure 4-18. Modifying RTU Properties

4.6 Set RTU Configuration Parameters in Each RTU

Use Configure Mode in the LocalView utility to configure IP port parameters, and the RTU's IP address (see *Chapter 5* for information on how to complete this part of the configuration).

4.7 Define Your Communication Line using the Comm Line Wizard

Now that your RTU network exists, and each RTU has an assigned IP address, the last important thing you have to do is define the characteristics of the communication line which the RTUs use.

There are two ways to activate the Comm Line Wizard:

- One way is to right click on the NHP icon, and select **Add**>**Line** from the pop-up menu to start the Comm Line Wizard.

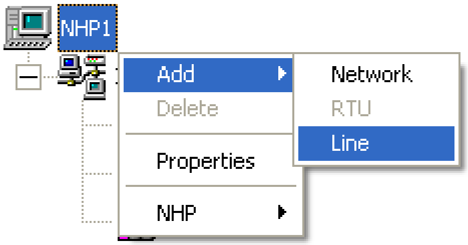
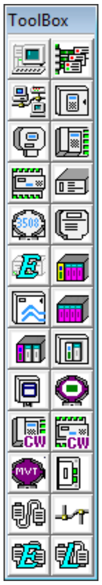


Figure 4-19. Starting the Comm Line Wizard – Method 1

The other way to start the Comm Line Wizard is to drag the IP comm line icon from the Toolbox, over to the NHP icon.



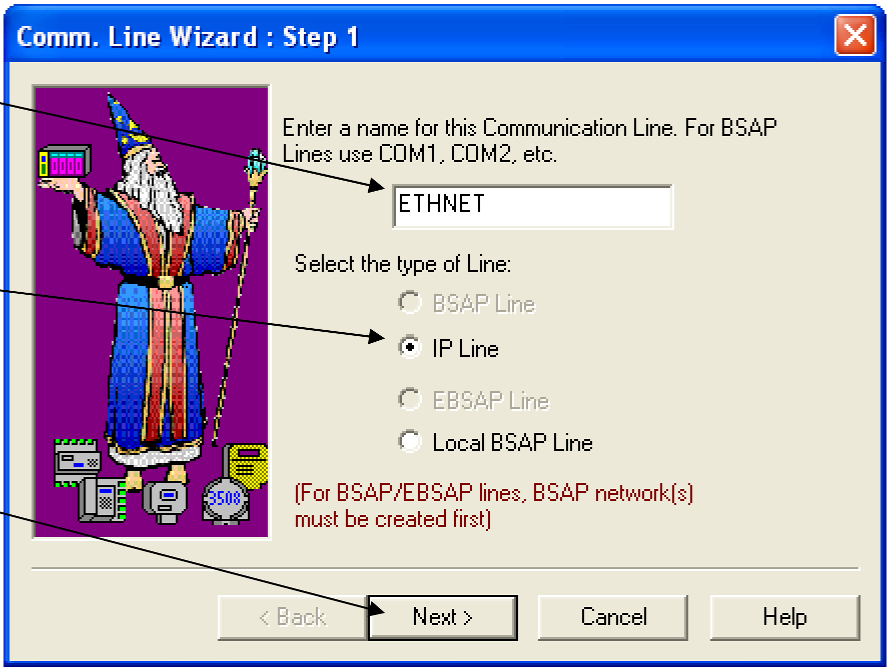
Drag the IP line icon over to the NHP

Figure 4-20. Starting the Comm Line Wizard – Method 2

4.7.1 Comm Line Wizard Page 1

On the first page of the Comm Line Wizard, you need to:

- Specify the name of the Communication Line. The name must be unique in this OpenBSI system.
- Specify the type of Communication Line. For purposes of this example, you must choose **IP Line**.



Enter a name for this Communication Line. For BSAP Lines use COM1, COM2, etc.

ETHNET

Select the type of Line:

○ BSAP Line
● IP Line
○ EBSAP Line
○ Local BSAP Line

(For BSAP/EBSAP lines, BSAP network(s) must be created first)

Enter a unique name for the communication line

Choose "IP Line"

Click here to go to page 2

Figure 4-21. Comm Line Wizard – Step 1

Click **Next** to go to Page 2 of the Comm Line Wizard.

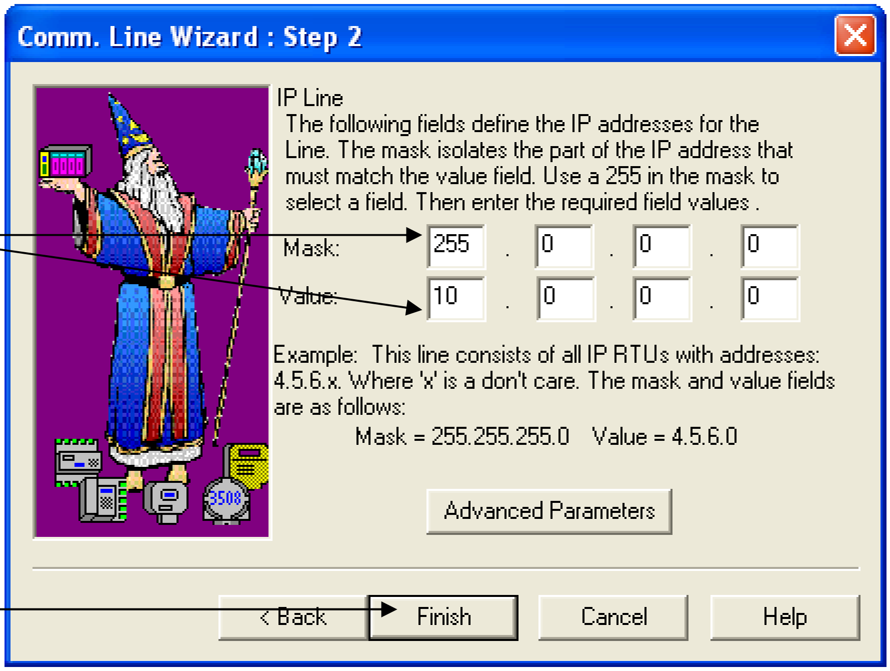
4.7.2 Comm Line Wizard Page 2

On the second page of the Comm Line Wizard, you need to:

- Specify the range of IP addresses for this communication line. In the **Value** fields, specify the portion(s) of the IP address (in dotted decimal format) which are common (i.e. the same) and contiguous starting from the left for all IP addresses on this line. For example, if the RTU's on this line have addresses:

  10.210.74.1,
  10.211.74.2,
  and 10.212.74.3,

  if you start from the left, "10" is the only common part; enter "10" in the first **Value** field, and “0” in the other three **Value** fields. ("74" doesn't count as a common part because it's **not** contiguous to the 10!) This means the mask for all 8 bits in the 10 must be on, so enter a value of 255 above the 10. Enter zeros in the remaining **Mask** fields.



Comm. Line Wizard : Step 2

IP Line

The following fields define the IP addresses for the Line. The mask isolates the part of the IP address that must match the value field. Use a 255 in the mask to select a field. Then enter the required field values .

Mask: 255 . 0 . 0 . 0

Value: 10 . 0 . 0 . 0

Example: This line consists of all IP RTUs with addresses: 4.5.6.x. Where 'x' is a don't care. The mask and value fields are as follows:

Mask = 255.255.255.0 Value = 4.5.6.0

Define the range of valid IP addresses for this line. In this example, any IP address beginning with “10” is valid.

Click Finish to exit the Comm Line Wizard

Figure 4-22. Comm Line Wizard – Step 2

Click **Finish** to exit the Comm Line Wizard.

NetView should now automatically begin to communicate with nodes on the IP line. To verify this, follow the steps in *Section 4.8.*

4.8 Verify Communications Are Active Using DataView

Choose one of your RTUs which has a running control strategy. (If you don't have an RTU running a control strategy, you need to download a control strategy.)

⚠ **Warning** **Never attempt to download an *untested* program into an RTU currently running an industrial process or plant. Prior to downloading, isolate the RTU from the process and disconnect I/O. Failure to take such precautions could result in injury to persons or damage to property.**

To download a control strategy, right click on the icon for that RTU and select **RTU>Download** (*Figure 4-23)* to download the appropriate control strategy file into the unit.

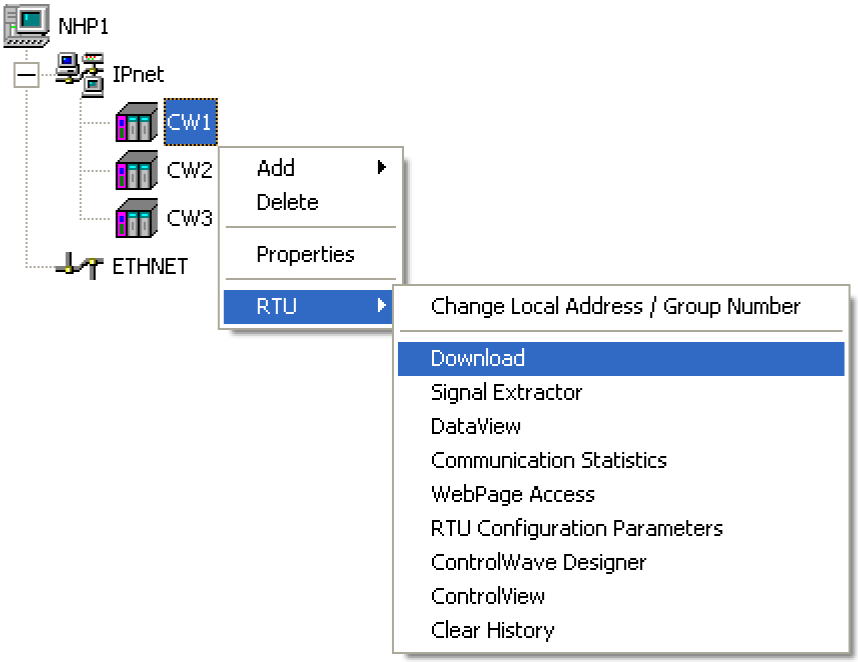


Figure 4-23. Downloading a Control Strategy

When any necessary download completes, right click on the icon for the same RTU, again, and select **RTU>DataView** to start the DataView utility. Click **Security> Sign On** from the DataView menu bar. If not already selected, choose the name of the RTU you want to communicate with from the Select New Node dialog box. These node names come directly from the information you entered, previously, in NetView. Enter the appropriate password or the username/ password combination for that RTU and click **OK**.

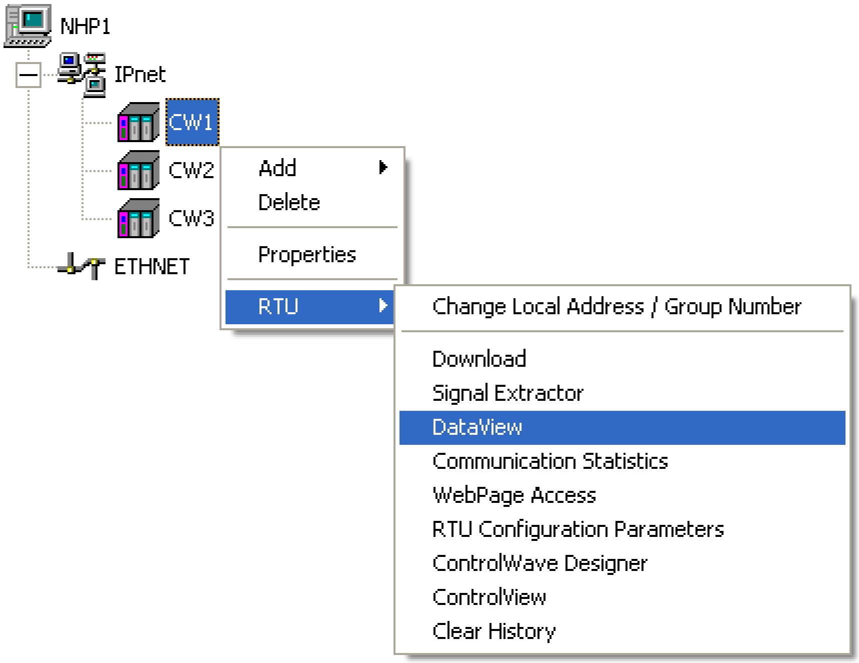


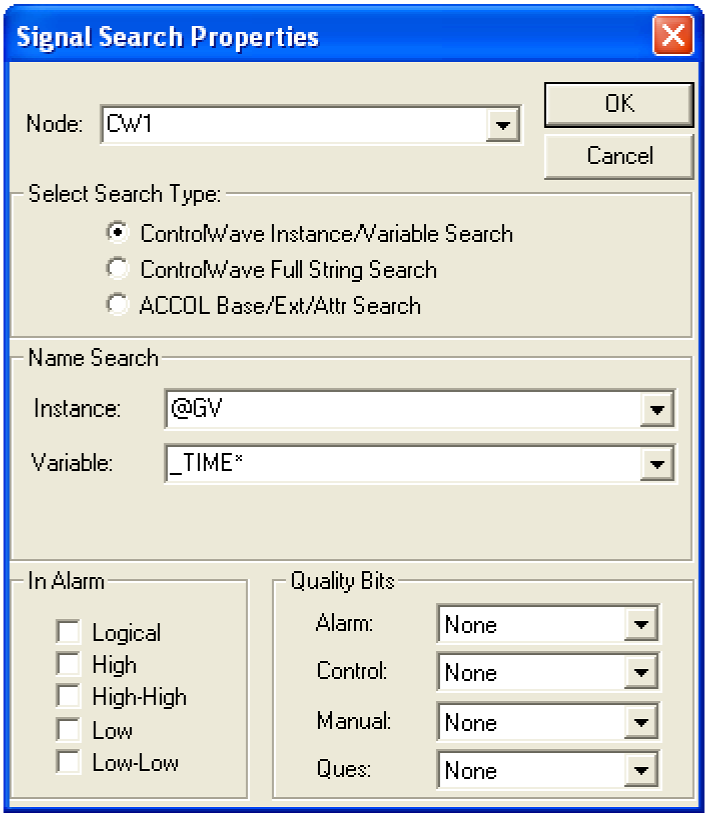
Figure 4-24. Collecting Data from the RTU Using DataView

If the message “Signed on to remote at level *n*” appears in the status bar, communications are active. Click the Signal Search icon (shown at left).

The desired node name should appear in the **Node** field of the Signal Search dialog box.

For ControlWave users: If you know of a specific global variable, enter the text “@GV” (for global variables) in the **Instance** field and the variable name in the **Variable** field, or a portion of the variable name with a wildcard, such as “_TIME*” (see *Figure 4-24)*. Otherwise, just leave the **Instance** and **Variable** fields blank, and then click **OK**; DataView displays all variables it can find.

For Network 3000 users: Enter the name #TIME in the **Base** field, and click **OK**.



Node: CW1

Select Search Type:

- ● ControlWave Instance/Variable Search
- ○ ControlWave Full String Search
- ○ ACCOL Base/Ext/Attr Search

Name Search

Instance: @GV

Variable: _TIME*

In Alarm

- □ Logical
- □ High
- □ High-High
- □ Low
- □ Low-Low

Quality Bits

Alarm: None

Control: None

Manual: None

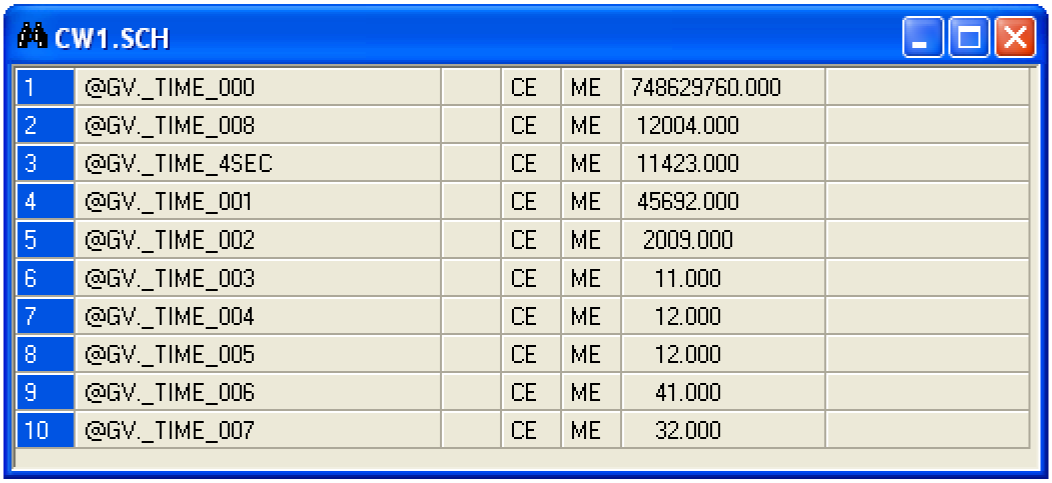
Ques: None

Figure 4-25. Signal Search dialog box

4.8.1 If NetView communicates….

If communications function properly, a screen of variables or signals with "live" data values should appear. If you see that, congratulations! You've successfully created an IP network!

(If you want these NETDEF files started automatically every time you start NetView, change the basename for all four files (*.NDF, *.MDB, *.DSN, and *.LDB) to CURRENT.)



1	@GV._TIME_000		CE	ME	748629760.000	
2	@GV._TIME_008		CE	ME	12004.000	
3	@GV._TIME_4SEC		CE	ME	11423.000	
4	@GV._TIME_001		CE	ME	45692.000	
5	@GV._TIME_002		CE	ME	2009.000	
6	@GV._TIME_003		CE	ME	11.000	
7	@GV._TIME_004		CE	ME	12.000	
8	@GV._TIME_005		CE	ME	12.000	
9	@GV._TIME_006		CE	ME	41.000	
10	@GV._TIME_007		CE	ME	32.000	

Figure 4-26. Signal Search Results Screen

4.8.2 If NetView fails to communicate…

If these tests fail, and you see other messages, such as “Node Currently Off-Line”, this indicates an error in one of the previous steps, or some other configuration problem. Try the following:

- Re-trace the steps throughout this Quickstart, and check each parameter carefully.
- Verify that all IP addresses and sub-net masks are correct. This is one of the most common errors. If necessary, test TCP/IP connections using the Ping command at the DOS prompt. Also use the Flash Configuration utility to check to see that you defined IP addresses, sub-net masks, and other communication parameters properly at the RTUs. Also check to see that the UDP port/socket numbers specified for security purposes in the NHP match the UDP port/socket numbers defined in each RTU.
- Check for port activity by examining the LEDs associated with the RTU communications port.
- Check for typographical errors in node names.
- For Network 3000 users: Check your ACCOL source file for errors in the IP Slave communication port configuration. If necessary, correct any errors then recompile the load, reset the unit, and then try to re-download the ACCOL load.
- If some communication between NetView and the RTU occurs, but you are unsure of proper data transmission, call up the Monitor window of NetView, and check the communication statistics for errors.

If problems persist, contact our Technical Support Group for help.

Chapter 5 – Using LocalView

LocalView lets you:

- Establish communications (using BSAP) with a locally connected RTU to allow access by OpenBSI tools (DataView, Downloader, etc.) We call this **Local Mode**.
- Perform field upgrades of system firmware in the locally connected RTU. We call this **Flash Mode**.
- Configure IP addresses and port parameters for certain types of locally connected RTUs. We call this **Configure Mode**.
- Establish IP communications with a single IP node. This allows access by OpenBSI tools (DataView, Downloader, etc.). We call this **IP Comm Mode**.

In This Chapter

5.1 LocalView Operational Restrictions

With the exception of IP Comm Mode, all LocalView functions apply to a single locally connected RTU. This connection uses either a direct communication cable between the PC and the RTU, or, in Local Mode only, a dial-up modem. Except for IP Comm Mode, all communication uses BSAP. LocalView only supports local BSAP messages; LocalView does **not** support EBSAP or global BSAP messages.

5.2 View Mode Files

LocalView stores your configuration parameters for a particular mode in a **View Mode File**. LocalView includes a configuration wizard for each of the different modes. You need to create a separate view mode file for each mode you want to use. LocalView's configuration wizards store View Mode Files as ASCII text, with a file extension of (*.LVG). Once you create and save a View Mode File, you can open it again for modification purposes, or create a new View Mode File based on it for use with a **different** RTU. **Note:** LocalView only allows one active View Mode File at a time.

5.3 System Firmware and RTU Configuration Parameters

Your control strategy file (a ControlWave project which you create in ControlWave Designer or an ACCOL load which you create in ACCOL Workbench) is not the only thing which dictates how your RTU operates. The other things that govern the operation of the RTU are its **system firmware**, and the **RTU configuration parameters**.

5.3.1 System Firmware

System firmware is the internal logic that tells the RTU how to understand the control strategy file, how to communicate with OpenBSI, and how to communicate with foreign devices using custom communication protocols, such as Modbus, etc.

Occasionally, you may need to upgrade the system firmware. For example, if you purchase an RTU, and then six months later, Emerson releases a new version of system firmware for that RTU containing new features you want to use (new communication options, etc.) you can often upgrade the RTU to support the new features through a field installation of new system firmware.

In years past, system firmware resided on a removable EPROM chip that you plugged directly into the RTU – when you needed a firmware upgrade you swapped in the new chip. Today all our current RTUs hold firmware in flash memory. (flash memory is non-volatile storage; if the RTU has a watchdog failure, or you reset it, flash memory preserves the system firmware.) You use LocalView's flash mode to upgrade the system firmware in the flash memory.

Notes:

- Another utility, the Remote System Firmware Downloader, also allows you to upgrade system firmware. For information on that, see *Appendix J.*
- LocalView stores other things in flash memory as well, including the control strategy file (ControlWave project or ACCOL load), and configuration parameters. Don't confuse these items with the system firmware.

5.3.2 RTU Configuration Parameters

When the RTU starts up, internal settings called **RTU configuration parameters** govern its operation. These settings include things like:

- baud rates the system uses for cold downloads (i.e. an RTU has no control strategy file inside, so it needs a download),
- the local address for the RTU in a BSAP network,
- the Expanded BSAP group number (if the unit resides in an EBSAP network),
- the IP address and mask (for IP nodes),
- various other parameters.

In our older model RTUs, customers set these parameters using physical hardware switches. Now we use software settings called **soft switches** to set these parameters. LocalView's Configure Mode runs the Flash Configuration Utility to let you to set soft switches and RTU configuration parameters. Both NetView and TechView also allow you to run the Flash Configuration Utility.

5.3.3 OpenBSI Application Parameters

If you need to, you can alter the default OpenBSI application parameters from within LocalView; click **View** > **Application Parms** from the menu bar to call up the Application Parameters dialog box. For details on the Application Parameters dialog box, see *Chapter 6*.

5.4 Methods for Starting LocalView

Note:: You must stop NetView or TechView to run LocalView.

If you want to create an all new view mode file, click **Start** > **Programs** > **OpenBSI Tools** > **LocalView** and LocalView starts.

If you want to start LocalView, and activate a particular view mode file immediately upon startup, you double-click the view mode (*.LVG) filename in Windows™ Explorer, or invoke LocalView from the DOS-prompt, as follows:

C:>loclview *filename*

where *filename* is the basename of the view mode file. You can omit the (.LVG) extension. If you include spaces in the *filename*, you must place quotation marks “ “ around *filename*.

You can also drag an existing LVG file and drop it on the icon which represents LocalView (shown at left) or on a running instance of the application.

5.5 Establishing Communications with an Attached RTU (Local Mode)

5.5.1 Before You Begin

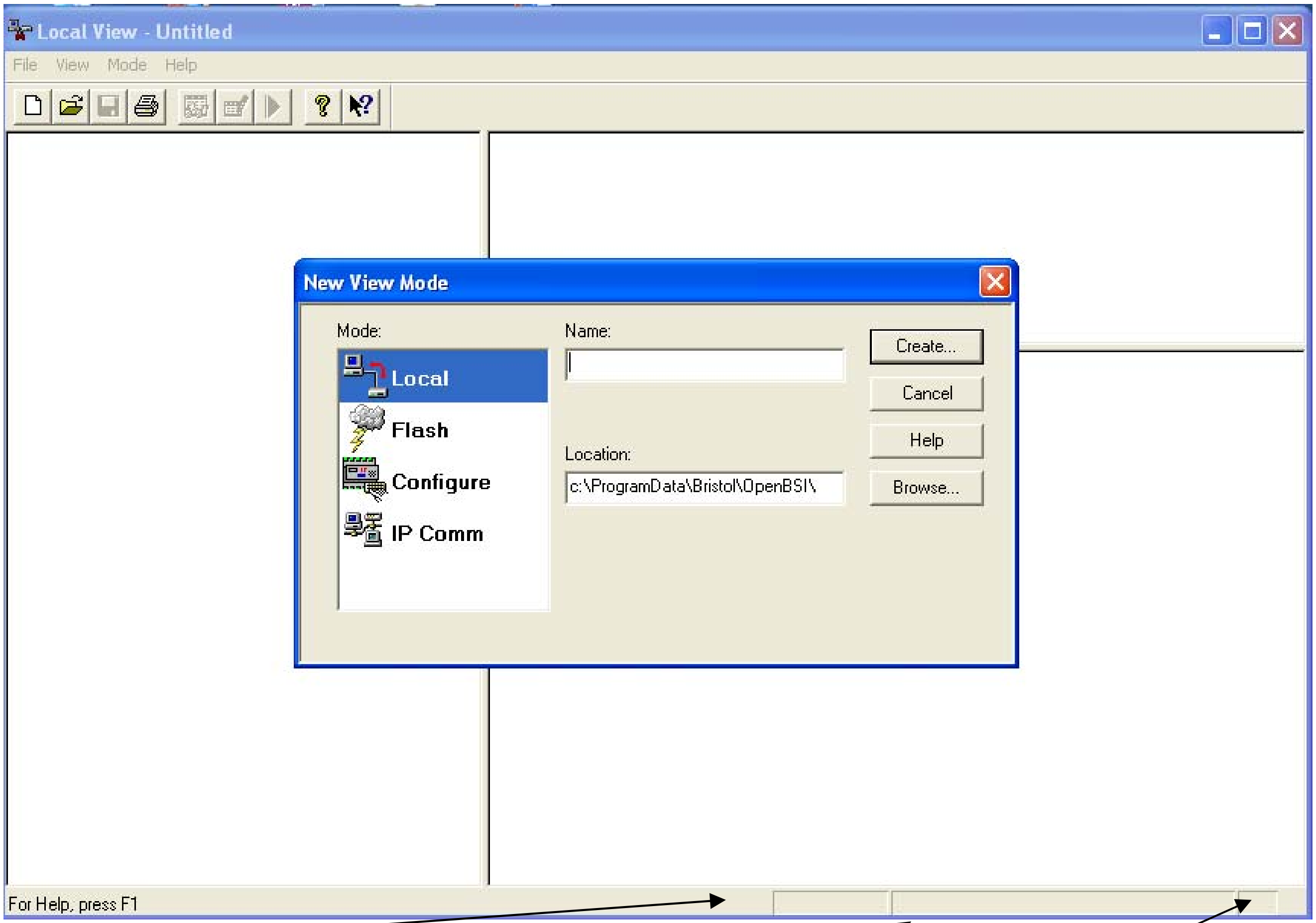
Before you can establish communications with a locally attached RTU, you need to:

- Connect the PC communication cable to one of the available serial ports on the RTU.
- For Network 3000 users, if an ACCOL load is already running in the unit, you must choose a port already configured as a Slave, Pseudo Slave, or Pseudo Slave with Alarms Port. If the unit is empty (no ACCOL load running) the first thing you need to do is to download an ACCOL load.
- For Network 3000 users, you must know the baud rate of the port you are connecting to, as configured in the running ACCOL load. If there is no running ACCOL load (unit is empty) you should use one of the default ports (as determined by switch settings, or if this is an IP RTU, by soft switches) at 9600 baud. For information on configuring soft switches in an IP RTU, see *Assigning IP Addresses and Cold Download Parameters for the Attached RTU (Configure Mode).* For IP nodes, you also set the cold download port parameters in Configure Mode.
- For ControlWave users, soft switch settings determine the baud rate. (If the Use/Ignore Soft Switches switch is in the OFF position, the ControlWave ignores the soft switches, and the baud rate for all serial ports is 9600 baud *except* for COM1 which defaults to 115200 baud. Initially, COM1 leaves the factory configured for BSAP, however, the default for COM1 as specified using the default switch is PPP.

5.5.2 Starting LocalView and the Setup Wizards

The following steps assume you do **not** have a view mode file already configured, and so you want to create a new one:

1. Click **Start** > **Programs** > **OpenBSI Tools** > **LocalView** and LocalView starts.



Mode currently in use, either: “Local,” “Flash,” “Configure, or” “IP Comm.”

Error and Status messages. Errors appear with a red background, status messages appear with a yellow background.

“Mod” in red indicates there are unsaved modifications to the current (LVG) view mode file.

Figure 5-1. LocalView

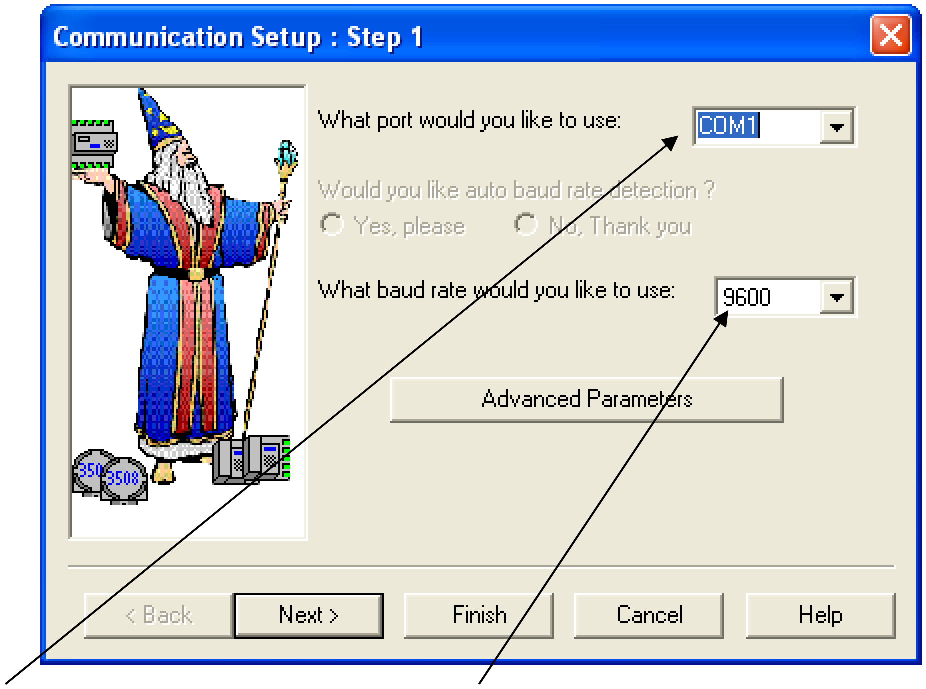
2. In order to use LocalView, you need to define a View Mode File (*.LVG). Enter the basename of the View Mode File in the **Name** field.
3. If you want to save your View Mode File in a directory other than that shown in the **Location** field, type in the directory name, or choose an alternate location using the **Browse** button.
4. When you’ve completed the fields, click **Create** to activate the setup wizards.

Notes:

- LocalView has multiple setup wizards. You will always need to use the **Communication Setup Wizard**.
- The **RTU Setup Wizard** is necessary in most cases.
- The **Dial and Command Setup Wizard** is only necessary if you use dial-up communications.

5.5.3 Communications Setup Wizard

Complete the fields in Communication Setup Wizard, as described, below:



Communication Setup : Step 1

What port would you like to use: COM1

Would you like auto baud rate detection ?

○ Yes, please ○ No, Thank you

What baud rate would you like to use: 9600

Select the PC port you want to use for this local connection

Specify the baud rate used for this port.

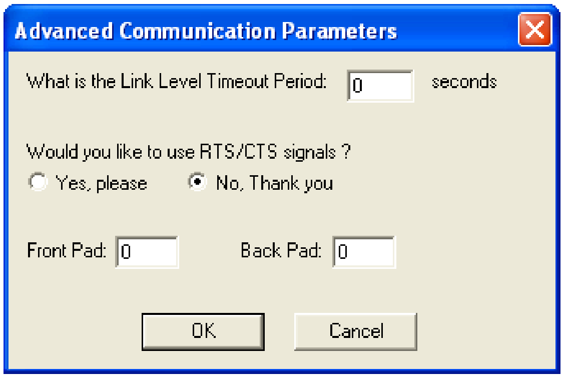
Figure 5-2. LocalView Communication Setup Wizard

Field	Description
What port would you like to use?	Select the PC port LocalView communicates through (e.g. COM1, COM2, etc.)
What baud rate would you like to use?	Select the baud rate for the PC port. It must match the RTU port baud rate.
Advanced Parameters	Click here only if you want to set parameters for more complex communications configurations, using the Advanced Communication Parameters dialog box.

If you want to accept the defaults for RTU setup you can click **Finish**. If you want to use RTU setup parameters other than the defaults, click **Next** to activate the RTU Setup Wizard.

Advanced Communication Parameters Dialog Box

You only need to use these advanced parameters for more complex communications configurations. Most users can skip this.



Advanced Communication Parameters

What is the Link Level Timeout Period: 0 seconds

Would you like to use RTS/CTS signals ?

○ Yes, please ● No, Thank you

Front Pad: 0 Back Pad: 0

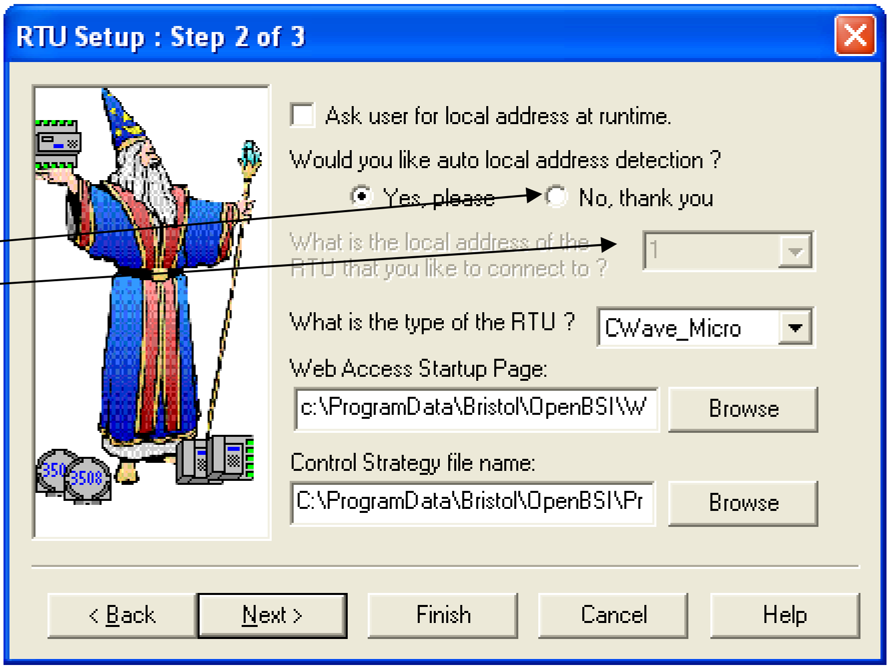
Figure 5-3. Advanced Communication Parameters dialog box

Field	Description
What is the Link Level Timeout Period	Specify the maximum amount of time (in seconds) that OpenBSI waits to receive a response to any one data link transaction. If you enter **0** the system calculates a default timeout based on the baud rate of the line.
Would you like to use RTS/CTS signals?	Click **Yes** if your communication line uses Ready to Send (RTS) / Clear to Send (CTS) signals (don't confuse this with ACCOL signals). Otherwise click **No**.
Front Pad, Back Pad	Use these fields to specify the number of null characters to insert at the beginning (front) or ending (back) of a message. Null characters are useful in situations where there may be a momentary delay which could cause an RTU to miss the start of a message, for example, while a radio link activates. Null characters are also necessary if you communicate using a 2-wire RS-485 link, to ensure that the PC does not drop DTR prematurely. To determine the delay caused by null packing, perform the following calculation: seconds of delay = (number of null characters * 10) / baud rate

Click **OK** to exit the Advanced Communication Parameters dialog box.

5.5.4 RTU Setup Wizard

Complete the fields in the RTU Setup Wizard, as described, below:



□ Ask user for local address at runtime.

Would you like auto local address detection ?

● Yes, please ○ No, thank you

What is the local address of the RTU that you like to connect to ? 1

What is the type of the RTU ? CWave_Micro

Web Access Startup Page: c:\ProgramData\Bristol\OpenBSI\W

Control Strategy file name: C:\ProgramData\Bristol\OpenBSI\Pr

If you choose "No" for auto address detection, enter the local address here.

Figure 5-4. LocalView RTU Setup Wizard

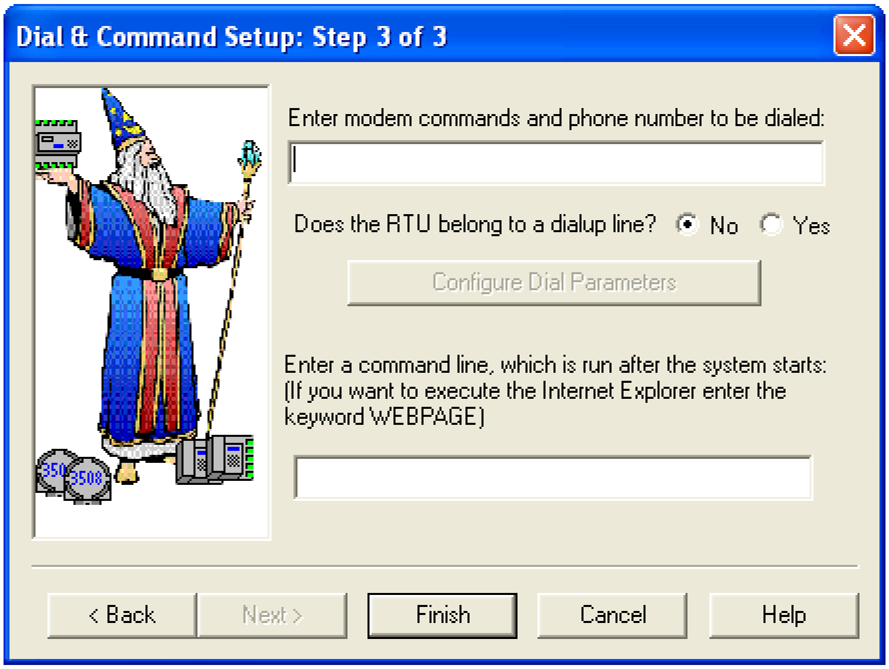
Field	Description
Ask user for local address at runtime	Check this box if you want LocalView to prompt the user to select the local address when the LocalView (*.LVG) file starts. This allows the same LVG file to be re-used with multiple different RTUs.
Would you like auto local address detection?	If you choose **Yes** (default), LocalView allows you to set up a local connection without knowing the local address of the RTU, because LocalView sequentially polls each address, until it finds an address which answers. If you choose **No** LocalView requires that you specify the local address in the field below. (NOTE: If the RTU is empty, waiting for a download, or is in a watchdog failure condition, you must choose **No**, because the RTU will be unable to answer a poll. You must also choose **No** if you want to use a dial-up modem to communicate with the RTU.)
What is the local address of the RTU that you would like to connect to?	Type the local address of the RTU (from 1 to 127) or select the address using the list box provided. Ignore this field if you answered **Yes** to the **Would you like auto local address detection** question.
What is the type of the RTU?	Use the list box to select the type of controller (RTU) LocalView will connect to. Choices include: 3305, 3308, 3310, 3330, 3335, 3530, 3508, ControlWave, CWave_LP, CWave_RIO, CWave_Micro, CWave_GFC, CWave_EFM, Cwave_XFC, CW_10, CW_30, 3808 or 4088B.

Web access startup page:	Optionally, you can use this field to specify the path and file name of a web page that LocalView calls up when it starts communications with this RTU. If necessary, use the **Browse** button to locate the web page.
Control Strategy file name:	If the attached RTU does **not** have a control strategy file (ControlWave project or ACCOL load, as appropriate) running inside it, the first thing you need to do after you establish communications is to download a control strategy file. So that the Downloader program, when invoked, knows which file to download, use the **Browse** button in LocalView's RTU Setup dialog box to locate the directory path and control strategy file name, or you can type this information in directly. **Note**: 3508 TeleTrans units, 3808 transmitters, the 4088B and some early versions of the EGM 3530-xx TeleFlow line, do **not** support control strategy files. In these cases, just leave the default "Newfile" name.

If you are **not** going to use a dial-up line, or do not intend to specify command line entries, click **Finish** to exit the RTU Setup wizard. If you want to use a dial-up line, or you want to specify a command line entry that LocalView executes when it starts, click **Next**. (If you want to use a dial-up line, but you cannot use the **Next** button because it is "grayed out," this is because you did **not** turn off auto local address detection and specify a local address. LocalView does not support auto local address detection on dial-up lines.)

5.5.5 Dial & Command Setup Wizard

To communicate using a dial-up modem, click **Yes** in answer to the question **"Does the RTU belong to a dialup line?"** and complete the fields described, below. If you don't want to use a dial-up line, answer **No** and click **Finish** to exit or click **Back** to return to the previous page.



Dial & Command Setup: Step 3 of 3

Enter modem commands and phone number to be dialed:

Does the RTU belong to a dialup line? ● No ○ Yes

Enter a command line, which is run after the system starts: (If you want to execute the Internet Explorer enter the keyword WEBPAGE)

Figure 5-5. LocalView Dial and Command Setup Wizard

Field	Description
Enter modem commands and phone number to be dialed:	Enter the dial string which LocalView sends to an attached modem in order to dial this RTU. You can also include modem commands in the dial string. LocalView automatically precedes the dial string with the "AT" modem command. Here are some typical dial strings: DT5551234 DT9,,,,452200
Configure Dial Parameters	Click here to call up the Dial Parameters dialog box. This dialog box is described in *Chapter 6*.
Enter a command line, which is run after the system starts:	You can optionally enter a DOS command line entry or the path of an executable (.EXE) here, which executes after LocalView communications start. This allows you to automatically start another program, e.g. the Windows UOI/TMS/Smartkit shell (WINUOI), or Internet Explorer.

When you finish with the Dial Parameters dialog box, and the Dial and Command Setup wizard, click **Finish**.

5.6 After You Have Finished With the Setup Wizards…

When you exit the wizards, your View Mode File is now complete, and LocalView attempts to use it. LocalView creates a small BSAP network, and attempts to poll the attached RTU, or dial it, if this is a dial-up line.

If the OpenBSI system starts successfully, LocalView adds an icon for a single RTU to the small BSAP network, and you can then activate various OpenBSI utilities to communicate with this RTU. (If this is a direct connection (no modem) and the RTU has no control strategy running in it, turn **off** auto address detection, to prevent polling, and then you can use the Downloader, at this point, to download a control strategy file.) You can use DataView, the Remote Communications Statistics Tool, and other tools, but **do not** start NetView or TechView because these programs cannot run while LocalView runs.

If auto local address detection is on, and polling is unsuccessful, the message “No RTU Found” appears in red in the status bar. This indicates a problem where LocalView cannot establish the connection to the RTU. You can re-activate the wizards to view/modify the parameters you entered and try again. (See *Reconfiguring the Active View Mode File*.)

5.6.1 Starting Other Programs in Local Mode

Once you successfully establish a local connection to the RTU, you can start other programs to use with the RTU by right-clicking on the RTU icon, and choosing “RTU” from the pop-up menu, and choosing the action you want to perform. (See *Figure 5-6*.)

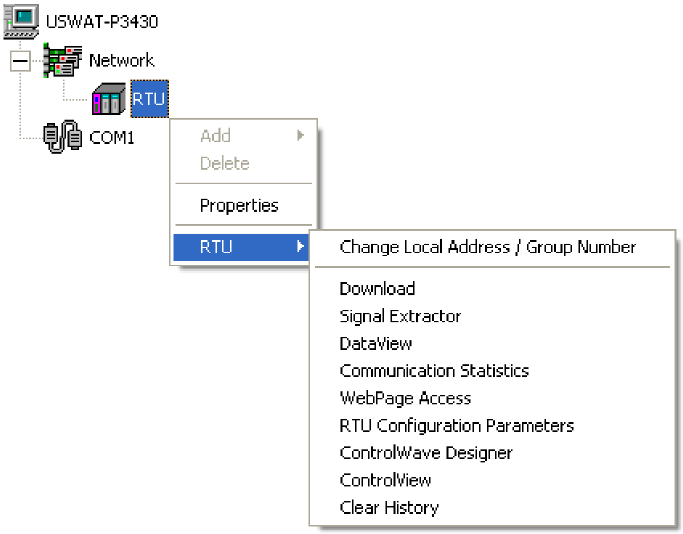


Figure 5-6. Calling up Other Programs

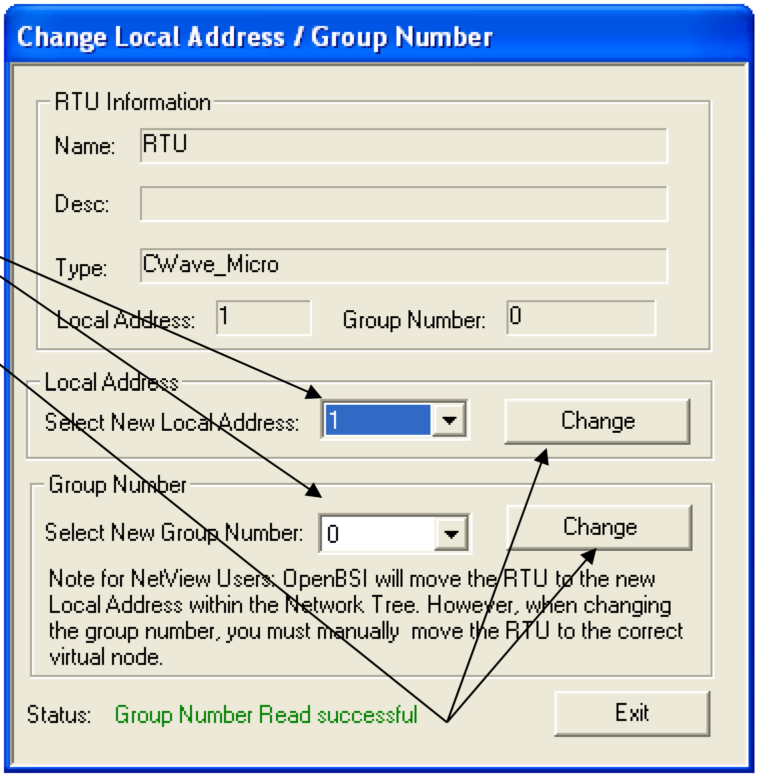
The various choices vary depending upon the RTU type. You can choose among the following:

- Choose **Download** to start the Downloader. (See *Chapter 7* for details.)
- Choose **DataView** to start DataView. (See *Chapter 8* for details.)
- Choose **Communication Statistics** to start the Remote Communication Statistics Tool. (See *Chapter 9* for details.)
- Choose **RTU Configuration Parameters** to set configuration parameters in the RTU. (See *Assigning IP Addresses and Cold*

Download Parameters for the Attached RTU (Configure Mode) later in this chapter for details.)

- Choose **Signal Extractor** to activate the Signal Extractor. (See *Chapter 12* for details.)
- Choose **WebPage Access** to call up the start-up web page associated with this RTU in Microsoft® Internet Explorer.
- Choose **WinUOI** to activate the Windows™ UOI/TMS/Smartkit shell. For information on this utility, see the addendum to the *UOI Configuration Manual* (document# D5074).
- Choose **Workbench** to activate the ACCOL Workbench program. (See the *ACCOL Workbench User Manual*, document# D4051 for details.)
- Choose **ControlWave Designer** to activate ControlWave Designer. (See the *Getting Started with ControlWave Designer Manual*, document# D5085 for details.)
- Choose **Change Local Address/Group Number** to change the local address of the attached 3530 TeleFlow / TeleRTU or ControlWave. Select the address from the **Select New Local Address** list box, and click **Change**. This option only applies to 3530-series devices, and ControlWave devices with 04.60 or newer firmware and actually changes the address within the device, not just in NetView.
- Choose **Change Local Address/Group Number** to change the EBSAP Group Number of the attached 3530 TeleFlow / TeleRTU or ControlWave. Select the address from the **Select New Group Number** list box, and click the **Change]** button. This option only applies to 3530-series devices, and ControlWave devices with 04.60 or newer firmware, and actually changes the group number within the device, not just in NetView.

Note: Although this operation changes the group number, it does **not** change its location in the network hierarchy. You must manually drag the icon for the controller under the correct Virtual Node.



Change Local Address / Group Number

RTU Information

Name: RTU

Desc:

Type: CWave_Micro

Local Address: 1 Group Number: 0

Local Address

Select New Local Address: 1

Group Number

Select New Group Number: 0

Note for NetView Users: OpenBSI will move the RTU to the new Local Address within the Network Tree. However, when changing the group number, you must manually move the RTU to the correct virtual node.

Status: Group Number Read successful

To change the BSAP Local Address or the EBSAP Group Number, choose the new address/group number from the list box, then click the associated "Change" button.

Figure 5-7. Changing the BSAP Local Address or EBSAP Group Number

- Choose **ControlView** to bring up the ControlView File Viewer utility. See the *BSI_Config User's Manual* (document# D5128) for details on ControlView.
- Choose **Clear History** to delete historical data from a ControlWave controller. See *Chapter 6* for details.

5.6.2 Reconfiguring the Active View Mode File

To modify the active view mode file, click the Configure Current View Mode icon, or from the menu bar, click **Mode**>**Configure**. This re-activates the wizards for the current LocalView mode. **Note**: In order for changes you make to come into effect, you must re-start the View Mode file (see *Restarting the View Mode File*).

5.6.3 Saving the View Mode File

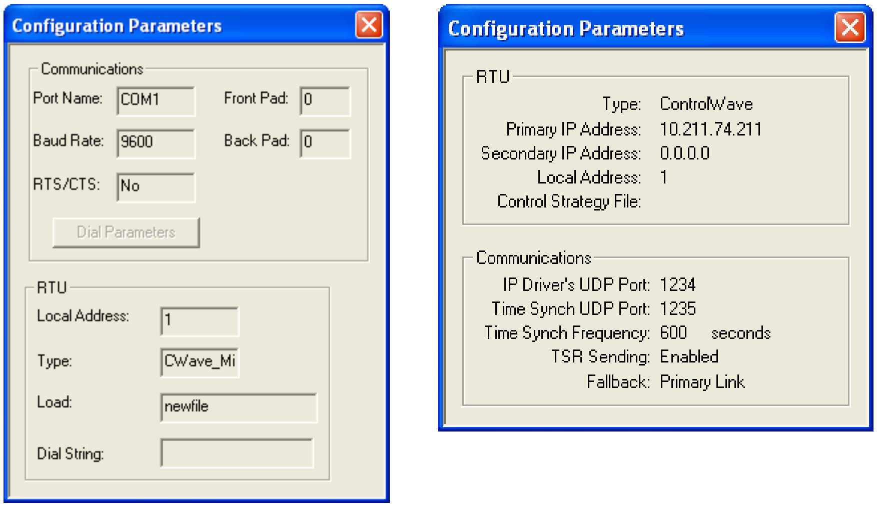
To save changes to the View Mode File, click the "Save file" icon, or from the menu bar, click **File**>**Save**. You can also save a View Mode File under a different name, using **File** > **Save As**.

5.6.4 Restarting the View Mode File

Any changes you make to the current View Mode File will not activate until you restart the View Mode File. To restart the active View Mode File, click the Restart icon, or, from the menu bar, click **Mode> Restart**.

5.6.5 Viewing Current Configuration Parameters

To view certain configuration parameters, click the icon, or, from the menu bar, click **View>Configuration**. The appearance of the Configuration Parameters dialog box varies depending upon the current LocalView mode.



Configuration Parameters

Communications

Port Name: COM1
Front Pad: 0
Baud Rate: 9600
Back Pad: 0
RTS/CTS: No

RTU

Local Address: 1
Type: CWave_Mi
Load: newfile
Dial String:

Configuration Parameters

RTU

Type: ControlWave
Primary IP Address: 10.211.74.211
Secondary IP Address: 0.0.0.0
Local Address: 1
Control Strategy File:

Communications

IP Driver's UDP Port: 1234
Time Synch UDP Port: 1235
Time Synch Frequency: 600 seconds
TSR Sending: Enabled
Fallback: Primary Link

Figure 5-8. Configuration Parameters dialog boxes

5.7 Upgrading System Firmware in the Field (Flash Mode)

Note: Most users find the Remote System Firmware Downloader easier to use than LocalView flash mode, because it does not require changes to switch settings. See *Appendix J* for instructions on using the Remote System Firmware Downloader.

When certain controllers (RTUs) ship from our factory, they have a pre-installed set of **system firmware** that resides in the RTU's flash memory. The system firmware is a collection of low-level programs that run internal to the controller and allow the hardware to understand the control strategy file (ControlWave project or ACCOL load), to perform communications, etc. In addition to the standard system firmware, your RTU may have **custom system firmware** that allows it to communicate with foreign devices (using Modbus protocols, for example).

If you want to upgrade the system firmware, because a new firmware revision is available, you can use LocalView in flash mode.

Note: Do not confuse system firmware with the control strategy file (ACCOL load or ControlWave project) which you configure specifically for your application (gas flow metering, pump control, etc.) Although certain controllers store the files in an area of flash memory, that operation generally does not relate to the flash mode we're discussing here. LocalView flash mode strictly relates to upgrading the system firmware area, and custom system firmware area of flash memory. You don't use flash mode to download control strategy files into flash memory. If you need to download a control strategy file, see *Chapter 7* of this manual.

5.7.1 Before You Upgrade the System Firmware

Only certain controllers support upgrades using LocalView flash mode. These include ControlWave-series controllers as well as the RTU 3305, EGM 3530, RTU 3530, and 386EX Real Mode and 386EX Protected Mode versions of the DPC 3330, DPC 3335, and RTU 3310.

For Network 3000 controllers, in order to upgrade system firmware, you must use a flash cable, which goes out from the PC, and plugs directly into the flash port of the RTU (**not** one of the serial or BIP ports.)

For ControlWave series controllers, there is no flash cable, use a regular serial communications cable, and plug it into COM Port 1 on the ControlWave unit.

Notes:

- If your unit is a ControlWave series controller, set it to Recovery Mode ENABLE (ON) prior to performing the flash upgrade, then set to Recovery Mode DISABLE (OFF) after the upgrade. See the hardware manual for your controller to determine the proper switch for recovery mode. (Support of flash mode with the ControlWave began with OpenBSI 5.1.)
- If your unit is a DPC 3330, DPC 3335, or RTU 3310 with a 386EX CPU you must set switch SW1-1 on the CPU board to the OFF position, and reset the CPU before you perform the flash upgrade. (When you finish the upgrade, return the switch to its original position.)
- If your unit is a EGM 3530 TeleFlow or RTU 3530 TeleRTU, you don't need to change any hardware settings prior to the flash upgrade.
- For the RTU 3305, you can set certain parameters in this mode.

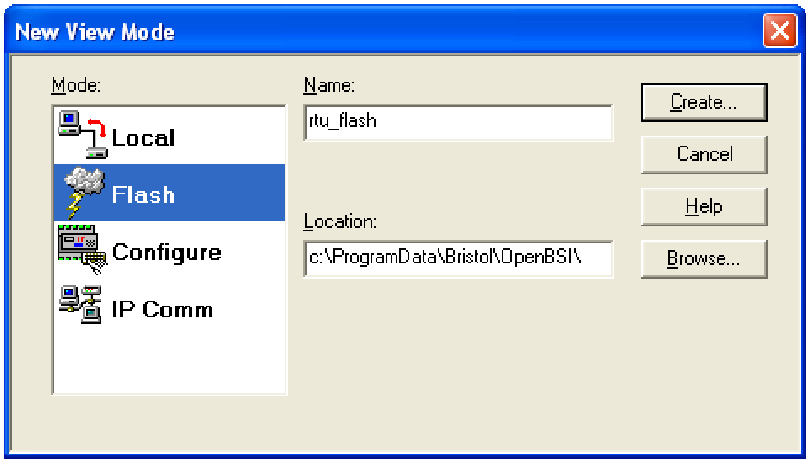
You need a binary (*.BIN) system firmware file to perform the upgrade. For Network 3000 users, that file is typically defined in the flash master file (FLASH.MST). *Figure 5-9* shows a sample flash master file:

```
plx021.bin     Protected Mode Firmware - NPX - Release 02.1
pcp031.bin     Protected Mode Firmware - Standard Custom- Release 03.1
```

Figure 5-9. Sample Flash Master File

5.7.2 Starting LocalView and the Setup Wizards

To start LocalView click **Start** > **Programs** > **OpenBSI Tools** > **LocalView.** The New View Mode dialog box opens. Follow the steps below:



Name: rtu_flash

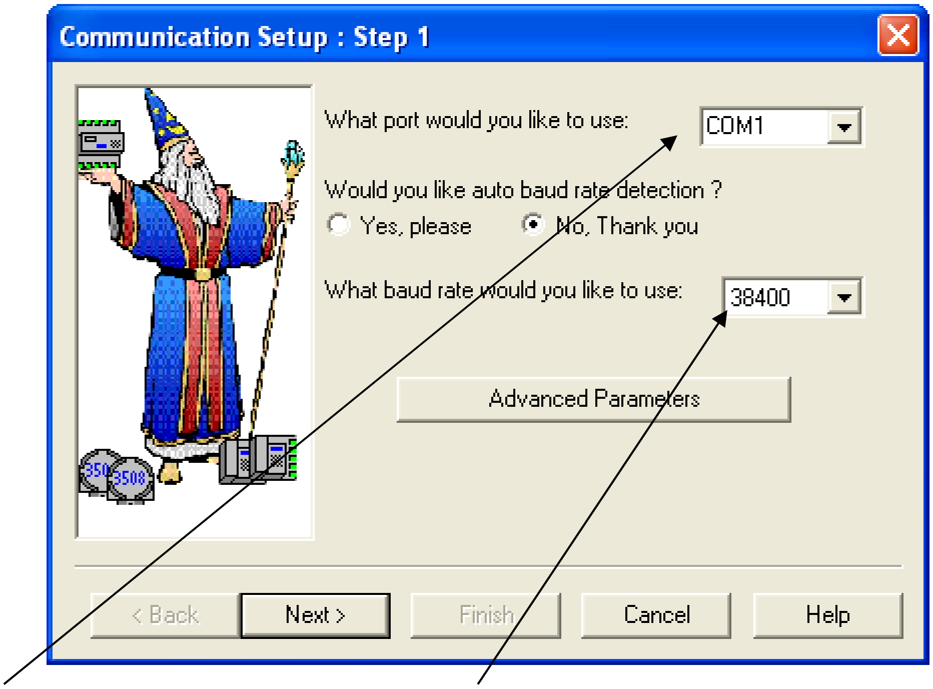
Location: c:\ProgramData\Bristol\OpenBSI\

Figure 5-10. Choosing "Flash" Mode

1. Choose **Flash** for the **Mode**.
2. Enter a name for the View Mode File in the **Name** field.
3. If you want to store the View Mode File in a directory other than the directory shown in the **Location** field, enter the new location there, or click **Browse** to find the directory.
4. Click **Create** to start the Communication Setup Wizard.

5.7.3 Communications Setup Wizard

Complete the fields in Communication Setup Wizard, as described, below:



Communication Setup : Step 1

What port would you like to use: COM1

Would you like auto baud rate detection ?

○ Yes, please ● No, Thank you

What baud rate would you like to use: 38400

Select the PC port you want to use for this connection

Specify the baud rate used for this port.

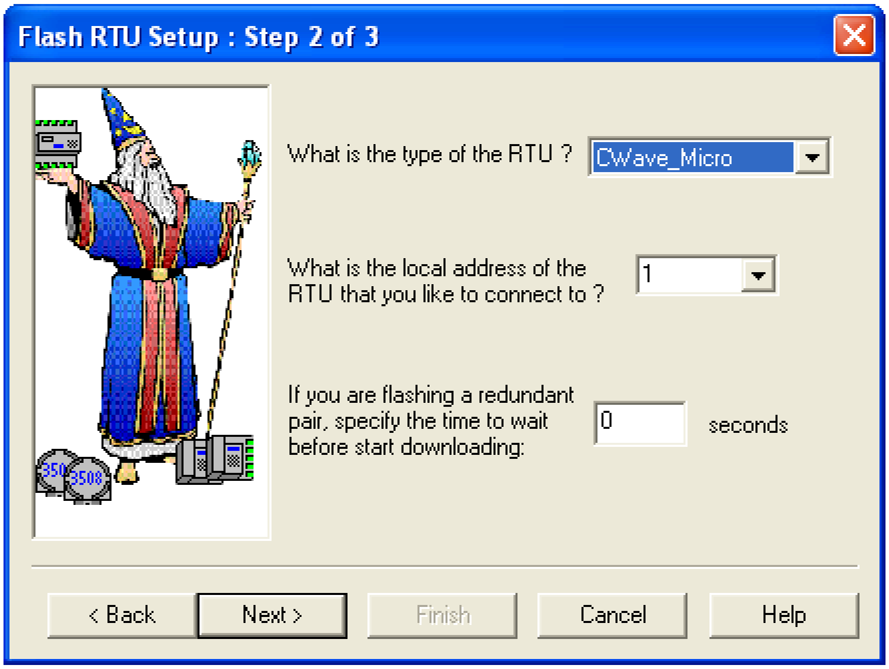
Figure 5-11. LocalView Communication Setup Wizard

Field	Description
What port would you like to use?	Select the PC port into which you plug the flash cable (e.g. COM1, COM2, etc.).
Would you like auto baud rate detection?	If you know which baud rate to use, answer **No** and specify the baud rate. **Note**: This does not apply for ControlWave-series RTUs.
What baud rate would you like to use?	Select the baud rate for the PC port. It must match the RTU port baud rate. **Note:** This does not apply for ControlWave-series RTUs.
Advanced Parameters	Click here only if you want to set parameters for more complex communications configurations, using the Advanced Communication Parameters dialog box. See *page 5-7* for details on this dialog box.

Click **Next** to activate the Flash RTU Setup page.

5.7.4 Flash RTU Setup Wizard

In the Flash RTU Setup Wizard, complete the fields as described, below:



Flash RTU Setup : Step 2 of 3

What is the type of the RTU ? CWave_Micro

What is the local address of the RTU that you like to connect to ? 1

If you are flashing a redundant pair, specify the time to wait before start downloading: 0 seconds

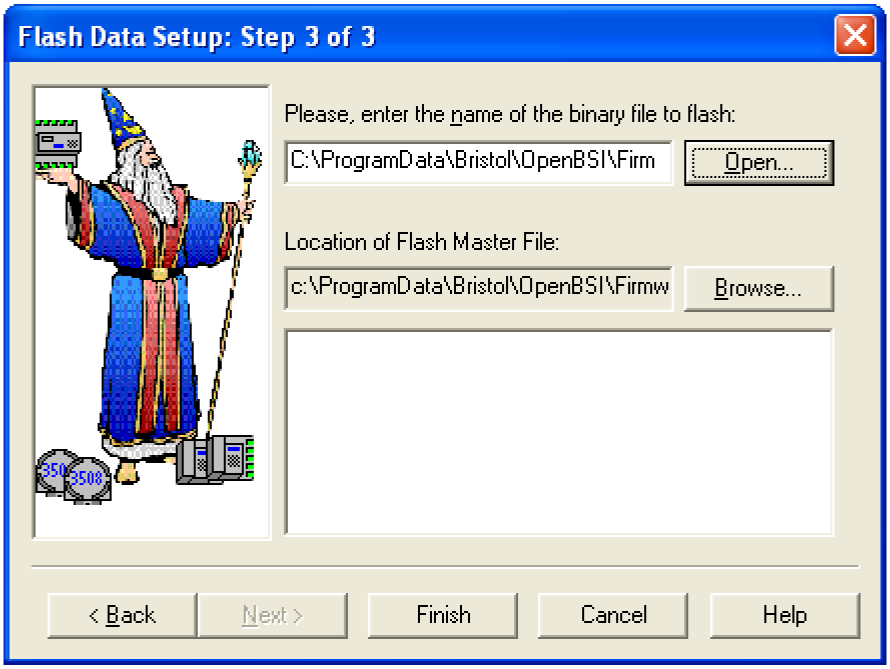
Figure 5-12. LocalView Flash RTU Setup Wizard

Field	Description
What is the type of the RTU?	Use the list box to select the type of controller (RTU) LocalView connects to. Choices include: 3305, 3308, 3310, 3330, 3335, 3530, 3508, ControlWave, CWave_LP, CWave_RIO, CWave_Micro, CWave_GFC, CWave_EFM, Cwave_XFC, CW_10, CW_30, 3808 and 4088B.
What is the local address of the RTU that you would like to connect to?	Type the local address of the RTU (from 1 to 127) or select the address using the list box provided. Ignore this field if you answered Yes to the **Would you like auto local address detection** question.
If you are flashing a redundant pair, specify the time to wait before start downloading	After you download firmware into the primary unit of a redundant pair, you need to power-down that unit, and give time for the backup unit to come on-line, so you can download its firmware. Specify the number of seconds the utility should wait before trying to download the system firmware to the backup unit.
Would you like to configure system parameters residing in the boot prom?	(This question only appears if you choose **3305** for the type of RTU) - If you answer **Yes** to this question, a special dialog box opens immediately after you exit the Flash Data Setup Wizard and you manually reset the 3305. This special dialog box allows you to set various system parameters in the boot prom of the 3305.

Click **Next** to activate the Flash Data Setup page.

5.7.5 Flash Data Setup Wizard

Complete the fields in the Flash Data Setup Wizard, as described, below:



Please, enter the name of the binary file to flash: C:\ProgramData\Bristol\OpenBSI\Firm

Location of Flash Master File: c:\ProgramData\Bristol\OpenBSI\Firmw

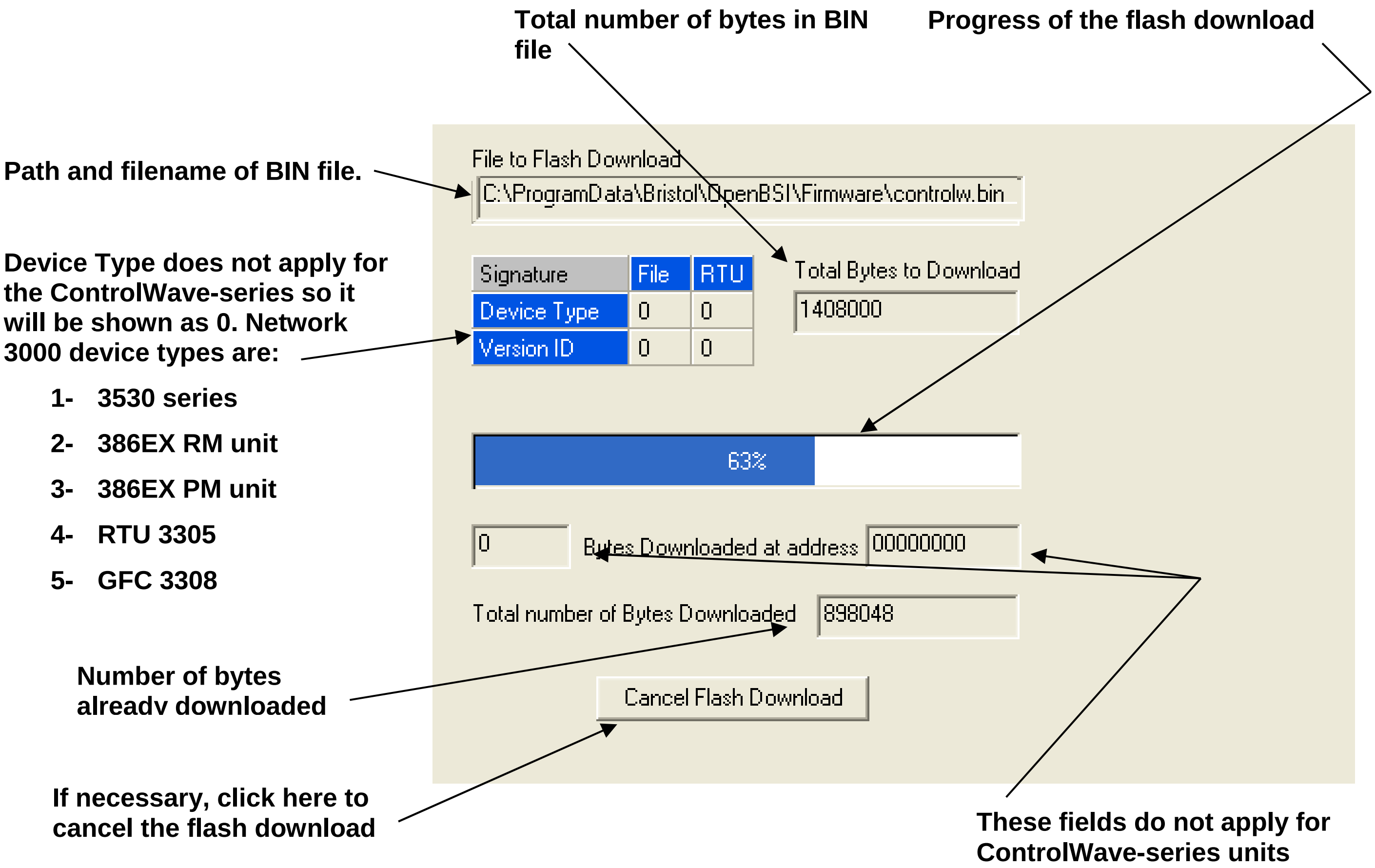
Figure 5-13. LocalView Flash Data Setup Wizard

Field	Description
Please enter the name of the binary file to Flash	To upgrade system firmware, you must specify the path and name of a binary (*.BIN) file on your hard disk containing the firmware. Optionally, the flash master file may include a description of the contents of the various available BIN files (see box at bottom of the dialog box). If you specify a flash master file, double-click the description of the binary file you want to download to the RTU and LocalView copies the path and name into this field. (If you do **not** have a flash master file, type the path and name of the binary file directly into this field.)
Location of Flash Master File	Specifies the location of the flash master file (FLASH.MST). The contents of the flash master file appear in the box at the bottom of the dialog box, and you can use them to select binary files for flash downloading. (See above). If necessary, you can use the **Browse** button to locate the flash master file.

Click **Finish** to install the specified BIN file in flash memory at the RTU.

Once the flash download begins, you will cannot shut down LocalView, unless you cancel the download, or it completes.

A window shows the progress of the flash download. If LocalView detects a mismatch in file versions, or if the type of .BIN file does not match the type of RTU, the download aborts.



Total number of bytes in BIN file

Progress of the flash download

Path and filename of BIN file.

Device Type does not apply for the ControlWave-series so it will be shown as 0. Network 3000 device types are:

1- 3530 series

2- 386EX RM unit

3- 386EX PM unit

4- RTU 3305

5- GFC 3308

Number of bytes alreadv downloaded

If necessary, click here to cancel the flash download

These fields do not apply for ControlWave-series units

File to Flash Download: C:\ProgramData\Bristol\OpenBSI\Firmware\controlw.bin

Signature	File	RTU
Device Type	0	0
Version ID	0	0

Total Bytes to Download: 1408000

63%

0 Bytes Downloaded at address 00000000

Total number of Bytes Downloaded: 898048

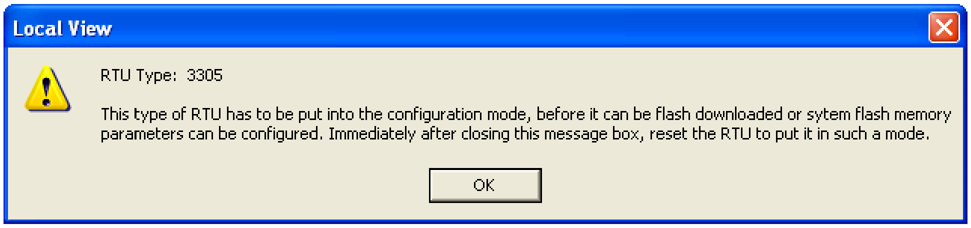
Figure 5-14. Progress of Flash Download

Notes:

- After you complete the flash download, remember to reset the switches on your controller to allow for normal operation.
- Device Type and Version ID do NOT apply for ControlWave-series controllers. Device Type shows as “0” for these units.
- If your unit is an RTU 3305, a message box pops up prior to *Figure 5-14*. You must physically reset the unit within 30 seconds of when you click **OK** in order for the 3305 to accept the system firmware upgrade. (See *Section 5.7.6* for more information.)

5.7.6 Setting RTU Configuration Parameters in the 3305 (3305 ONLY)

If, in the Flash RTU Setup wizard, you answered **Yes** to the question **“Would you like to configure system parameters in the boot prom?”** the message box below appears.

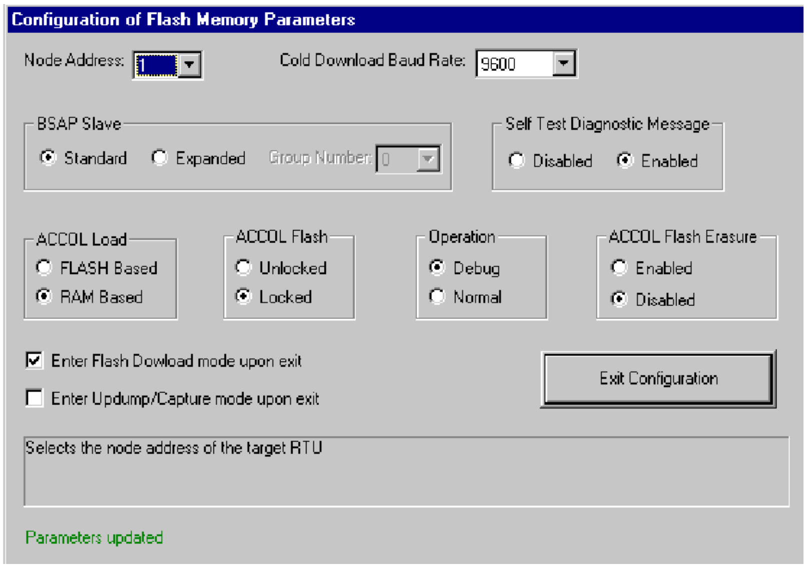


Local View

RTU Type: 3305

This type of RTU has to be put into the configuration mode, before it can be flash downloaded or sytem flash memory parameters can be configured. Immediately after closing this message box, reset the RTU to put it in such a mode.

After you click **OK** and manually reset the RTU, a dialog box comes up to let you configure these parameters.



Configuration of Flash Memory Parameters

Node Address: 1

Cold Download Baud Rate: 9600

BSAP Slave: ● Standard ○ Expanded Group Number: 0

Self Test Diagnostic Message: ○ Disabled ● Enabled

ACCOL Load: ○ FLASH Based ● RAM Based

ACCOL Flash: ○ Unlocked ● Locked

Operation: ● Debug ○ Normal

ACCOL Flash Erasure: ○ Enabled ● Disabled

☑ Enter Flash Dowload mode upon exit

☐ Enter Updump/Capture mode upon exit

Selects the node address of the target RTU

Parameters updated

Figure 5-15. RTU 3305 Flash Parameters

Field	Description
Node Address	Sets the local address of the locally connected RTU 3305. LocalView initially communicates using 127, which is the default.
Cold Download Baud Rate	Sets the baud rate the RTU 3305 uses for cold downloads (unit currently empty, no ACCOL load). You can only perform cold downloads on port B or D of the RTU 3305.
BSAP Slave	If this RTU is part of an expanded node addressing network (EBSAP), choose **Expanded** and enter the EBSAP group number in **Group Number**; otherwise, choose **Standard**.
Self Test Diagnostic Message	You can configure the RTU 3305 to send self-test diagnostic messages out through Port A. Choose **Enabled** to allow these messages, or **Disabled** to inhibit these messages.

ACCOL Load	If this ACCOL load is **RAM Based** the load only continues to run so long as you don't reset the 3305 or the 3305 does not suffer a watchdog failure, in which case the load is lost. If a power failure occurs, the 3305 retains the load only as long as the backup battery functions. If the ACCOL load is **FLASH Based** the 3305 stores the ACCOL load in flash memory, and then copies it into RAM to execute. If you reset the unit or it suffers a watchdog failure, the 3305 preserves the load in flash and restarts it from scratch when you return the unit to operation.
ACCOL Flash	When set to **Locked** prevents you from downloading a new ACCOL load into flash, unless the ACCOL flash area is empty. When set to **Unlocked** allows a new download into the ACCOL flash area.
Operation	When set to **Debug** you can updump 3305 system memory. This option also disables the watchdog and real time clock correction in the 3305 and enables tracing for buffers. Set to **Normal** if you don't want to perform debug operations.
ACCOL Flash Erasure	When set to **Enabled** (and the **ACCOL Flash** option is set to **Unlocked**) *immediately erases* the ACCOL load currently in flash. The erasure begins as soon as you click **Enabled - -** NOT when you exit the dialog box. You use the ACCOL Flash Erasure feature only in the case where you erroneously download an ACCOL load without a valid communication port configured; once the download completes you cannot communicate with the unit. If this situation occurs, set **ACCOL Flash Erasure** to **Enabled**. The 3305 immediately erases the ACCOL load from flash, and automatically disables this option. Now you can download a new load.
Exit Configuration	Click here to close the Configuration of Flash Memory Parameters dialog box. Depending upon selections you make (see below) the 3305 either enters Flash Download mode or Updump / Capture mode after you click this button.
Enter Flash Download mode upon exit	If you select this option, when you click **Exit Configuration** to exit the dialog box, the RTU 3305 enters Flash Download mode and LocalView begins to download the previously selected BIN file.
Enter Updump/Capture mode upon exit	If you select this option, when you click **Exit Configuration** to exit the dialog box, the RTU 3305 enters Updump/Capture mode (i.e. ready to updump system memory). Only choose this option when you want to debug hardware / firmware.

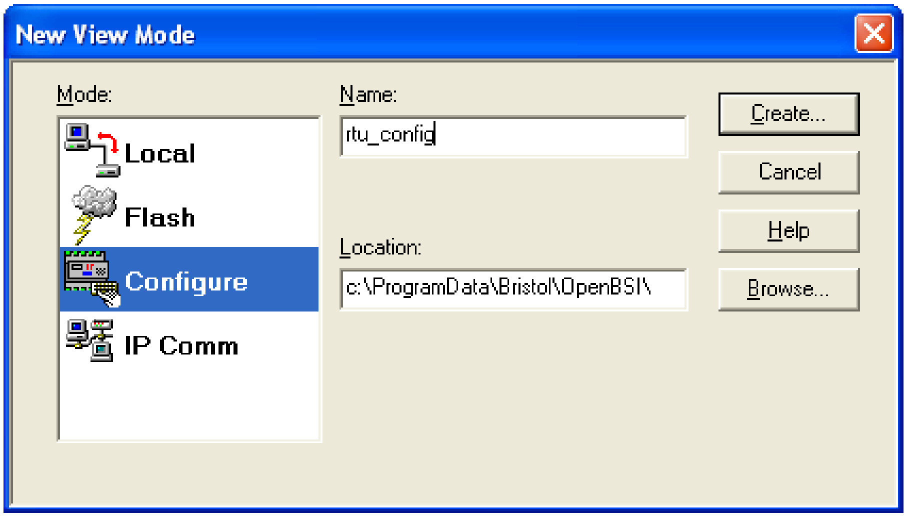
5.8 Assigning IP Addresses and Cold Download Parameters for the Attached RTU (Configure Mode)

Configure Mode lets you set configuration parameters including IP addresses and cold download parameters in your RTU. To work, you must set switches to unlock soft switches on the RTU. See the appropriate hardware manual for your RTU to identify the location of the unlock switch.

Note: For Network 3000 users: Configure mode requires the standard communication cable; **not** the flash cable used in flash mode.

5.8.1 Starting LocalView and the Setup Wizards

To start LocalView click **Start > Programs> OpenBSI Tools > LocalView**. The New View Mode dialog box opens. Follow the steps below.



Name: rtu_config

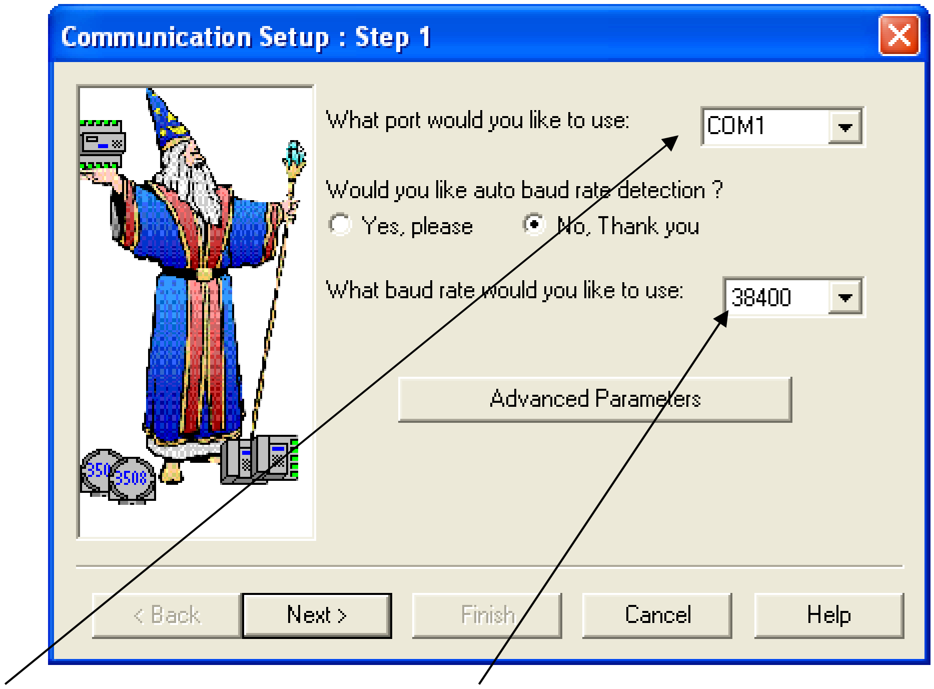
Location: c:\ProgramData\Bristol\OpenBSI\

Figure 5-16. Choosing "Configure" Mode

1. Choose **Configure** for the **Mode**.
2. Enter a name for the View Mode File in the **Name** field.
3. If you want to store the View Mode File in a directory other than the directory shown in the **Location** field, enter the new location there, or click **Browse** to find the directory.
4. Click **Create** to start the Communication Setup Wizard.

5.8.2 Communications Setup Wizard

Complete the fields in Communication Setup Wizard, as described, below:


Communication Setup : Step 1

What port would you like to use: COM1

Would you like auto baud rate detection ?

○ Yes, please ● No, Thank you

What baud rate would you like to use: 38400

Select the PC port you want to use for this connection

Specify the baud rate used for this port.

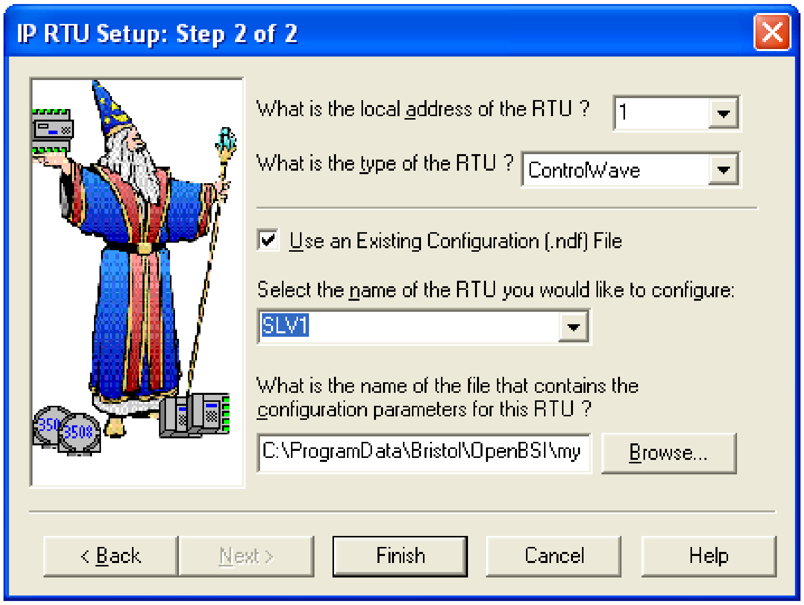
Figure 5-17. LocalView Communication Setup Wizard

Field	Description
What port would you like to use?	Select the PC port into which you plug the flash cable (e.g. COM1, COM2, etc.).
Would you like auto baud rate detection	If you know which baud rate to use, answer **No** and specify the baud rate. **Note**: This does not apply for ControlWave-series RTUs.
What baud rate would you like to use?	Select the baud rate for the PC port. It must match the RTU port baud rate. **Note:** Does not apply for ControlWave-series RTUs.
Advanced Parameters	Click here only if you want to set parameters for more complex communications configurations, using the Advanced Communication Parameters dialog box. See *page 5-7* for details on this dialog box.

Click **Next** to activate the IP RTU Setup page.

5.8.3 IP RTU Setup Wizard

Complete the fields in the IP RTU Setup Wizard as described, below.



IP RTU Setup: Step 2 of 2

What is the local address of the RTU ? 1

What is the type of the RTU ? ControlWave

☑ Use an Existing Configuration (.ndf) File

Select the name of the RTU you would like to configure: SLV1

What is the name of the file that contains the configuration parameters for this RTU ? C:\ProgramData\Bristol\OpenBSI\my

Figure 5-18. IP RTU Setup Wizard

Field	Description
What is the local address of the RTU?	Specify the local address of the RTU, which must be an integer from 1 to 127. *NOTE: This must be a unique local address in your network, to allow for proper routing of alarm and RBE messages,*
What is the type of the RTU?	Specify the type of controller (although there are other choices, you should choose either “3330”, “3335”, “ControlWave”, “CWave_LP”, “CWave_Micro”, “CWave_EFM” “CWave_GFC”, “CWave_XFC”, “CW_10”, “CW_30”, and “CW_35” since these controllers support IP communication).
Use an Existing Configuration (.ndf) File	Unless this box is checked, LocalView uses its own temporary NETDEF files; however, this is inconvenient when changing configuration parameters, since you want to store them in the real NETDEF files created for your network by NetView, not in the temporary files used by LocalView. Select this option to specify the actual NETDEF filename, and change the parameters in the actual NETDEF files used by NetView.
Select the name of the RTU you would like to configure	When you check **Use an Existing Configuration (.ndf) File** you must use this list box to specify the name of the RTU for which you want to change configuration parameters. This RTU name must exist in the NETDEF file.
What is the name of the file that contains the configuration parameters for this RTU?	When you have check **Use an Existing Configuration (.ndf) File** you must specify the path and name of the NETDEF file which holds configuration parameters for this RTU. (If necessary, click **Browse** to locate the file.)

Click **Finish** when complete. LocalView processes the information, and if there are no errors, it launches the Flash Configuration utility.

5.9 Setting RTU Parameters in the Flash Configuration Utility

Note: In order to use the Flash Configuration Utility to view or change parameters in a ControlWave series controller, you **must** have administrative privileges. For an all-new ControlWave, use the administrative username “SYSTEM” and the password “666666.”

You initially activate the Flash Configuration Utility using configure mode in LocalView. Once you use LocalView to set these parameters, and complete other system configuration, you may later modify the parameters by calling up the same utility from within NetView, (or LocalView) by right clicking on the icon for the RTU, and choosing **RTU** > **RTU Configuration Parameters**.

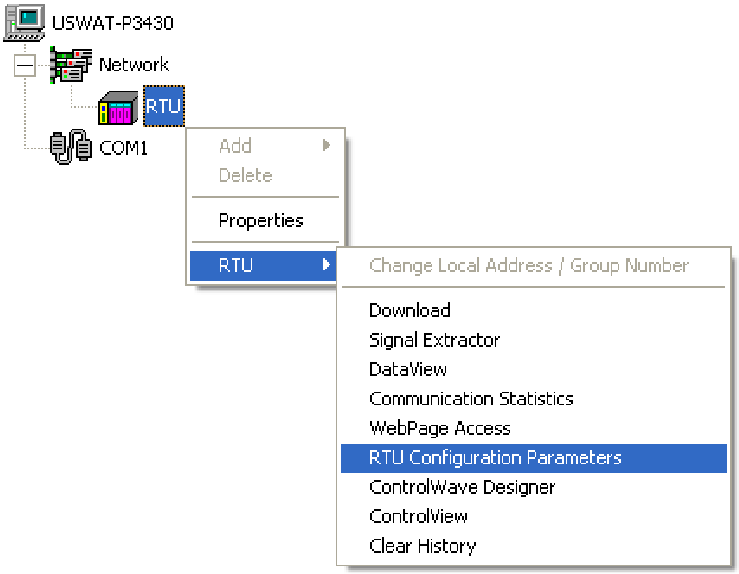
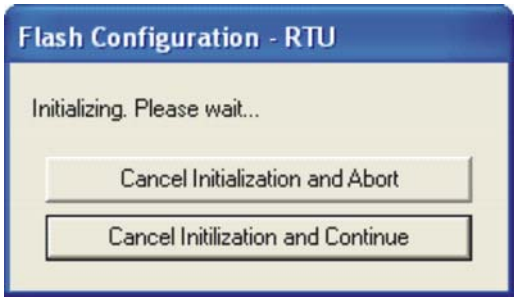


Figure 5-19. Starting the Flash Configuration Utility

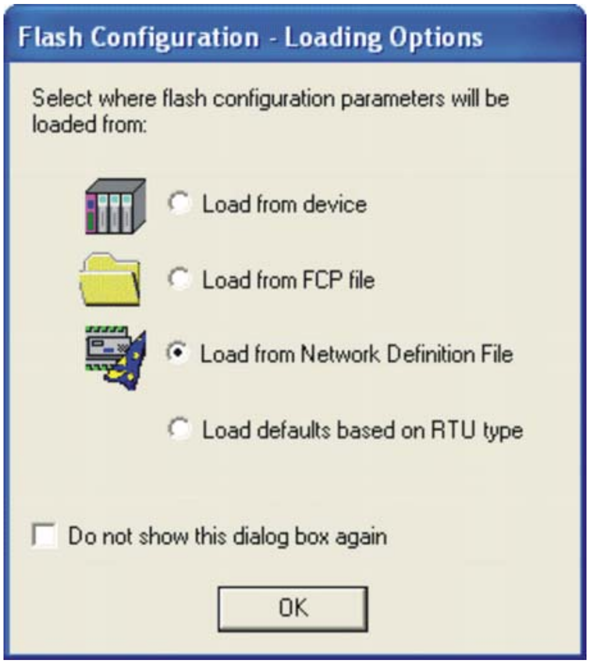
Certain options in the Flash Configuration utility don’t require you to establish communications with the RTU, for example, writing flash data to the NETDEF file. If while the utility begins to establish communications you decide you want to use the utility offline, you can click **Cancel Initialization and Continue** to do that (*Figure 5-20)*. If, for some reason, the utility cannot establish communications, you can shut down the utility if you click on **Cancel Initialization and Abort**.


Flash Configuration - RTU
Cancel Initialization and Abort
Cancel Initilization and Continue

Initializing. Please wait...

Figure 5-20. Cancel Initialization dialog box

Once the Flash Configuration utility establishes communication with the RTU, you can optionally specify the source for the initial parameters displayed in the utility (*Figure 5-21*).



Select where flash configuration parameters will be loaded from:

○ Load from device

○ Load from FCP file

● Load from Network Definition File

○ Load defaults based on RTU type

□ Do not show this dialog box again

Figure 5-21. Flash Configuration Loading Options dialog box

The choices for this are described below.

Field	Description
Load from device	This prompts you to log into the RTU. The utility then loads the current parameters from the RTU into the Flash Configuration utility pages.
Load from FCP file	This prompts you to specify the location and filename of a Flash Configuration Profile (FCP) file. FCP files are files you can use to store flash parameters on the OpenBSI workstation. This simplifies your configuration because once you store these parameters in an FCP file you can optionally re-use the FCP file to load the same flash parameters into a different RTU. That way, you

	don't have to re-enter everything for each RTU. Once you specify the FCP filename, the utility loads the current parameters from the FCP file into Flash Configuration Utility pages.
Load from Network Definition File	This choice causes the utility to load flash parameters from the current NETDEF file into the pages of the utility. **Note**: Only choose this option if you start the Flash Configuration utility from within NetView or TechView, or LocalView in Configure mode with a specific NDF – don't choose this if you are running LocalView in other modes (Local, IP Comm, Flash) because LocalView uses its own temporary NETDEF file in those modes which only exists during the LocalView session.
Load defaults based on RTU type	This choice causes the utility to copy some basic flash parameters into the pages of the Flash Configuration utility. These basic parameters are based on default settings for the type of RTU.
Do not show this dialog box again	If you check this box, the Loading Options dialog box does not appear again in subsequent Flash Configuration sessions, and the last loading option you choose becomes the default.

Click **OK** to finalize your choice and exit the dialog box. Parameters load into the Flash Configuration utility pages based on your choice, or you answer prompts to load them from the RTU or FCP file.

Note: If you want to prevent the Loading Options dialog box from appearing, right-click on the title bar of the Flash Configuration utility, and choose **Settings** to bring up the Settings dialog box. You can un-check the **Show Loading Options dialog box at startup**. You can also check **Close Transfer dialog box** to automatically close the transfer dialog box after a successful transfer. Click **OK** to exit the Settings dialog box.

The Flash Configuration utility includes different pages for different types of parameters. To access them, click on the tab for a particular page. The number of pages varies depending upon the type of controller; ControlWave controllers have more pages than Network 3000 controllers.

Click on any of these tabs to bring up other pages of the Flash Configuration utility.

This is only useful when using NetView. It allows you to close the session with the current controller, while still leaving the current values on the various pages of the utility. This allows you to configure a different controller, without having to re-enter values in all the fields.

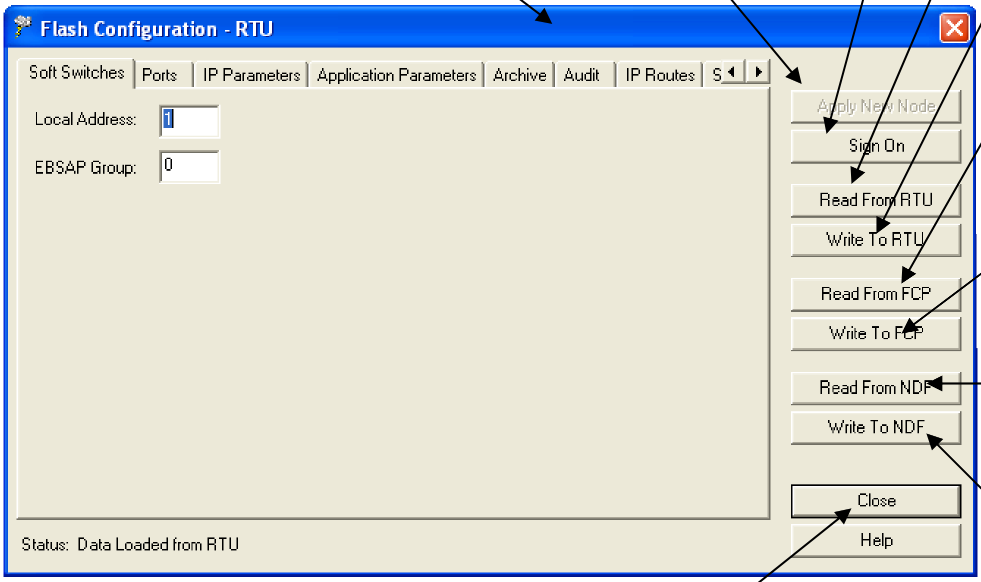
You must click here to sign-on with a username and password in order to access any flash parameters. (ControlWave ONLY)

This button reads the current configuration from the controller into the utility.

This button saves ALL changes to the controller.

This button reads the current configuration from the Flash Configuration (FCP) file.

This button saves ALL changes to the FCP file.



Local Address: 1

EBSAP Group: 0

Status: Data Loaded from RTU

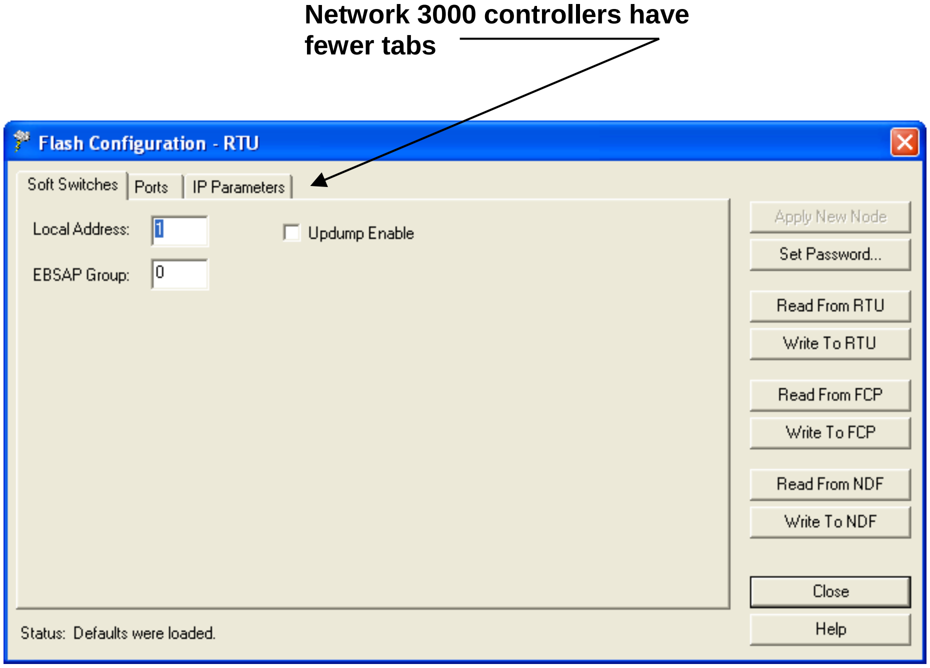
This button reads the current configuration from the NETDEF files into the utility.

This button saves ALL changes to the NETDEF files.

This button shuts down the Flash Configuration utility.

Figure 5-22. Flash Configuration Utility - ControlWave

Note: The only Network 3000 controllers you can use with the Flash Configuration Utility are DPC 3330 / DPC 3335 units with PLS03 /PLX03 /PES03 /PEX03 or newer Protected Mode firmware.



Network 3000 controllers have fewer tabs

Local Address: 1

EBSAP Group: 0

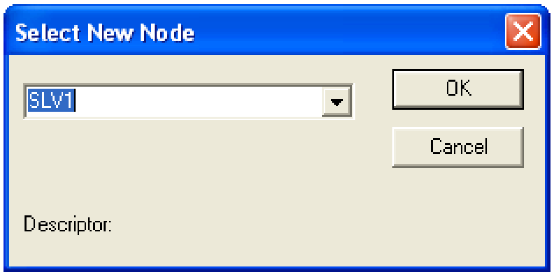
☐ Updump Enable

Status: Defaults were loaded.

Figure 5-23. Flash Configuration Utility – Network 3000

5.9.1 Flash Configuration Utility Buttons

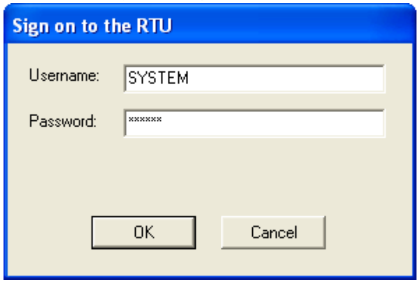
The Flash Configuration utility contains several buttons, primarily for read/write file operations. Some of these operations prompt you to sign on to the RTU before you can proceed. The Flash Configuration utility buttons include:

Button	Description
Apply New Node	Use this button only when you start the Flash Configuration utility from within NetView (since you cannot access other nodes in the Select New Node dialog box within LocalView).  SLV1 Descriptor: This option allows you to close the session with the current controller, and then select a *different* controller for configuration, in the Select New Node dialog box, without reinitializing the values in the pages of the utility. A definition for the new controller must exist within the NETDEF files.

One application of this is for you to open a session with a new node, and then load configuration information from the NETDEF file(s) for a *different* node (via **Read from NDF**). This is useful if you want multiple nodes to share similar configurations; you can load the common configuration into the utility, and then you only need to modify the portions unique to each individual controller.

Sign On

(ControlWave-series ONLY) – You must use this to sign-on to the controller with a username and password prior to reading or writing flash parameters.


Sign on to the RTU

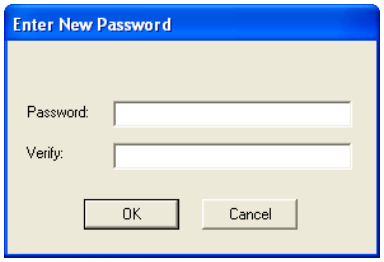
Username: SYSTEM

Password: ******

Note: If you do NOT sign on, the first time you attempt a read/write operation with the controller, LocalView prevents you from doing so and prompts you to sign on.

Set Password

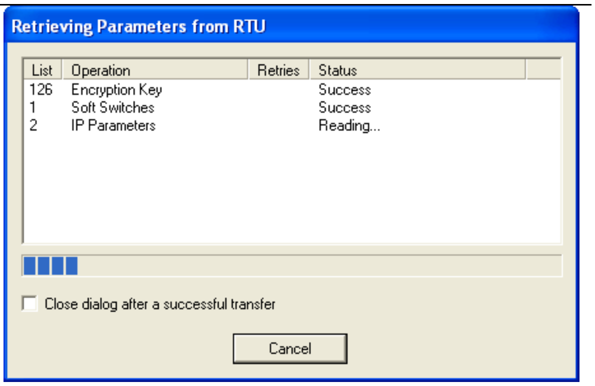
(Network 3000-series ONLY) – Click this to open the Enter New Password dialog box. This optionally allows you to set a password which users must subsequently enter any time the Flash Configuration Utility accesses this particular controller.


Enter New Password

This option prevents unauthorized changes to flash configuration parameters. Enter the password in the **Password** field, then enter it again in the **Verify** field and click **OK**. **Note:** LocalView does not perform password checking until it actually attempts to alter the RTU configuration parameters; at that point, LocalView requests the old password, and if it is correct, the *new password* takes effect.

Read From RTU

Click here to read the current configuration characteristics directly from the controller, and copy them into the pages of the Flash Configuration Utility. You can subsequently store these in the NETDEF using the **Write To NDF** button, to avoid the need to re-enter the same configuration details inside NetView.



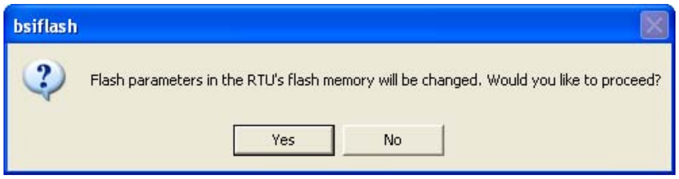
Retrieving Parameters from RTU

List	Operation	Retries	Status
126	Encryption Key		Success
1	Soft Switches		Success
2	IP Parameters		Reading...

Note: LocalView prompts you to sign on when you click this button, if you did not sign on previously.

Write To RTU

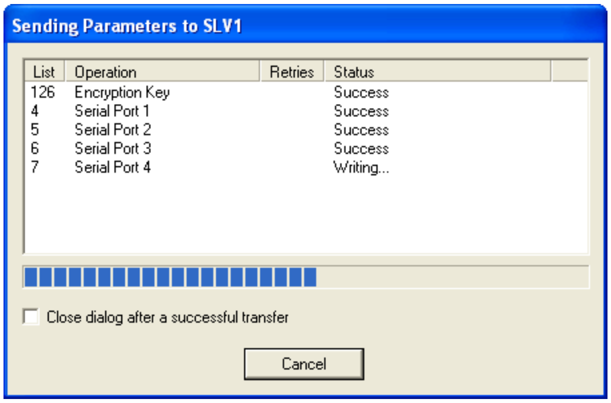
Click here to save all entries in all pages of the Flash Configuration Utility to the controller. The utility prompts you to confirm you want to write to the flash memory.



bsiflash

Flash parameters in the RTU's flash memory will be changed. Would you like to proceed?

The Flash Configuration Utility displays the progress of the save operation.



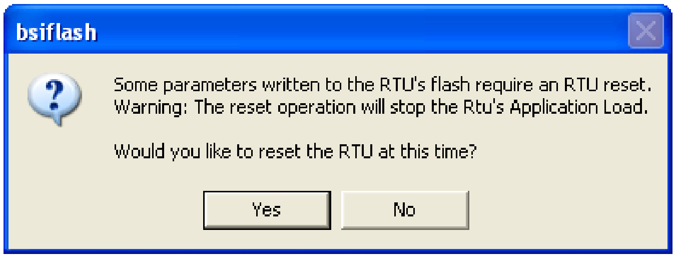
Sending Parameters to SLV1

List	Operation	Retries	Status
126	Encryption Key		Success
4	Serial Port 1		Success
5	Serial Port 2		Success
6	Serial Port 3		Success
7	Serial Port 4		Writing...

After the write operation to the ControlWave completes, the Flash Configuration Utility assesses whether or not the changes require you to reset the ControlWave. If the utility determines that you must reset it prompts you to do so.

⚠ **Warning**

During the reset process, your controller performs no measurement or control of your process. Ensure you have backup control mechanisms in place during the reset process. Failure to take such precautions could result in injury to persons or damage to property

	 bsiflash Some parameters written to the RTU's flash require an RTU reset. Warning: The reset operation will stop the Rtu's Application Load. Would you like to reset the RTU at this time? Click **Yes** for OpenBSI to stop any currently running project and reboot the ControlWave unit immediately; changes then take effect. Click **No** if you want to manually reboot the unit later; changes do not take effect until the reboot. See *Section 5.9.2* for information on forcing a reboot.
Read From FCP	Click here to read the current configuration of this controller, as specified in a Flash Configuration Profile file (*.FCP), and copy it into the pages of the Flash Configuration Utility. You can then subsequently copy the configuration into the controller using the **Write To RTU** button.

⚠ **Caution**

The Flash Configuration utility does not perform any validation checks on an FCP file when it opens it. Therefore, we recommend you do NOT attempt to edit the FCP file manually with a text editor, because you could corrupt the profile file. Recommended best practice is to edit the FCP only through the Flash Configuration utility.

Write To FCP	Click here to copy all entries made in the Flash Configuration Utility for the current controller into the Flash Configuration Profile file (*.FCP).
Read From NDF	If you click here, the utility reads the current configuration of this controller as specified in NetView's NETDEF files, and copies it into the pages of the Flash Configuration Utility. This can be particularly useful in a situation where the CPU board of a controller fails, and you need to configure a replacement board. This option allows you to call up the configuration from the NETDEF, and subsequently copy it into the controller using the **Write To Rtu** button. **Note:** Only choose this option if you start the Flash Configuration utility from within NetView or TechView, or if you specify an NDF file in LocalView Configure mode (see **Use an Existing Configuration (.ndf) File** in *Figure 5-18*). Don't choose this if you are running LocalView in other modes (Flash, IP Comm, Local) because LocalView uses its own temporary NETDEF file which only exists during the LocalView session and disappears on program exit.

Write To NDF	If you click here, the utility copies all entries you made in the Flash Configuration Utility for the current controller into the current NETDEF file. This avoids the need to re-enter the same configuration information in NetView. **Note:** Only choose this option if you start the Flash Configuration utility from within NetView or TechView, or if you specify an NDF file in LocalView Configure mode (see **Use an Existing Configuration (.ndf) File** in *Figure 5-18*). Don't choose this if you are running LocalView in other modes (Flash, IP Comm, Local) because LocalView uses its own temporary NETDEF file which only exists during the LocalView session and disappears on program exit.
Close	Click here to shut down the Flash Configuration Utility.

5.9.2 Forcing a Reboot of the ControlWave

You can reset the ControlWave, at any time, using the Flash Configuration Utility. To do this, *right*-click on the title bar, and choose **Reset Rtu** from the pop-up menu:

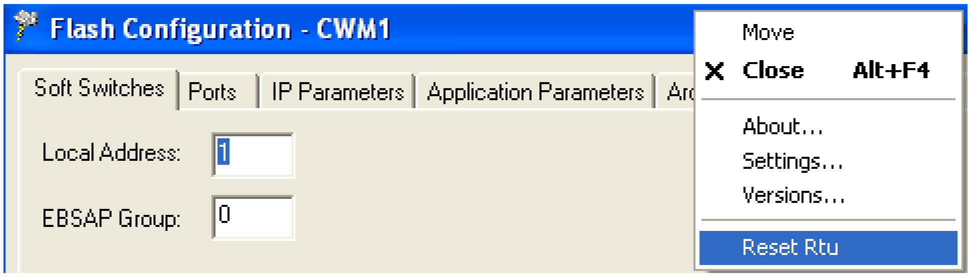


Figure 5-24. Forcing a Reboot of the ControlWave

5.9.3 Flash Configuration Utility Tabs

The Flash Configuration utility contains multiple pages; you access a page by clicking on its tab. Network 3000 controllers have fewer tabs. The various tabs include:

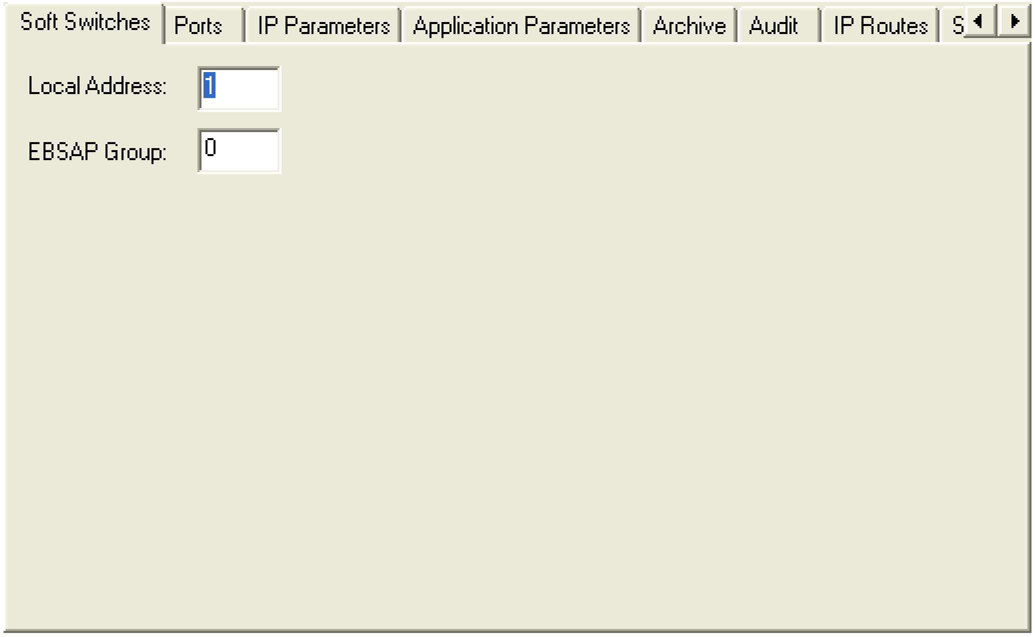
- Soft Switches - the most important of these is the BSAP local address of the controller. (See *Section 5.9.4*.)
- Ports - this includes all communication ports on the controller - serial BSAP ports, serial IP ports (PPP), and Ethernet IP ports. Some controllers also support other port types. (See *Section 5.9.5*.)
- IP Parameters - if this controller performs IP communications, you must configure certain parameters such as the IP address of the

Network Host PC (NHP), UDP socket numbers, and the address of the default gateway. (See *Section 5.9.6.*)

- Application Parameters - (ControlWave-series ONLY) - Most of these are "tuning" parameters which govern how the ControlWave executes its application (project). (See *Section 5.9.7.*)
- Archive - (ControlWave-series ONLY) - Archive data is one portion of the historical capabilities of the ControlWave controller. It allows you to save "snapshots" of many variables at the same instant, to provide a detailed historical record of process variables at a particular moment in time. The controller stores the archive data in structures called **archive files**. You configure the archive feature, in part, using the ARCHIVE function block in your ControlWave project. OpenBSI Utilities such as DataView, or the Harvester can collect and display the archive data. (See *Section 5.9.8.*)
- Audit - (ControlWave-series ONLY) - Audit logging is one portion of the historical capabilities of the ControlWave controller. It allows you to save records of when certain variables change value, as well as records of all alarms in the system. Use the Audit page to specify various parameters used to set up the Audit system. You also need to configure the AUDIT function block in your ControlWave project. (See *Section 5.9.9.*)
- IP Routes - (ControlWave-series ONLY) - Dynamic IP routes allows the ControlWave to take messages which cannot successfully reach a particular destination address, to re-route them through a different path in the IP network. (See *Section 5.9.10.*)
- Security - (ControlWave-series ONLY) - This page allows you to configure user accounts and privileges. (See *Section 5.9.11* .)

5.9.4 Soft Switches

To reach the "Soft Switches" page, click on the "Soft Switches" tab in the Flash Configuration utility.



Local Address: 1

EBSAP Group: 0

Figure 5-25. Soft Switches Page

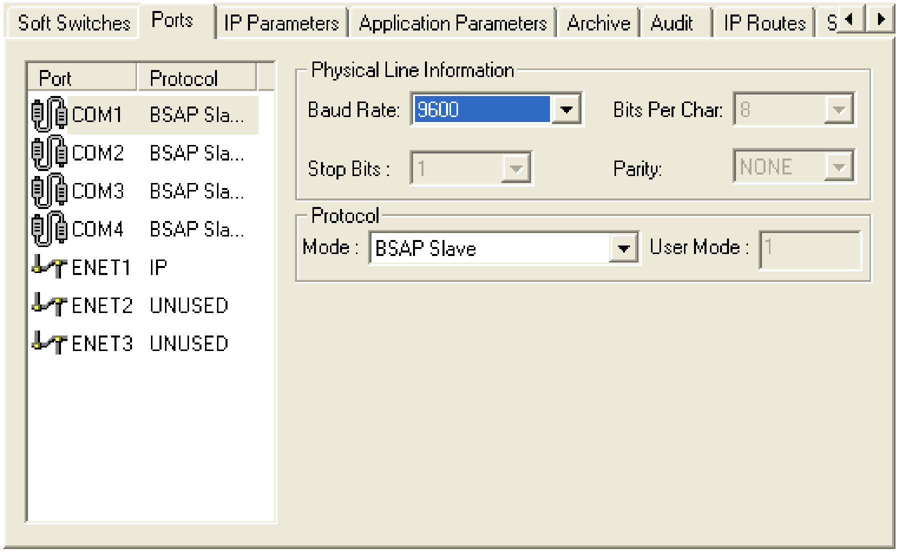
Complete the fields as described below:

Field	Description
Local Address	Specify the BSAP local address here, which must be an integer from 1 to 127. The default is 1. The BSAP local address is important even in non-BSAP networks to ensure proper routing of alarm and RBE messages.
EBSAP Group	Specify the EBSAP group number here; if this node does **not** use expanded node addressing (EBSAP), enter “0” for the group number.
Updump Enable	(Network 3000 ONLY - does NOT apply to ControlWave-series) – Emerson Support personnel occasionally use this option to help debug a problem. When you select this option, the RTU resets, and waits for a few seconds for you to press the reset button again. Rather than enter self-test mode following a crash, updump enable activates a menu on the attached PC or laptop which allows system RAM to be saved in a disk file. We call this disk file a “memory dump”.

5.9.5 Ports

To reach the “Ports” page, click on the “Ports” tab in the Flash Configuration utility. The numbers and types of ports shown for configuration vary depending upon the type of controller.

To configure a particular port, click on its icon in the left part of the page, and the right part of the page will display the parameters for that port (which can further change depending upon the mode and how you configure the port).



Port	Protocol
COM1	BSAP Sla...
COM2	BSAP Sla...
COM3	BSAP Sla...
COM4	BSAP Sla...
ENET1	IP
ENET2	UNUSED
ENET3	UNUSED

Physical Line Information

Baud Rate: 9600

Bits Per Char: 8

Stop Bits : 1

Parity: NONE

Protocol

Mode : BSAP Slave

User Mode : 1

Figure 5-26. Ports Page

⚠ **Caution**

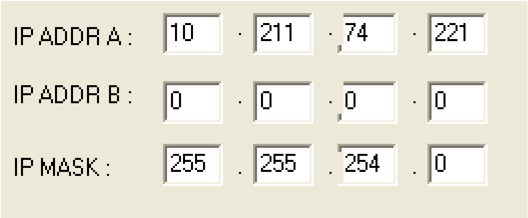
When configuring ports in the Flash Configuration Utility, *exercise care regarding the port through which you are currently communicating* using NetView, TechView, or LocalView. For example, if you *change* the baud rate for the serial port on which you are currently communicating and click “Write to RTU” all communications on that port immediately cease because you now made the baud rates incompatible with the current baud rate setting in NetView, TechView, or LocalView.

If you do this accidentally, you can re-start the NetView/TechView/LocalView session using a new baud rate or you can re-establish communications by setting the “Use/Ignore Soft Switches” switch (also referred to as the “default switch”) on your CPU module to OFF, and then re-connect to one of the serial ports using the factory default baud rate setting. See your ControlWave hardware manual for details on switches and default baud rates for particular ports.

Sub-sections follow which describe the configuration for each type of port.

Ethernet Port Parameters

The Ethernet port parameters specify the IP address of this RTU's Ethernet port(s), as well as the range of IP addresses to which this RTU can send messages. To access the Ethernet Port Parameters, click the “ENET” icon in the **"Ports"** list box. Some controllers support up to three Ethernet ports (ENET1 through ENET3).



IP ADDR A : 10 . 211 . 74 . 221

IP ADDR B : 0 . 0 . 0 . 0

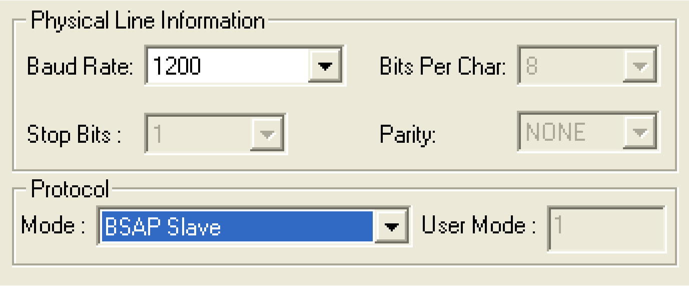
IP MASK : 255 . 255 . 254 . 0

Figure 5-27. Ethernet Port Parameters

Field	Description
IP ADDR A	This lets you specify the IP address of the Ethernet Port on the RTU, or, if this RTU is the “A” unit of a redundant pair of RTU's, the IP address for its Ethernet Port as part of the redundant pair. You must enter a unique IP address in dotted decimal format.
"P ADDR B"	This lets you specify the IP address of the Ethernet Port on the “B” unit of a redundant pair of RTU's. If this RTU is NOT part of a redundant pair, specify an address of 0.0.0.0. If the RTU is part of redundant pair, you must enter a unique IP address in dotted decimal format.
IP MASK	This lets you specify the range of valid IP addresses which this RTU can send messages to through this port. You must enter the mask in dotted decimal format. The default is 0.0.0.0 (all devices are reachable). Each part of the **"IP MASK"** can *only* be one of the following numbers: 255, 254, 252, 248, 240, 224, 192, 128, or 0. These values correspond to a decimal representation of the number of bits in the IP addresses of all nodes, reachable through this port, which must match exactly. If you enter anything other than "255" in a particular part of the **"IP MASK"** field, you must set all fields to the right to 0. Example: In the figure, above, the only IP nodes directly reachable through this port must have addresses of 10.*x.y.z* where *x, y,* and *z* are any integer from 0 to 255. For a more detailed explanation of IP addresses and IP masks see *Chapter 1.*

BSAP Slave / EBSAP Slave Port Parameters

Use these parameters to specify the baud rate used for BSAP cold downloads through the selected serial port. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit. For Network 3000 controllers, the serial ports are BIP 1, BIP 2, Port A through D, Port G through J.



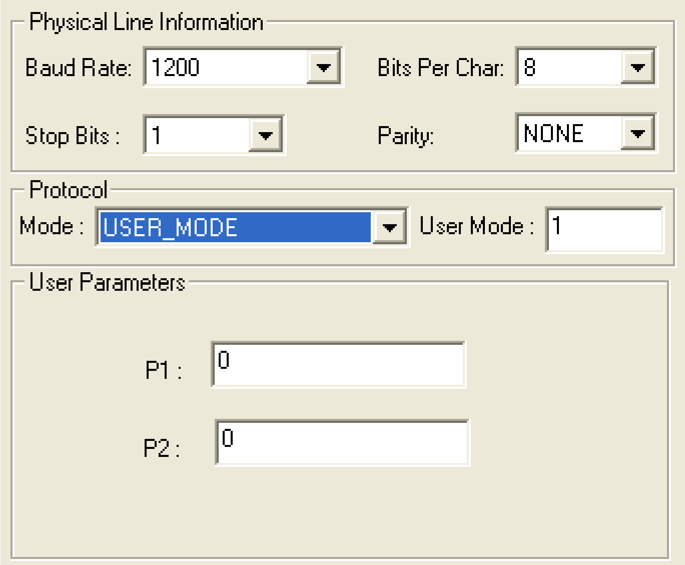
Baud Rate: 1200
Bits Per Char: 8
Stop Bits : 1
Parity: NONE
Mode : BSAP Slave
User Mode : 1

Figure 5-28. BSAP Slave / EBSAP Slave Port Parameters

Field	Description
Mode	Choose either **BSAP Slave** if this controller belongs to a BSAP network (or sub-network) or **EBSAP Slave** if this controller belongs to an EBSAP network.
Baud Rate	For Network 3000 controllers, the baud rate specified here is for cold download usage, which does not become active until you reset the unit. During all other on-line usage, the ACCOL load settings determine the baud rate, not the rate you specify here. For ControlWave-series controllers, the baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.

User Mode Port Parameters

Use these parameters to configure a customized serial data link protocol. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit. For Network 3000 controllers, the serial ports are BIP 1, BIP 2, Port A through D, Port G through J.



Physical Line Information

Baud Rate: 1200

Bits Per Char: 8

Stop Bits : 1

Parity: NONE

Protocol

Mode : USER_MODE

User Mode : 1

User Parameters

P1 : 0

P2 : 0

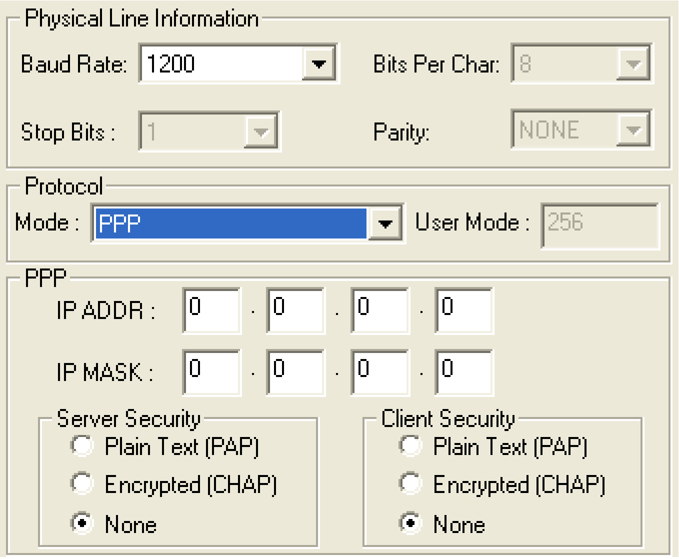
Figure 5-29. User Mode Port Parameters

Field	Description
Mode	Choose **USER_MODE**.
Baud Rate	Specify the baud rate for your customized protocol. The default value for baud rate is 9600. For Network 3000 controllers, the baud rate specified here is for cold download usage, which does not become active until you reset the unit. During all other on-line usage, the ACCOL load settings determine the baud rate, not the rate you specify here. For ControlWave-series controllers, the baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.
Bits Per Char	Specify the number of bits in a character for this custom protocol. The default is 8.
Stop Bits	Specify the number of stop bits per character for this custom protocol. The default is **1.**
Parity	Specify **ODD**, **EVEN**, or **NONE** for the parity. The default is NONE.
User Mode	Specify a protocol number which the firmware uses to reference internal and custom tables at the RTU, in order to select the proper driver software for this custom data link.

P1	This is is a protocol-specific value which a non-standard protocol uses at RTU initialization. Its value is 4 bytes unsigned, and defaults to 0. (This field is only for non-standard, customized data links.)
P2	This is a second protocol-specific value which a non-standard protocol uses at RTU initialization. Its value is 4 bytes unsigned, and defaults to 0. (This field is only for non-standard, customized data links.)

PPP Port Parameters

PPP (Point-to-Point Protocol) ports allow serial IP communication. Use these parameters to specify the baud rate used for BSAP cold downloads through the selected serial port. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit. For Network 3000 controllers, the serial ports are BIP 1, BIP 2, Port A through D, Port G through J.



Physical Line Information

Baud Rate: 1200

Bits Per Char: 8

Stop Bits : 1

Parity: NONE

Protocol

Mode : PPP

User Mode : 256

PPP

IP ADDR : 0 . 0 . 0 . 0

IP MASK : 0 . 0 . 0 . 0

Server Security

○ Plain Text (PAP)

○ Encrypted (CHAP)

● None

Client Security

○ Plain Text (PAP)

○ Encrypted (CHAP)

● None

Figure 5-30. PPP Port Parameters

Field	Description
Mode	Choose **PPP**.
Baud Rate	Specify the baud rate for serial IP Point-to-Point Protocol (PPP) communication. The default is 9600. For Network 3000 controllers, the baud rate specified here is for cold download usage, which does not become active until you reset the unit. During all other on-line usage, the ACCOL load settings determine the baud rate, not the rate you specify here. For ControlWave-series controllers, the baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made

	here are immediate, and do not require you to reset the unit.
IP ADDR	Specify the IP address of this serial IP port. You must enter a unique IP address in dotted decimal format.
IP MASK	This lets you specify the range of valid IP addresses which this RTU can send messages to through this port. You must enter the mask in dotted decimal format. The default is 0.0.0.0 (all devices are reachable). Each part of the **IP MASK** can *only* be one of the following numbers: 255, 254, 252, 248, 240, 224, 192, 128, or 0. These values correspond to a decimal representation of the number of bits in the IP addresses of all nodes, reachable through this port, which must match exactly. If you enter anything other than "255" in a particular part of the **IP MASK** field, you must set all fields to the right to 0. Example: In the figure, above, the only IP nodes directly reachable through this port must have addresses of 10.*x.y.z* where *x, y,* and *z* are any integer from 0 to 255. For a more detailed explanation of IP addresses and IP masks see *Chapter 1.*
Server Security	This parameter only applies to ControlWave-series controllers which serve as Password Authentication Protocol (PAP) / Challenge Handshaking Authentication Protocol (CHAP) servers. Choose **Plain Text (PAP)** to designate this controller as a PAP Server, **Encrypted (CHAP)** to designate this controller as a CHAP Server, or **None** if you do not intend to implement CHAP or PAP. (See *Chapter 1* for explanations of PAP/CHAP Protocols).
Client Security	This parameter only applies to ControlWave-series controllers which serve as PAP/CHAP clients. Choose **Plain Text (PAP)** to designate this controller as a PAP Client, **Encrypted (CHAP)** to designate this controller as a CHAP Client, or **None** if you do not intend to implement CHAP or PAP. (See *Chapter 1* for an explanation of PAP/CHAP Protocols).

Notes About Using PAP/CHAP on a PPP Link

You can implement either the PAP or CHAP protocol as a security measure on the PPP link. CHAP is the more secure of the two protocols. The basic configuration steps at the ControlWave are the same for both.

1. Define user accounts on the “Security” page of the Flash Configuration Utility (described later in this chapter).
2. On the “Ports” page for the PPP link, use the **Client Security** or **Server Security** choice (described above) to specify whether this ControlWave port is a client or a server, and choose the security protocol for it - PAP or CHAP. Clients initiate a request for access, and servers validate the request. If you configure more than one PPP

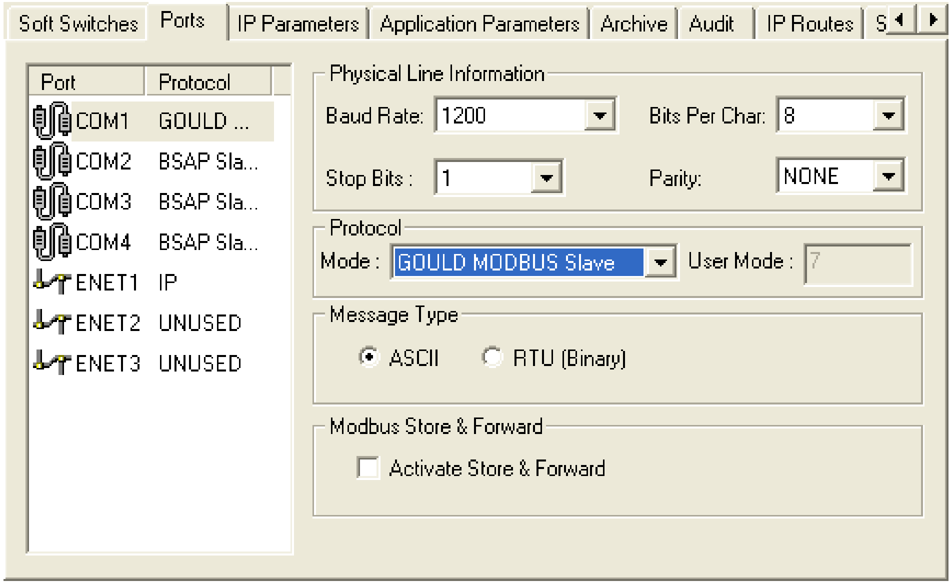
port, you can configure a client on one port, and a server on another port.

3. On the “IP Parameters” page of the Flash Configuration Utility (described later), choose whichever user account you want to use for PAP/CHAP transmissions in this controller.

Modbus Port Parameters (ControlWave only)

ControlWave supports three different Modbus port parameters (GOULD MODBUS Slave, ENRON Slave, MODBUS Master. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit.

Note: Although DPC 3330/3335 controllers support these Modbus protocols, in these units, you do **not** define these parameters in the Flash Configuration Utility so this section does not apply.



Port	Protocol
COM1	GOULD ...
COM2	BSAP Sla...
COM3	BSAP Sla...
COM4	BSAP Sla...
ENET1	IP
ENET2	UNUSED
ENET3	UNUSED

Physical Line Information

Baud Rate: 1200 Bits Per Char: 8

Stop Bits : 1 Parity: NONE

Protocol

Mode : GOULD MODBUS Slave User Mode : 7

Message Type

● ASCII ○ RTU (Binary)

Modbus Store & Forward

□ Activate Store & Forward

Figure 5-31. MODBUS Port Parameters

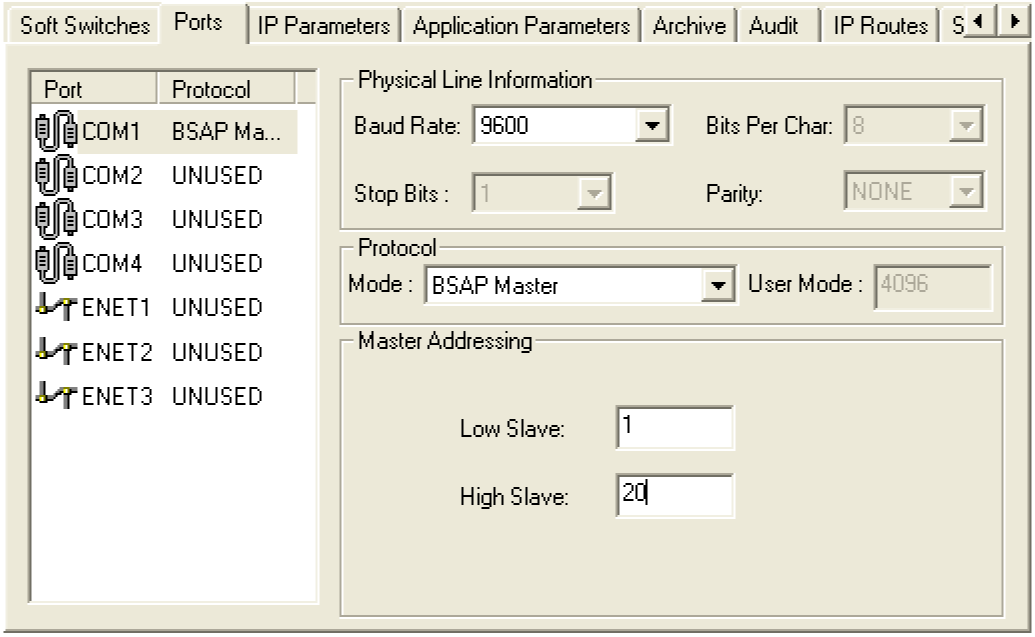
Field	Description
Mode	Choose either **GOULD MODBUS Slave**, **ENRON Slave,** or **MODBUS Master**.
Baud Rate	Specify the baud rate for Modbus communication. The default is 9600. The baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.
Bits Per Char	Specify the number of bits in a character for this protocol. If the **Message Type** is “ASCII” the number

	of bits is 7 or 8. The default is 8. If the **Message Type** is “RTU (binary)” this parameter must be 8.
Stop Bits	Specify the number of stop bits per character. The default is 1.
Parity	Specify either ODD, EVEN, or NONE for the parity. The default is NONE.
Message Type	'Specify the type of data which the protocol transmits, either “RTU (binary)” or “ASCII”.
Modbus Store & Forward – Activate Store & Forward	Click this to activate the Modbus Store and Forward feature (Modbus slaves only.) See the ControlWave Designer online help for an explanation of Modbus store and forward.

BSAP Master Port Parameters (ControlWave only)

BSAP master ports allow this controller to communicate with any BSAP slave RTUs. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit.

Note: Although DPC 3330/3335 controllers support BSAP master ports, in those units, you do **not** define these parameters in the Flash Configuration Utility so this section does not apply.



Port	Protocol
COM1	BSAP Ma...
COM2	UNUSED
COM3	UNUSED
COM4	UNUSED
ENET1	UNUSED
ENET2	UNUSED
ENET3	UNUSED

Physical Line Information

Baud Rate: 9600

Bits Per Char: 8

Stop Bits : 1

Parity: NONE

Protocol

Mode : BSAP Master

User Mode : 4096

Master Addressing

Low Slave: 1

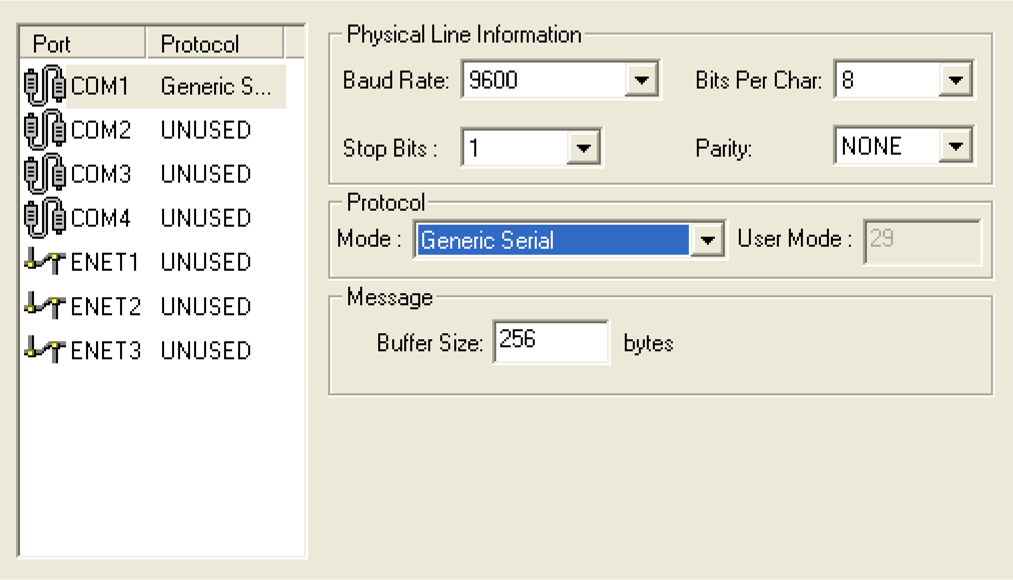
High Slave: 20

Figure 5-32. BSAP Master Port Parameters

Field	Description
Mode	Choose **BSAP Master**.
Baud Rate	Specify the baud rate for this BSAP master port. The default is 9600. The baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.
Low Slave	Specify the lowest BSAP local address among all slave nodes on this BSAP line. Together with **High Slave** this address defines the range of slave node addresses for this Master port.
High Slave	Specify the highest BSAP local address among all slave nodes on this BSAP line. Together with **Low Slave** this address defines the range of slave node addresses for this Master port.

Generic Serial (ControlWave only)

The generic serial interface provides support for custom serial protocols you may choose to implement. For ControlWave controllers, the serial ports range from COM1 to COM11 depending upon the type of unit.



Port	Protocol
COM1	Generic S...
COM2	UNUSED
COM3	UNUSED
COM4	UNUSED
ENET1	UNUSED
ENET2	UNUSED
ENET3	UNUSED

Physical Line Information

Baud Rate: 9600

Bits Per Char: 8

Stop Bits : 1

Parity: NONE

Protocol

Mode : Generic Serial

User Mode : 29

Message

Buffer Size: 256 bytes

Figure 5-33. Generic Serial Port Parameters

Field	Description
Mode	Choose **Generic Serial**.
Baud Rate	Specify the baud rate for the generic serial port. The baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.
Bits Per Char	Specify the number of bits in a character for this protocol. This defaults to 8.
Stop Bits	Specify the number of stop bits per character.
Parity	Specify either ODD, EVEN, or NONE for the parity. The default is NONE.
Buffer Size	Specify the message buffer size. This can range from 256 bytes (default) to 32,767 bytes. Internally the utility stores this as Parameter 1 for the Generic Serial Port. (OpenBSI 5.6 Service Pack 1 and newer).

Note: For more information on configuring the generic serial interface, see the ControlWave Designer online help.

Allen-Bradley DF1 Master / Slave Protocols (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

Note: Although DPC 3330/3335 controllers support certain Allen-Bradley protocols, in those units, you do **not** define these parameters in the Flash Configuration utility.

VSAT Slave (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

Note: Although DPC 3330/3335 controllers support certain VSAT slave protocol, in those units, you do **not** define these parameters in the Flash Configuration utility.

DNP3 Master / Slave Protocols (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

AI Net Slave Protocol (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

Hex Repeater Protocol (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

HART Protocol (ControlWave only)

See the ControlWave Designer online help for details on this protocol.

Note: Although DPC 3330/3335 controllers support HART protocol, in those units, you do **not** define these parameters in the Flash Configuration utility.

Serial EXP Rack (ControlWave only)

Use this mode to communicate with a ControlWave I/O expansion rack using an RS485 link. Requires OpenBSI 5.8 or newer.

The fields vary depending upon whether you are connected to the I/O rack itself (slave) or the host ControlWave controller (master).

See the ControlWave Designer online help for more information on this mode.

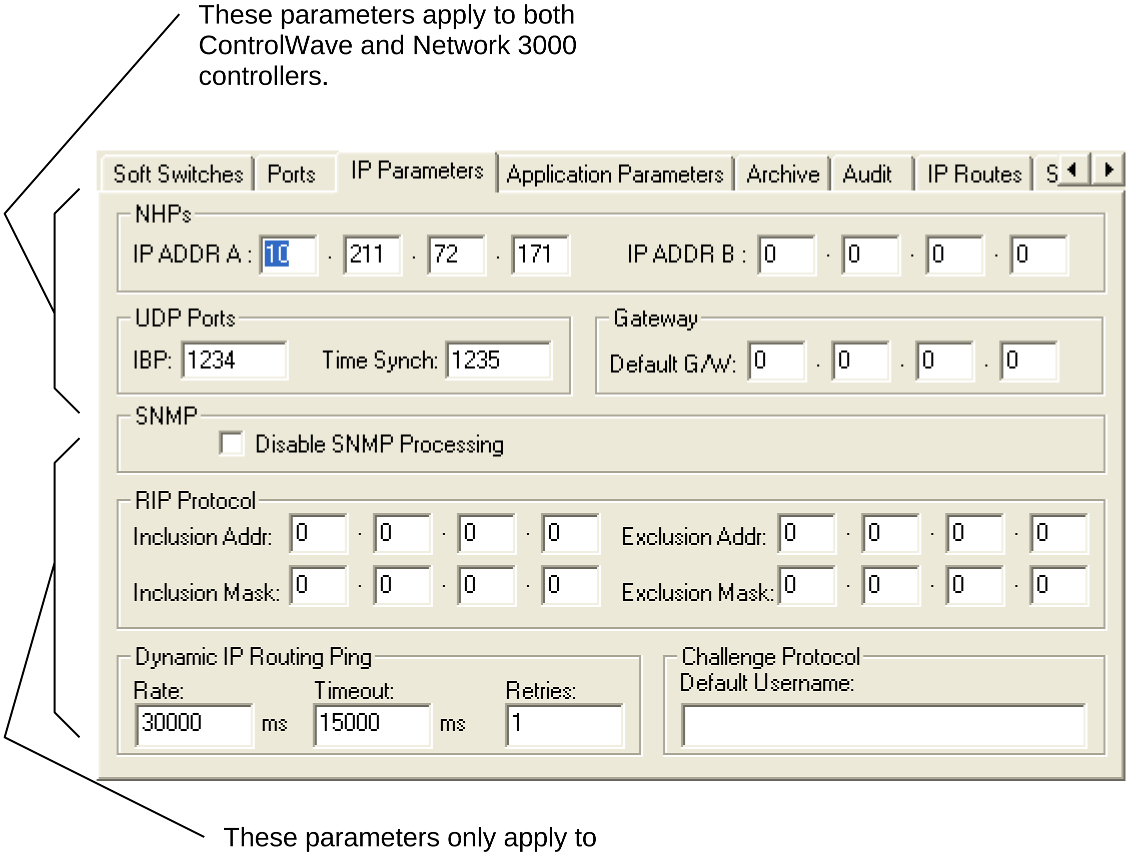
Field	Description
Mode	Set to **Serial EXP Rack**.
Baud Rate	The baud rate you enter here applies to any usage of this port. In addition, if the port already exists, changes made here are immediate, and do not require you to reset the unit.
Master Addressing:	Configure these fields if this is a host ControlWave controller to the I/O expansion rack.
IP Address	This is the IP address (in dotted decimal format) of a port used by the master to communicate with one or more I/O expansion rack(s). **The first three bytes of the IP address must match the first three bytes of the associated slave port on each I/O expansion rack on this line.** For example, if this IP address is 10.56.82.251, the first three bytes of the IP address for each I/O expansion rack on this line must be 10.56.82 and the last byte must be unique for each

	I/O expansion rack. If this is a non-redundant ControlWave host, set the fourth byte of this IP address to **251**. If this ControlWave host is part of a redundant pair, specify the fourth byte of the IP address to be **251** for the "A" unit or **252** for the "B" unit.
Maximum Slave Address	Set this to the maximum number of I/O expansion racks connected to the host through this port.
Slave Addressing:	Configure these fields if this unit is an I/O expansion rack communicating with a host ControlWave controller using RS485.
IP Address	Specify the IP address of a slave port on the I/O expansion rack which communicates with a host ControlWave controller. The first three byes of the IP address must match the first three bytes of the host ControlWave's master IP port. The fourth byte must be unique for each slave on the line and can range from 1 to 250. If this slave rack is part of a redundant pair of I/O expansion racks, specify the fourth byte of the IP address for the "B" unit to be one more than the "A" unit. For example, if the "A" unit is 10.211.43.6, then the "B" unit must be 10.211.43.7. Never assign the "A" unit in a redundant pair a number higher than 249, since the "B" unit number cannot exceed 250.
Unit is Redundant	Check this box if this unit is part of a redundant pair or I/O expansion racks.

5.9.6 IP Parameters

To reach the “IP Parameters” page, click on the “IP Parameters” tab in the Flash Configuration utility. The numbers and types of ports shown for configuration vary depending upon the type of controller.

In this page you specify the IP addresses (in dotted decimal format) of this RTU's Network Host PC (NHP), as well as UDP port/socket information. For ControlWave-series units, you can specify additional parameters for IP routing, and communications security.



These parameters apply to both ControlWave and Network 3000 controllers.

NHPs
IP ADDR A : 10 . 211 . 72 . 171
IP ADDR B : 0 . 0 . 0 . 0

UDP Ports
IBP: 1234
Time Synch: 1235

Gateway
Default G/W: 0 . 0 . 0 . 0

SNMP
□ Disable SNMP Processing

RIP Protocol
Inclusion Addr: 0 . 0 . 0 . 0
Exclusion Addr: 0 . 0 . 0 . 0
Inclusion Mask: 0 . 0 . 0 . 0
Exclusion Mask: 0 . 0 . 0 . 0

Dynamic IP Routing Ping
Rate: 30000 ms
Timeout: 15000 ms
Retries: 1

Challenge Protocol
Default Username:

These parameters only apply to ControlWave series controllers.

Figure 5-34. IP Parameters page

Field	Description
<u>NHP</u> **IP ADDR A**	Specify the primary IP address for this RTU's Network Host PC (NHP). You must enter the address in dotted decimal format.
IP ADDR B	Specify a secondary IP address for the same NHP referenced by **IP ADDR A** or the IP address of a redundant backup NHP. If neither of these situations apply, leave **IP ADDR B** blank. If you enter an address you must use dotted decimal format.

UDP	
IBP	Specify the UDP port number (socket number) the IP driver uses. The driver uses this value to split message traffic along different “streams”. *All PC's or RTU's which you want to communicate with each other must share the same **IBP** number.* In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, the system uses a default value from the NETDEF files. **Note:** The term “UDP Port” has no actual relationship with the physical communication ports.
Time Synch	Specify the UDP port number (socket number) the IP driver uses for time synchronization of the RTU's. All PC's or RTU's must share this same value, or else they cannot receive time synchronization messages. In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, the system uses a default value from the NETDEF files. (**Note:** The term “UDP Port” has no actual relationship with the physical communication ports.)
Gateway	
Default G/W	Specify an IP address of a default gateway. The default gateway is an address to which any messages with destinations that are not directly reachable are sent (i.e. not in the valid address range specified by the IP mask for this node). You must enter this address in dotted decimal format. For more information on using gateways in your network, see *Chapter 1.*
SNMP	
Disable SNMP Processing	SNMP allows monitoring and remote adjustment of certain IP parameters. For security purposes, you may want to check this box to disable this capability.

Note: SNMP equires CWP/LPS/CWR 03.00 or newer firmware or CWM 04.00 or newer)

RIP Protocol
(ControlWave only)

This section allows configuration of parameters for the **Routing Internet Protocol (RIP)**. Beginning with ControlWave firmware CWP02.0, the ControlWave supports **dynamic IP routing** using the **RIP** protocol. A router which supports RIP essentially maintains a set of tables of IP address ranges which it can reach, either directly, or through another router. You can specify “include address ranges” and “exclude address ranges" for use in these tables, to avoid sending out routes to known areas in the same network.

Note: The source for this information on RIP is Douglas Comer and David Stevens, *Internetworking with TCP/IP - Volumes 1 & 2* (Englewood Cliffs, NJ: Prentice Hall, 1991); Frank Derfler and Steve Rigney, *TCP/IP A Survival Guide for Users* (New York: MIS Press, 1998)

Each router sends a broadcast message (at periodic intervals) which includes these tables. Other routers receive the broadcast message, and determine from them, whether there is a better route to a particular IP destination, than the route stored in their *own* tables. If there is, they update their own tables. In this way, devices throughout the network(s) can determine the best possible route to send a message from one node to another. RIP includes safeguards to prevent looping situations where two routers each think the *other* router has the best route to a particular destination.

Field	Description
Inclusion Addr	Specify an IP address, which the system uses with the **Inclusion Mask** (below) to define a range of IP addresses which this controller "advertises" that it can reach. This helps define a route that RIP broadcasts throughout the network. You can restrict this range further if you define an **Exclusion Addr** and **Exclusion Mask**.
Inclusion Mask	If you enter a non-zero value in any of the **Inclusion Mask** fields, that indicates that the corresponding **Inclusion Addr** field specifies a portion of the IP address which must match exactly with every IP address on routes which this controller "advertises" in its RIP broadcasts. If you enter a zero value in any of the **Inclusion Mask** fields this means that RIP considers any integer (from 0 to 255) valid *for that corresponding portion* of the Inclusion address.
Exclusion Addr	You can enter an IP address which RIP uses with the **Exclusion Mask** (below) to define a range of IP addresses on routes which this controller will not "advertise" in its RIP broadcasts, because they are already considered reachable, i.e. they are in the same network. You can modify this further based on the optional definitions of an **Inclusion Addr** and **Inclusion Mask** discussed above.
Exclusion Mask	If you enter a non-zero value in any of the **Exclusion Mask** fields it means the corresponding **Exclusion Addr** field specifies a portion of the IP address which must exactly match with every IP address which this controller specifically excludes from its advertised routes. A zero value in any of the **Exclusion Mask** fields means the protocol considers any integer from (0 to 255) valid for that corresponding portion of the destination exclusion address.

Notes:

- If you do not make any entries in either the **Inclusion Addr/Mask** or **Exclusion Addr/Mask**, RIP does **not** function.
- Only devices which you configure for RIP can use the routing tables provided in the RIP broadcast messages.

Some examples for setting the inclusion and or exclusion address/mask pairs follow:

In Example #1 (*Figure 5-35*) Network A's configuration supports RIP. The configurations for Gateway 1 and Gateway 2 also support RIP. Network B does not support RIP but has Gateway 1 as its default Gateway. Because of RIP, Network A knows about Gateway 2 as an alternate route to Network B, if Gateway 1 fails.

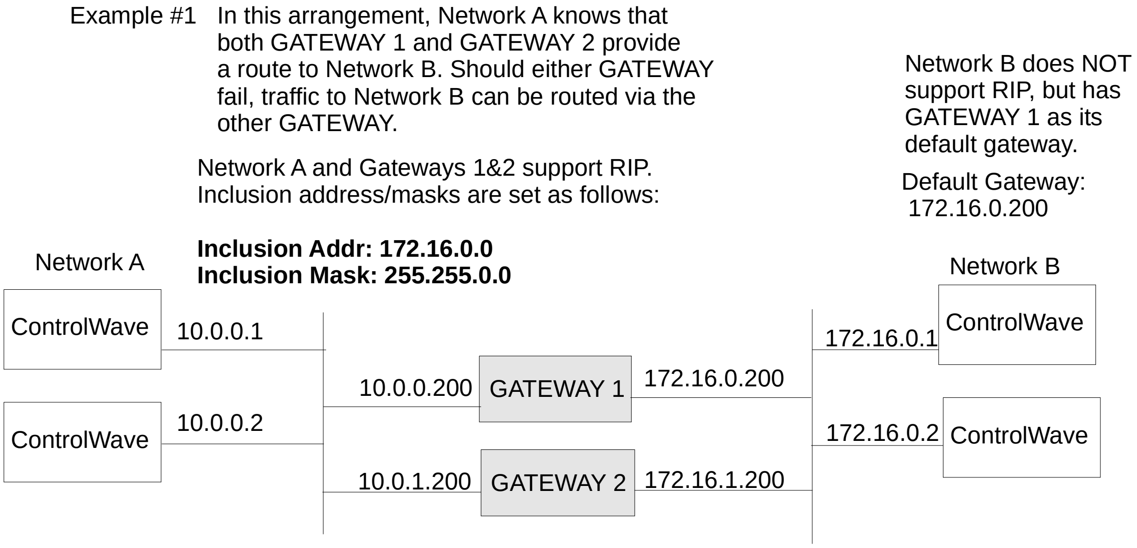

Example #1
In this arrangement, Network A knows that both GATEWAY 1 and GATEWAY 2 provide a route to Network B. Should either GATEWAY fail, traffic to Network B can be routed via the other GATEWAY.
Network B does NOT support RIP, but has GATEWAY 1 as its default gateway.
Network A and Gateways 1&2 support RIP. Inclusion address/masks are set as follows:
Default Gateway: 172.16.0.200
Network A
Inclusion Addr: 172.16.0.0
Inclusion Mask: 255.255.0.0
Network B
ControlWave
10.0.0.1
172.16.0.1
ControlWave
10.0.0.200
GATEWAY 1
172.16.0.200
ControlWave
10.0.0.2
172.16.0.2
ControlWave
10.0.1.200
GATEWAY 2
172.16.1.200

Figure 5-35. Example 1 – Routing Internet Protocol (RIP)

In Example #2 (*Figure 5-36*) the configurations for Networks A and B, as well as the Gateways all support RIP. Here we specify just an Exclusion Address and Mask for an address which isn't even on any of the two networks. In this case we choose 1.1.1.1. With this minimal exclusion range, RIP broadcasts include routes to **all** known addresses outside a particular Network, i.e. Network A receives information about routes to Network B, and Network B receives information about routes to Network A.

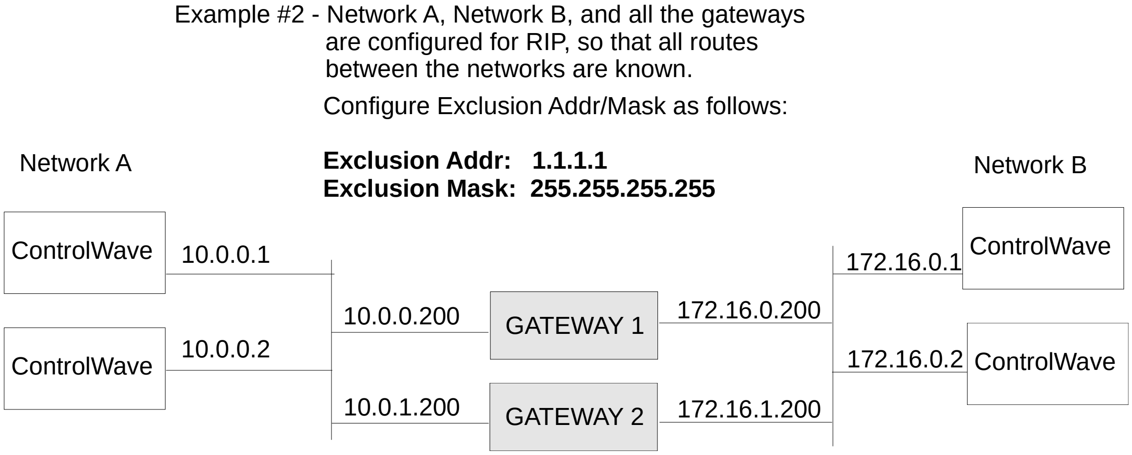

Example #2 - Network A, Network B, and all the gateways
are configured for RIP, so that all routes
between the networks are known.
Configure Exclusion Addr/Mask as follows:
Network A
Exclusion Addr: 1.1.1.1
Exclusion Mask: 255.255.255.255
Network B
ControlWave
10.0.0.1
ControlWave
10.0.0.2
10.0.0.200
GATEWAY 1
172.16.0.200
10.0.1.200
GATEWAY 2
172.16.1.200
172.16.0.1
ControlWave
172.16.0.2
ControlWave

Figure 5-36. Example 2 – Routing Internet Protocol (RIP)

Dynamic IP Routing Ping
(ControlWave only)

See the **"IP Routes"** page (*Section 5.9.10*) for a description of dynamic IP routing.

Field	Description
Rate	This is the frequency (in milliseconds) at which the system tests an IP route (using a ping message) to verify that the connection still functions. If the test is unsuccessful (no return from the ping within the specified timeout) the test fails. If **Retries** is a non-zero value, the system makes that number of additional attempts to perform the ping test. If the test is still unsuccessful, the system re-routes IP traffic according to the information defined on the **IP Routes** page.
Timeout	This is period of time (in milliseconds) after which the system declares the failure of the ping test for a given IP route.
Retries	This is the number of additional ping tests the system makes after the first failure. If the total number of retries reaches this number, the system begins to re-route IP traffic.

Challenge Protocol

(ControlWave only)

ControlWave supports two standard protocols for security on PPP links: Challenge Handshaking Authentication Protocol (CHAP) and Password Authentication Protocol (PAP). These protocols operate in a client/server arrangement. We usually recommend CHAP since it provides greater security..

The CHAP (or PAP) server is a ControlWave-series controller. The CHAP (or PAP) client could be either a ControlWave-series controller, or an OpenBSI workstation.

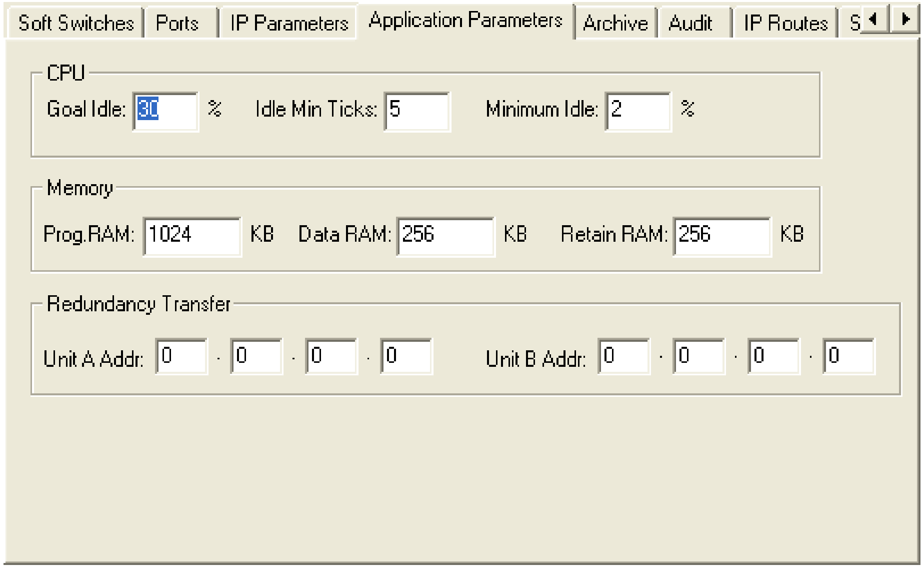
The client must always supply a valid username/password combination in order to gain access to the server. If a ControlWave controller is the client, you just pre-configure the username and password combination and store it in flash at the unit. The ControlWave automatically transmits the username / password text string in response to a login prompt from the server.

Field	Description
Default Username	This is the username which the ControlWave (PAP/CHAP client) transmits in response to a challenge message from the PAP/CHAP server. This username must be one of the user accounts defined for the ControlWave, and is sent along with the password defined for the specified user account.

5.9.7 Application Parameters

To reach the “Application Parameters” page, click the “Application Parameters” tab in the Flash Configuration utility.

These parameters apply only to ControlWave-series units configured as IP nodes.



CPU

Goal Idle: 30 % Idle Min Ticks: 5 Minimum Idle: 2 %

Memory

Prog.RAM: 1024 KB Data RAM: 256 KB Retain RAM: 256 KB

Redundancy Transfer

Unit A Addr: 0 . 0 . 0 . 0 Unit B Addr: 0 . 0 . 0 . 0

Figure 5-37. Application Parameters page

Field	Description
CPU	
Goal Idle	This is a goal expressing the desired percentage of time the ControlWave CPU remains idle. The default value is 30%. If the CPU cannot meet this goal, the the system automatically adjusts the DEFAULT task period to free up CPU time.
Idle Min Ticks	This is the minimum number of 1 millisecond clock ticks allowed between executions of the DEFAULT task. The default value is 2.
Minimum Idle	If the ControlWave CPU cannot maintain this percentage of free CPU time, it reports an overload exception. The default value is 5%.

⚠ **Caution**

Exercise caution when you modify the application parameters for memory. If you make significant changes to these parameters without an understanding of how the parameters interact, you can actually reduce the amount of available memory, even though you increase the values of the parameters. If you do change these parameters, use small, incremental changes only.

Field	Description
Memory	
Prog RAM	In kilobytes, this is the amount of memory the system reserves at startup to store the code for the ControlWave project. This value should **not** significantly exceed the amount of memory the project requires, because any unused reserved memory is unavailable for data or other purposes. **Note**: If the system does not have sufficient memory to hold the user requests, the system reduces the requests proportionally. This defaults to 1024k in the ControlWave and ControlWave MICRO, and 256k in the ControlWaveLP. This ranges from 10k to 1024k.
Data RAM	This is the size of storage the system reserves for variables in kilobytes. This ranges from 10k to 1024k. The default is 256k in the ControlWave and ControlWave MICRO, and 64k in the ControlWaveLP. NOTE: This amount does not include historical data (audit/archive).
Retain RAM	This is the size of storage space (in kilobytes) the system reserves at startup for variables marked “RETAIN”. The system preserves the values of variables marked “RETAIN” in the event of a warm start download. **Retain RAM** ranges from 0k to 1024k, and defaults to 256k in the ControlWave and ControlWave MICRO, and 64k in the ControlWaveLP.

Redundancy Transfer	
Unit A Addr	This IP address must correspond to an Ethernet port on the A controller in a redundant pair.
Unit B Addr	This IP address must correspond to an Ethernet port on the B controller in a redundant pair.

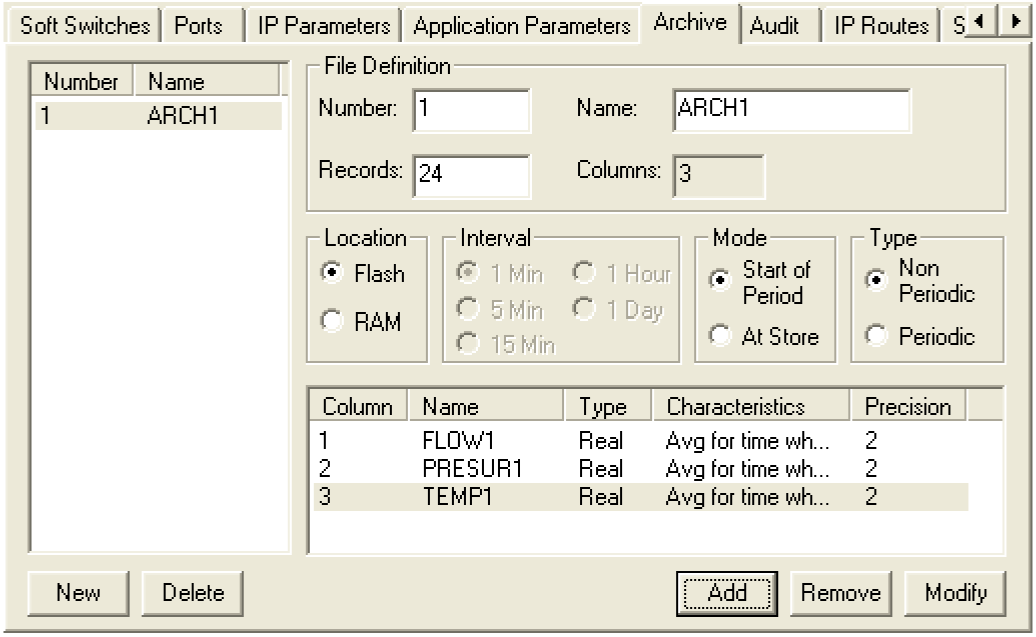
Variations when using the ControlWave I/O Expansion Rack

- For the ControlWave I/O Expansion Rack, the Application Parameters page appears slightly different. The page omits the “Memory” and “CPU” sections and includes a “Timeouts” section.
- The **Power Fail Timeout** determines how outputs of the I/O rack operate when power is restored following a power failure, or under certain circumstances, during a restart following a CPU watchdog.
- **Host Comm Loss Timeout** specifies how a communication failure with the host ControlWave controller affects the outputs of the I/O Rack.
- For a full description of these options, please see the *ControlWave I/O Expansion Rack Quick Setup Guide* (document# D5122).

5.9.8 Archive

To reach the "Archive" page, click the "Archive" tab in the Flash Configuration utility.

Note: Although most Network 3000 controllers also support Archiving, you cannot configure it from this page.



Number	Name
1	ARCH1

File Definition

Number: 1 Name: ARCH1

Records: 24 Columns: 3

Location: ● Flash ○ RAM

Interval: ● 1 Min ○ 1 Hour ○ 5 Min ○ 1 Day ○ 15 Min

Mode: ● Start of Period ○ At Store

Type: ● Non Periodic ○ Periodic

Column	Name	Type	Characteristics	Precision
1	FLOW1	Real	Avg for time wh...	2
2	PRESUR1	Real	Avg for time wh...	2
3	TEMP1	Real	Avg for time wh...	2

Figure 5-38. Archive page

The Archive feature is one portion of the historical capabilities of the ControlWave-series controllers. It allows the system to save "snapshots" of many variables at the same instant. This provides a detailed historical record of process variables at a particular moment in time.

Archive files are structures which hold the archive data inside the ControlWave. You can use OpenBSI Utilities such as DataView, or the Harvester to collect the archive files from the ControlWave.

The **Archive** page specifies various parameters that set up the Archive system.

Note: You must perform additional configuration for archiving within the ControlWave project file, using the ARCHIVE function block. See the *ControlWave Designer Programmer's Handbook* (document# D5125) for details, as well as the on-line help for the ARCHIVE function block in ControlWave Designer.

To begin defining an archive file, click the **New** button and complete the fields as described below:

To delete an existing archive file, click on the file number in the box at the upper left of the page, then click the **Delete** button.

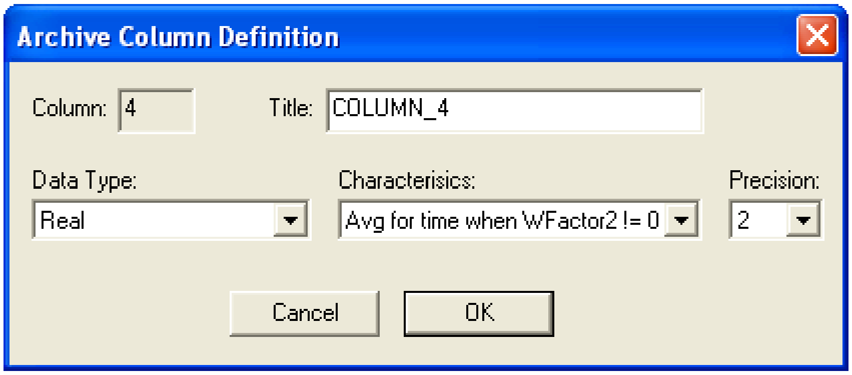
Note: Even after you click the **Save to RTU** button, the actual file deletion does not occur until you reset the unit.

Field	Description
File Definition	
Number	This is a unique ID number for this archive file. It can range from 1 to 32767.
Name	This is the archive file name. Use up to 8 alphanumeric characters for the name.
Records	Specify how many rows of "snapshot" data this archive file retains. For example, if you want to save 24 rows (records) enter 24 here. The size of each record determines the upper limit on the number of records. An archive file cannot exceed 74,000 bytes. This means that as the size of the defined archive record increases (based on your configuration of the number of columns, types of data, etc.) the number of records the system can save in the archive file decreases. **Note:** Each archive record includes 14 bytes to store the timestamp and sequence numbers, in addition to the bytes used to store the actual column data.
Columns	This is the number of columns in the archive file. Each column corresponds to a particular variable in the ControlWave project. The number of columns ranges from 1 to 64.
Location	
Flash	When you select this, you configure the ControlWave to store all archive records in flash memory. Flash memory preserves the records in the event you reset the ControlWave, or if the unit's backup battery fails.
RAM	When you select this, you configure the ControlWave to store all archive records in static RAM. If the ControlWave resets, for any reason, it only preserves archive records so long as the unit's backup battery continues to operate, or until you perform a system cold start. See the *ControlWave Designer Programmer's Handbook* manual (document# D5125) for a discussion of system cold starts.
Interval	
1 Min, 5 Min, 15 Min, 1 Hour, 1 Day	Only applies when the **Timestamp Mode** is **Periodic**. This specifies how often the ControlWave should take "snapshots" of data for archive records.

Mode **At Store**	When you select **At Store** the archive system assigns a timestamp to this archive record based on the time it stored the record.
Start of Period	When you select **Start of Period** the archive system assigns a timestamp to this archive record based on the time of the beginning of the interval.
Type **Non Periodic**	When you select **Non Periodic**, the system stores archive records when the ARCHIVE function block executes, if the criteria determined by the iiMode terminal is met. See the on-line help for the ARCHIVE function block, for details.
Periodic	When you select **Periodic**, the system stores archive records when the ARCHIVE function block executes, *and* the chosen interval (either 1 minute, 5 minute, 15 minute, 1 hour, 1 day) expires. See the on-line help for the ARCHIVE function block, for details.

Column Definitions

To define a column in the archive file, click the **Add** button. The Archive Column Definition dialog box opens. Make entries as described, below and click **OK** when finished.



Column: 4

Title: COLUMN_4

Data Type: Real

Characterisics: Avg for time when WFactor2 != 0

Precision: 2

Figure 5-39. Archive Column Definition dialog box

If you need to modify a column after you exit the Archive Column Definition dialog box, select the column number in the list in the lower right part of the Archive page, and click **Modify** to re-call the dialog box.

To delete an existing column, select the column number in the list in the lower right part of the Archive page, then click **Remove**. The utility renumbers the remaining columns automatically.

Field	Description
Column	This displays the number of the column you want to define; the utility assigns column numbers sequentially; you cannot change them.
Title	Enter a description for the column here. It can range from 1 to 16 characters.
Data Type	Allows you to choose the data type of the variable associated with this column. This should match the data type you configure for this variable in ControlWave Designer. **Note**: You determine the assignments of which variable goes with which column when you configure the ARCHIVE function block, in your ControlWave project.
Characteristics	Determines the type of calculation the system performs on the collected data for this variable. Click on the **Characteristics** field and choose from the list box. See *Table 5-1* for an explanation of the characteristics. This table includes formulas which use the following notation: (i) is the time at which the ARCHIVE function block executes and reads or “samples” the variable. (n) is the number of module executions or samples that can occur within the defined Periodic Interval e.g., with a one second Task execution and a one Hour Periodic Interval “n” is 3600. Wfactor in these formulas refers to the **Weight Factor**. You specify Weight Factors in the ARCHIVE function block. (See the *ControlWave Designer Programmer’s Handbook* (document# D5125).)
Precision	Specify the numerical precision you want to use to display variables.

Table 5-1. Archive Characteristics

Characteristic	Explanation
Avg for time when Wfactor2 !=0	This performs a simple sum and divide averaging calculation, but applies a weight factor to each sample as it reads the sample. Program logic sets the weight factor, as required, to control the averaging done by the module; typically you write the program logic to ensure that the variable being read is only averaged while another condition is valid. See the equation below:

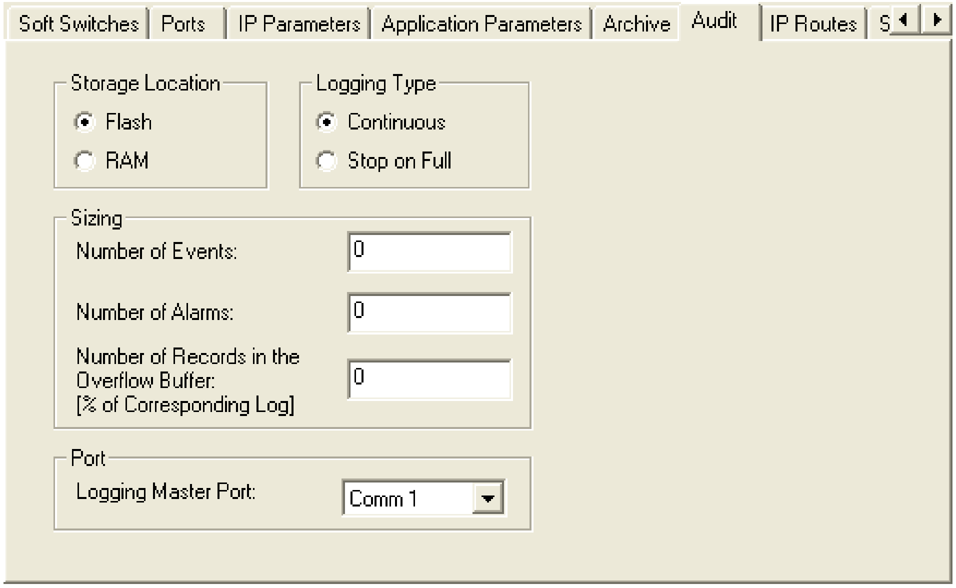
Characteristic	Explanation
	$\dfrac{\sum_{i=1}^{n} \text{Variable\_Value(i)} * \text{WeightFactor2(i)}}{\sum_{i=1}^{n} \text{WeightFactor2(i)}}$ (NOTE: This equation is only used when WeightFactor2 is non-zero.)
Arithmetic Mean Over Wfactor1	Performs a simple sum and divide average with each sample weighted by WeightFactor1. See the equation below: $\dfrac{\sum_{i=1}^{n} \text{Variable\_Value}(i) * \text{WeightFactor1}(i)}{\sum_{i=1}^{n} \text{WeightFactor1}(i)}$
Avg of Sqrt(var) for time when Wfactor2 !=0	During the periodic interval, sample the variable, take the square root of the sample, multiply it by WeightFactor2, and sum it. At the end of the interval, calculate the average square root and store the result in the archive. See the equation, below: $\dfrac{\sum_{i=1}^{n} \sqrt{\text{Variable\_Value}(i)} * \text{WeightFactor2}(i)}{\sum_{i=1}^{n} \text{WeightFactor2}(i)}$
Sqr of (Avg of sqrt(var))	During the periodic interval, sample the variable, take the square root of the sample, multiply it by WeightFactor2 and sum it. At the end of the interval, calculate the average square root, then square it and store the result in the archive. See the equation below: $\left(\dfrac{\sum_{i=1}^{n} \sqrt{\text{Variable\_Value}(i)} * \text{WeightFactor2}(i)}{\sum_{i=1}^{n} \text{WeightFactor2}(i)}\right)^2$ **Note:** The result is zero if Weight Factor 2 is zero for the entire interval.
Instantaneous Place value in log	No calculation performed. At the end of the periodic interval, simply store the current value of the variable in the archive.

Characteristic	Explanation
Min observed value for period	At the end of the periodic interval, store the lowest value of the variable among all samples collected during this interval.
Max observed value from period	At the end of the periodic interval, store the highest value of the variable among all samples collected during this interval.
Place value in log, and 0 signal	At the end of the periodic interval, store the current value of the variable, and reset the variable to zero.
Integration over Wfactor2	Sum the samples taken during the periodic interval after multiplying each sample by WeightFactor 2. Perform the following calculation: $\sum_{i=1}^{n} \text{Variable\_Value}(i) * \text{WeightFactor2}(i)$

5.9.9 Audit

To reach the “Audit” page, click the “Audit” tab in the Flash Configuration utility.

Note: Although most Network 3000 controllers also support Audit, you cannot configure it from this page.



Storage Location

● Flash
○ RAM

Logging Type

● Continuous
○ Stop on Full

Sizing

Number of Events: 0

Number of Alarms: 0

Number of Records in the Overflow Buffer: [% of Corresponding Log] 0

Port

Logging Master Port: Comm 1

Figure 5-40. Audit page

Audit logging is one portion of the historical capabilities of the ControlWave-series controllers. The Audit feature keeps records of when certain variables change value, as well as a record all alarms in the system. Beginning with ControlWave firmware 05.20, operator login/logout activity is also included in the Audit log. The Audit Configuration page specifies various parameters that set up the Audit feature.

Note: For the Audit feature to work, you must also configure your ControlWave project file, using the AUDIT function block. See the *ControlWave Designer Programmer's Handbook* (document# D5125) as well as the on-line help for the AUDIT function block, for details.

Field	Description
Storage Location	
Flash	When you select this, you configure the ControlWave to store all Audit records in flash memory. Flash memory preserves the records in the event you reset the ControlWave, or if the unit's backup battery fails.
RAM	When you select this, you configure the ControlWave to store all Audit records in static RAM. If the ControlWave resets, for any reason, it only preserves Audit records so long as the unit's backup battery continues to operate, or until you perform a system cold start. See the *ControlWave Designer Programmer's Handbook* manual (document# D5125) for a discussion of system cold starts.
Logging Type	
Continuous	If you choose this, when the storage area for audit records fills up, the system overwrites (erases) the oldest records as new records come in.
Stop on Full	If you choose this, when the storage area for audit records fills up, all logging stops. **Note:** This has no impact on the variables themselves; they continue to change; only the audit system no longer records the changes.
Sizing	
Number of Events	Specify the number of events the audit system logs. This value can range from 0 to 584. "0 "is the default, which means the system does not log any events.

Number of Alarms	Specify the number of alarms the audit system logs. This value can range from 0 to 584. “0” is the default, which means that the system does not log any alarms.
Number of Records in the Overflow Buffer"	When you choose Flash as the storage location for the audit records, eventually the Alarm or Event flash logs fill up. When this happens, the audit system attempts to re-arrange the flash logs to make room for new records. The system temporarily stores any new incoming records during this re-arrangement procedure in the overflow buffer, until such time as there is sufficient space in the flash logs. **Number of Records in the Overflow Buffer** determines the size of the overflow buffer as a percentage of the full flash logs. For example, if you set **Number of Records in the Overflow Buffer** to 50, that means the system sizes the overflow buffer so it is large enough to hold 50% of the full Alarm and Event flash logs (or half) of the logs. We recommend that if you have a high frequency of audit record generation, that you set this value to 100.
<u>Port</u> **Logging Master Port**	Defines the only port on the ControlWave which can delete audit records from the audit logs. The Logging Master Port is only meaningful when the recording mode is **Stop on Full**.

5.9.10 IP Routes

To reach the IP Routes page click the **"IP Routes"** tab in the Flash Configuration Utility.

Beginning with ControlWave firmware CWP02.0, you can optionally configure multiple gateways (routers) for a particular network to support dynamic IP routing.

A **dynamic IP route** is a range of destinations (IP addresses) and the gateways the system uses to reach them.

Gateways are essentially routers (devices with IP connections on two or more separate networks). As such, they provide a means to send messages from one network to another. You might want to think of gateways as entrance ramps to a highway.

You can configure up to four gateways to reach a particular destination address range, and you can specify up to 16 destination address ranges for a particular controller.

Since the system can send messages to a particular route by a choice of more than one gateway, the system can attempt transmission through one gateway, and if it fails, send traffic through one of the *other* gateways. This provides a degree of fault-tolerance in the system. (See figure, below)

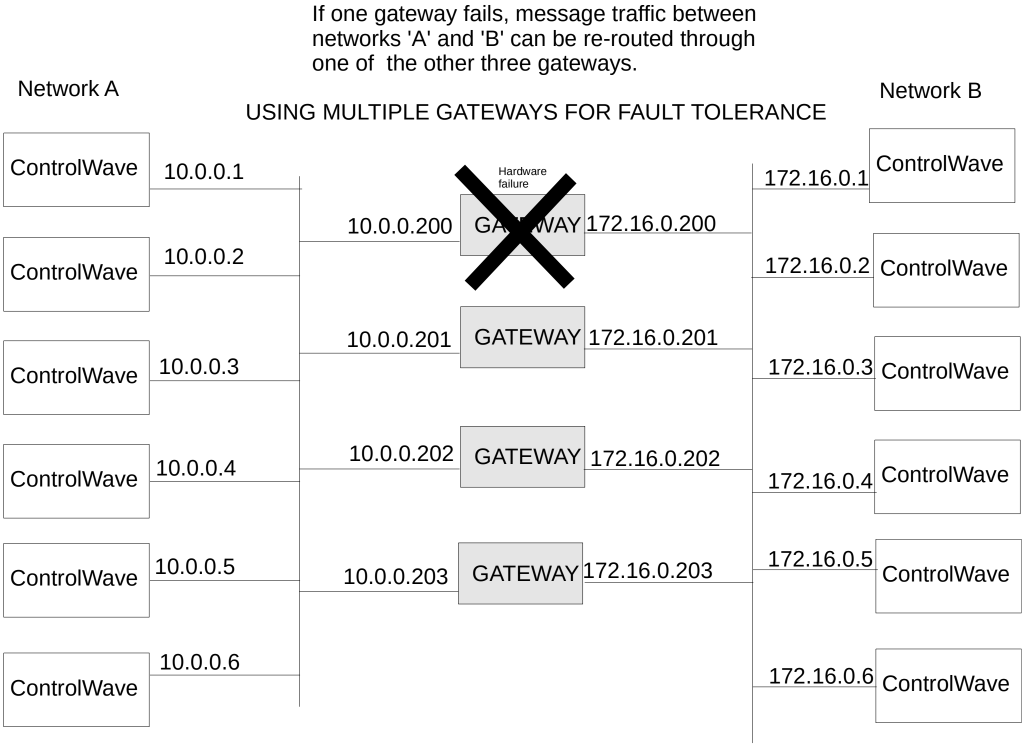
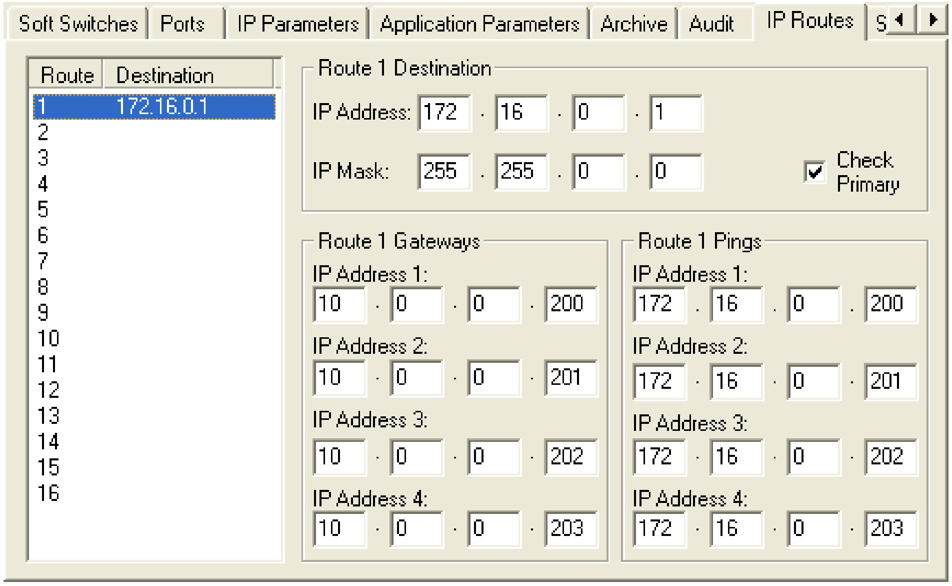


Figure 5-41. IP Routes

The system can test a particular path by using a specified ping address. The ping address can be the address of the gateway itself, or it could be the address of the destination controller.

The actual re-routing occurs only after a specified timeout expires. (See **"IP Parameters"** page for details.)

The **"IP Routes"** page (shown below) shows a typical configuration for the network depicted on the previous page. (This configuration applies for a controller that belongs to network "A" as shown on the previous page.)



Route	Destination
1	172.16.0.1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

Route 1 Destination

IP Address: 172 . 16 . 0 . 1

IP Mask: 255 . 255 . 0 . 0

☑ Check Primary

Route 1 Gateways

IP Address 1: 10 . 0 . 0 . 200

IP Address 2: 10 . 0 . 0 . 201

IP Address 3: 10 . 0 . 0 . 202

IP Address 4: 10 . 0 . 0 . 203

Route 1 Pings

IP Address 1: 172 . 16 . 0 . 200

IP Address 2: 172 . 16 . 0 . 201

IP Address 3: 172 . 16 . 0 . 202

IP Address 4: 172 . 16 . 0 . 203

Figure 5-42. IP Routes page

After you completely define a particular route, you can click on the next route number in the box in the upper left corner, to clear the various fields so you can enter information on the next route. You can define a total of 16 separate routes.

Field	Description
Route *x* Destination	
IP Address	This **IP Address** together with its **IP Mask** define a range of destination IP addresses on this particular route.
IP Mask	Any non-zero value in the **IP Mask** specifies a portion of the IP address which must match exactly for every IP address on the destination route.
Check Primary	If you check this selection, if event re-routing occurs due to a failure, the system forces a re-test of the first

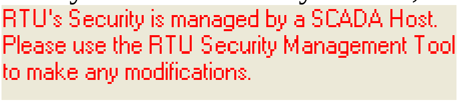
	gateway (or ping address) to see if the failure still exists. This check allows traffic to return to its normal path using the first gateway when the problem no longer exists. This might be particularly important if the secondary route is *slower* than the primary. If you don't check this selection, and there is a failure, re-routed traffic continues to use the secondary route, unless it too fails.
Route *x* Gateways	
IP Address 1 to **IP Address 4**	You must specify IP addresses for gateways that reside in the same network as the current controller. During normal operation, traffic uses the gateway 1 address, but if a failure occurs along the path for that gateway, the system attempts to re-route traffic to the *next* gateway (IP address 2). If that second gateway doesn't work, then the system tries the third one, and that doesn't work it tries the fourth gateway. If the fourth gateway fails, the system tries the first gateway again, and so on.
Route *x* Pings	
IP Address 1 to **IP Address 4**	For each of the four possible paths of a given route, you can optionally define a ping address for testing the route. Typically, you specify the IP address for the gateway of the *other network* as the ping address. Alternatively, you can specify the address of one of the destination controllers in the other network as the ping address; you might do this so the system checks for failure of one of the controllers in a redundant pair.

5.9.11 Security

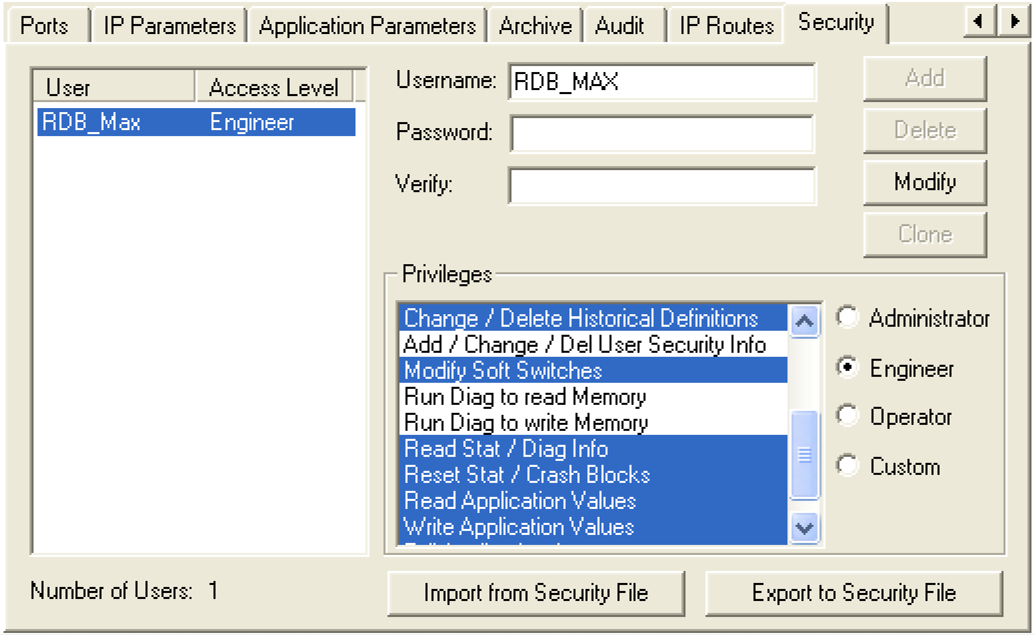
To reach the Security page click the **"Security"** tab in the Flash Configuration Utility.

In the Security page, you create usernames and passwords for each user of this ControlWave-series controller, and you specify the features the user can use when they sign on. This allows you to set restrictions on who has access to certain features of the ControlWave.

Note: Beginning with OpenBSI 5.8, a new utility for security configuration called the Security Management Tool allows you to manage ControlWave security details from the OpenBSI workstation. If you choose to use the Security Management Tool, changes from the Security page of the Flash Configuration Utility are locked out by default, and you will see this message:



RTU's Security is managed by a SCADA Host.
Please use the RTU Security Management Tool
to make any modifications.



User	Access Level
RDB_Max	Engineer

Username: RDB_MAX

Password:

Verify:

Privileges

- Change / Delete Historical Definitions
- Add / Change / Del User Security Info
- Modify Soft Switches
- Run Diag to read Memory
- Run Diag to write Memory
- Read Stat / Diag Info
- Reset Stat / Crash Blocks
- Read Application Values
- Write Application Values

○ Administrator
● Engineer
○ Operator
○ Custom

Number of Users: 1

Figure 5-43. Security page

Adding a New User

A ControlWave-series controller supports up to 240 different users (previous to OpenBSI 5.8, 32 users was the maximum allowed). To add a user, first enter the user's name (up to 16 characters long) in the **"Username"** field, and enter a password (up to 16 characters long) for that user in the **"Password"** AND **"Verify"** fields. (The password does not appear as you type it.)

Note: Prior to OpenBSI 5.8 Service Pack 1, some OpenBSI programs which communicated with the controller (such as DataView) only supported shorter usernames and passwords (10 characters or less for the username, 6 characters or less for the password) and UPPERCASE only for the password. If you have any OpenBSI workstations you haven't upgraded yet, you may want to limit ControlWave usernames/passwords to conform to this. Newer OpenBSI software conforms to the ControlWave limits.

Next, to select the privileges for this user click **"Custom"** and then select the individual privileges in the **"Privileges"** list box, to highlight them. Alternatively, you can choose **"Operator"**, **"Engineer"** or **"Administrator"** for a particular user, which automatically highlights privileges associated with those user categories. The tables, on the next page, show the privileges associated with these user categories, and list what all the various privileges mean.

When all desired privileges have been selected, click the **Add** button to add the user to the system.

Note: Every ControlWave-series controller has a special user called **RDB_Max**. This user account defines the *maximum* privileges allowed for RDB protocol messages coming into the

ControlWave. (Programs such as DataView, the Harvester, etc. use RDB to request data from the ControlWave.) You cannot delete the RDB_Max user, or rename it, but you *can* change its privileges.

The table, below, shows the privileges associated with the Operator, Engineer, and Administrator categories:

Table 5-2. Standard User Privileges

Privilege	Operator	Engineer	Administrator
Read Data Value	✓	✓	✓
Update Data Value	✓	✓	✓
Read Flash Files via FTP		✓	✓
Change/Del Flash Files via FTP		✓	✓
Read Historical Data	✓	✓	✓
Change Last Read Pointers in Audit Info		✓	✓
Change/Delete Historical Definitions		✓	✓
Add / Change / Del User Security Info			✓
Modify Soft Switches		✓	✓
Run Diag to read Memory			✓
Run Diag to write Memory			✓
Read Stat / Diag Info	✓	✓	✓
Read Stat / Crash Blocks	✓	✓	✓
Read Application Values		✓	✓
Write Application Values		✓	✓
Full Application Access		✓	✓
Add New Historical Definitions		✓	✓

The table, below, describes the meaning of each privilege:

Table 5-3. User Privileges

Privilege	Description
Read Data Value	Allows this user to read data values from this controller.
Update Data Value	Alows this user to change data values in this controller.

Privilege	Description
Read Flash Files via FTP	Allows this user read access (using File Transfer Protocol) to files stored in this ControlWave's flash memory. This includes the ControlWave boot project, source files (*.ZWT), etc.
Change/Del Flash Files via FTP	Allows this user (using File Transfer Protocol) to change or delete files stored in the ControlWave's flash memory. This could include the ControlWave boot project, source files (*.ZWT), etc.
Read Historical Data	Allows this user to view historical data (Audit / Archive information) from the controller, using either web pages, or DataView.
Change Last Read Pointers in Audit Info	Allows this user to delete audit records from the controller.
Add New Historical Definitions	Allows this user to create new archive file definitions, and / or to set up the alarm and event buffers for audit configuration using the Flash Configuration Utility.
Change/Delete Historical Definitions	Allows this user to change or delete historical definitions via the Flash Configuration Utility.
Add / Change / Del User Security Info	Allows this user to add, change, or delete security configuration information via the Flash Configuration Utility security page.
Modify Soft Switches	Allows this user to change soft switch values in the soft switches page of the Flash Configuration Utility.
Run Diag to read Memory	Allows this user to run diagnostics to read memory at the controller.
Run Diag to write Memory	Allows this user to run diagnostics to write to memory at the controller.
Read Stat / Diag Info	Allows this user to view communication statistics and other information on the Statistics web pages.
Read Stat / Crash Blocks	Allows this user to reset statistics and crash block areas on the Statistics web pages.
Read Application Values	Allows this user to read values using the ControlWave Designer OPC Server.
Write Application Values	Allows this user to modify values using the ControlWave Designer OPC Server.
Full Application Access	Allows this user full privileges to perform debugging operations in ControlWave Designer.

Modifying the Privileges of an Existing User

To change the privileges of an existing user, select the user's name from the list of **"Usernames"** and select / de-select privileges for that user in the **"Privileges"** list box. When you finish making selections, click the **Modify** button to store the modified privileges for that user.

Cloning a User

If you want to create several users with identical privileges, click on the name of the user that has the desired privileges, then click **Clone**.

Number of Cloned Users: 1

Type the number of users you want to create in the **Number of Cloned Users** box, then press the **[Enter]** key. Users named CLONE will appear. You can then modify those users with new usernames and passwords. (OpenBSI 5.8 and newer.)

Deleting an Existing User

To delete a user from the system, select the user's name from the **"Usernames"** list and click the **Delete** button.

Notes:

- You **cannot** delete the RDB_Max user. You also **cannot** delete the current user, or any user who is currently signed on to this ControlWave-series controller.
- You can only modify privileges for users defined as **Custom**. The privileges for operators, engineers, administrators, etc. are fixed.

Importing / Exporting Security Information

If desired, you can export the configuration information for the users on this ControlWave to a *.SEC file. By default the SEC file basename is the RTU name. You can then import the SEC file into the Flash Configuration utility when you configure another ControlWave. This allows you to easily replicate the same security configuration on multiple ControlWaves.

To export a security file, click **Export to Security File** and provide a filename, or use the default.

To import a security file, click **Import from Security File** and select the SEC file.

The import/export feature requires OpenBSI 5.8 and newer.

⚠ **Caution**

Importing security data from an SEC file overwrites any existing security entries in the Flash Configuration utility.

Unless you are an advanced user, do not attempt to edit the SEC file with a text editor. Never edit the password in a text editor because it is encrypted and will corrupt the security configuration.

When You Finish Making Security Changes

Changes you make to security occur immediately after you click **Write to Rtu**.

Turn the default switch **ON** when you finish, otherwise the special default security account (SYSTEM) remains active. For ControlWave controllers, this is CPU switch SW1-3; for ControlWave LP controllers, this is CPU switch SW4-3, and for ControlWave MICRO controllers, this is CPU switch SW2-3.

5.10 Establishing Communications With an IP RTU (IP Comm Mode)

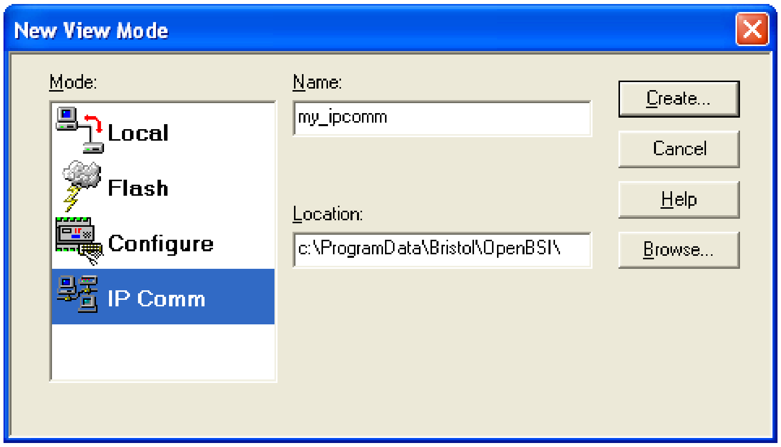
Notes:

- This mode requires OpenBSI Version 5.2 or newer.
- Before you establish communications with an IP RTU, your PC must belong to the same IP network that contains the configured IP RTU.

Every IP RTU requires at least one IP port, which could be an Ethernet Port, or a serial port running serial IP Point-to-Point Protocol (PPP).

5.10.1 Starting LocalView and the Setup Wizards

To start LocalView click **Start > Programs> OpenBSI Tools > LocalView**. The New View Mode dialog box opens. Follow the steps below.



Name: my_ipcomm

Location: c:\ProgramData\Bristol\OpenBSI\

Figure 5-44. Choosing "IP Comm" Mode

4. Choose **IP Comm** for the **Mode**.

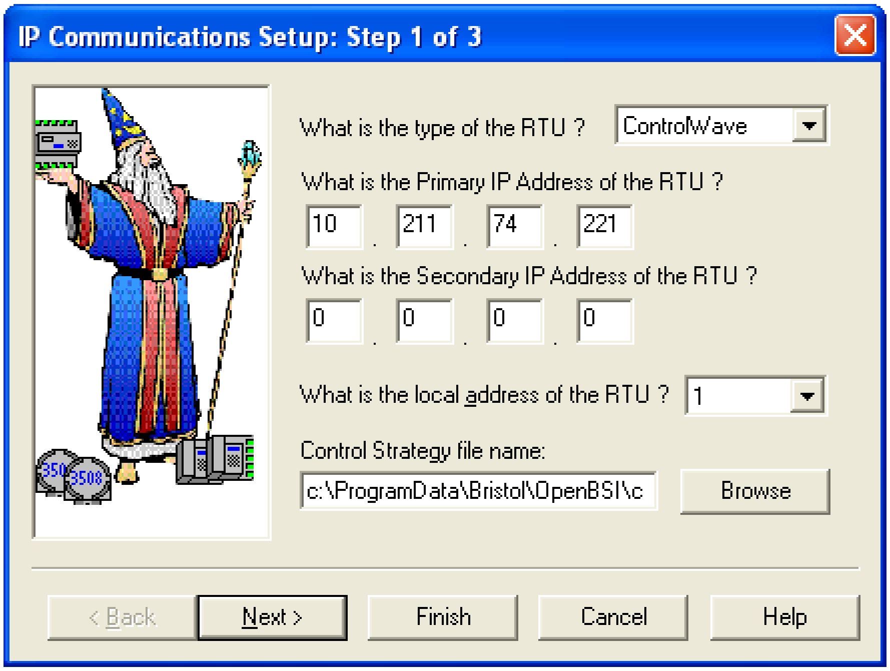
5. Enter a name for the View Mode File in the **Name** field.

6. If you want to store the View Mode File in a directory other than the directory shown in the **Location** field, enter the new location there, or click **Browse** to find the directory.

7. Click **Create** to start the Communication Setup Wizard.

5.10.2 IP Communications Setup Wizard (Step 1 of 3)

Complete the fields in Communication Setup Wizard, as described, below:


IP Communications Setup: Step 1 of 3

What is the type of the RTU ? ControlWave

What is the Primary IP Address of the RTU ? 10 . 211 . 74 . 221

What is the Secondary IP Address of the RTU ? 0 . 0 . 0 . 0

What is the local address of the RTU ? 1

Control Strategy file name: c:\ProgramData\Bristol\OpenBSI\c

Figure 5-45. IP Communications Setup Page 1

Field	Description
What is the type of the RTU?	Select, from the list, the type of controller you want to communicate with, for example “ControlWave.”
What is the Primary IP Address of the RTU?	Specify the IP address of the RTU, in dotted decimal format.
What is the Secondary IP Address of the RTU?	If the RTU has two IP ports, enter the address of the second port. If this RTU belongs to a redundant pair of RTUs, enter the address of the “B” unit of the redundant pair.
What is the local address of the RTU?	The local address is a number from 1 to 127 which describes the position of this RTU within the BSAP network. Even if it does **not** belong to a BSAP network, you must specify a local address, since the system uses the BSAP local address to properly route alarm messages.
Control Strategy file name:	This is the name of the ACCOL load file, or ControlWave project, associated with this RTU.

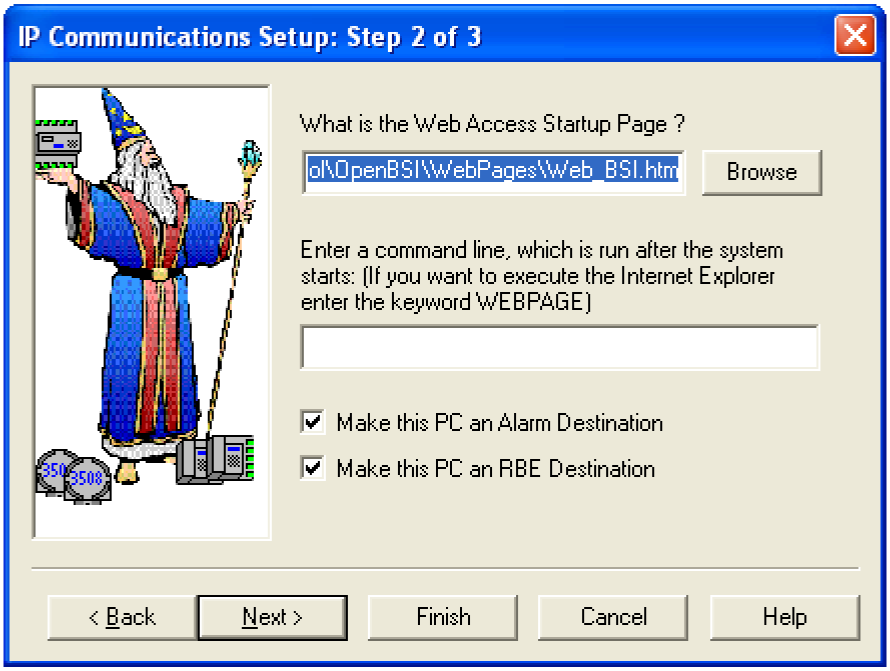
If you just want to establish IP communications, for example, to collect data from the RTU using DataView or to download a new control strategy file using the Downloader, you can click **Finish** at this point. If, however, you want to:

- receive alarms or RBE messages from this RTU at this OpenBSI Workstation
- specify a particular web page to use with this controller
- start a particular program via the command line after communications start
- specify certain IP and communication fail-over parameters,

then click **Next** to continue to step 2 of the dialog box.

5.10.3 IP Communications Setup Wizard (Step 2 of 3)

Complete the fields, as described below, for Step 2 of the IP Communications Setup dialog box.



What is the Web Access Startup Page ?

ol\OpenBSI\WebPages\Web_BSI.htm

Enter a command line, which is run after the system starts: (If you want to execute the Internet Explorer enter the keyword WEBPAGE)

☑ Make this PC an Alarm Destination

☑ Make this PC an RBE Destination

Figure 5-46. IP Communication Setup Page 2

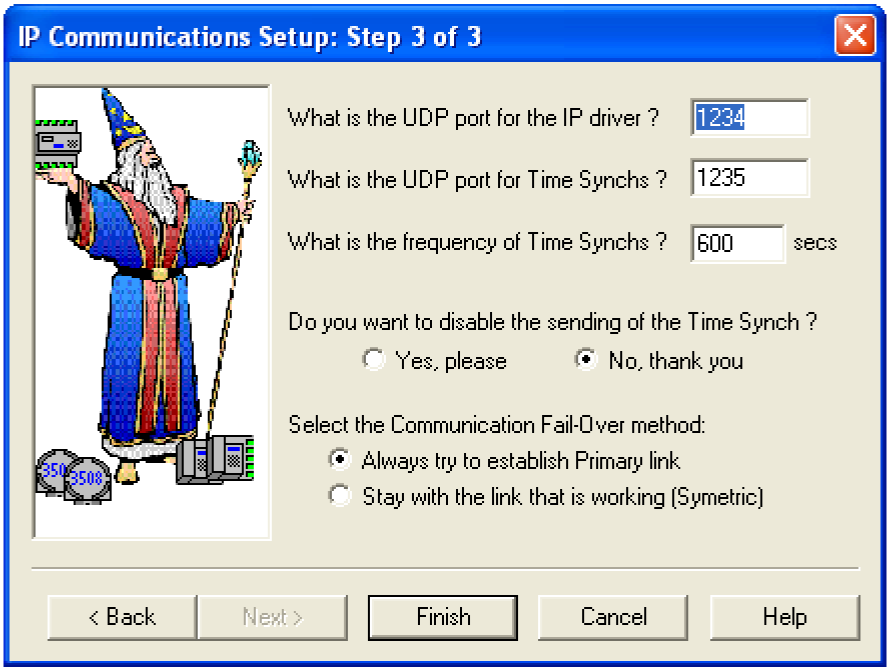
Field	Description
What is the Web Access Startup Page?	This specifies the first web page the system presents when the user requests **"Webpage access"** to this controller. Type the path and filename of the HTML file in the field, or use the **Browse** button to locate it.
Enter a command line, which is run after the system starts: [If you want to execute the Internet Explorer, enter the keyword	You can optionally enter a DOS command line entry or the path of an executable (.EXE) here, which the system executes after LocalView communications start. You can use this to automatically start another program. To automatically start Internet Explorer, once communications start enter the keyword

WEBPAGE].	WEBPAGE here.
Make this PC an Alarm Destination	When you check this, it specifies that this RTU should send any alarm messages to this OpenBSI Workstation.
Make this PC an RBE Destination	When you check this, it specifies that this RTU should send any RBE messages (if the RTU supports RBE) to this OpenBSI Workstation.

If you don't want to leave the IP parameters at their default values, click **Finish** at this point, to establish communications. Otherwise, click **Next**, and proceed to step 3.

5.10.4 IP Communications Setup Wizard (Step 3 of 3)

Complete the fields, as described below, for Step 3 of the IP Communications Setup dialog box.


IP Communications Setup: Step 3 of 3

What is the UDP port for the IP driver ? 1234

What is the UDP port for Time Synchs ? 1235

What is the frequency of Time Synchs ? 600 secs

Do you want to disable the sending of the Time Synch ?

○ Yes, please ● No, thank you

Select the Communication Fail-Over method:

● Always try to establish Primary link

○ Stay with the link that is working (Symetric)

Figure 5-47. IP Communication Setup Page 3

Field	**Description**
What is the UDP Port for the IP Driver?	Specify the UDP port number (socket number) the IP driver uses. The driver uses this value to split message traffic along different "streams". *All PC's or RTU's which you want to communicate with each other must share the same UDP port number.* In a sense, this value is like a common password which each node in the network must know. If you don't enter a value, the system uses a default value from

	the NETDEF files. (**Note:** The term “UDP Port” has no actual relationship with the physical communication ports.) This value should *never* be 0.
What is the UDP Port for Time Synchs?	Specify the UDP port number (socket number) the IP driver uses for time synchronization of the RTU's. All PC's or RTU's must share this same value, or else they cannot receive time synchronization messages. In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, the system uses a default value from the NETDEF files. (**Note:** The term “UDP Port” has no actual relationship with the physical communication ports.) This number should *never* be 0.
What is the frequency of Time Synchs?	This value specifies (in seconds) how often the system sends time synchronization messages to this RTU.
Do you want to disable the sending of the Time Synch?	If you choose **Yes**, this RTU does not receive time synchronization messages. If you choose **No**, this RTU does receive time synchronization messages.
Select the Communication Fail-Over Method	If you choose **Always try to establish Primary link** OpenBSI always attempts to communicate with this RTU using the Primary link (Primary IP Address), unless that link fails, in which case, it tries to communicate using the Secondary link (Secondary IP Address). If you choose **Stay with link that is working (Symmetric)**, OpenBSI always attempts to use the current working communication link (either Primary or Secondary) and then if that link fails, fails-over to the alternate link. Choose this method if the RTU belongs to a redundant pair.

Click **Finish** when complete. LocalView processes the information, and if there are no errors, it establishes communications.

Once you establish IP communications, you can call up other OpenBSI utilities to communicate with this RTU such as DataView, or the Downloader.

Chapter 6 – Using NetView

NetView controls communications from the PC to the RTU network. It also allows you to:

- Define the characteristics of a network.
- Define the characteristics of an RTU.
- Define the characteristics of communication lines.
- Start and/or stop OpenBSI communications.
- Assign usernames and passwords for OpenBSI users.
- Monitor the “health” of OpenBSI communications.
- Make on-line changes to the network.

In This Chapter

NetView stores details of your configuration in **Network Definition (NETDEF) Files**. The Network Definition Files include an NDF file containing system constants and application-level parameters, as well as a set of database files (*.MDB, *.DSN, and *.LDB) which contain details about specific system components (NHPs, RTUs, communication lines, and networks).

6.1 Starting NetView

Click on **Start>Programs>OpenBSI Tools>NetView**.

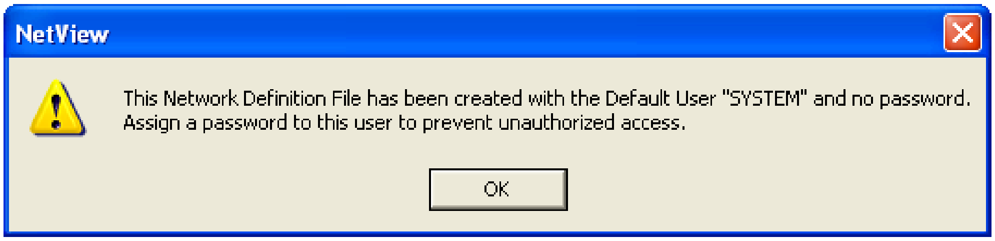
Note: If this is the very first time you start NetView on this particular computer, the system reminds you to register the software. Otherwise, you can only use the software for a maximum of 60 days. For more information on the registration process, see *Chapter* 2.

If you have named a set of NETDEF files (*.NDF, *.MDB, *.DSN, and *.LDB) with a file basename of CURRENT, it opens automatically. Otherwise, you must open a configured set of NETDEF files (see *Section 6.4 Opening an Existing Set of NETDEF Files).*

After you select the NETDEF files, NetView prompts you to enter a username and password to gain access to the NETDEF files. If you log on correctly, OpenBSI communications starts. For more information on this, see *Section 6.9.7 Signing on to the System* later in this chapter.

If you have no configured NETDEF files, you must set them up; see *Section 6.8 Overview of Configuration* later in this chapter.

Note: If you create an all-new set of NETDEF files, they do **not** yet have usernames and passwords associated with them. OpenBSI automatically creates a default user called “SYSTEM”, with no password, and full privileges. A message box, shown below, appears notifying you of this. Click **OK** to sign on as the SYSTEM user. NOTE: We strongly recommend that you assign a password for the SYSTEM user at a later time. (We discuss this subject later.)



This Network Definition File has been created with the Default User "SYSTEM" and no password. Assign a password to this user to prevent unauthorized access.

Figure 6-1. Default User "SYSTEM" message box

6.1.1 Network Definition (NETDEF) Files

NetView uses a set of four (4) Network Definition (NETDEF) files to define any system. Only one such set of NETDEF files can run on the PC at any one time. The four files share the same file basename, but each has a different file extension. The NDF file; which uses an ASCII text format, includes all system-wide constants and application parameters. The remaining three files have extensions of MDB, LDB, and DSN and together form a standard database. The three database files define system components such as NHPs, communication lines, networks, and RTUs.

Note: If you ever decide you want to move your NETDEF files to a different directory, and you copy them there, you must manually edit the statement **DBQ=*path*** in the DSN file to reflect the new directory path. Otherwise, NetView uses the original path and potentially references an incorrect set of NETDEF files.

Configuring a set of NETDEF files to start automatically when NetView starts

Rename whatever NETDEF files you want to start automatically to the name CURRENT. For example, if you named your NETDEF files MYNET.NDF, MYNET.DSN, MYNET.MDB, and MYNET.LDB, rename them to CURRENT.NDF, CURRENT.DSN, CURRENT.MDB, and CURRENT.LDB, respectively. CURRENT is the default file basename that NetView looks for upon startup. For help on renaming files, see *Section 6.7 Renaming the Currently Running NETDEF Files.* The next time NetView starts; it automatically opens the NETDEF files named CURRENT.

6.1.2 Starting OpenBSI Communications When Windows Starts

You can start OpenBSI communications automatically whenever Windows starts.

If you are running the Windows 7 or Windows 2008 Server operating system, use OBSIService.

If you are running Windows XP Professional, use the BSAUTO program.

OBSIService – (Windows 7, Windows 2008 Server only)

Configure OBSIService as follows:

1. To allow system startup, you need to install a startup program as a service. First, start an MS-DOS or command prompt session.
2. Change the directory to the OpenBSI installation directory.
3. Execute one of the following commands, depending upon how you want the system to start:

   OBSIService -INSTALL *username password ndfname*

   which starts the service and uses the NETDEF files with the basename *ndfname*.

   Notes:

   - You must include the full path and filename for the *ndfname* and you must place quotation marks ” “ around it.
   - The *username* and *password* must correspond to a valid username/password combination you defined previously for those NETDEF files. If the user has no password, enter “blank” for the password, or make up a password.

   - **or** - use the command:

   OBSIService -STD *username password ndfname*

   again, using the same restrictions noted above.

4. Go to the Windows Services: Open Windows Control Panel and double-click **Administrative Tools**, then double-click **Services**.
5. A service with the title **“OBSIService”** should be present; double-click on it to open the properties.
6. Choose **"Automatic"** for the Startup Type and click **OK**.

Reboot Windows and OpenBSI starts using the specified NETDEF files. When using this option application parameters are unavailable.

Note: If, for some reason, OBSISERVICE becomes “stuck,” close the **Services** page and enter:

OBSISERVICE –REMOVE

at the DOS prompt. This stops OBSISERVICE without requiring you to reboot.

BSAUTO - (Windows XP Professional only)

Configure BSAUTO as follows:

1. To allow system startup, you need to install a startup program as a service. First, start an MS-DOS or command prompt session.
2. Change the directory to the OpenBSI installation directory.
3. Execute one of the following commands, depending upon how you want the system to start:

   BSAUTO -INSTALL *username password ndfname*

   which starts the service and uses the NETDEF files with the basename *ndfname*. If you include spaces in the *ndfname*, you must place quotation marks " " around *ndfname*. If you don't specify an *ndfname*, the system uses a default of CURRENT. **Note**: The username and password must correspond to a valid username/password combination you defined previously for those NETDEF files. If the user has no password, enter "blank" for the password, or make up a password.

   - **or** - use the command:

   BSAUTO -STD *username password ndfname*

   to run as a window with whichever set of NETDEF files you specify with *ndfname*. Again, username and password must correspond to a username/password combination you previously defined for the NETDEF files. If you include spaces in the *ndfname*, you must place quotation marks " " around *ndfname*. If the user has no password, enter "blank" for the password, or make up a password.

4. Go to the Windows Services. In XP, you open Windows Control Panel and double-click **Administrative Tools**, then double-click **Services**.
5. A service with the title **"OpenBSI Automatic Startup"** should be present; double-click on it to open the properties.
6. Choose **"Automatic"** for the Startup Type and click **OK**.
7. Reboot Windows and OpenBSI starts using the specified NETDEF files. When using this option application parameters are unavailable.

Note: If, for some reason, BSAUTO becomes "stuck," close the **Services** dialog box (if open) then enter:

BSAUTO –REMOVE

at the DOS prompt. This stops BSAUTO without requiring you to reboot, and also removes the “OpenBSI Automatic Startup” service from the services list.

6.1.3 Starting NETVIEW from the Command Line

To start NetView from the command line, enter:

NETVIEW *filename* -pt *username password*

Where:

filename is the name of the NETDEF (NDF) file. If you include spaces in the *filename*, you must place quotation marks “ “ around *filename*.

username is the username for that NETDEF file.

password is the password for that NETDEF file.

6.2 Starting OpenBSI Communications

Notes:

- In order to start communications using NetView, neither LocalView nor TechView can be running
- Starting OpenBSI communications refers to starting the OpenBSI communications driver. System configuration must have been successfully completed before actual communications with the network is possible.

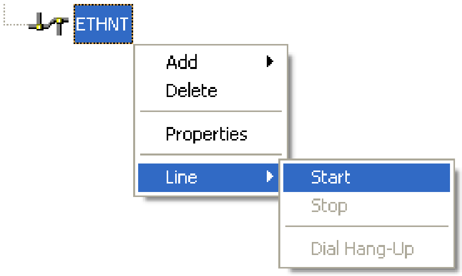
To start OpenBSI communications you start NetView, and then open an existing set of NETDEF files, which you previously configured (see *Section 6.4 Opening an Existing Set of NETDEF Files*).

If you configure a set of NETDEF files and named them CURRENT in the default OpenBSI directory, they start automatically when you start NetView.

If you do not have a configured set of NETDEF files, you must create one *first*. See *Section 6.8 Overview of Configuration,* later in this chapter, to see a list of steps which you must perform.

6.2.1 Restarting a Communication Line

If a configured set of NETDEF files is *already* running, but communications are not currently active, the communication line may be stopped. To re-start it, click on the icon for the communication line, then choose **Line>Start** from the pop-up menu.



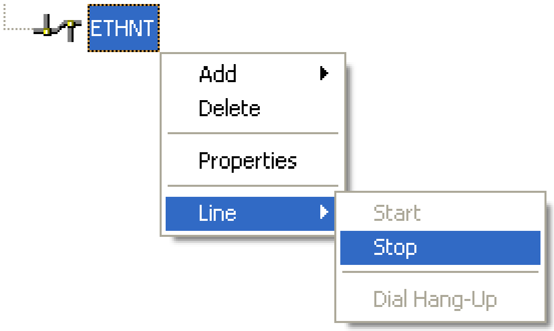
6.3 Stopping OpenBSI Communications

There are three ways to stop OpenBSI communications:

6.3.1 Method 1: Stop the Communication Line

This method keeps the current NETDEF files open; it simply shuts down communications for the selected communication line. To do this, click on the communication line icon, and press the right mouse button.

Choose **Line>Stop** from the pop-up menu**.**



6.3.2 Method 2: Close the Current NETDEF files.

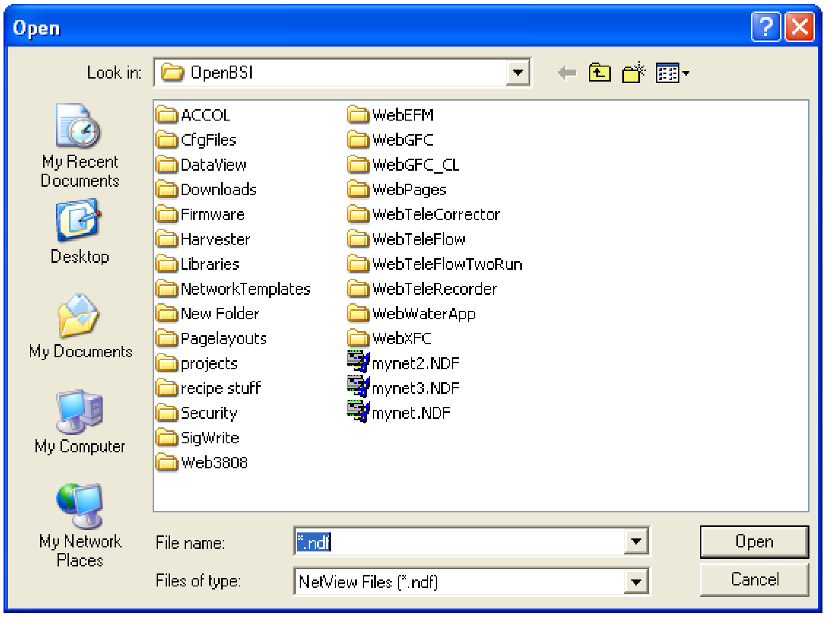
This method keeps NetView running, but shuts down the current NETDEF files, and thereby stops OpenBSI communications. To do this, click **File>Close**.

6.3.3 Method 3: Shut down NetView.

Shutting down NetView stops all OpenBSI communications for this NHP / workstation. To do this, click **File>Exit.**

6.4 Opening an Existing Set of NETDEF Files

To open an existing set of NETDEF files, click on the Open File icon, or, from the menu bar, click **File**>**Open** and the Open dialog box opens. Select the desired file name and click the **Open** button. **Note**:: Opening the NDF file automatically opens the associated NETDEF database files (*.MDB, *.LDB, and *.DSN), however, this is transparent to the user.



Look in: OpenBSI

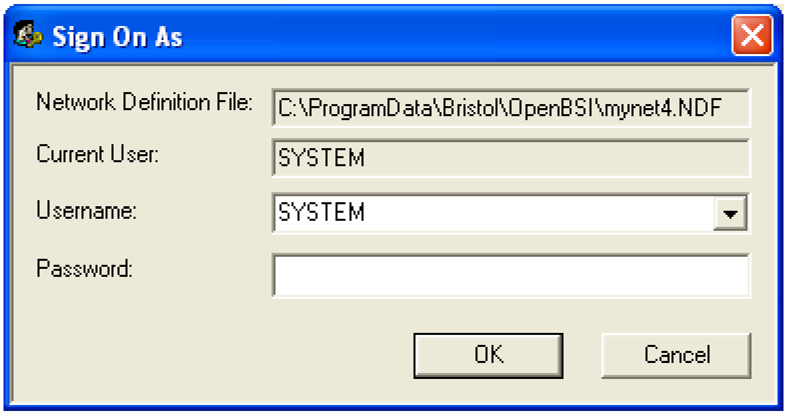
File name: *.ndf

Files of type: NetView Files (*.ndf)

Figure 6-2. Opening an Existing NETDEF File

After you select the NDF file, NetView prompts you to sign on with a **Username** and **Password**. The username and password must correspond to one of the username /password combinations stored in the NETDEF files. In some cases, there are no username /password combinations stored yet, in the NETDEF files. This is typically because you are either creating an all-new set of NETDEF files so these username/password combinations don't exist yet.

For an all-new sets of NETDEF files, a message box opens and notifies you that NetView has automatically created a user named "SYSTEM" without a password. Sign on by entering "SYSTEM" in the **"Username"** field, and leave the **"Password"** field blank, then click **OK.**



Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet4.NDF

Current User: SYSTEM

Username: SYSTEM

Password:

Figure 6-3. Sign On As dialog box

⚠ **Caution** **The SYSTEM user has full administrative privileges for OpenBSI, therefore, we strongly recommend you assign a password to the SYSTEM user before you place the system in operation. Otherwise, anyone reading this book, could gain access to your NETDEF files. For information on how to define OpenBSI users, and how to assign passwords to them, see *Section 6.10 Configuring OpenBSI Security***

6.5 Saving Changes to Your NETDEF Files

NetView *automatically* saves changes to the current NETDEF files, as you edit.

6.6 Erasing the Last Change Made to Your NETDEF Files

You can reverse *certain* changes made to your NETDEF files if you click **Edit>Undo**. For example, if you accidentally delete an RTU definition, you can restore it with this command.

Note: This only works for certain changes; some changes cannot be undone.

6.7 Renaming the Currently Running NETDEF Files

Click **File>Save As**. The Save As dialog box opens. Enter a name for the second copy of the NETDEF files in the **File Name** field and click **Save**. This renames the current NETDEF files; the original files remain unchanged.

6.8 Overview of Configuration

In order to get your OpenBSI system up-and-running, you need to complete the following steps:

1. Start NetView to create a new set of **Network Definition (NETDEF) File**s. See *Section 6.1 Starting NetView*.

2. Define a **Network Host PC (NHP)** using the **System Wizard**, and specify application-level parameters. See *Section 6.9 Defining an NHP and Application Parameters*
3. Sign-on as the SYSTEM user (this allows you to proceed with additional configuration.)
4. Configure OpenBSI security. See *Section 6.10 Configuring OpenBSI Security* (**Note**: You can optionally do this later in the configuration process, if that is more convenient for you.)
5. Add a network to your NHP using the **Network Wizard**. You can define a BSAP network (*Section* 6.14), an IP network (*Section 6.15*), or both types of networks.)

Notes:

- **Beginning with OpenBSI 5.9, you can have up to 1000 BSAP networks (including sub-networks).**
- **OpenBSI 5.5 through OpenBSI 5.8 Service Pack 2 supported up to 99 BSAP networks (including sub-networks).**
- **Prior to OpenBSI 5.5, you could only define one BSAP network, however, you could add multiple BSAP sub-networks underneath IP RTUs.**

6. Add remote process controllers (RTUs) to your network using the **RTU Wizard.** The type of RTU you add must match the type of network you define: you add RTUs running BSAP to the BSAP network (or sub-networks) as described in *Section* 6.16; you add IP RTUs to IP network(s) as described in *Section 6.17*.
7. Define Communication Line(s) using the **Comm Line Wizard** (see *Sections 6.18* and *6.19*).You can define up to 5000 communication lines, if necessary.
8. If you want to create additional OpenBSI workstations, you need to determine how you want to handle **proxy** RTU access (*Section 6.26*.)

6.9 Defining an NHP and Application Parameters

A **Network Host PC (NHP)** is the first of four basic components you need to configure in order for OpenBSI communications to function. You define it using the **System Wizard**.

6.9.1 What is A Network Host PC (NHP)?

A Network Host PC is any OpenBSI workstation. Typically, you connect some ControlWave or Network 3000-series remote process controllers (RTUs) to the OpenBSI workstation. When you connect the RTUs we say that the workstation serves as the “host” for those RTUs. You must define those RTUs in the Network Definition (NETDEF) Files at this NHP. Any *other* NHP can only gain access to *these RTUs* if *this* NHP grants access to the RTUs. **Note**: If an OpenBSI Workstation has no attached RTUs, we still technically consider it to be an NHP, even though it does not host any RTUs.

How do NHPs work?

In a BSAP or EBSAP network, the Network Host PC (NHP) performs the function of the network master node or level 0 node; it polls all Level 1 controllers (RTUs) for data. (See *Figure 6-4*.)

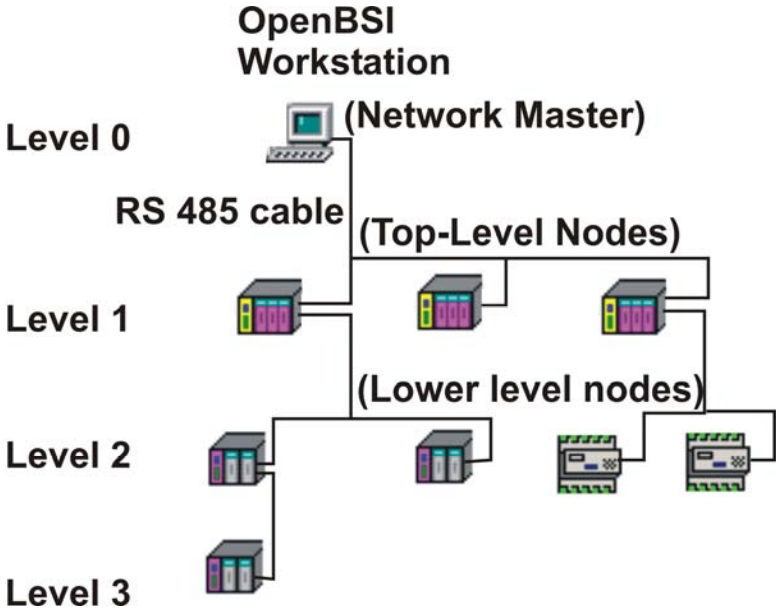


Figure 6-4. BSAP Network

For an IP network (and also BSAP or EBSAP networks) the Network Host PC (NHP) serves as a central location for obtaining address information about RTUs and workstations in this portion of the network. The Network Definition (NETDEF) Files, generated by NetView, store the address information for this portion of the network.

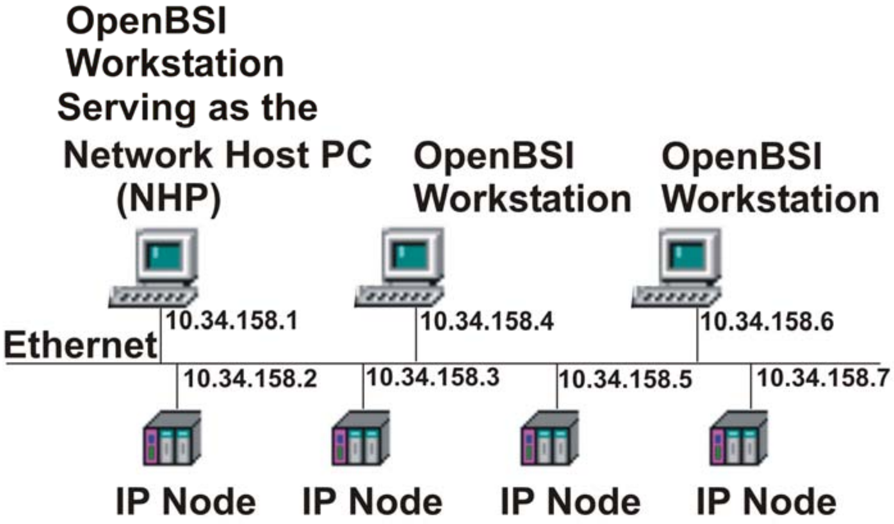


Figure 6-5. IP Network

Any OpenBSI workstation, whether or not it has attached RTUs of its own, can communicate with any RTU in the network, provided that the NHP for that RTU grants the workstation access to the RTU.

The concept of the NHP is easier to understand if you consider an analogy to the public telephone system. Most people remember a certain set of phone numbers for people they call frequently, but occasionally, they need to call someone whose number they don't know, so they call directory assistance and ask for the correct phone number. The NHP performs the exact same function as the directory assistance operator; except instead of giving out phone numbers, it provides address information, on request, for connections to any node in its section of the network.

In addition, following our same analogy, the directory assistance operator can generally do one of two things when you call for information. If you cannot call someone directly yourself, one thing the directory assistance operator can do is *establish a connection for you*. This same concept applies with respect to NHPs. If a particular OpenBSI Workstation needs to communicate with an RTU associated with another NHP, the other NHP can relay messages between its RTU and the inquiring workstation. We call this proxy access; see *Figure 6-6:*

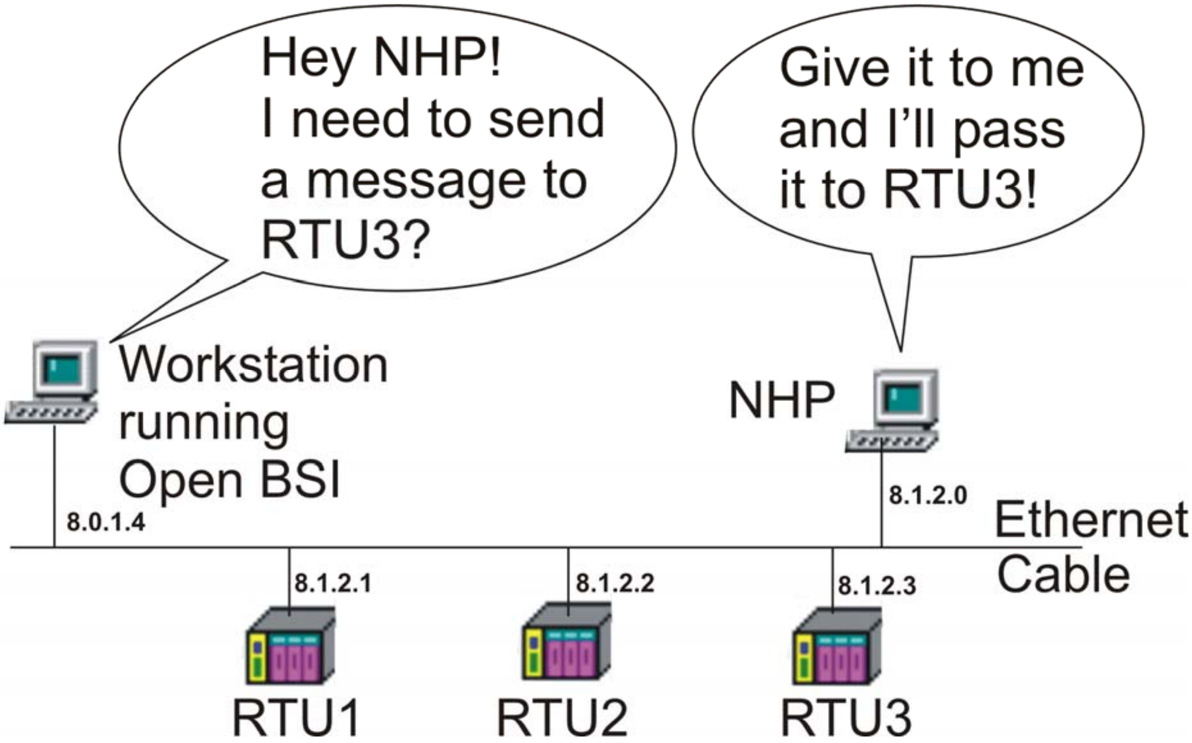

Hey NHP! I need to send a message to RTU3?
Give it to me and I'll pass it to RTU3!
Workstation running Open BSI
8.0.1.4
NHP
8.1.2.0
Ethernet Cable
8.1.2.1
8.1.2.2
8.1.2.3
RTU1
RTU2
RTU3

Figure 6-6. Proxy Access

The second thing that can happen when you call for information is that the directory assistance operator just gives you the number of the person you want to call and says "call them yourself, directly!" This also applies in the case of NHPs. An NHP can grant **proxy direct access** to a workstation that requests access to one or more of its RTUs. That workstation can then contact the RTU directly, without the need to pass messages through the RTU's NHP. **Note**: Proxy direct access is only possible in IP networks, and requires the definition in the Comm Line Wizard (at the workstation requesting access) of an IP communication line for the proxy RTUs. *Figure 6-7* depicts proxy direct access.

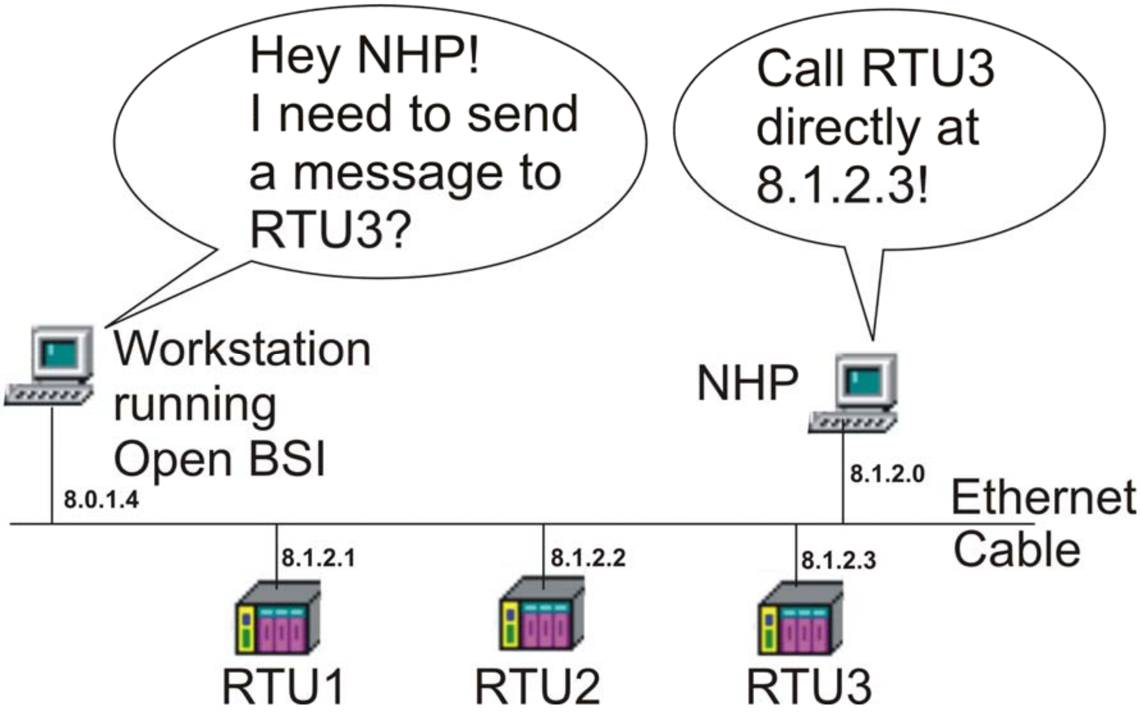

Hey NHP! I need to send a message to RTU3?
Call RTU3 directly at 8.1.2.3!
Workstation running Open BSI
NHP
8.0.1.4
8.1.2.0
Ethernet Cable
8.1.2.1
8.1.2.2
8.1.2.3
RTU1
RTU2
RTU3

Figure 6-7. Proxy Direct Access

What are the advantages of using NHPs?

All any OpenBSI workstation in the network needs to know in order to communicate with an RTU is the IP address of the NHP for that RTU, and the RTU name. This simplifies network configuration because if the address of an RTU should change, for any reason, only its NHP needs to know. Any other workstation finds out from the NHP.

Also, because you can have multiple NHPs, each of which is responsible for a portion of your network, your supervisory control is truly distributed among multiple sites. Through proxy access, any OpenBSI workstation can communicate with RTUs belonging to any NHP in the network, provided that it knows the name of the RTU, and the IP address of the NHP for that RTU.

NHPs can be redundant

The NHP can belong to a redundant pair, in which two OpenBSI workstations share the same NHP name. If the primary of the two workstations experiences a failure, the secondary workstation assumes the NHP duties. See *Section 6.9.6 - System Wizard: Step 3 of 3*.

Every OpenBSI system must have at least one NHP

Every OpenBSI system requires at least one NHP. You cannot delete the NHP from your system.

6.9.2 Activating the System Wizard

To open a new set of NETDEF files, click the “New File” icon, shown at left, or click **File>New**. The “Save As” dialog box opens; enter a name for this set of NETDEF files, and click **Save**. The System Wizard activates.

6.9.3 Navigating Between Pages of the System Wizard

Click either **Next** or **Back**, whichever is appropriate.

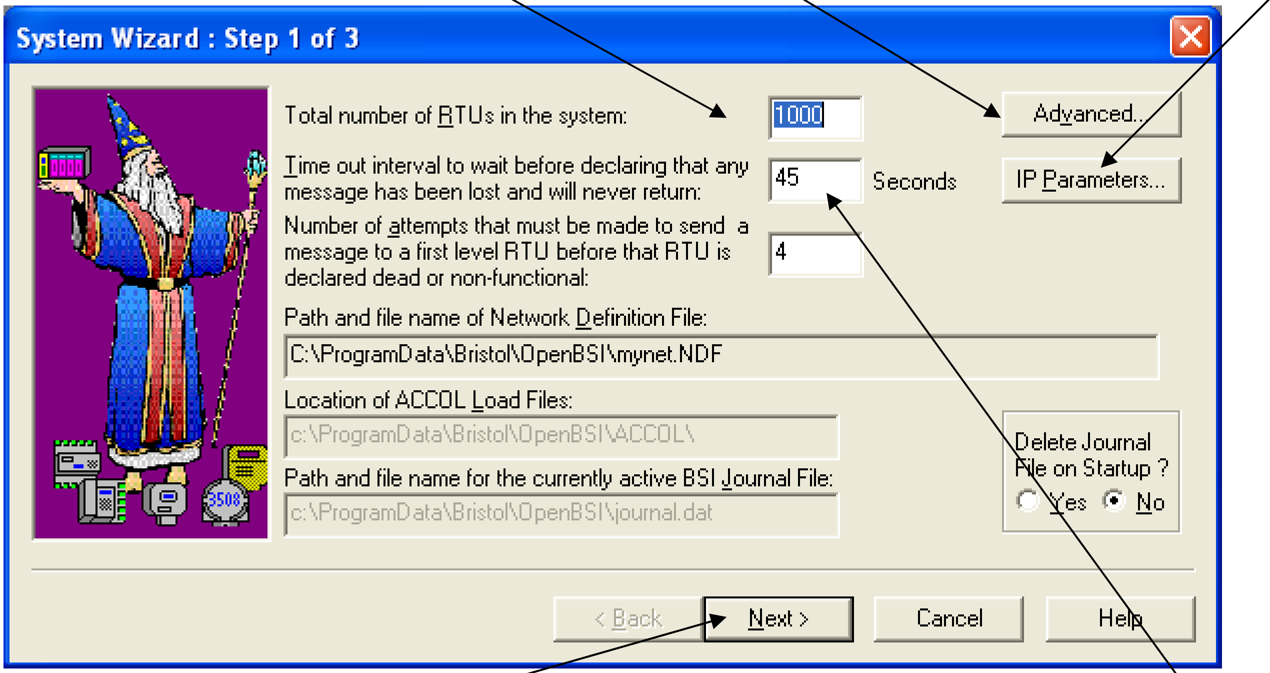
6.9.4 System Wizard: Step 1 of 3

After you start NetView, and save your NETDEF files, the System Wizard activates so you can define various system constants, and Network Host PC (NHP) information.

This number defines the maximum number of RTUs your system can support. This must be at least “100.”

Most users can leave the “Advanced Parameters” at their default values.

These only apply when defining an IP network.



System Wizard : Step 1 of 3

Total number of RTUs in the system: 1000

Time out interval to wait before declaring that any message has been lost and will never return: 45 Seconds

Number of attempts that must be made to send a message to a first level RTU before that RTU is declared dead or non-functional: 4

Path and file name of Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet.NDF

Location of ACCOL Load Files: c:\ProgramData\Bristol\OpenBSI\ACCOL\

Path and file name for the currently active BSI Journal File: c:\ProgramData\Bristol\OpenBSI\journal.dat

Delete Journal File on Startup ? ○ Yes ● No

Click here to go to page 2.

A controller (node) must respond to a program (such as DataView) within this time period. If no response is received, that node is said to have “timed out.”

Figure 6-8. System Wizard – Step 1 of 3

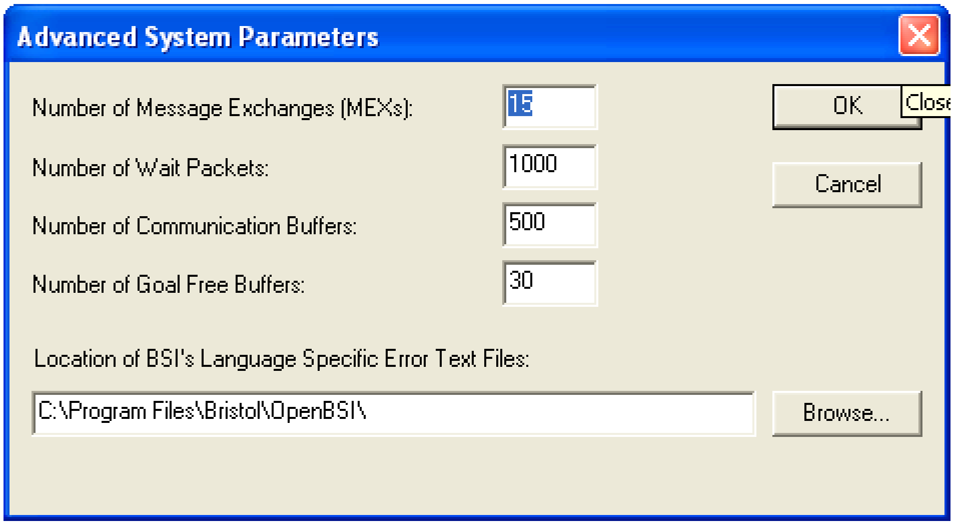
On the first page of the System Wizard, you may define the following items, or use the defaults NetView provides.

Field	Description
Total number of RTUs in the system	This is actually the *maximum* number of remote process controllers (RTUs) in your system. The default is 1000. (The minimum value for this is 100; if you have less than 100 RTUs, set the value to 100). **Note**: This number must include *all* RTUs from all networks in your system whether IP, BSAP (from any level), EBSAP, or proxy RTUs. **Note**: OpenBSI has an absolute limit of 4,999 for the total number of RTUs in a system.
Time out interval to wait before declaring that any message has been lost and will never return	An RTU must respond to a program (such as DataView, NetView, OpenEnterprise, etc.) within this number of seconds. If the program receives no response within this time, we say the node has "timed out." (OpenBSI rounds this value up to the nearest 5 seconds.) Give special consideration when you specify this value in a BSAP or EBSAP network: You must consider the baud rate, number of network levels, and poll periods when you choose this value. Never make the value less than the sum of the poll periods for each level of the network, but also don't make it too large, since that delays the initiation of a retry, if an attempt to send a message fails.
Number of attempts that must be made to send a message to a first level RTU before that RTU is declared dead or non-functional	This is the default number of times OpenBSI attempts to communicate with a directly connected (first level) BSAP RTU.
Path and filename of Network Definition File	This field displays the location and name of the NDF Network Definition (NETDEF) File created by NetView. The default location is the \ProgramData\Bristol\OpenBSI sub-directory. **Note**: If you copy the MDB, LDB, NDF, and DSN files to a different directory, you must *manually* edit the DBQ path in the DSN file to reflect the new location.
Location of ACCOL Load files	This is the location where ACCOL load files (.ACL) as well as ACCOL source files (.ACC) are ACCOL object files (.ACO) are stored on this PC. The default location is the \ProgramData\Bristol\ACCOL sub-directory. (Network 3000 only)
Path and file name for currently active BSI journal file	This is the location and name of the journal file. OpenBSI maintains this journal of important system events such as when OpenBSI was started or stopped.
Delete Journal File on Startup?	When you select **Yes**, OpenBSI deletes the previous journal file, and opens a new journal file, each time OpenBSI starts. When you select **No**, the system appends new journal entries to the existing journal

	file.
Advanced Parameters	Click here only if you want to set parameters for more complex communications configurations, using the Advanced Communication Parameters dialog box.
IP Parameters	Click here only if you want to set IP parameters for an IP network.

Advanced System Parameters dialog box

Most users do not need to edit the advanced parameters. If you need to, though, click the **Advanced** button on page 1 of the System Wizard to bring up the Advanced System Parameters dialog box. See *Figure 6-9.*



Number of Message Exchanges (MEXs): 15

Number of Wait Packets: 1000

Number of Communication Buffers: 500

Number of Goal Free Buffers: 30

Location of BSI's Language Specific Error Text Files:

C:\Program Files\Bristol\OpenBSI\

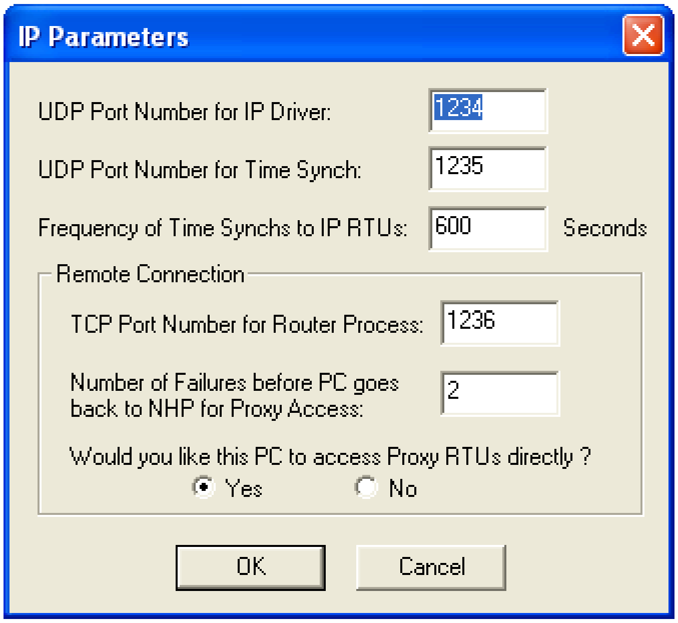
Figure 6-9. Advanced System Parameters dialog box

Field	**Description**
Number of Message Exchanges (MEXs)	Every application program on the NHP which communicates simultaneously using OpenBSI requires a **message exchange**. Message exchanges serve as "mailboxes" through which programs can send and receive messages. For example, if NetView, DataView, and Intellution® FIX® run simultaneously, they use a total of three message exchanges. Set the number of message exchanges to the maximum number of simultaneous applications which communicate using OpenBSI; this number must range from 1 to 127. You should always set this to *at least* 10.
Number of Wait Packets	This number is a limit on the "backlog" of total un-received response messages which programs that communicate using OpenBSI can accumulate. If, at any one time, the programs using OpenBSI wait for a total number of response messages equal to the number of wait packets, then the system forces these programs to wait for some of the messages to either "time out" or arrive. The number of wait packets must exceed 50, and also exceed the number of communication buffers (see below). The default number of wait packets is 1000.
Number of	This is the number of temporary communication

Communication Buffers	buffers OpenBSI uses at this PC. OpenBSI uses the buffer to hold a message that awaits transmission to an RTU, but which the system cannot send yet. The minimum number of buffers is ten. In general, the more active nodes in the network, the more buffers the system requires. Normally, you should define at least 50 buffers. The default number of buffers is 500.
Number of Goal Free Buffers	OpenBSI attempts to keep a ready supply of buffers available for general use. If the number of buffers available is less than this value, OpenBSI copies some data into local buffers of the currently running process. Set the number of goal free buffers to one half of the total number of communication buffers, or around 20, whichever is smaller.
Location of BSI's Language Specific Error Text Files	Users who purchase the OpenBSI Development Kit can edit the message text within the error text files (BSSTATUS.TXT and BSJOURN.TXT) to conform to the language requirements of their system for example, to create error messages in Spanish, French, etc. If you want to specify a different location than the default directory, you can type it in directly, or use the **Browse** button to locate the new directory.

IP Parameters dialog box

This dialog box configures certain parameters for your IP network, if you have one. To access IP parameters, click the **IP Parameters** button on page 1 of the System Wizard (*Figure 6-8*).


IP Parameters

UDP Port Number for IP Driver: 1234

UDP Port Number for Time Synch: 1235

Frequency of Time Synchs to IP RTUs: 600 Seconds

Remote Connection

TCP Port Number for Router Process: 1236

Number of Failures before PC goes back to NHP for Proxy Access: 2

Would you like this PC to access Proxy RTUs directly ?
● Yes ○ No

Figure 6-10. IP Parameters dialog box

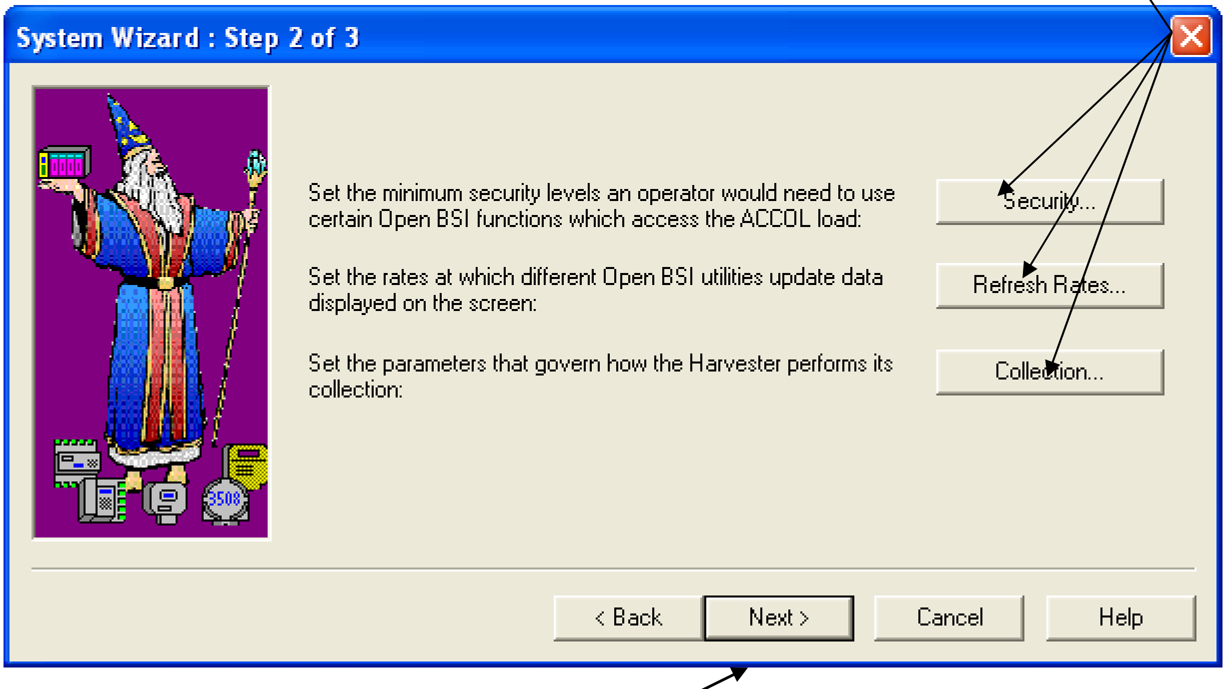
Field	Description
UDP Port Number for IP Driver	Specify the UDP port number (socket number) the IP driver uses. The driver uses this value to split message traffic along different “streams”. *All PC's or RTU's which you want to communicate with each other must share the same UDP port number.* In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, the system uses a default value from the NETDEF files. (**Note:** The term “UDP Port” has no actual relationship with the physical communication ports.) Never set this to 0.
UDP Port Number for Time Synch	Specify the UDP port number (socket number) the IP driver uses for time synchronization of the RTU's. All PC's or RTU's must share this same value, or else they cannot receive time synchronization messages. In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, the system uses a default value from the NETDEF files. (**Note:** The term “UDP Port” has no actual relationship with the physical communication ports.) Never set this to 0.
Frequency of Time Synchs to IP RTUs	This value specifies (in seconds) how often the IP driver sends time synchronization messages to IP RTUs.
Remote Connection **TCP Port Number for Router Process**	This is the TCP port number used for communication between message routers. All PC's or RTU's must share this same value, or else they cannot use the same message router. In a sense, this value is like a common password which each node in the network must know. If you don’t enter a value, NetView uses a default value from the NETDEF files. (**Note:** The term “TCP port” has no actual relationship with the physical communication ports.) **Note**: The **TCP Port Number for Router Process** should *never* be 0.
Number of Failures before PC goes back to NHP for Proxy Access	When using Proxy Direct Access, if this PC’s attempts to send data to a proxy RTU fail, this count is the maximum number of failures the system allows before this PC must contact the RTU's NHP to see if communication parameters have changed.
Would you like this PC to access Proxy RTUs directly?	If this PC needs to communicate with RTUs associated with *another* NHP (i.e. proxy RTUs), and you select **Yes**, it means that this PC requests that the other NHP provide the actual IP addresses of the proxy RTUs. This allows direct communication between this PC and the proxy RTUs, and bypasses the NHP on future communication requests. This option only works for IP networks, and in order to function, it requires that you define a communication line at this PC (using the Comm Line Wizard) that accepts direct communication with the proxy RTUs.

	If you select **No**, it means that for this PC to communicate with proxy RTUs, all messages must pass *through* the NHP associated with the proxy RTUs first. This option prohibits direct communication between this PC and those proxy RTUs.

6.9.5 System Wizard: Step 2 of 3

The second page of the System Wizard (*Figure 6-11)* defines various application parameters for this OpenBSI workstation.

Usually you can leave these at their defaults unless your system has some special requirements.



Set the minimum security levels an operator would need to use certain Open BSI functions which access the ACCOL load:

Set the rates at which different Open BSI utilities update data displayed on the screen:

Set the parameters that govern how the Harvester performs its collection:

Click here to go to page 3.

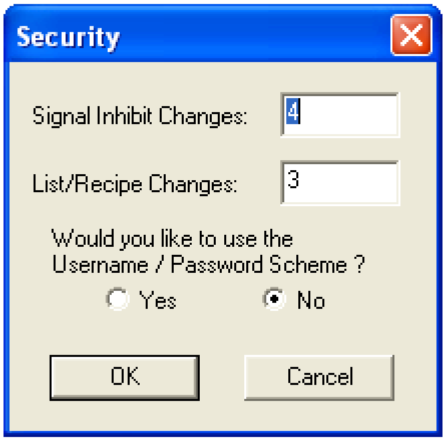
Figure 6-11. System Wizard – Step 2 of 3

You can make on-line changes to the parameters you enter here, later, according to the instructions in *Viewing / Modifying Application Parameters*.

Field	Description
Set the minimum security levels an operator would need to use certain OpenBSI functions which access the ACCOL load:	Operators must possess the proper security level in order to access certain signals and structures in the RTU. Because various OpenBSI utilities provide access to these signals and structures, security levels in the ACCOL load restrict access to them. ACCOL supports six different levels of security access (1 to 6), as well as security level 0, which indicates no access. Operators who possess a particular security level can access any signal or structure with a security level *less than or equal to* their own. For example, an operator who signs on to an RTU with the security level of 3 can only access those system functions which accept security levels 1 through 3; functions which require security levels of 4 or above are inaccessible. By clicking the **Security** button, you can call up the Security dialog box (*Figure 6-12)* in which you can specify the minimum security levels needed to change certain structures.
Set the rates at which different OpenBSI utilities update data displayed on the screen:	Click **Refresh Rates** to call up the Refresh Rates dialog box (*Figure 6-13)* and specify the rate at which signal, data array, and communication statistics update on the screen. You cannot configure rates faster than one second.
Set the parameters that govern how the Harvester performs its collection:	Click the **Collection** push button to specify certain communication parameters for the OpenBSI Harvester software. (See *Figure 6-14.*)

Security dialog box

This dialog box specifies certain minimum security levels an operator requires to change certain system structures.



Security

Signal Inhibit Changes: 4

List/Recipe Changes: 3

Would you like to use the Username / Password Scheme ?

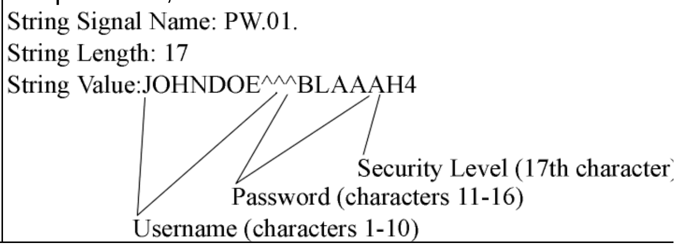
○ Yes ● No

Figure 6-12. Security dialog box

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td><b>Signal Inhibit Changes</b></td><td>This specifies the minimum security level an operator needs to alter the value of the manual inhibit/enable (MI/ME), control inhibit/enable (CI/CE) or alarm inhibit/enable (AI/AE) status flags for ACCOL signals. The default security level for this function is 4.</td></tr>
<tr><td><b>List/Recipe Changes</b></td><td>This specifies the minimum security level an operator needs to change the configuration for the list and recipe features of DataView. The default security level for this function is 3.</td></tr>
<tr><td><b>Would you like to use the Username / Password Scheme?</b></td><td>There are two mutually-exclusive methods for defining operator security levels:

<b>Password only</b> (default method, chosen when you select <b>No</b>): This method requires you to define six different passwords (also referred to as “security codes”) within each ACCOL load, one for each security level. Each password is from one to six alpha-numeric characters in length, with no spaces allowed. If using letters, you must CAPITALIZE them. For every operator who requires the same level of access, you issue them the same password. The default passwords (which you should change) appear in the table, below. Beginning with ACCOL Workbench (RM) 1.0 and ACCOL Workbench (PM) 6.2, the system automatically encrypts these passwords in the ACCOL source file, and, optionally, in the ACO/ACL file as well. Encryption provides a greater measure of security against unauthorized access.

<table>
<tr><th>Security Level</th><th>Default Password for this Level</th></tr>
<tr><td>1</td><td>111111</td></tr>
<tr><td>2</td><td>222222</td></tr>
<tr><td>3</td><td>333333</td></tr>
<tr><td>4</td><td>444444</td></tr>
<tr><td>5</td><td>555555</td></tr>
<tr><td>6</td><td>666666</td></tr>
</table>
See the <i>ACCOL Workbench User Manual</i> (document# D4051) for more information about passwords.

<b>Username and Password:</b> (Optional method, chosen when you select <b>Yes</b>): An alternate method is to create string signals within each ACCOL load that contain usernames, passwords, and security levels. This method does not use encryption. Each string signal requires a string length of 17. The signal name must follow the format “PW.<i>nn</i>” where you enter “PW,” the base name, exactly as shown, and you replace <i>“nn”</i> with a number ranging from 01 to 32. For example, PW.01., PW.02., etc. This method reserves the first ten characters of the string for the operator's username, the next six characters for the password, and reserves the 17th character for the

String Signal Name: PW.01.
String Length: 17
String Value:JOHNDOE^^^BLAAAH4
Security Level (17th character)
Password (characters 11-16)
Username (characters 1-10)

</td></tr>
</table>

	operator's security level (0 to 6). You can optionally create an analog signal called “SIGNON..” that the system uses in conjunction with the EAudit Module to keep a history of which users sign on.

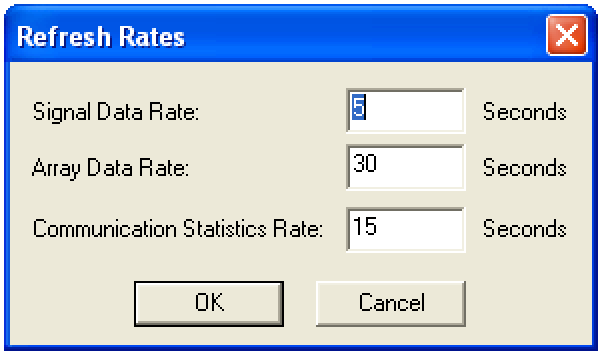
Click **OK** to save your changes and exit the Security dialog box.

Notes about Other Security Issues:

- For information on configuring OpenBSI security, which restricts access to NETDEF files, as well as certain utilities such as the Alarm Router, and Signal Writer, see *Section 6.10 Configuring OpenBSI Security* later in this manual.
- To modify application parameters, to configure networks, to configure RTUs, and to configure communication lines, you must sign on *first* using OpenBSI security. See *Section 6.9.7. Signing on to the System.*
- To gain access to an RTU for various functions in DataView, or other OpenBSI tools, you need to sign-on to the RTU. See *Chapter 8* for details.
- For information on setting a password to prevent unauthorized changes to RTU flash configuration parameters, see *Chapter 5*.
- For information on setting the read and write security level of individual ACCOL signals, see the *ACCOL Workbench User Manual* (document# D4051).
- For information on setting UDP and TCP port numbers, and restricting proxy access of a workstation, see *Section* 6.9.4 earlier in this chapter, for details.
- For details on exporting proxy files, which can grant a workstation access to the RTU's of another NHP see *Section 6.26 Setting up Proxy Access*.

Refresh Rates dialog box

This dialog box specifies the rates at which data updates on the screen in certain OpenBSI programs.



Signal Data Rate: 5 Seconds

Array Data Rate: 30 Seconds

Communication Statistics Rate: 15 Seconds

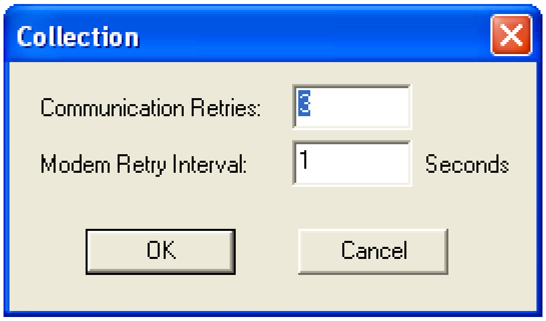
Figure 6-13. Refresh Rates dialog box

Field	Description
Signal Data Rate	This is the rate (in seconds) at which DataView updates the signal/variable values it currently shows in its window. The default signal data rate is 5 seconds.
Array Data Rate	This is the rate (in seconds) at which DataView updates the data array data it currently shows in its window. The default data array rate is 30 seconds.
Communication Statistics Rate	This is the rate (in seconds) at which the Remote Communication Statistics tool updates the data it currently shows in its window. The default rate is 15 seconds.

Click **OK** to save your changes and exit the Refresh Rates dialog box.

Collection dialog box

This dialog box specifies certain parameters for the OpenBSI Harvester software.



Communication Retries: 3

Modem Retry Interval: 1 Seconds

Figure 6-14. Collection dialog box

Field	Description
Communication Retries	This specifies the number of unsuccessful attempts the Harvester makes to collect data from an RTU, before it declares an error. If the Harvester uses a modem to access the RTUs, this same number defines the number of modem retries the system makes. The default value for this parameter is 3.
Modem Retry Interval	This defines the rate at which the Harvester examines the Modem Confirm signal, to see if it is ON. The default value for this parameter is 1 second. (This is used where an application uses a pair of signals to notify that a modem should turn ON/OFF to allow for data collection.)

Click **OK** to save your changes.

When you finish with the entries on Page 2 of the System Wizard, click **Next** to go to Page 3.

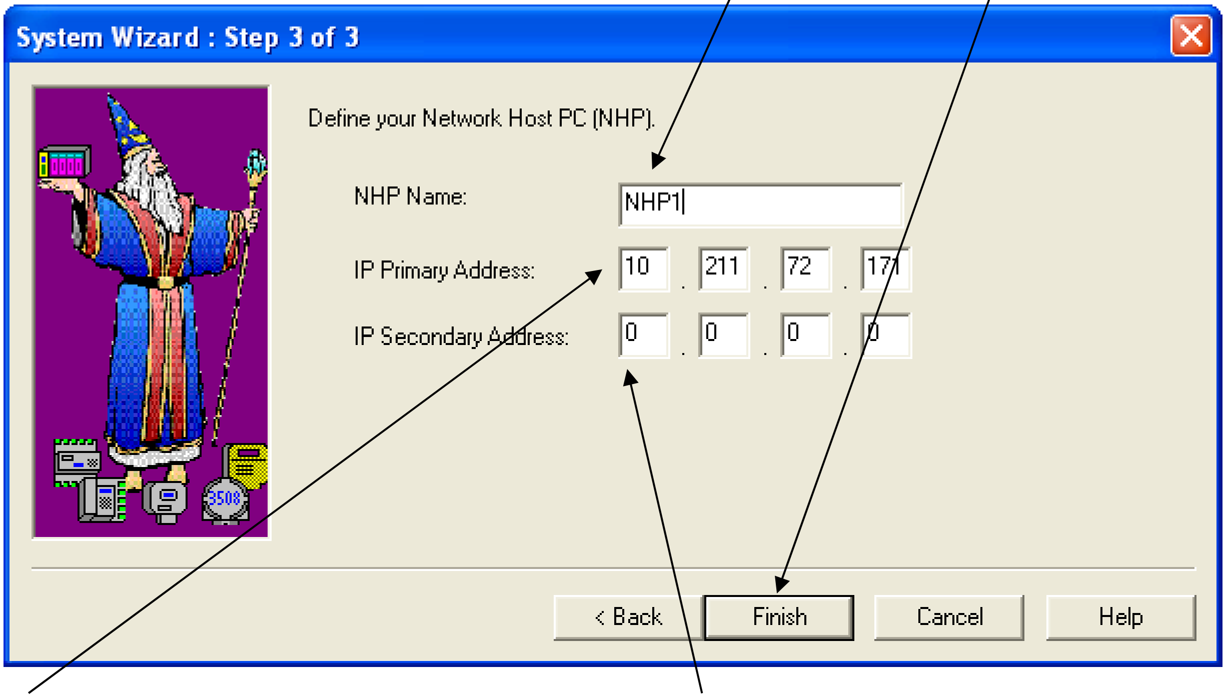
6.9.6 System Wizard: Step 3 of 3

The third page of the System Wizard defines parameters specific to this Network Host PC such as the name for the NHP, and the IP address(es) for the NHP.

In a pure BSAP network, you may leave these parameters at their defaults. If, however, this PC resides on an IP network, these parameters are critically important.

Name for the current PC (or pair of PCs if you are defining redundant NHPs).

Click "Finish" to exit the System Wizard.



System Wizard : Step 3 of 3

Define your Network Host PC (NHP).

NHP Name: NHP1

IP Primary Address: 10 . 211 . 72 . 171

IP Secondary Address: 0 . 0 . 0 . 0

IP Primary Address is the IP address (in dotted decimal format) for the current workstation, or if this workstation is part of a redundant pair of workstations, the IP address of the "A" unit.

IP Secondary Address is left blank unless this workstation has two IP connections, or it is part of a redundant pair. If it is part of a redundant pair this is the IP address of the "B" unit.

Figure 6-15. System Wizard – Step 3 of 3

Field	Description
NHP Name	This is a name which you assign to the current PC (or pair of PCs if you define redundant Network Host PCs). The name must be unique in the system. (OpenBSI uses a default name it obtains by querying TCP/IP information you already configured on the PC.) **Note:** The NHP name must start with a letter, and we recommend it include only alpha-numeric characters and underscores. Spaces and apostrophes will not work, and in general, you should avoid other characters or punctuation marks.

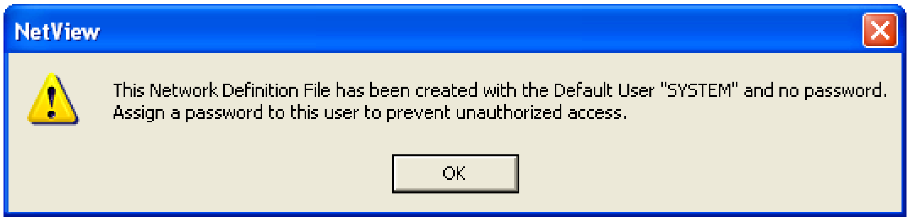
IP Primary Address	This is the primary IP address of the NHP in dotted decimal format. OpenBSI shows a default IP address it obtains by querying the PC for TCP/IP information. **For BSAP networks:** If you define a purely BSAP network, and you plan no IP connections at any time in the future, and you have no other workstations in your system, you can leave this field at its default. **For IP networks:** If this is a single non-redundant PC workstation in an IP network, with a single IP connection, enter the IP address of this PC. If this is a single non-redundant PC workstation with *two* IP connections, e.g. two Ethernet ports, enter the address of the primary connection. If this PC workstation belongs to a redundant pair of workstations (redundant NHPs) enter the IP address of the "A" unit of the redundant pair.
IP Secondary Address	This is the secondary IP address in dotted decimal format. **For BSAP networks:** If you define a purely BSAP network, and you plan no IP connections at any time in the future, you can leave this field at its default. **For IP networks:** If this is a single non-redundant PC workstation in an IP network, with a single Ethernet connection, **leave this field blank**, since there is no IP secondary address. If this is a single non-redundant PC workstation with *two* IP connections, e.g. two Ethernet ports, enter the address of the secondary connection. If this PC workstation belongs to a redundant pair of workstations (redundant NHPs) enter the IP address of the "B" unit of the redundant pair.

⚠ **Caution**

This is your last opportunity to change entries in the System Wizard before you click "Finish" to exit, Once you exit the System Wizard, many of your entries cannot be changed online in NetView and if you want to change them, you must use the Off-Line Database Configuration Utility (described in *Appendix B*). If you need to make any changes, use the "Back" button to go to the appropriate page before you exit the wizard.

Click **Finish** to exit the System Wizard.

After NetView processes your System Wizard data, it presents the following message box (See *Figure 6-16.*)



This Network Definition File has been created with the Default User "SYSTEM" and no password. Assign a password to this user to prevent unauthorized access.

Figure 6-16. Default User "SYSTEM" message box

This message box tells you that this new set of NETDEF files has a single user who can access it for editing purposes. That user has the name “SYSTEM” and does not require a password. When you click **OK** OpenBSI automatically logs you on as the SYSTEM user.

When signing on, you can leave the “SYSTEM” user with the “Password” field blank to **disable** OpenBSI security; allowing you to avoid the requirement to log on repeatedly during initial configuration activities.

⚠ **Caution** **We strongly recommend that when you complete installation and configuration activities that you assign a password for the SYSTEM user. See *Section 6.10* for more information on OpenBSI security.**

6.9.7 Signing on to the System

You must sign on to the system before you attempt to:

- Modify application parameters
- Define a network
- Define RTUs
- Define communication lines
- Assign usernames and passwords
- Use certain other OpenBSI tools such as Signal Writer, Alarm Router, or DDE Server

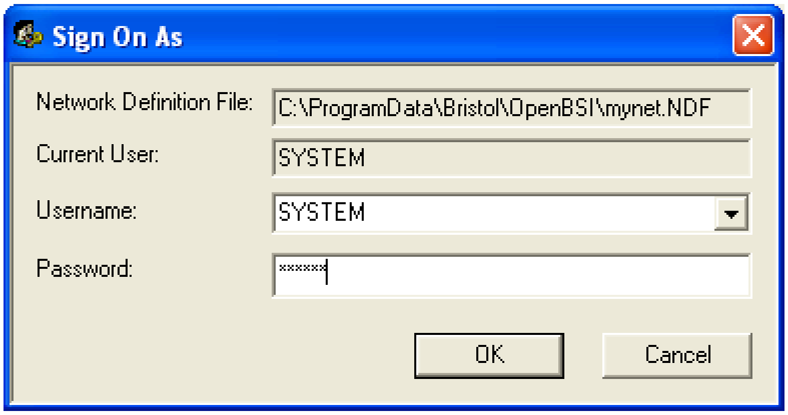
An OpenBSI workstation only allows one user to be signed on at any one time.

To activate the Sign On dialog box, click **Security>Sign On**

-or-

Click the Sign-On icon (shown at left). .

The Sign On dialog box opens.



Sign On As

Network Definition File: C:\ProgramData\Bristol\OpenBSI\mynet.NDF

Current User: SYSTEM

Username: SYSTEM

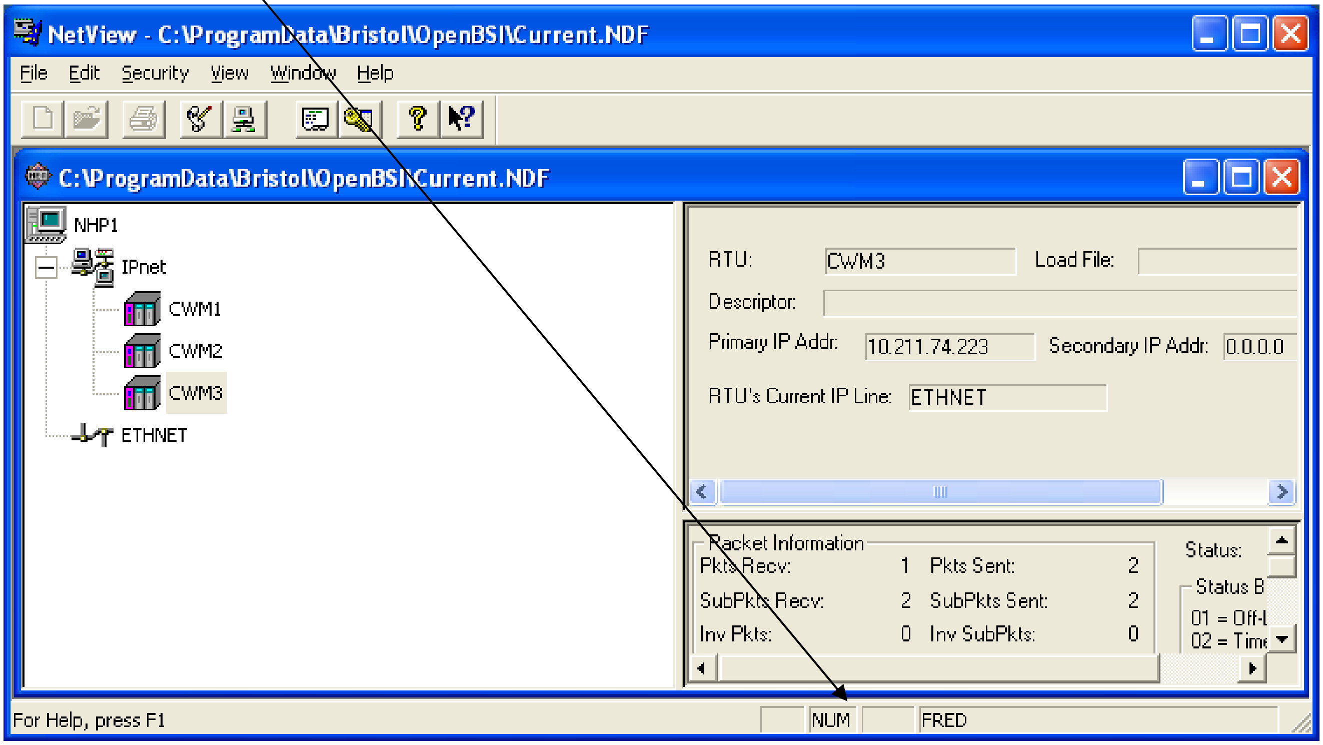
Password: ******

Figure 6-17. Sign On dialog box

Enter your **Username** and **Password** and click **OK**.

Note: If you just ran the System Wizard, and you just created an all new set of NETDEF files, there is only one user currently defined, called, “SYSTEM” and you are already signed on automatically as the SYSTEM user. Initially, the SYSTEM user has no password, so when you sign on, subsequently, you can sign on with just the “SYSTEM” **Username** and leave the **Password** field blank. We recommend, however, that you assign a password for the SYSTEM user, later. See *Section 6.10 Configuring OpenBSI Security* later in this chapter. Once you sign on, you are the currently logged on user, and NetView displays your username in the lower right corner of the NetView window (see Figure 6-18*)*. In addition, NetView makes an entry in the OpenBSI journal file that indicates the time that you signed on as this user.

Name of the currently logged on user appears here.


NetView - C:\ProgramData\Bristol\OpenBSI\Current.NDF
File
Edit
Security
View
Window
Help
C:\ProgramData\Bristol\OpenBSI\Current.NDF
NHP1
IPnet
CWM1
CWM2
CWM3
ETHNET

RTU: CWM3

Load File:

Descriptor:

Primary IP Addr: 10.211.74.223

Secondary IP Addr: 0.0.0.0

RTU's Current IP Line: ETHNET

Packet Information

Pkts Recv:	1	Pkts Sent:	2
SubPkts Recv:	2	SubPkts Sent:	2
Inv Pkts:	0	Inv SubPkts:	0

Status:

Status B

01 = Off-l

02 = Time

For Help, press F1 | NUM | FRED

Figure 6-18. Currently Logged On User

6.9.8 Signing Off

To sign off the current user: Click **Security> Sign Off**

Another way to sign off the current user, is to sign on as a different user. To do this, click **Security>Sign On**, and the Sign On as dialog box opens. Specify the username and password of a different user, and click **OK**.

6.10 Configuring OpenBSI Security

Note: The subject of OpenBSI security is entirely separate from the subject of security at the RTU. Please do not confuse the two issues.

In order to open any set of NETDEF files, you must supply the username and password associated with those NETDEF files. Because OpenBSI communications requires NETDEF files, and because most OpenBSI utilities require active communications, this prevents unauthorized users from starting the OpenBSI network, and running the various OpenBSI utilities that use it.

6.10.1 Users, Usernames, and Passwords

- We call any person who logs into the OpenBSI system a **user**.
- OpenBSI identifies each user by their **Username** and **Password** combination.
- Although OpenBSI does not enforce a limit on the number of users, only one user can be logged onto an OpenBSI workstation at any one time.

A username or password consists of any combination of up to 16 alpha-numeric characters (letters and numbers). You cannot include spaces within a username or password.

Passwords are case sensitive, i.e. OpenBSI considers the password abc123, and the password ABC123 to be *different* passwords, even though you spell them the same.

⚠ **Caution** **We strongly recommend that you configure OpenBSI security. Beginning with OpenBSI Version 5.3, however, if you choose to leave your OpenBSI system without security, you can do so by not assigning any password to the default user SYSTEM. When the default user SYSTEM has no password, you can start NetView automatically, without any prompt for a password.**

6.10.2 Default User (SYSTEM)

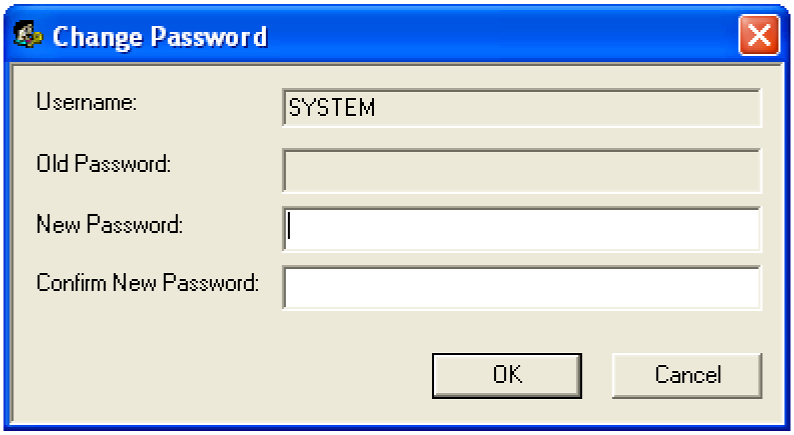
When you create a new set of NETDEF files, using the System Wizard, NetView automatically creates a default user named “SYSTEM” for the new set of NETDEF files, and displays the message box shown in Figure 6-16.

The SYSTEM user has full administrative privileges for OpenBSI, including the right to add, modify, or remove users from the system. Initially, the username SYSTEM does not include an associated password, so it is important that you assign one.

Note: If you do **not** assign a password to the SYSTEM user, NetView operates as if there is no security, and automatically starts without prompting you for a username/password.

6.10.3 Assigning or Changing the Password of the Current User

1. To change the password of the currently logged on user, for example, the “SYSTEM” user, click **Security>Change Password.** The Change Password dialog box opens (see *Figure 6-19*.)



Username: SYSTEM

Old Password:

New Password:

Confirm New Password:

Figure 6-19. Changing a Password

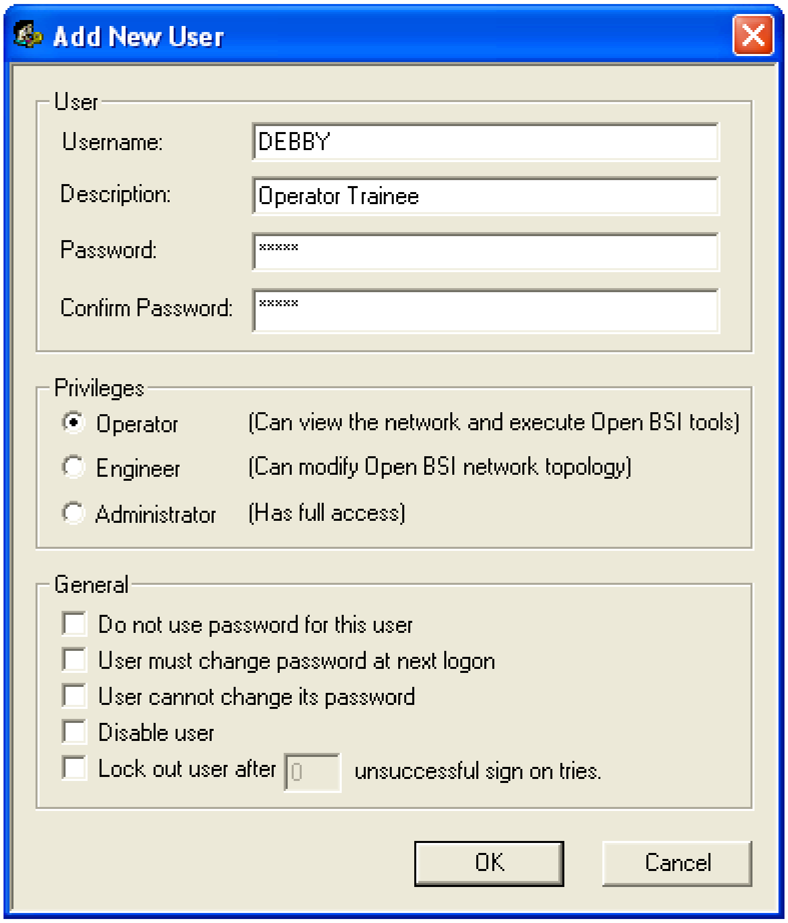
2. Enter the current password in the **Old Password”** field (if you haven’t defined one yet, as is initially the case with the SYSTEM user, leave the **Old Password** field blank).
3. Passwords consist of any combination of up to 16 alphanumeric characters (letters and numbers), and are case sensitive. Enter the new password in both the **New Password** and **Confirm New Password** fields, and then click **OK**.

Note: If the **Security**>**Change Password** menu item appears “grayed out,” this indicates that either the currently logged on user does **not** have privilege to change their password, or that some process other than NetView started OpenBSI.

6.10.4 Adding a New User

Note: You must be log on as an Administrator in order to add a new user. (The SYSTEM user is, by default, an Administrator.)

1. To define a new user, click **Security> Security Maintenance**. The Security Maintenance dialog box opens. **Note:** If the menu selection is “grayed out” it either means you did not log on as an Administrator, or some process other than NetView started OpenBSI.
2. Click the **Add** button. The Add New User dialog box opens.
3. Complete the fields as described, below, then click **OK**.



Add New User

User

Username: DEBBY

Description: Operator Trainee

Password: *****

Confirm Password: *****

Privileges

● Operator (Can view the network and execute Open BSI tools)

○ Engineer (Can modify Open BSI network topology)

○ Administrator (Has full access)

General

□ Do not use password for this user

□ User must change password at next logon

□ User cannot change its password

□ Disable user

□ Lock out user after 0 unsuccessful sign on tries.

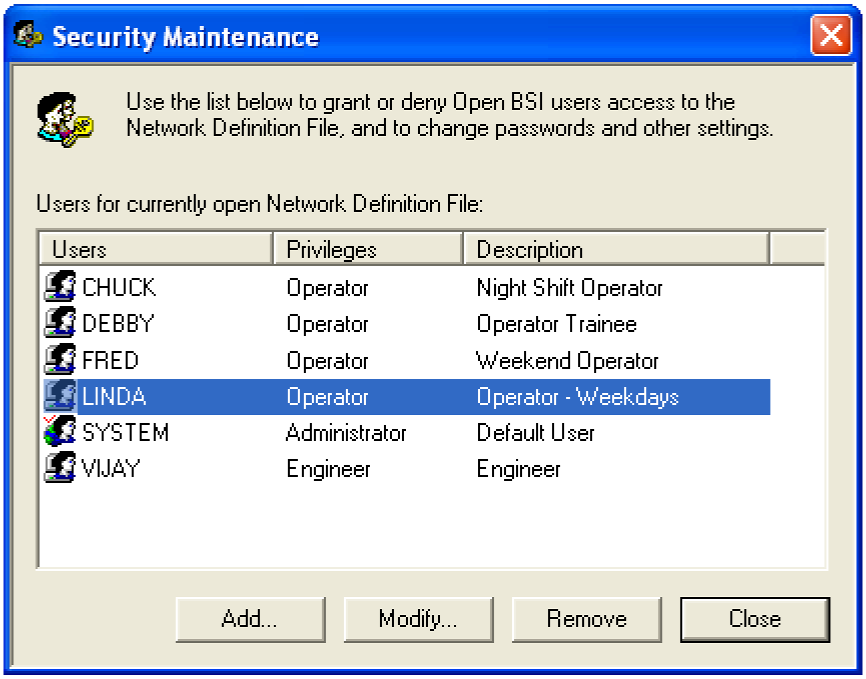
Figure 6-20. Add New User dialog box

Field	Description
<u>**User**</u>	
Username	The name of this user. Usernames consist of any combination of up to 16 alphanumeric characters. You cannot include spaces in a username.
Description	(Optional) – Enter up to 49 characters to describe this user.
Password	The user's password. Enter any combination of up to 16 alphanumeric characters. Passwords are case sensitive. You cannot include spaces in a password.
Confirm Password	You must enter the exact same password here, to confirm the correct spelling, and case.
<u>**Privileges**</u>	
Operator	OpenBSI allows Operators to view the RTU network, and start utilities such as DataView. If you allow it, they can also change their own passwords.
Engineer	OpenBSI allows engineers to modify the RTU network, run all OpenBSI utilities, and modify application parameters. Engineers can also

	acknowledge alarms and configure collections. If you allow it, they can also change their own passwords.
Administrator	OpenBSI allows administrators all the privileges of an engineer, plus they can add, remove, and modify users through the Security Maintenance dialog box.
General	
Do not use password for this user	If you check this box, this user has no password, only a username. When this user logs on, they leave the password field blank. We recommend you limit this option to users with operator privileges or less.
User must change password at next logon	If you check this box, the next time this user logs on, OpenBSI prevents them from doing anything until they change their password using the Change Password dialog box.
User cannot change its password	If you check this box, OpenBSI does not allow this user to change their password. If their password needs to be changed, an Administrator must make the change.
Disable user	If you check this box, OpenBSI prevents this user from logging on, but keeps their security configuration in the system. You can re-instate their log-in privileges at a later time, if you un-check this box.
Lock out user after x unsuccessful sign on tries	If you check this box, OpenBSI prevents a user from logging on after the specified number of login failures. You can specify between 3 and 15 login attempts for the user.

6.10.5 Modifying Passwords, Privileges for an Existing User

To change the password, privileges, description, or general parameters for an existing user *either* click on the name of the user in the Security Maintenance dialog box, then click **Modify**, *or* double-click on the selected user’s name. The Modify User’s Security Information dialog box opens. This dialog box is identical to the Add New User dialog box, except that the user’s name cannot be changed. (For information on the other fields in the dialog box, see the descriptions for the Add New User dialog box, earlier in this section.)



Use the list below to grant or deny Open BSI users access to the Network Definition File, and to change passwords and other settings.

Users for currently open Network Definition File:

Users	Privileges	Description
CHUCK	Operator	Night Shift Operator
DEBBY	Operator	Operator Trainee
FRED	Operator	Weekend Operator
LINDA	Operator	Operator - Weekdays
SYSTEM	Administrator	Default User
VIJAY	Engineer	Engineer

Figure 6-21. Security Maintenance dialog box

Note: If, for some reason, you do want to change the name of a user, you must remove that user from the system, and then add them again.

6.10.6 Removing a User from the Security System

If, for some reason, you want to permanently remove a user from the security system, for example, if they are leaving the company, click on the name of the user in the Security Maintenance dialog box, then click **Remove**.

Notes:

- You cannot remove the currently logged on user.
- If you want to temporarily disable a user's login privileges, but keep them in the Security system, for example, while someone is on an extended leave of absence, use the **Disable user** option in the Modify User's Security Information dialog box.

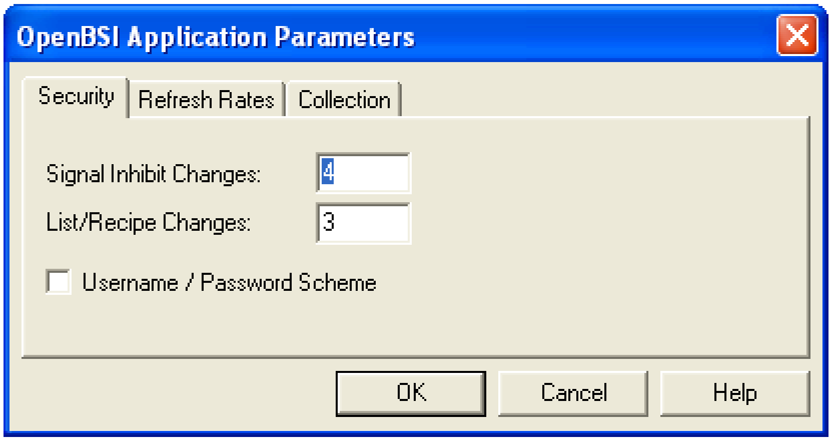
6.11 Viewing / Modifying Application Parameters

You initially define application parameters for OpenBSI from the second page of the System Wizard.

You can view these application parameters from most OpenBSI tools (DataView, Downloader, Remote Communication Statistics Tool, etc.) by clicking on the icon at left.

If you need to modify these parameters, you must edit them from within NetView. To do this:

1. Open your set of NETDEF files.
2. Sign-on to the system.
3. Call up the OpenBSI Application Parameters dialog box. To do this click the application parameters icon (shown above) or click **Edit>Application Parms** from the menu bar. The OpenBSI Application Parameters dialog box consists of multiple pages that you access through tabs. Each page corresponds to the same application parameters defined in the System Wizard.



Signal Inhibit Changes: 4

List/Recipe Changes: 3

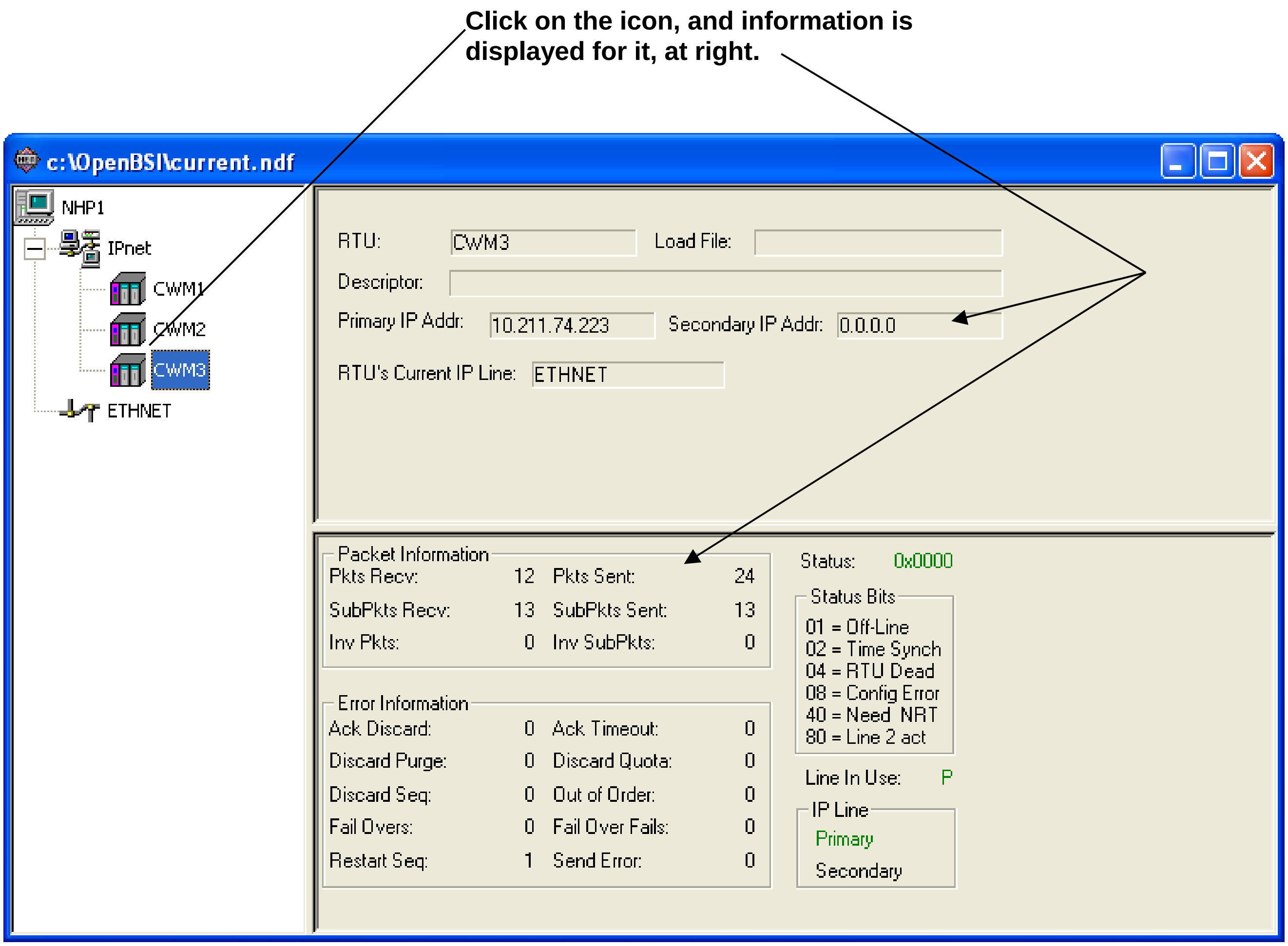
☐ Username / Password Scheme

Figure 6-22. OpenBSI Application Parameters dialog box

Note: If you ever choose to move your NETDEF files to a different place on your PC, you must manually edit the DBQ path specified in the DSN file to reflect the new location.

6.12 Viewing Other Parameters You Have Already Defined

In NetView, you can view the configuration information on the networks, RTUs, and communication lines you already defined.



Click on the icon, and information is displayed for it, at right.

c:\OpenBSI\current.ndf

RTU: CWM3 Load File:

Descriptor:

Primary IP Addr: 10.211.74.223 Secondary IP Addr: 0.0.0.0

RTU's Current IP Line: ETHNET

Packet Information

Pkts Recv:	12	Pkts Sent:	24
SubPkts Recv:	13	SubPkts Sent:	13
Inv Pkts:	0	Inv SubPkts:	0

Error Information

Ack Discard:	0	Ack Timeout:	0
Discard Purge:	0	Discard Quota:	0
Discard Seq:	0	Out of Order:	0
Fail Overs:	0	Fail Over Fails:	0
Restart Seq:	1	Send Error:	0

Status: 0x0000

Status Bits
01 = Off-Line
02 = Time Synch
04 = RTU Dead
08 = Config Error
40 = Need NRT
80 = Line 2 act

Line In Use: P

IP Line
Primary
Secondary

Figure 6-23. Viewing Configuration Information

To view this information, click on the icon for the network, communication line, or RTU you want information about, and NetView displays the information on the right-hand panes of the NetView window.

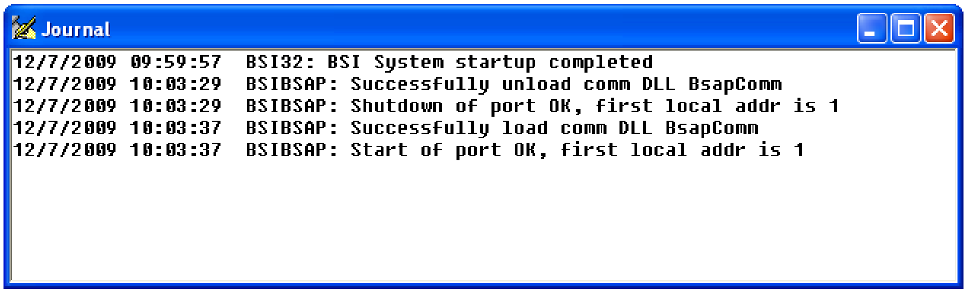
Much of the data in these panes consists of statistics about communications.

For information on the various statistics and status flags see later sections of this chapter, beginning with *Section 6.21*.

6.13 Viewing the OpenBSI Journal File

The OpenBSI journal file records various events which occur in the system, such as when the system starts or stops, when a user signs on, etc. To view the contents of the journal file, click on the icon, shown at left, or, from the menu bar, click **View>Journal**.

You can also search for journal entries concerning particular system tasks, if you click in the menu bar on **View> Select Task**, while the journal file is visible, and then enter the task name in the Filter dialog box.



```
12/7/2009 09:59:57  BSI32: BSI System startup completed
12/7/2009 10:03:29  BSIBSAP: Successfully unload comm DLL BsapComm
12/7/2009 10:03:29  BSIBSAP: Shutdown of port OK, first local addr is 1
12/7/2009 10:03:37  BSIBSAP: Successfully load comm DLL BsapComm
12/7/2009 10:03:37  BSIBSAP: Start of port OK, first local addr is 1
```

Figure 6-24. Journal File

6.14 Defining a BSAP Network

A network (either BSAP or IP) is one of the four basic components you must define for an OpenBSI communications system to function. You define your network, using the Network Wizard, only after you define your NHP.

6.14.1 Activating the Network Wizard

There are two ways to activate the Network Wizard:

- One way is to **right** click on the NHP, and select **Add>Network** from the pop-up menu.

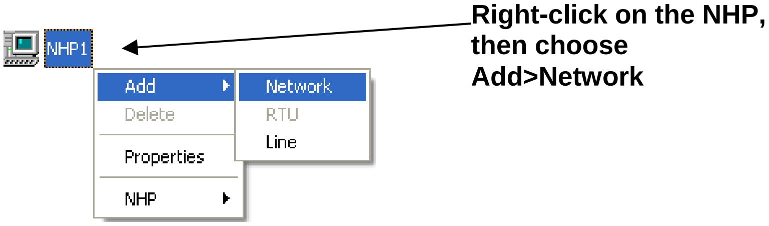


Figure 6-25. Starting the Network Wizard – Method 1

- The other way to activate the Network Wizard is to first click **View>Toolbox** from the menu bar. This activates the Toolbox. From the Toolbox (see *Figure 6-26*) drag the BSAP network symbol over to the NHP icon. This activates the Network Wizard.

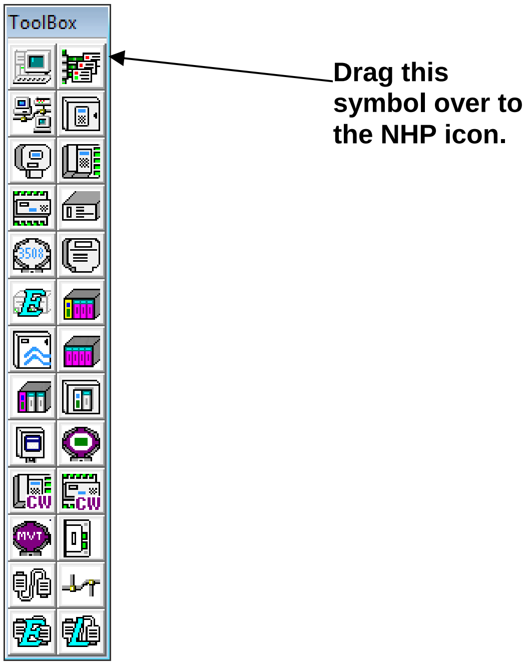


Figure 6-26. Starting the Network Wizard – Method 2

Either of these methods starts the Network Wizard.

Notes:

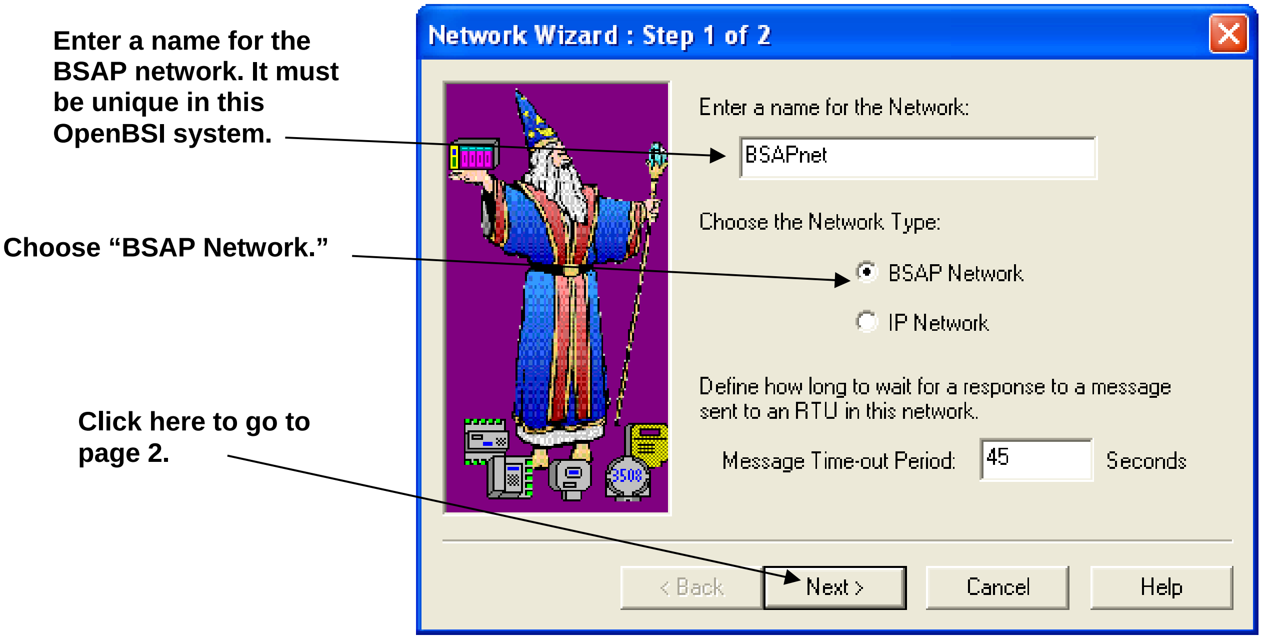
- A BSAP network must use the NHP as its network master. The BSAP network supports up to six network levels.
- If necessary, you can add a BSAP sub-network underneath an IP RTU. In that case the network master for the BSAP sub-network is *still* the NHP, and the IP RTU is the only level 1 node *for that sub-network*. The BSAP RTUs, in this case, only exist on network level 2 through 6. This limits the BSAP sub-network to five network levels for this scenario.
- Prior to OpenBSI 5.5, you could only have one BSAP network in your system, but OpenBSI allowed BSAP subnets underneath an IP RTU. OpenBSI 5.5 (and newer versions) allow you to define *multiple* BSAP networks in the same system, as well as BSAP subnets. You can define a maximum of 99 BSAP networks (including subnets).
- OpenBSI treats each BSAP network, and any BSAP sub-network, as a separate, independent structure. Because they are separate structures, you can re-use the same BSAP local address for a level 1 node in each separate BSAP network or sub-network.

6.14.2 Navigating Between Pages of the Network Wizard

Click on either the **Next** or **Back** button, whichever is appropriate.

6.14.3 Network Wizard: Step 1 of 2

The first page of the Network Wizard defines the type of network (in this case we define a BSAP network), and the name of the network.



Enter a name for the Network: BSAPnet

Choose the Network Type:

● BSAP Network

○ IP Network

Define how long to wait for a response to a message sent to an RTU in this network.

Message Time-out Period: 45 Seconds

Enter a name for the BSAP network. It must be unique in this OpenBSI system.

Choose "BSAP Network."

Click here to go to page 2.

Figure 6-27. Network Wizard – Step 1 of 2

Complete the fields as described, below:

Field	Description
Enter a name for the Network	Provide a name for the network. It doesn't really matter what you name it, so long as the name is *unique* in the system.
Choose the Network Type	Choose **BSAP Network** as the Network Type. **Note**: If you activate the Network Wizard using the Toolbox, the wizard chooses **BSAP Network** for you.
Define how long to wait for a response to a message sent to an RTU in this network (Message Time-out Period)	An RTU must respond to a program (such as DataView, NetView, OpenEnterprise, etc.) within this number of seconds. If the program receives no response within this time, we say the node has "timed out." (OpenBSI rounds this value up to the nearest 5 seconds.) Give special consideration when you specify this value in a BSAP or EBSAP network: You must consider the baud rate, number of network levels, and poll periods when you choose this value. Never make the value less than the sum of the poll periods for each level of the network, but also don't make it too large, since that delays the initiation of a retry, if an attempt to send a message fails. **Note*:*** You need only alter this time out period if you want to specify a timeout period for this network which is different from the system-wide default timeout period you entered in the System Wizard.

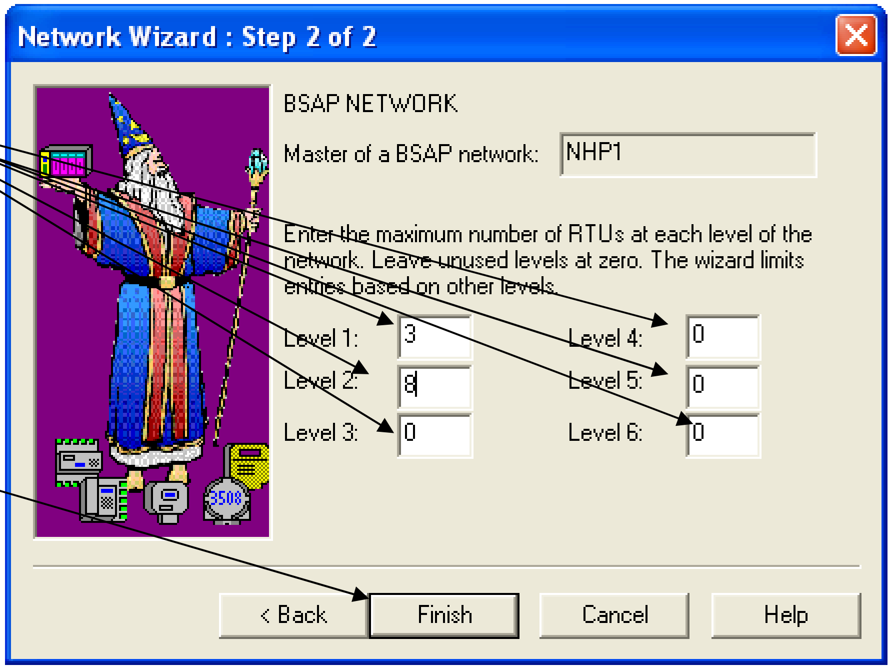
Click **Next** to go to the second page of the Network Wizard.

6.14.4 Network Wizard: Step 2 of 2

On the second page of the Network Wizard, you need to define the size of your BSAP network.

Exercise care when specifying these numbers because you CANNOT change them on-line once you exit the Network Wizard. (You can change them using the Off-Line Database Configuration Utility.)

Click here to exit the Network Wizard.


Network Wizard : Step 2 of 2

BSAP NETWORK

Master of a BSAP network: NHP1

Enter the maximum number of RTUs at each level of the network. Leave unused levels at zero. The wizard limits entries based on other levels.

Level 1: 3
Level 2: 8
Level 3: 0
Level 4: 0
Level 5: 0
Level 6: 0

Figure 6-28. Network Wizard – Step 2 of 2

Field	Description
Enter the maximum number of RTUs at each level of the network. Leave unused levels at zero. The wizard limits entries based on other levels.	A BSAP network supports from one to six network levels. Specify the maximum number of controllers (RTUs) under a given master node, on each level of your BSAP network. **Note:** There is a maximum limit of 127 RTUs under a given master node; NetView may enforce additional limitations on network size based on the number of bits required to specify the network global addresses.

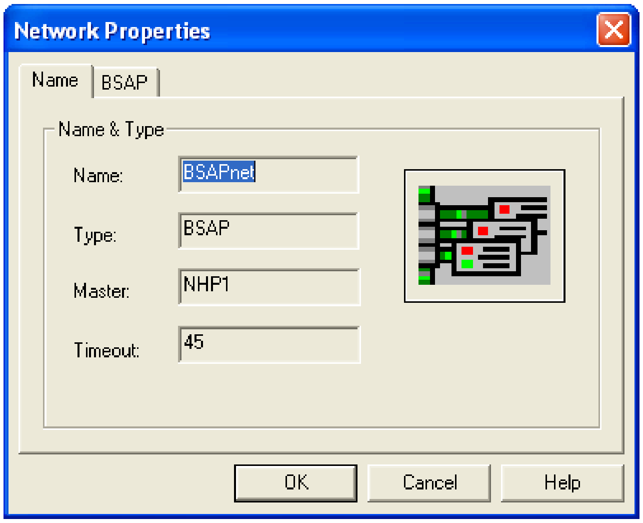
Click **Finish** to exit the Network Wizard.

6.14.5 Viewing BSAP Network Parameters

Once you define your BSAP network in the Network Wizard, you can view the characteristics of the network if you click on the icon for the network, then *right* click, and select **Properties** from the pop-up menu.

The Network Properties dialog box opens. This is a multi-page dialog box which allows you to view many of the characteristics of your BSAP network.

The first page ("Name" tab) displays the type of network, the name of the network's NHP, the message timeout value, and the name of the network. If necessary, you can change the name of the network from this page.



Network Properties

Name: BSAPnet

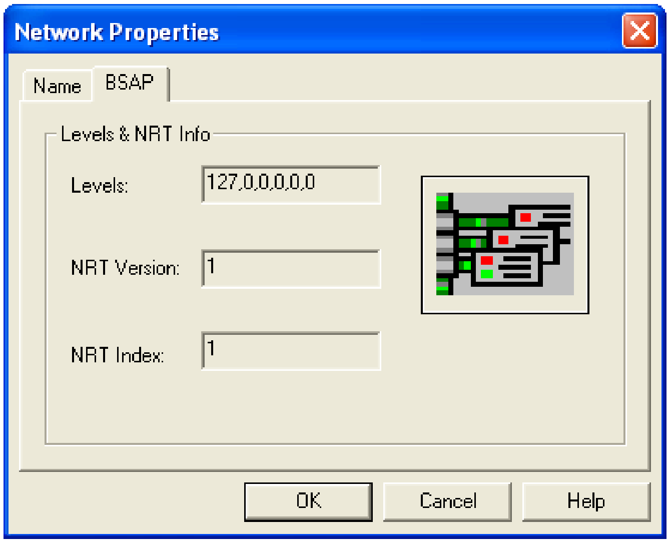
Type: BSAP

Master: NHP1

Timeout: 45

Figure 6-29. Network Properties – Name tab

The second page of the Network Properties dialog box ("BSAP" tab) displays various information about the structure of the BSAP network including the number of network levels, and the version of the node routing table.



Network Properties

Levels: 127,0,0,0,0,0

NRT Version: 1

NRT Index: 1

Figure 6-30. Network Properties – BSAP tab

Click **OK** or **Cancel** to exit the Network Properties dialog box.

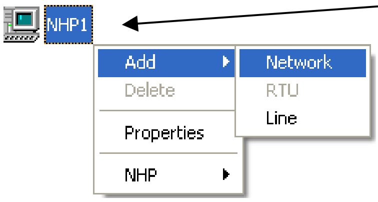
6.15 Defining an IP Network

A network (either BSAP or IP) is one of the four basic components you must define for an OpenBSI communications system to function. You define your network, using the Network Wizard, only after you define your NHP.

6.15.1 Activating the Network Wizard

There are two ways to activate the Network Wizard:

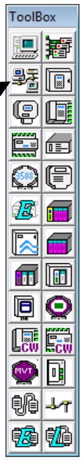
- One way is to **right** click on the NHP, and select **Add**>**Network** from the pop-up menu.



Right-click on the NHP, then choose Add>Network

Figure 6-31. Starting the Network Wizard – Method 1

- The other way to activate the Network Wizard is to first click **View**>**Toolbox** from the menu bar. This activates the Toolbox. (see *Figure 6-32*). Now drag the IP network symbol over to the NHP icon. This activates the Network Wizard.



Drag this symbol over to the NHP icon.

Figure 6-32. Starting the Network Wizard – Method 2

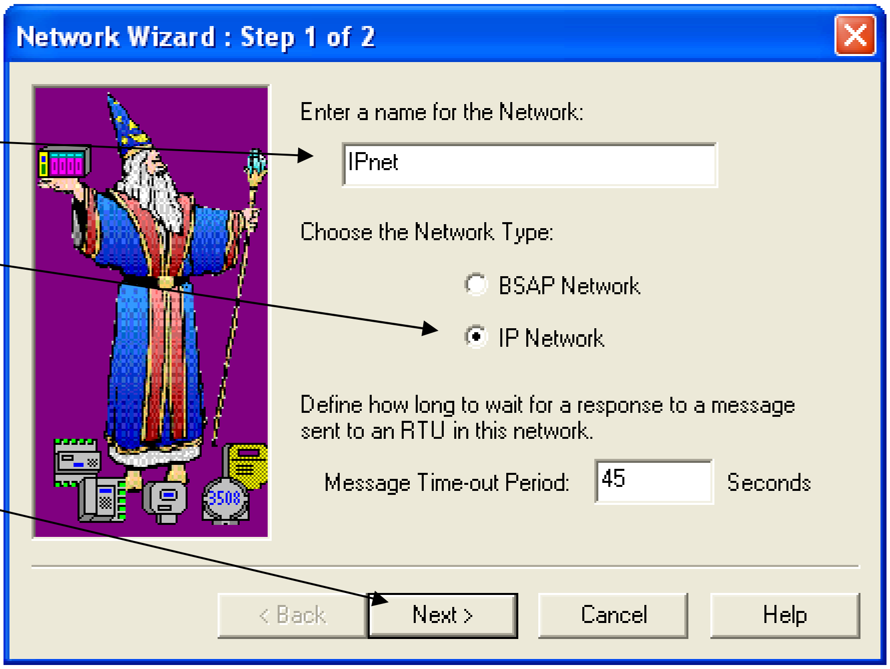
Either of these methods starts the Network Wizard.

6.15.2 Navigating Between Pages of the Network Wizard

Click either **Next** or **Back** whichever is appropriate.

6.15.3 Network Wizard: Step 1 of 2

The first page of the network wizard defines the type of network (in this case we define an IP network), and the name of the network.



Enter a name for the IP network. It must be unique in this OpenBSI system.

Choose “IP Network.”

Click here to go to page 2.

Network Wizard : Step 1 of 2

Enter a name for the Network: IPnet

Choose the Network Type:

○ BSAP Network

● IP Network

Define how long to wait for a response to a message sent to an RTU in this network.

Message Time-out Period: 45 Seconds

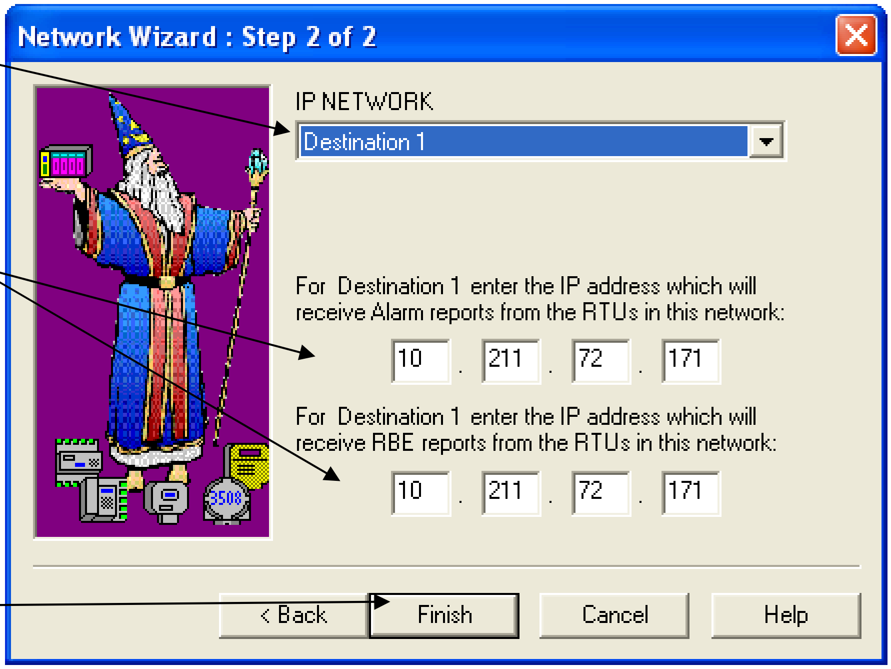
Figure 6-33. Network Wizard – Step 1 of 2

Field	Description
Enter a name for the Network	Provide a name for the network. It doesn't really matter what you name it, so long as the name is *unique* in the system.
Choose the Network Type	Choose **IP Network** as the Network Type.
Define how long to wait for a response to a message sent to an RTU in this network (Message Time-out Period)	An RTU must respond to a program (such as DataView, NetView, OpenEnterprise, etc.) within this number of seconds. If the program receives no response within this time, we say the node has “timed out.” (OpenBSI rounds this value up to the nearest 5 seconds.) **Note*:*** You need only alter this timeout period if you want to specify a timeout period for this network which is *different from* the system-wide default timeout period you enter in the System Wizard.

Click **Next** to go to the second page of the Network Wizard.

6.15.4 Network Wizard: Step 2 of 2

On the second page of the Network Wizard, you need to define where OpenBSI sends alarm and RBE messages from RTUs in this network.



Network Wizard : Step 2 of 2

IP NETWORK

Destination 1

For Destination 1 enter the IP address which will receive Alarm reports from the RTUs in this network:

10 . 211 . 72 . 171

For Destination 1 enter the IP address which will receive RBE reports from the RTUs in this network:

10 . 211 . 72 . 171

Use this list box to choose which of the four destinations you want to configure.

You can specify up to four different destination IP addresses for alarm data and up to four different destination IP addresses for RBE data. These destinations are OpenBSI workstations. By default, “Destination 1” is this NHP.

Click here to exit the Network Wizard.

Figure 6-34. Network Wizard – Step 2 of 2

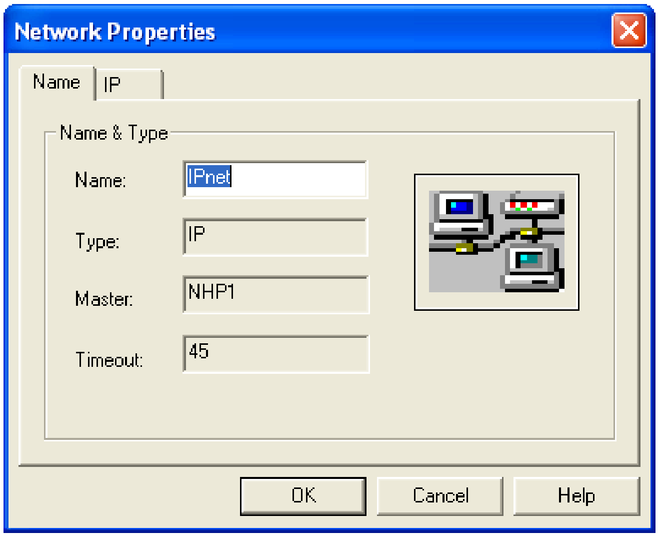
Field	Description
For Destination *n* enter the IP address which will receive alarm [RBE] reports from the RTUs in this network.	Use the IP NETWORK list box to choose the destination number *n*, and specify up to four different destinations each, for alarm and RBE reports from the RTUs in this network. You specify the destination as an IP address. Destination 1 defaults to the address of this NHP. (Any OpenBSI workstation’s IP address is a valid destination.)

Click **Finish** to exit the Network Wizard.

6.15.5 Viewing IP Network Parameters

Once you define your IP network in the Network Wizard, you can view the characteristics of the network if you right-click on the icon for the network, and select **Properties** from the pop-up menu.

The first page of the Network Properties dialog box (“Name” tab) allows you to change the name of the network. It also displays the type of network, the name of the network's NHP, and the message timeout value.



Name & Type

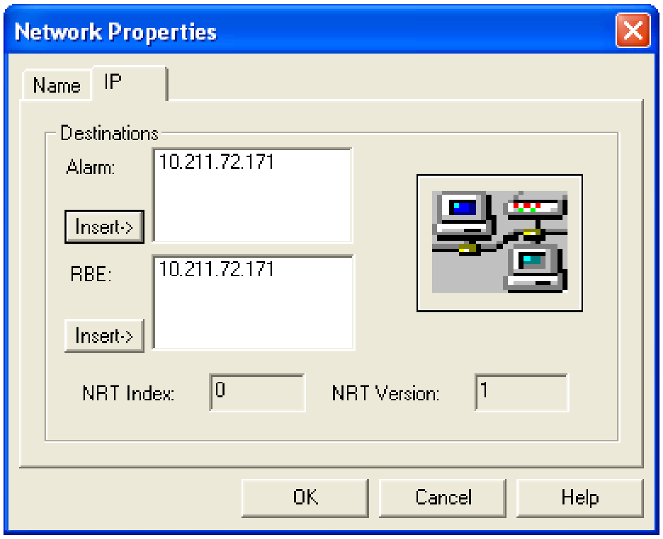
Name: IPnet

Type: IP

Master: NHP1

Timeout: 45

Figure 6-35. Network Properties – Name tab



Destinations

Alarm: 10.211.72.171

RBE: 10.211.72.171

NRT Index: 0

NRT Version: 1

Figure 6-36. Network Properties – IP tab

The second page of the Network Properties dialog box (“IP” tab) shows the IP addresses of OpenBSI workstations which receive alarm and RBE data from the RTUs in this network. It also displays the version of the node routing table.

To add an IP address to the list, click the **Insert** button and enter the new address, then click **OK.**

Click **OK** or **Cancel** to exit the Network Properties dialog box.

6.16 Defining RTUs (BSAP)

BSAP networks support both Network 3000-series and ControlWave series remote process controllers which we refer to generically in OpenBSI as **RTU**s. The RTU is one of the four basic components which allow an OpenBSI communication system to function. You can define RTUs as either BSAP devices or IP devices. You cannot define an RTU until after you define the NHP and network components of your system. You can only add BSAP devices to BSAP networks or BSAP sub-networks; and IP devices to IP networks. You define RTUs using the **RTU Wizard**.

6.16.1 Activating the RTU Wizard

There are two ways to activate the RTU Wizard:

- One way is to right click once on the location in the network where you want to add the RTU (when you start a new network, this is just the network name) then select **Add>RTU** from the pop-up menu.

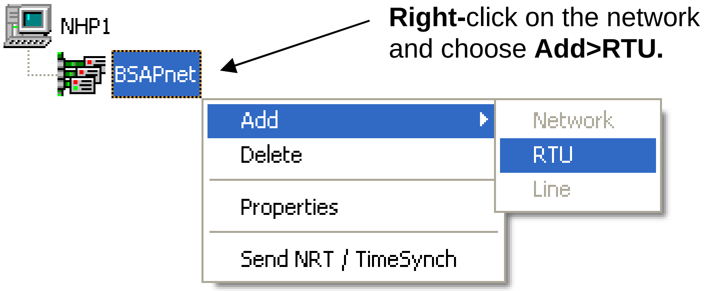


Figure 6-37. Starting the RTU Wizard – Method 1

- The other way to start the RTU Wizard is to drag the icon for the RTU you want to add from the Toolbox, over to the place in the network where you want to add it.

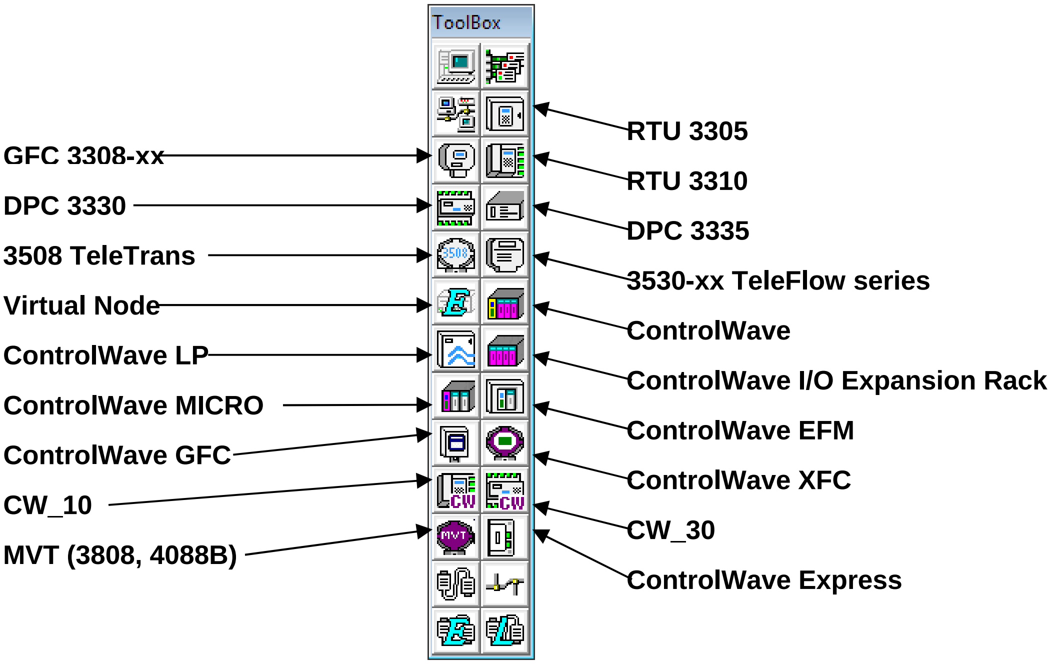


Figure 6-38. Starting the RTU Wizard – Method 2

Notes:

- Certain types of RTUs **cannot** support slave nodes, therefore, you must place them at the bottom (terminal) level of the network.
- If you use expanded node addressing (also known as expanded BSAP or EBSAP), **NetView requires that you define virtual nodes on level 1** of the network. This thereby requires you to define the expanded addressing slave nodes on level 2. You define virtual nodes like any other RTU in NetView. See the *Expanded Node Addressing* section of the *ACCOL II Reference Manual* (document# D4044) or the *ControlWave Designer Programmer's Handbook* (document# D5125) for more information on expanded node addressing.

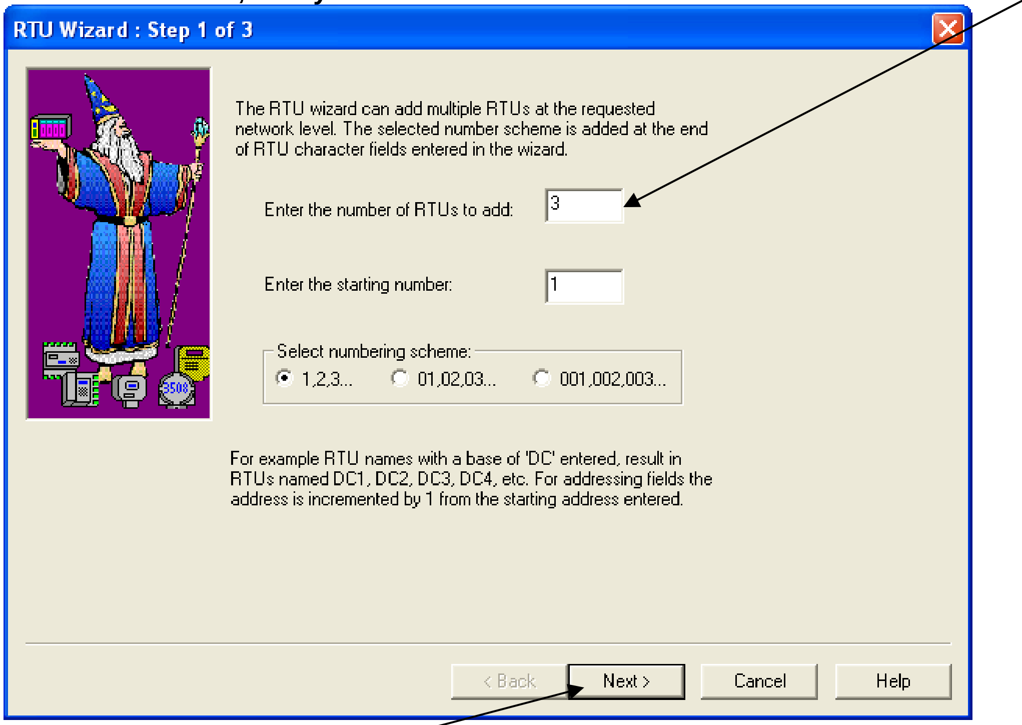
6.16.2 Navigating Between Pages of the RTU Wizard

Click on either the **Next** or **Back** button, whichever is appropriate.

6.16.3 RTU Wizard: Step 1 of 3

The first page of the RTU Wizard defines how many RTUs you want to add, and how you intend to number them.

You can add controllers (RTUs) one at a time, invoking the RTU Wizard for each one you add, or you can add multiple RTUs all at the same time, if they are on the same network level.



RTU Wizard : Step 1 of 3

The RTU wizard can add multiple RTUs at the requested network level. The selected number scheme is added at the end of RTU character fields entered in the wizard.

Enter the number of RTUs to add: 3

Enter the starting number: 1

Select numbering scheme: ● 1,2,3... ○ 01,02,03... ○ 001,002,003...

For example RTU names with a base of 'DC' entered, result in RTUs named DC1, DC2, DC3, DC4, etc. For addressing fields the address is incremented by 1 from the starting address entered.

Click here to go to page 2.

Figure 6-39. RTU Wizard – Step 1 of 3

Field	Description
Enter the number of RTUs to add	Specify how many RTUs you want to add at a given network level, under a single master (NHP is the master for Level 1 RTUs). If you want, you can enter "1" to add just one RTU at a time, but then you need to invoke the RTU Wizard separately each time you want to add an RTU.
Enter the starting number	If you add more than one RTU, the RTU Wizard appends the number you specify to a text string (entered on page 2 of the RTU Wizard) to create a node name for the first RTU. The wizard then increments the starting number sequentially (using a numbering scheme you choose) and appends it to the text string to create a name for each additional RTU. (You can easily change the names later if you right-click on an RTU, and select **Properties** from the pop-up menu.)
Select numbering scheme	If you want to add more than one RTU, choose a numbering scheme for the numbers you use (along with a text string you enter on page 2 of the RTU Wizard) to assign node names for each of the new RTUs. (You can easily change the names later if you right-click on an RTU, and select **Properties** from the pop-up menu.)

Click **Next** to go to the second page of the RTU Wizard.

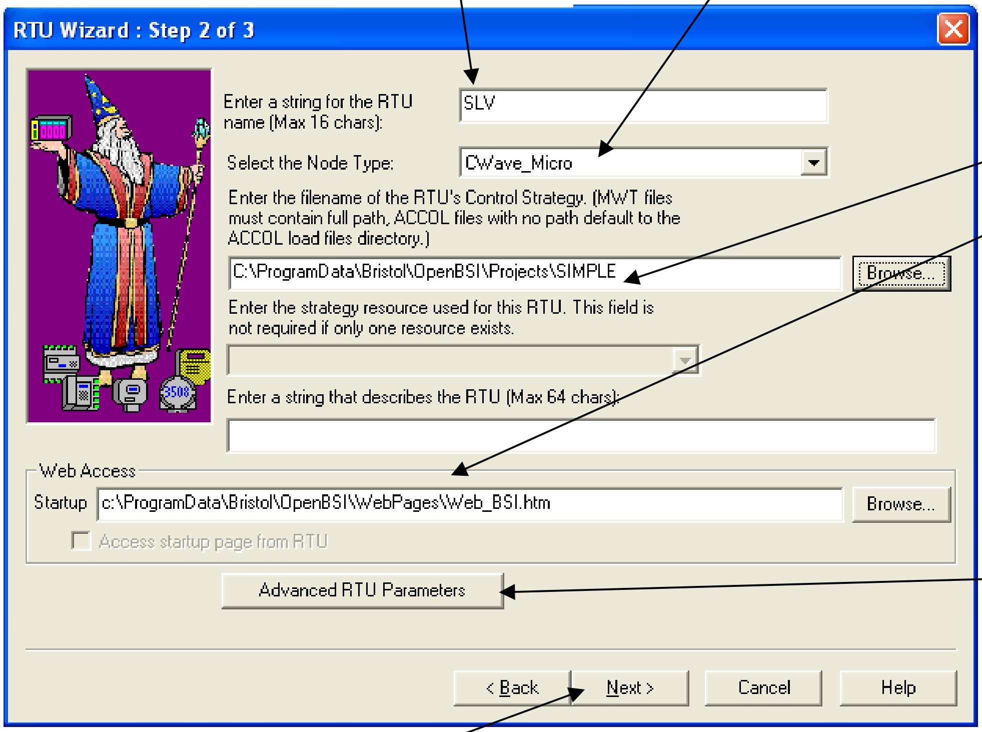
6.16.4 RTU Wizard: Step 2 of 3

On the second page of the RTU Wizard, you need to define a name for each RTU, the type of RTU, and the control strategy file name.

If you are adding a single RTU, enter the compete name here. If you are adding multiple RTUs, enter only the portion of the name which is combined with the numbers specified on page 1. The complete RTU name cannot exceed 16 characters.

Choose the type of controller (RTU).

By default the RTU name is used for the control strategy filename. For ControlWave, specify a full path in addition to the filename. For Network 3000, the system assumes that the file resides in the ACCOL directory. If you are adding multiple RTUs, leave this blank for now



RTU Wizard : Step 2 of 3

Enter a string for the RTU name (Max 16 chars): SLV

Select the Node Type: CWave_Micro

Enter the filename of the RTU's Control Strategy. (MWT files must contain full path, ACCOL files with no path default to the ACCOL load files directory.)

C:\ProgramData\Bristol\OpenBSI\Projects\SIMPLE

Enter the strategy resource used for this RTU. This field is not required if only one resource exists.

Enter a string that describes the RTU (Max 64 chars):

Web Access

Startup: c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

□ Access startup page from RTU

This defines the optional startup HTML page used with this RTU. Specify the full path and filename of the HTML file stored on your workstation.

Most users can ignore the Advanced Parameters.

Click here to go to page 3.

Figure 6-40. RTU Wizard – Step 2 of 3

Field	Description
Enter a string for the RTU name (max 16 chars)	Specify the name of the RTU. If you define only a single RTU, enter the complete name. If you define multiple RTUs on the same level, specify only the beginning portion of the name; the wizard assigns numbers for the RTUs (based on the starting number and numbering scheme you specify on page 1 of the RTU Wizard) and appends them to the beginning portion of the name. The complete name, including the appended numbers, must not exceed 16 characters. In general, we recommend you only use alpha-numeric characters (letters, numbers) plus the underscore. You cannot use spaces, however, and you should avoid punctuation marks. **Note:** Older programs (including some older versions of OpenBSI tools, as well as HMI packages which

	were designed to use older versions of the BSI communications driver) are unable to communicate with node names which exceed 4 characters
Select the node type	Specify the type of remote process controller (RTU). Valid choices include: “3305” for RTU 3305 controllers, “3308” for GFC-3308-xx AccuRate flow computers/correctors, “3310” for RTU 3310 controllers, “3330” for DPC 3330 controllers, “3335” for DPC 3335 controllers, “3508” for 3508 TeleTrans transmitters, “3530” for EGM/RTU-3530-xx TeleFlow flow computers/correctors, or TeleRTU units, “VIRTUAL” for expanded node addressing virtual nodes, “ControlWave” for ControlWave process automation controllers, “CWave_LP” for the ControlWave LP, “CWave_Micro” for the ControlWave Micro, “CWave_EFM” for the ControlWave EFM, “CWave_RIO” for the ControlWave I/O Expansion Rack, “CWave_GFC” for the ControlWave Gas Flow Computer, “CWave_XFC” for the ControlWave Explosion-Proof Gas Flow Computer, “CW_10” for the CW_10 unit, “CW_30” for the CW_30 unit, “3808” for the 3808 transmitter and “4088B” for the Rosemount 4088B.
Enter the filename of the RTU's Control Strategy (ACCOL files with only a basename will default to ACCOL Load Files Directory)	Specify the control strategy file name for the RTU. For ACCOL files residing in the default ACCOL directory, you can omit the path and ACC file extension. For any other control strategy files (ACCOL files in *other* directories, or ControlWave .MWT files), type the full path in addition to the file basename, or use the **Browse** button to specify the correct path and file basename. **Note**: The 3508 TeleTrans, 3808, 4088B and certain versions of the TeleFlow do not use ACCOL load files; however, you must leave the default name there, anyway.
Enter the strategy resource used for this RTU. This field is not required if only one resource exists.	If this is a ControlWave file with more than one resource, select which resource you want to use with this RTU.
Enter a string that describes the RTU (Max 64 chars)	Specify a description of the RTU. (Optional) **Note**: If you define multiple controllers, all RTUs share the description you enter; it may be easier to edit this information, later.
Web Access	This section specifies the first web page (.HTML file) OpenBSI opens when you request Webpage access to this controller. Type the path and filename of the HTML file in the **Startup** field, or use the **Browse** button to locate it. The OpenBSI workstation stores the web pages and you can use them with any RTU type.

Advanced Parameters	Click here to open the Advanced RTU Parameters dialog box, discussed later in this section.

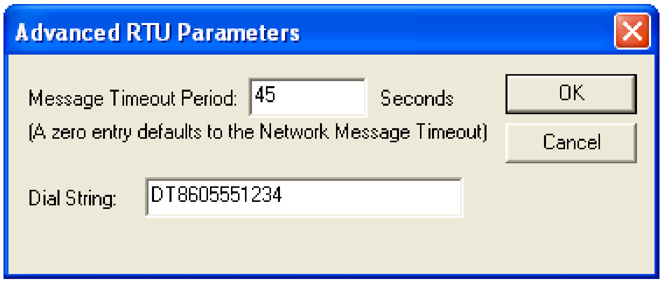
Click **Next** to go to page 3 of the RTU Wizard.

Considerations when using EBSAP

If you use expanded node addressing (also known as expanded BSAP or EBSAP), **NetView requires you to define your virtual nodes on Level 1** of the network; this requires that you define the expanded addressing slave nodes on Level 2. You specify a virtual node when you choose “VIRTUAL” as the node type in NetView. Virtual nodes do not have properties, statistics, etc. and NetView identifies them by an "E" in the icon for the node. See the *Expanded Node Addressing* section of the *ControlWave Designer Programmer's Handbook (document# D5125)* or the *ACCOL II Reference Manual* (document# D4044) for more information on expanded node addressing.

Advanced Parameters dialog box

The **Advanced Parameters** button on page 2 of the RTU Wizard activates the Advanced RTU Parameters dialog box.



Advanced RTU Parameters

Message Timeout Period: 45 Seconds

(A zero entry defaults to the Network Message Timeout)

Dial String: DT8605551234

Figure 6-41. Advanced RTU Parameters dialog box

Field	Description
Message Timeout Period	This value specifies (in seconds) how long to wait before declaring that a message that OpenBSI sent to this RTU is lost. If you don’t specify a value, the system uses the default message time-out period for the network (from your entries in the Network Wizard).
Dial String	The dial string consists of the phone number the OpenBSI workstation sends to an attached modem in order to dial this RTU. You can also include modem commands in the dial string. OpenBSI immediately precedes the dial string with the “AT” modem command. Here are some typical dial strings: DT5551234 DT9,,,,452200

Notes:

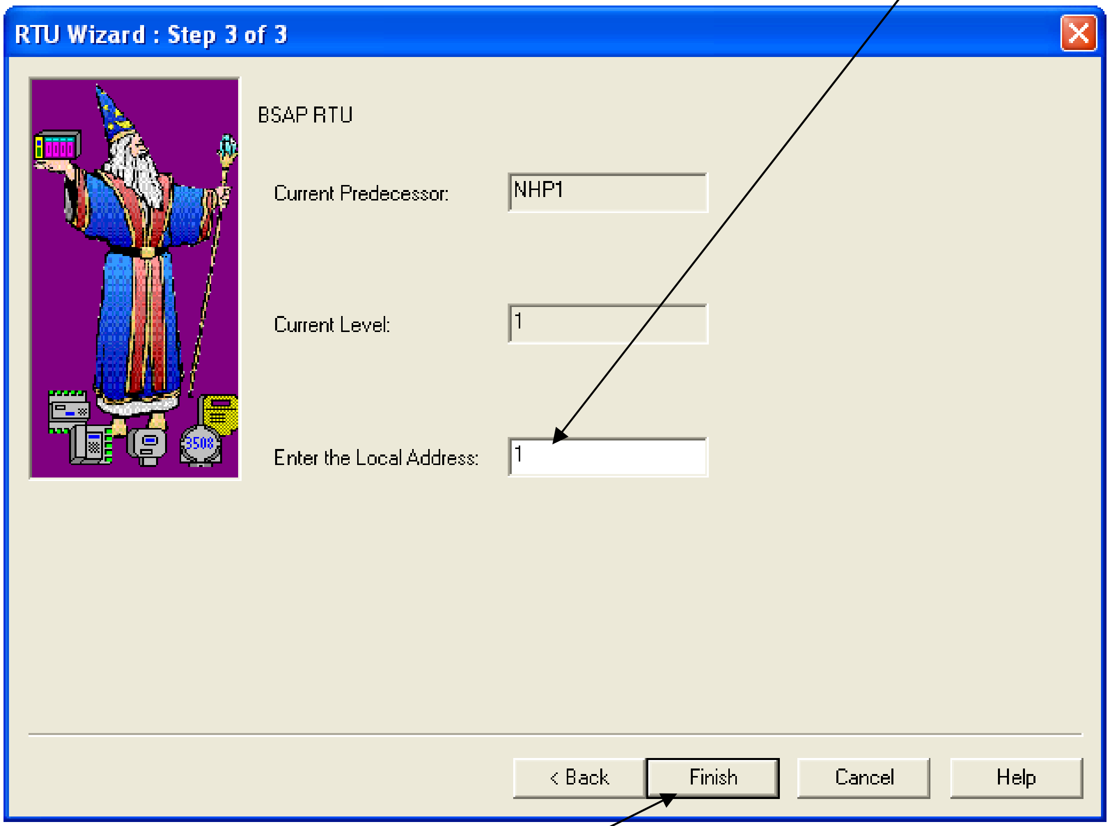
- OpenBSI can only dial top-level nodes (Level 1 RTUs).
- You must define additional dial parameters in the Comm Line Wizard.

Click **OK** to save any changes to the advanced parameters.

6.16.5 RTU Wizard: Step 3 of 3

On the third page of the RTU Wizard, you need to specify the BSAP local address of the RTU. The third page of the RTU Wizard also displays the network level, and the predecessor node (the master of this slave node).

The BSAP local address you enter here must match the address configured at the RTU (either through the Flash Configuration utility or switch/jumper settings).



RTU Wizard : Step 3 of 3

BSAP RTU

Current Predecessor: NHP1

Current Level: 1

Enter the Local Address: 1

Click here to exit the RTU Wizard.

Figure 6-42. RTU Wizard – Step 3 of 3

Field	Description
Current Predecessor	Displays the name of the master node of this RTU.
Current Level	Displays the BSAP network level for this RTU.
Enter the Local Address	Specify the BSAP local address of the RTU (which must range from 1 to 127). If you define multiple RTUs, specify the address of the first RTU; the wizard assigns the address of each additional RTU sequentially in ascending order.

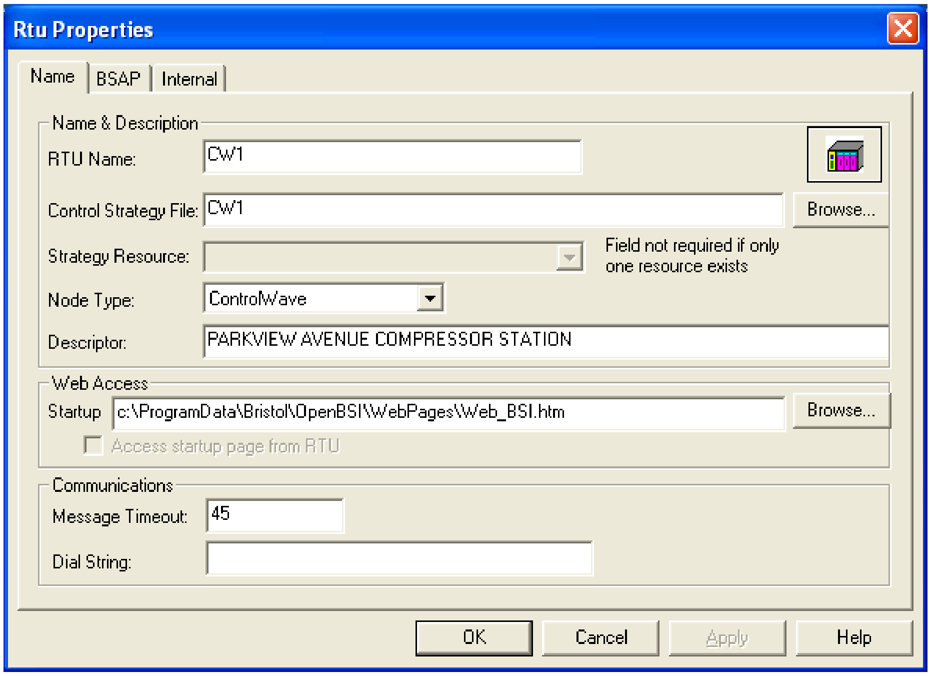
Click **Finish** to exit the RTU Wizard.

6.16.6 Modifying BSAP RTU Parameters

Once you define your RTUs, if necessary, you can edit their properties if you right-click on the RTU icon and select **"Properties"** from the pop-up menu. This activates the RTU Properties dialog box.

The RTU Properties dialog box contains three pages, each of which you can reach using the “file tabs.” If you click **OK** on any page the dialog box closes and saves your entries for all three pages.

The “Name” page allows you to modify most of the properties for an RTU including the name of the RTU, the name of the control strategy file, the type of RTU, and the advanced parameters for dialing. For more information on these subjects, see the earlier portions of this chapter.



RTU Name: CW1

Control Strategy File: CW1

Strategy Resource:

Field not required if only one resource exists

Node Type: ControlWave

Descriptor: PARKVIEW AVENUE COMPRESSOR STATION

Startup c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

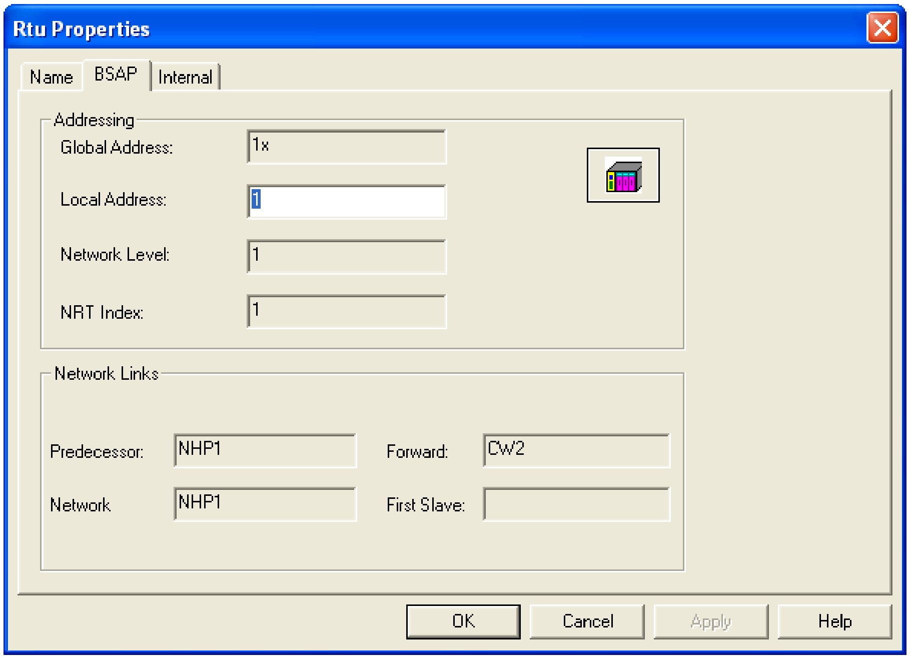
□ Access startup page from RTU

Message Timeout: 45

Dial String:

Figure 6-43. RTU Properties – Name tab

The “BSAP” tab of the RTU Properties dialog box displays various details about this RTU's location in the BSAP network. It also allows you to change the local address of the RTU.



Global Address: 1x

Local Address: 1

Network Level: 1

NRT Index: 1

Predecessor: NHP1

Forward: CW2

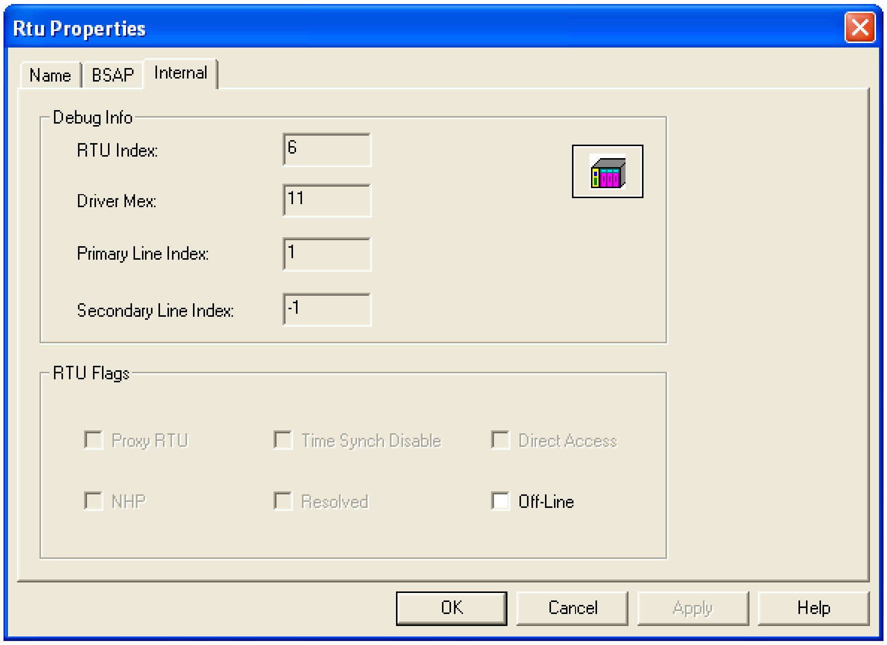
Network NHP1

First Slave:

Figure 6-44. RTU Properties – BSAP tab

Note: If your RTU node type is “3530” (TeleFlow or TeleRTU), and you change the local address here, the wizard prompts you to decide whether or not you also want to change the address in the RTU itself, which it can do automatically.

The “Internal” page of the RTU Properties dialog box displays various debugging parameters which Emerson technical support personnel sometimes examine. It also allows you to turn off polling for the current RTU, if you check the **Off-Line** box.



Rtu Properties

Debug Info

RTU Index: 6

Driver Mex: 11

Primary Line Index: 1

Secondary Line Index: -1

RTU Flags

□ Proxy RTU □ Time Synch Disable □ Direct Access

□ NHP □ Resolved □ Off-Line

Figure 6-45. RTU Properties – Internal tab

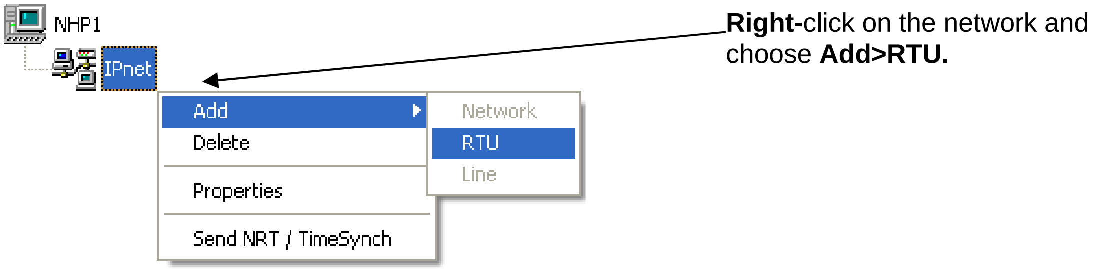
6.17 Defining RTUs (IP)

IP networks support both ControlWave series and certain Network 3000 series remote process controllers which we refer to generically in OpenBSI as **RTU**s. The RTU is one of the four basic components which allow an OpenBSI communication system to function. You can define RTUs as either BSAP devices or IP devices. You cannot define an RTU until after you define the NHP and network components of your system. You can only add BSAP devices to BSAP networks or BSAP sub-networks; and IP devices to IP networks. You define RTUs using the **RTU Wizard**.

6.17.1 Activating the RTU Wizard

There are two ways to activate the RTU Wizard:

- One way is to right click once on the location in the network where you want to add the RTU (when you start a new network, this is just the network name) then select **Add>RTU** from the pop-up menu.



Right-click on the network and choose **Add>RTU.**

Figure 6-46. Starting the RTU Wizard – Method 1

- The other way to start the RTU Wizard is to drag the icon for the RTU you want to add from the Toolbox, over to the place in the network where you want to add it.

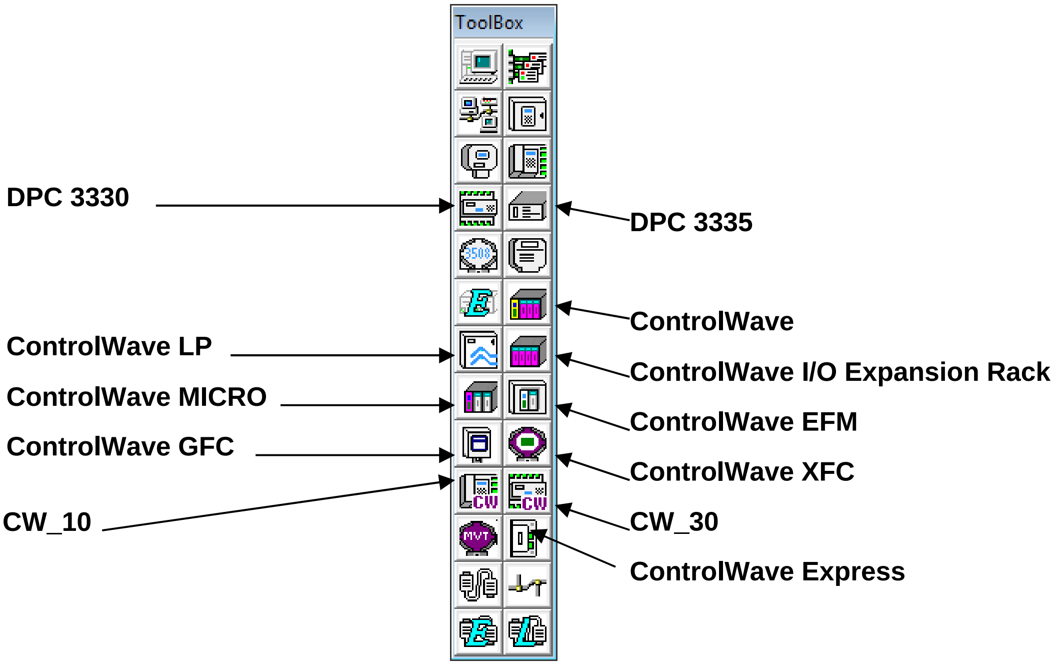


Figure 6-47. Starting the Network Wizard – Method 2

Note: DPC 3330 and DPC 3335 controllers require PES03 / PEX03 (or newer) firmware to support IP communication through OpenBSI.

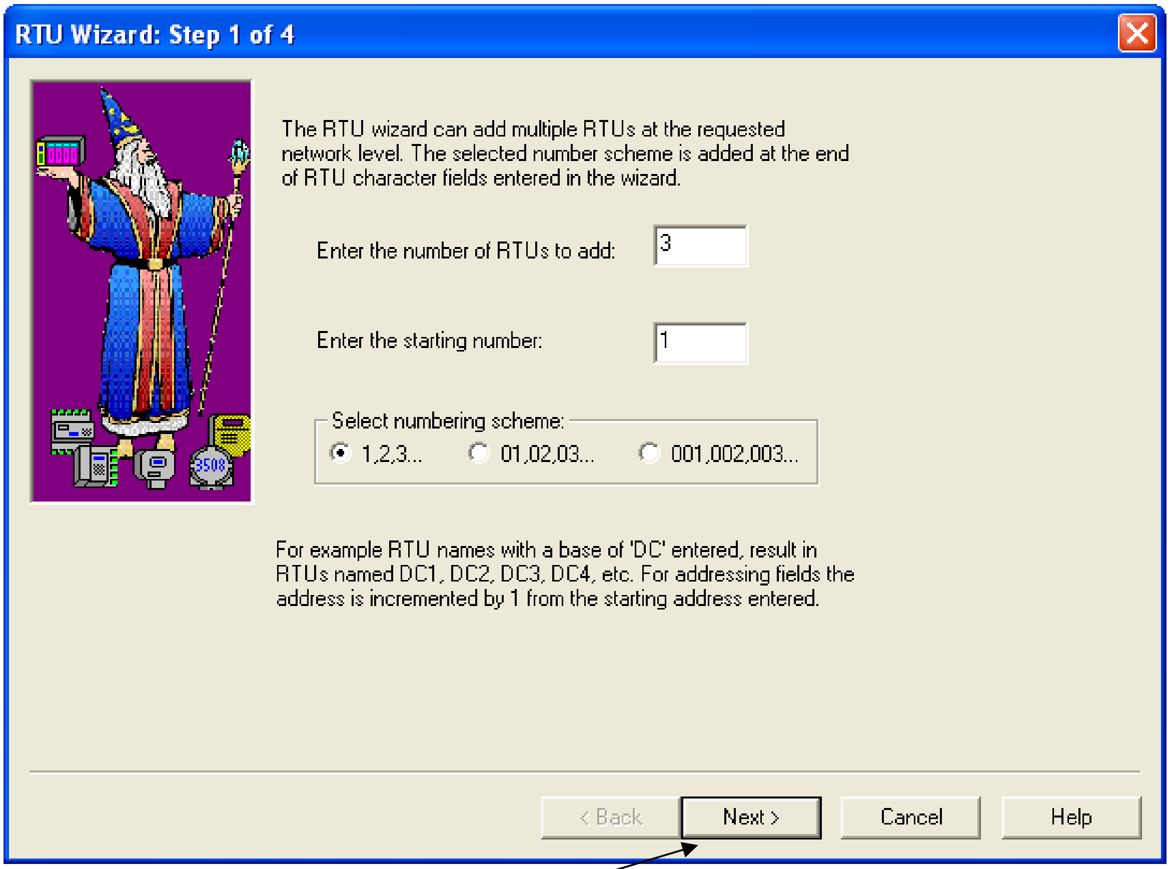
6.17.2 Navigating Between Pages of the RTU Wizard

Click either **Next** or **Back**, whichever is appropriate.

6.17.3 RTU Wizard: Step 1 of 4

The first page of the RTU Wizard defines how many RTUs you want to add, and how you intend to number them.

You can add controllers (RTUs) one at a time, invoking the RTU Wizard for each one you add, or you can add multiple RTUs all at the same time. You can also specify a numbering scheme and starting number if you add multiple RTUs.


RTU Wizard: Step 1 of 4

The RTU wizard can add multiple RTUs at the requested network level. The selected number scheme is added at the end of RTU character fields entered in the wizard.

Enter the number of RTUs to add: 3

Enter the starting number: 1

Select numbering scheme:
● 1,2,3... ○ 01,02,03... ○ 001,002,003...

For example RTU names with a base of 'DC' entered, result in RTUs named DC1, DC2, DC3, DC4, etc. For addressing fields the address is incremented by 1 from the starting address entered.

Click Next to go to the next page.

Figure 6-48. RTU Wizard – Step 1 of 4

Field	Description
Enter the number of RTUs to add	Specify how many RTUs you want to add. If you want, you can enter “1” to add just one RTU at a time, but then you need to invoke the RTU Wizard separately each time you want to add an RTU.
Enter the starting number	If you add more than one RTU, the RTU Wizard appends the number you specify to a text string (entered on page 2 of the RTU Wizard) to create a node name for the first RTU. The wizard then increments the starting number sequentially (using a numbering scheme you choose) and appends it to the text string to create a name for each additional RTU. (You can easily change the names later if you right-click on an RTU, and select **Properties** from the pop-up menu.)

Select numbering scheme	If you want to add more than one RTU, choose a numbering scheme for the numbers you use (along with a text string you enter on page 2 of the RTU Wizard) to assign node names for each of the new RTUs. (You can easily change the names later if you right-click on an RTU, and select **Properties** from the pop-up menu.)

Click **Next** to go to the second page of the RTU Wizard.

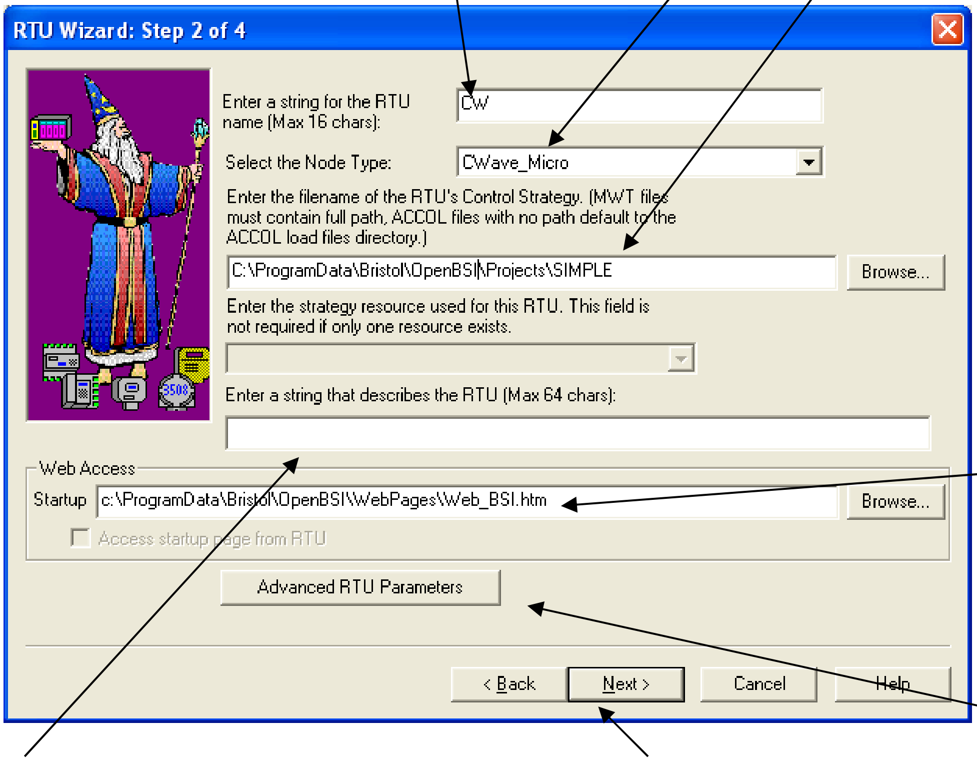
6.17.4 RTU Wizard: Step 2 of 4

On the second page of the RTU Wizard, you need to define a name for each RTU, the type of RTU, and the control strategy file name.

If you are adding a single RTU, enter the compete name here. If you are adding multiple RTUs, enter only the portion of the name which is combined with the numbers specified on page 1. The complete RTU name cannot exceed 16 characters.

Choose the type of controller (RTU).

By default the RTU name is used for the control strategy filename. For ControlWave, specify a full path in addition to the filename. For Network 3000, the system assumes that the file resides in the ACCOL directory. If you are adding a single RTU, enter the compete name here. If you are adding multiple RTUs, enter only the portion of the name which is combined with the numbers specified on page 1. The complete RTU name cannot exceed 16 characters



RTU Wizard: Step 2 of 4

Enter a string for the RTU name (Max 16 chars): CW

Select the Node Type: CWave_Micro

Enter the filename of the RTU's Control Strategy. (MWT files must contain full path, ACCOL files with no path default to the ACCOL load files directory.)

C:\ProgramData\Bristol\OpenBSI\Projects\SIMPLE

Enter the strategy resource used for this RTU. This field is not required if only one resource exists.

Enter a string that describes the RTU (Max 64 chars):

Web Access

Startup c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

□ Access startup page from RTU

This defines the optional startup HTML page used with this RTU. Specify the full path and filename of the HTML file stored on your workstation.

If you are adding multiple RTUs, leave this blank for now.

Click here to go to page 3.

Most users can ignore the Advanced Parameters.

Figure 6-49. RTU Wizard – Step 2 of 4

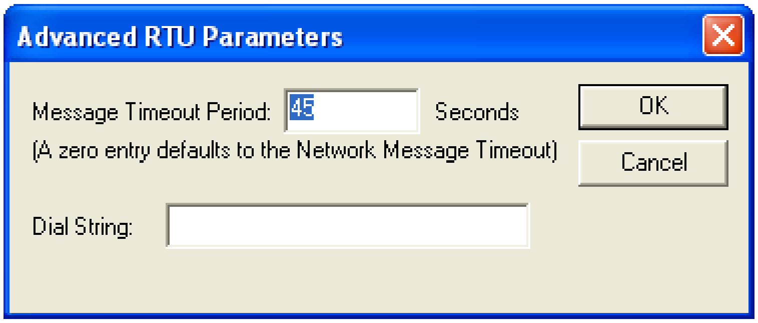
Field	Description
Enter a string for the RTU name (max 16 chars)	Specify the name of the RTU. If you define only a single RTU, enter the complete name. If you define multiple RTUs on the same level, specify only the beginning portion of the name; the wizard assigns numbers for the RTUs (based on the starting number and numbering scheme you specify on page 1 of the RTU Wizard) and appends them to the beginning portion of the name. The complete name, including the appended numbers, must not exceed 16 characters. In general, we recommend you only use alpha-numeric characters (letters, numbers) plus the underscore. You cannot use spaces, however, and you should avoid punctuation marks. **Note:** Older programs (including some older versions of OpenBSI tools, as well as HMI packages which were designed to use older versions of the BSI communications driver) are unable to communicate with node names which exceed 4 characters
Select the node type	Specify the type of remote process controller (RTU). Valid choices for IP nodes include: “3330” for DPC 3330 controllers, “3335” for DPC 3335 controllers, “ControlWave” for ControlWave process automation controllers, “CWave_LP” for ControlWave LP, “CWave_Micro” for the ControlWave MICRO, “CWave_RIO” for the ControlWave I/O Expansion Rack, “CWave_EFM” for the ControlWave EFM, “CWave_GFC” for the ControlWave Gas Flow Computer, “CWave_XFC” for the ControlWave Explosive-proof Gas Flow Computer, “CW_10” for the CW_10 unit, and “CW_30” for the CW_30 unit.
Enter the filename of the RTU's Control Strategy (ACCOL files with only a basename will default to ACCOL Load Files Directory)	Specify the control strategy file name for the RTU. For ACCOL files residing in the default ACCOL directory, you can omit the path and ACC file extension. For any other control strategy files (ACCOL files in *other* directories, or ControlWave .MWT files), type the full path in addition to the file basename, or use the **Browse** button to specify the correct path and file basename.
Enter the strategy resource used for this RTU. This field is not required if only one resource exists.	If this is a ControlWave file with more than one resource, select which resource you want to use with this RTU.
Enter a string that describes the RTU (Max 64 chars)	Specify a description of the RTU. (Optional) **Note**: If you define multiple controllers, all RTUs share the description you enter; it may be easier to edit this information, later.
Web Access	This section specifies the first web page (.HTML file) OpenBSI opens when you request web page access to this controller. Type the path and filename of the HTML file in the **Startup** field, or use the **Browse** button to locate it. The OpenBSI workstation stores

	the web pages and you can use them with any RTU type. If you check the **Access startup page from RTU,** OpenBSI downloads the zipped copy of the HTML file from the RTU to the OpenBSI workstation; not all RTUs support this.
Advanced Parameters	Click here to open the Advanced RTU Parameters dialog box, discussed later in this section.

Click **Next** to go to page 3 of the RTU Wizard.

Advanced Parameters dialog box

The **Advanced Parameters** button on page 2 of the RTU Wizard activates the Advanced RTU Parameters dialog box.



Message Timeout Period: 45 Seconds
(A zero entry defaults to the Network Message Timeout)

Dial String:

Figure 6-50. Advanced RTU Parameters dialog box

Field	Description
Message Timeout Period	This value specifies (in seconds) how long to wait before declaring that a message that OpenBSI sent to this RTU is lost. If you don't specify a value, the system uses the default message time-out period for the network (from your entries in the Network Wizard).
Dial String	This is not supported for IP RTUs.

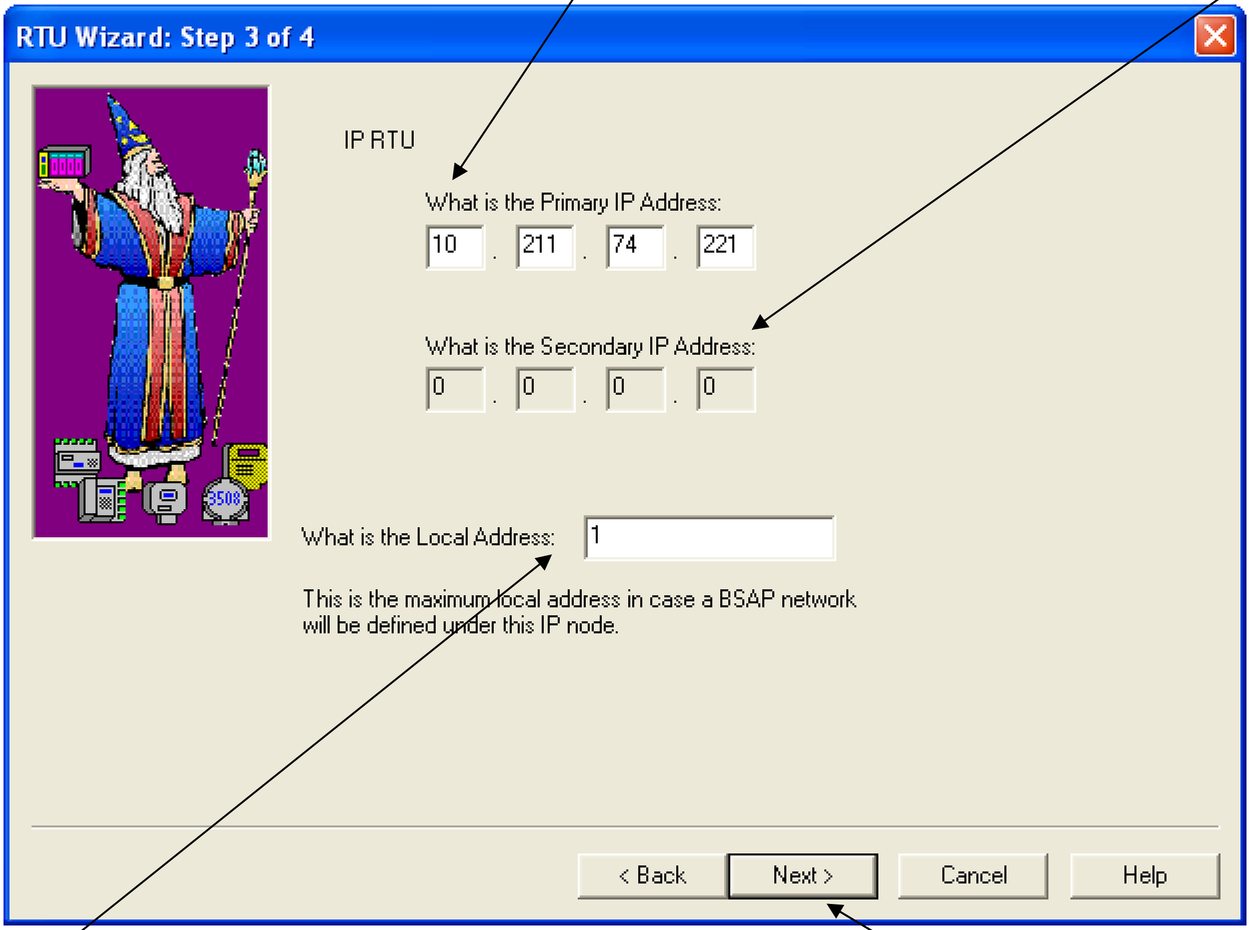
Click **OK** to save any changes to the advanced parameters.

6.17.5 RTU Wizard: Step 3 of 4

The third page of the RTU Wizard requires you to specify the IP address of the RTU.

Define the IP address for this RTU's IP port as the Primary IP Address. This must match the address defined during RTU communications configuration. If you are defining multiple RTUs, enter the address of the first RTU here; addresses of the remaining RTUs are assigned sequentially based on the first address.

If this RTU is part of a redundant pair, enter the "A" unit's address for the Primary IP Address, and the "B" unit's address for the Secondary IP Address.



RTU Wizard: Step 3 of 4

IP RTU

What is the Primary IP Address: 10 . 211 . 74 . 221

What is the Secondary IP Address: 0 . 0 . 0 . 0

What is the Local Address: 1

This is the maximum local address in case a BSAP network will be defined under this IP node.

The BSAP local address you enter here must match the address configured at the RTU (either through the Flash Configuration utility or switch/jumper settings). Even though this isn't a BSAP network, this address is used for routing of alarms and RBE messages.

Click here to go to page 4.

Figure 6-51. RTU Wizard – Step 3 of 4

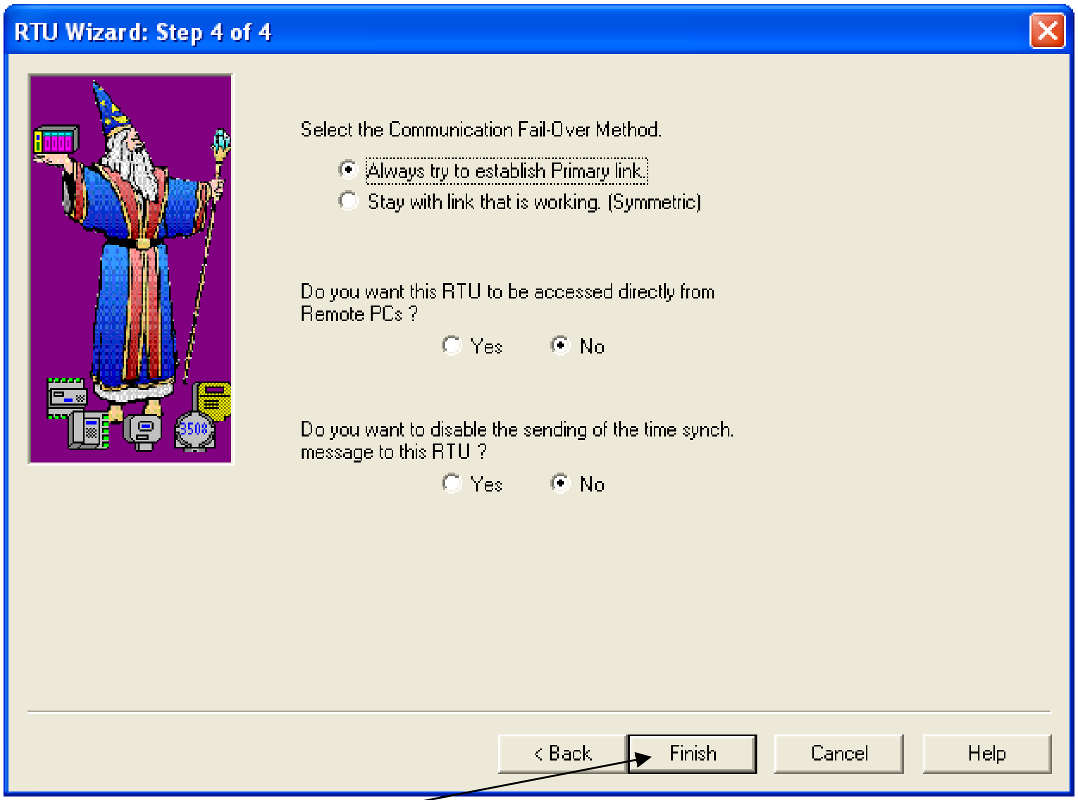
Field	Description
What is the primary IP address?	Specify the IP address of the RTU in dotted decimal format. If you define multiple RTUs, specify the address of the first RTU; the RTU Wizard assigns sequential addresses to the remaining RTUs. If this RTU has two IP ports, enter the address of the primary port. If this RTU belongs to a redundant pair

	of RTUs, enter the address for the "A" unit of the redundant pair.
What is the secondary IP address?	If this RTU has two IP ports, enter the address of the second port. If this RTU belongs to a redundant pair of RTUs, enter the address for the "B" unit of the redundant pair. If neither of these cases exist, specify “0” in each field. **Note**: If you are add multiple RTUs at the same time, this field appears “grayed out”.
What is the Local Address	*If this IP RTU has a BSAP sub-network underneath it*, you must assign the IP RTU a BSAP local address. Be aware, that NetView uses the local address you choose for the IP RTU in the calculation of BSAP global addresses for the BSAP sub-network, below it. If you enter a large number for the local address of the IP RTU, the number requires more bits in the network global address calculation, and thereby reduces the number of BSAP slave nodes which OpenBSI supports on Levels 2 through 5 of the BSAP sub-network. In NetView, the IP RTU itself is considered the Level 1 node, and the NHP is the Level 0 node. The value you enter for the local address must match the local address configured in the RTU. *If this IP RTU is only part of an IP Network*, the local address you define here must still match whatever local address you set to in the RTU to allow for proper routing of alarm and RBE messages.

Click on the **[Next]** push button to go to page 4 of the RTU Wizard.

6.17.6 RTU Wizard: Step 4 of 4

The fourth page of the RTU Wizard allows you to specify communication fail-over information, and also specify whether you want to allow proxy direct access to the RTU.



RTU Wizard: Step 4 of 4

Select the Communication Fail-Over Method.

● Always try to establish Primary link.

○ Stay with link that is working. (Symmetric)

Do you want this RTU to be accessed directly from Remote PCs ?

○ Yes ● No

Do you want to disable the sending of the time synch. message to this RTU ?

○ Yes ● No

Click here to exit the RTU Wizard

Figure 6-52. RTU Wizard – Step 4 of 4

Field	Description
Select the Communication Fail-Over Method	There are two fail over methods to choose from: **Always try to establish Primary link** - If you choose this option, OpenBSI always attempts to communicate with this RTU through the primary link (**Primary IP Address**), unless that link fails, in which case, it tries to communicate using the secondary link (**Secondary IP Address**). If that link also fails, OpenBSI continually swaps back and forth between each link, and tries to establish communications using one of the links. If you can establish communication using the secondary link (because the primary is still "dead"), OpenBSI periodically checks for restoration of the primary link, by sending a time synchronization message using the primary link. If, during one of these periodic checks, OpenBSI detects that the primary link now works, OpenBSI switches all communications back to the primary link. **Stay with link that is working. (Symmetric)** If you choose this option, OpenBSI uses the current working communication link (either primary or secondary) and then if that link fails, fails over to the alternate link. OpenBSI makes a few attempts to establish communications using the alternate link; if these attempts fail, OpenBSI abandons attempts to re-establish communications; and it does not send out

	time synchronization messages. OpenBSI does not attempt to communicate again unless it receives a request to send a particular message, or communication links re-start. Choose this method if the RTU belongs to a redundant pair.
Do you want this RTU to be accessed directly from Remote PCs?	If you choose **Yes**, any OpenBSI workstation which you grant proxy direct access to can send messages directly to this RTU. If you choose **No**, any OpenBSI workstation which you grant proxy access to needs to route messages to the RTU through the RTU's NHP.
Do you want to disable the sending of time synch messages to this RTU?	If you choose **Yes**, OpenBSI does not transmit time synchronization messages to this RTU. If you choose **No**, OpenBSI periodically transmits time synchronization messages to this RTU.

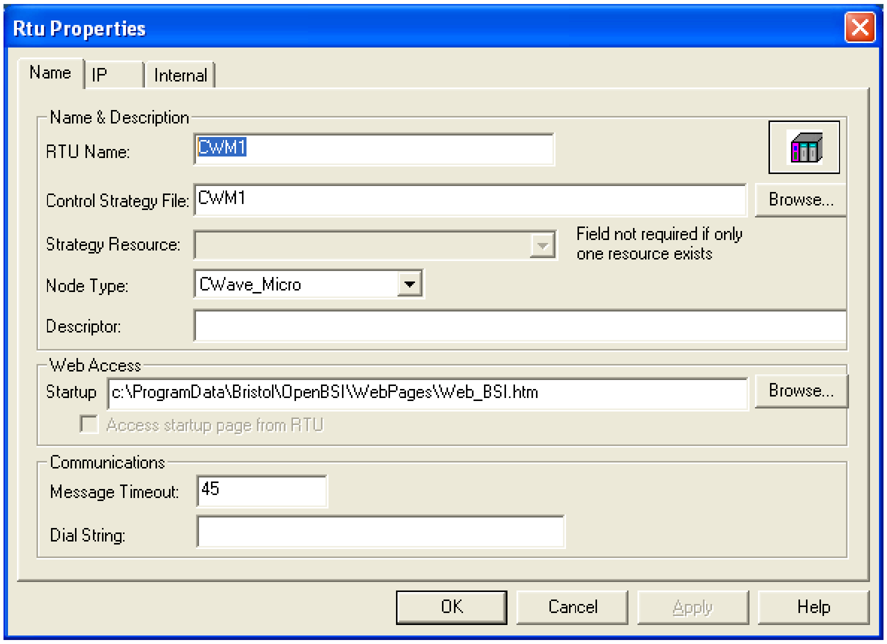
Click **Finish** to exit the RTU Wizard.

6.17.7 Modifying IP RTU Parameters

Once you define your RTUs, if necessary, you can edit their properties if you right click on the RTU icon, and select **Properties** from the pull down menu.

The RTU Properties dialog box contains three pages, each of which you can reach using the “file tabs”. For more information on what the various fields mean, see the earlier portions of this chapter. Click **OK** on any page to exit the dialog box and save your entries for all three pages.

The “Name” page allows you to modify most of the properties for an RTU including the name of the RTU, the name of the control strategy (load file), the type of RTU, and the advanced parameters for dialing.



RTU Name: CWM1

Control Strategy File: CWM1

Strategy Resource:

Field not required if only one resource exists

Node Type: CWave_Micro

Descriptor:

Startup c:\ProgramData\Bristol\OpenBSI\WebPages\Web_BSI.htm

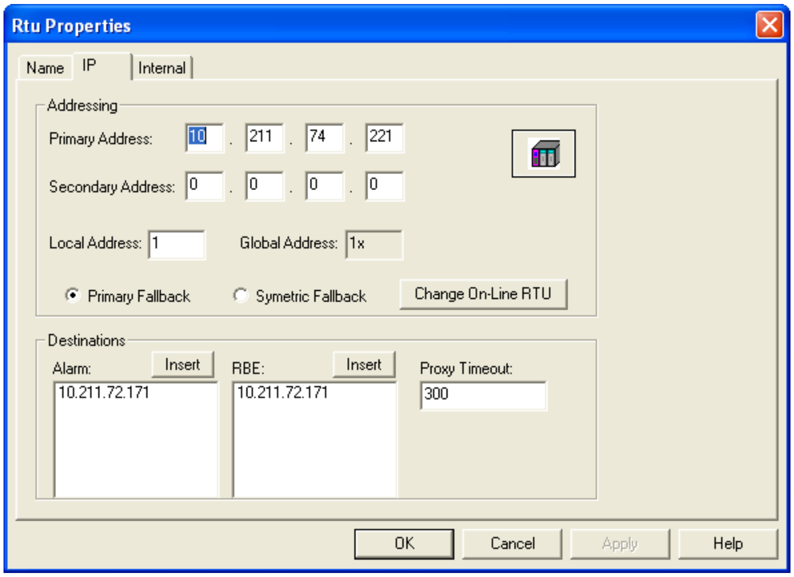
☐ Access startup page from RTU

Message Timeout: 45

Dial String:

Figure 6-53. RTU Properties – Name tab

The "IP" page allows you to modify the IP address(es) of the RTU, as well as the fail-over parameters if this is a redundant pair of RTUs. In addition, if this is a redundant pair of RTUs, you can change which IP address NetView uses right now if you click the **Change On-Line RTU** button. **Note:** This does not cause a redundant fail-over, it just swaps the IP addresses NetView currently uses for communications, i.e. if messages currently go to the primary address, when you click that button, messages now go to the secondary address.



Primary Address: 10 . 211 . 74 . 221

Secondary Address: 0 . 0 . 0 . 0

Local Address: 1

Global Address: 1x

● Primary Fallback ○ Symetric Fallback

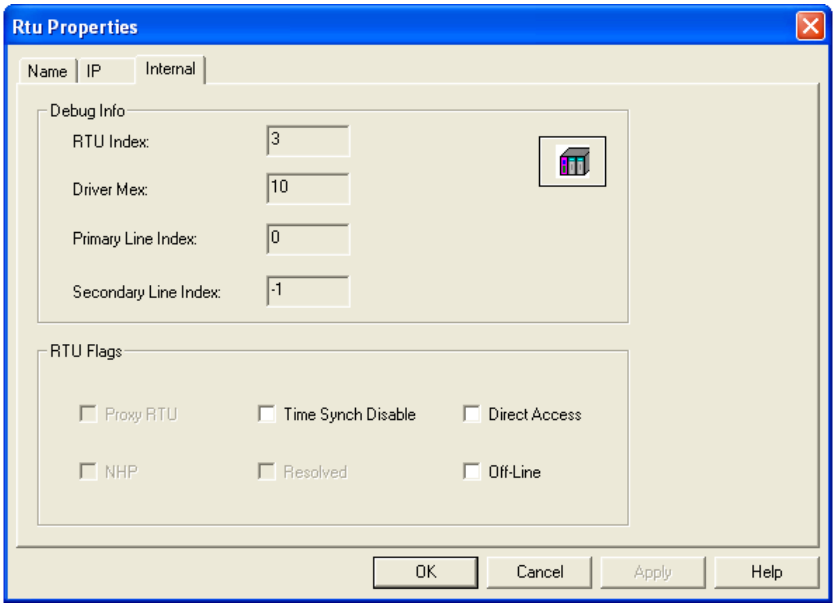
Alarm: 10.211.72.171

RBE: 10.211.72.171

Proxy Timeout: 300

Figure 6-54. RTU Properties – IP tab

The "Internal" page displays certain parameters for debugging which Emerson personnel may use. It also allows you to change the setting for this RTU's proxy direct access, to specify whether this RTU receives time synchronization messages, and it also allows you to take this RTU “off-line” so the NHP will not attempt to communicate with it.



Debug Info

RTU Index: 3

Driver Mex: 10

Primary Line Index: 0

Secondary Line Index: -1

RTU Flags

□ Proxy RTU □ Time Synch Disable □ Direct Access

□ NHP □ Resolved □ Off-Line

Figure 6-55. RTU Properties – Internal tab

6.18 Defining a Communication Line for a BSAP Network

Communication Lines are one of the four basic components which you must configure in OpenBSI. You define a communication line in NetView using the Comm Line Wizard. You can only define a communication line after you define an NHP.

6.18.1 Activating the Comm Line Wizard

There are two ways to activate the Comm Line Wizard:

- One way is to right click on the NHP icon, and select **Add**>**Line** from the pop-up menu to start the Comm Line Wizard.

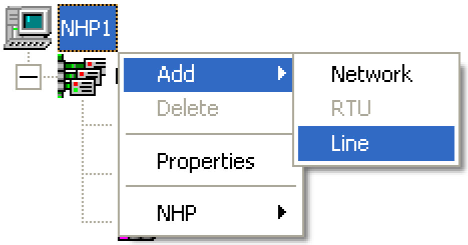
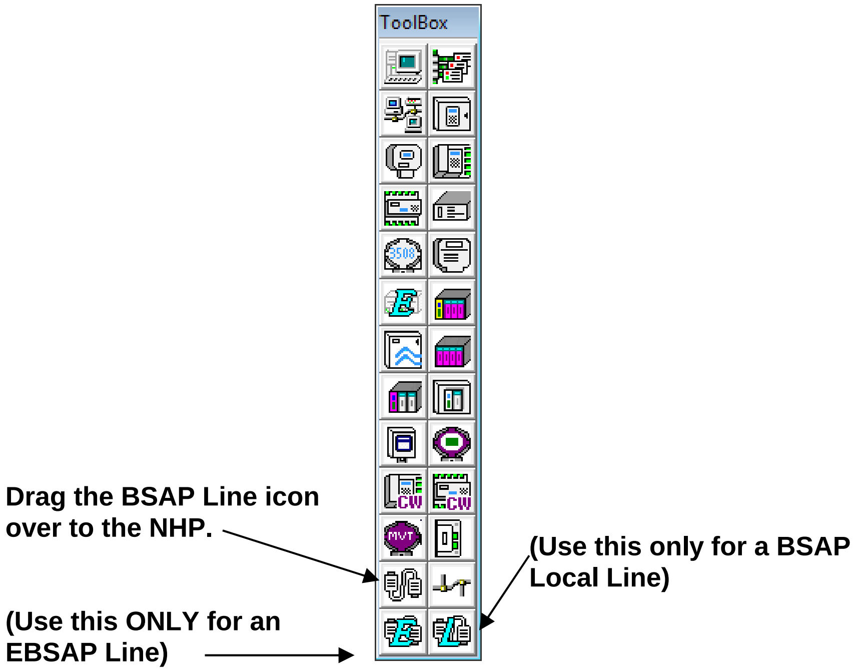


Figure 6-56. Starting the Comm Line Wizard – Method 1

- The other way to start the Comm Line Wizard is to drag the BSAP comm line icon from the Toolbox, over to the NHP icon.



Drag the BSAP Line icon over to the NHP.

(Use this only for a BSAP Local Line)

(Use this ONLY for an EBSAP Line)

Figure 6-57. Starting the Comm Line Wizard – Method 2

6.18.2 Navigating Between Pages of the Comm Line Wizard

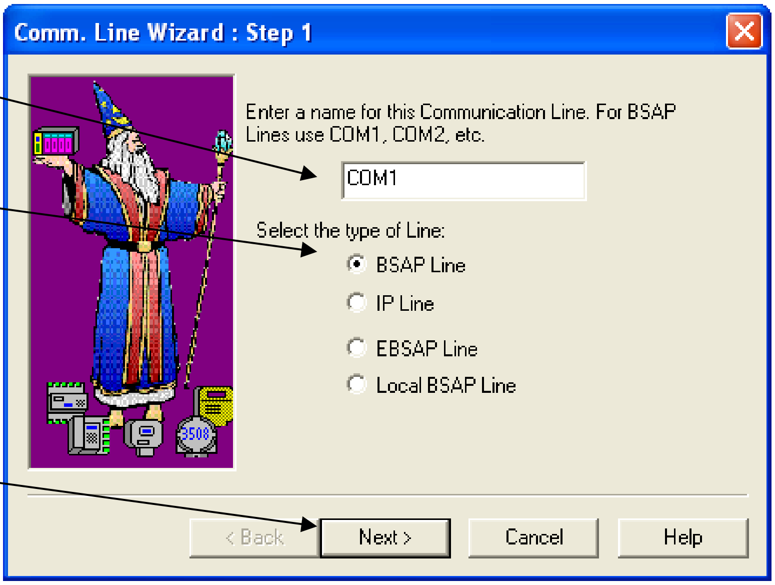
Click **Next** or **Back**, whichever is appropriate.

6.18.3 Comm Line Wizard: Step 1

The first page of the Comm Line Wizard includes the following fields / questions:

Field	Description
Enter a name for this Communication Line	Specify a name for the Communication Line. Typically, you use the name "COM1" or "COM2." The system allows you to define up to 5000 communication lines.
Select the type of Line	Generally you choose **BSAP Line.** Only choose **EBSAP Line** if you want to use expanded node addressing. Use **Local BSAP Line** to establish a local BSAP connection at a lower level of the network.

Click **Next** to go to Page 2 of the Comm Line Wizard.



For BSAP networks, you typically choose "COM1"

Choose BSAP Line, EBSAP Line or Local BSAP Line. (Most applications use BSAP Line.)

Click here to go to page 2

Comm. Line Wizard : Step 1

Enter a name for this Communication Line. For BSAP Lines use COM1, COM2, etc.

COM1

Select the type of Line:

● BSAP Line
○ IP Line
○ EBSAP Line
○ Local BSAP Line

Figure 6-58. Comm Line Wizard – Step 1

6.18.4 Comm Line Wizard: Step 2 (BSAP and/or EBSAP Lines)

For BSAP and/or EBSAP Lines, the second page of the Comm Line Wizard requires you to define the valid range of slave node addresses for nodes that communicate on this line. Slave node addresses range from 1 to 127.

This is the rate at which the NHP requests data from the Level 1 RTUs

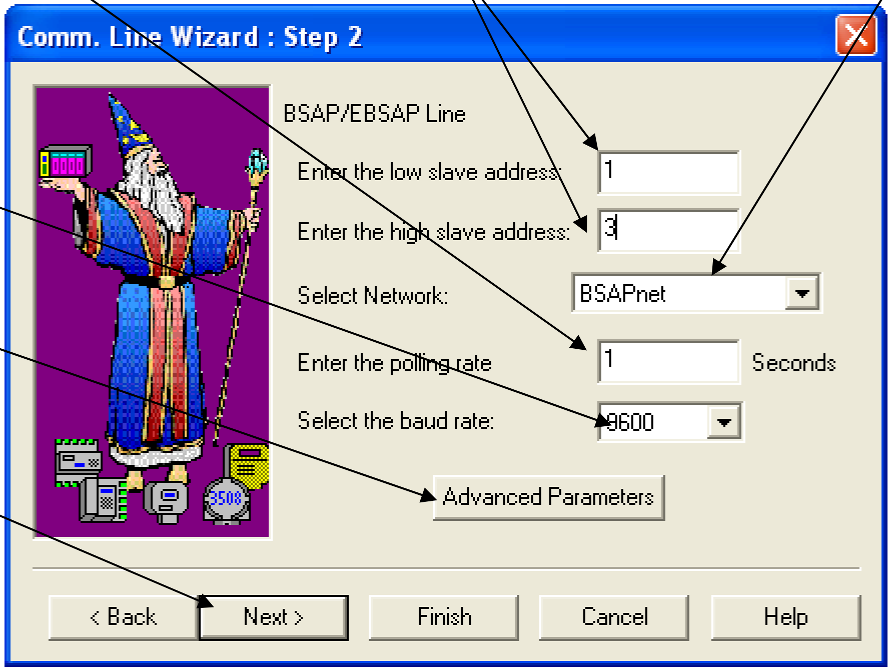
These two parameters define the range of local addresses for RTUs on Level 1 of the BSAP network. This must be consistent with entries you made previously in the Network Wizard

If your system includes more than on BSAP network, you must choose which network uses this COM line

The baud rate selected here must match the baud rate setting at the RTU

Most users can ignore the Advanced Parameters

Click Next to go to page 3 of the Comm Line Wizard



Comm. Line Wizard : Step 2

BSAP/EBSAP Line

Enter the low slave address: 1

Enter the high slave address: 3

Select Network: BSAPnet

Enter the polling rate: 1 Seconds

Select the baud rate: 9600

Figure 6-59. Comm Line Wizard – Step 2 (BSAP/EBSAP Line)

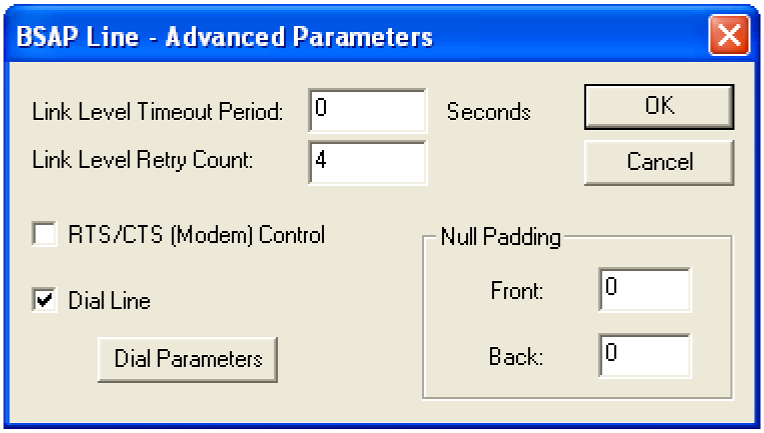
Field	Description
Enter the low slave address	Enter the value of the lowest local address among all of the Level 1 RTUs on this communication line. (Depending upon the model of RTU, you configure the RTU's local address using switches or jumpers at the RTU, or you set soft switches with the Flash Configuration utility.)
Enter the high slave address	Enter the value of the highest local address among all of the Level 1 RTUs on this communication line. It **cannot** be less than the value of the low slave address.
Select Network	If you define more than one BSAP network, you must select which network uses this COM line. **Note**: To use multiple BSAP networks requires OpenBSI 5.5 (or newer).
Enter the polling rate	Enter the rate (in seconds) at which OpenBSI polls the top level (Level 1) RTUs for data.

Select the baud rate	Use the list box to specify the rate at which communications occur on this line. The rate you choose must match the configured baud rate for each Level 1 RTU.
Advanced Parameters	Click this button to call up the BSAP Line Advanced Parameters dialog box.

BSAP Line - Advanced Parameters dialog box

The **Advanced Parameters** button on page 2 of the Comm Line Wizard activates the BSAP Line - Advanced Parameters dialog box.

If you use dial-up modems or radios as part of your data link, you need to edit the advanced parameters. For most other applications, you don't need to edit these parameters, unless you have a complex system that requires network "tuning" to achieve optimum performance.



Link Level Timeout Period: 0 Seconds

Link Level Retry Count: 4

☐ RTS/CTS (Modem) Control

☑ Dial Line

Null Padding

Front: 0

Back: 0

Figure 6-60. BSAP Line – Advanced Parameters dialog box

Field	Description
Link Level Timeout Period	This defines the maximum amount of time (in seconds) that OpenBSI waits to receive a response to any one data link transaction. If you enter "0" as the link timeout period, the system uses a default timeout it calculates based on the baud rate of the line. Generally, you specify a link level timeout of between 0.5 seconds to 1 second.

⚠ **Caution**

You should only modify the link level timeout if you have a specific reason for doing so, i.e. you have a complex communications setup using radios, satellites, etc., which requires a longer timeout. A link level timeout longer than 10 seconds is very rare. The maximum link level timeout, beginning with OpenBSI 5.4, is 300 seconds. A long link level timeout lengthens the period of time needed for OpenBSI to detect changes to Line Parameters, and also slows down the system's response to requests to shutdown the OpenBSI Workstation.

Link Level Retry Count	If OpenBSI records this number of Link Level Timeouts from a particular RTU, OpenBSI declares the RTU “dead.”
RTS/CTS (Modem) Control	Check this box if the RTUs on this line require RTS/CTS hand-shaking to communicate. The NHP turns on the Request to Send (RTS) control line for the RTU, which must respond to the NHP by turning on the Clear to Send (CTS) control line, at which point, the data is sent. **Note:** If you use radios, see the troubleshooting tip about RTS/CTS in *Appendix D*.
Null Padding - Front, Null Padding - Back	You use these fields to specify a certain number of null characters OpenBSI inserts at the beginning (front) or ending (back) of a message. Messages may require null characters in situations where there is a momentary delay which causes an RTU to miss the start of a message, for example, while the RTU activates a radio link. You may also need to use null characters if you send communications using a 2-wire RS-485 link, to ensure that DTR does not drop prematurely. To determine the delay caused by null packing, perform the following calculation: $\text{seconds of delay} = \frac{\text{number of null characters} \; * \; 10}{\text{baud rate}}$
Dial Line	Check this box if the NHP must communicate to the Level 1 RTUs on this communication line using a modem. When you check this box you must also configure dialing parameters. Use the Dial Parameters dialog box, which you access from the **Dial Parameters** button.

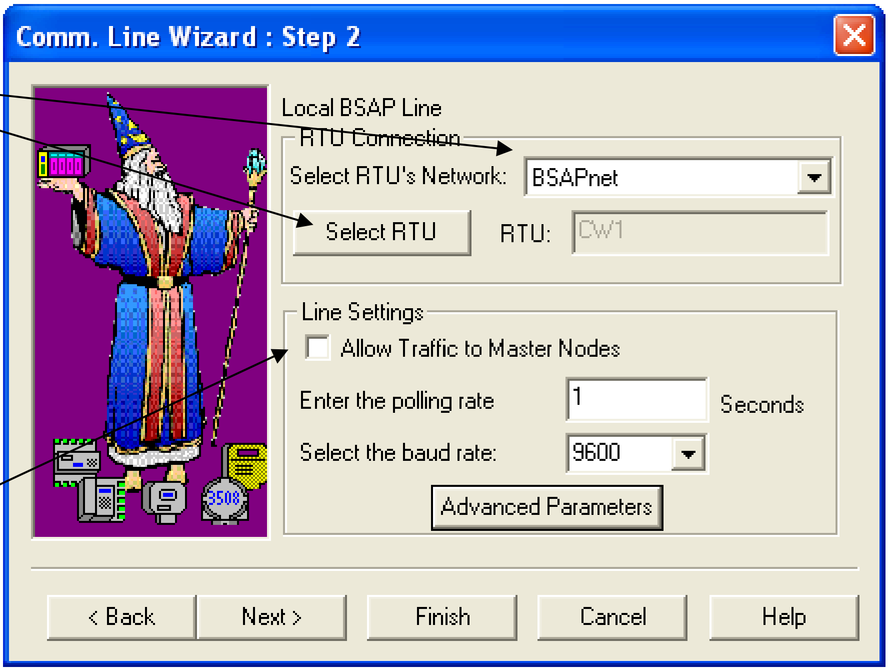
6.18.5 Comm Line Wizard: Step 2 (Local BSAP Line)

Typically, you use local BSAP lines to plug into the pseudo-slave port of a particular BSAP RTU, to gain access to that RTU, and other RTUs in the network. Usually, you do this on a lower level BSAP RTU (network levels 2, 3, 4, 5, or 6) for system checkout or debugging. The local BSAP line allows technicians to temporarily run OpenBSI Utilities (for example, on a laptop at a remote geographical location) to allow access to various BSAP nodes in the network.

Another use for local BSAP lines is to provide a temporary backup communication line, for use when normal communications are down. For example, if the regular hard-wired communication cable disconnects from an RTU, but the RTU also has a pseudo slave port connected to a modem, and auto-answer is configured, the local BSAP line could dial into the RTU until the normal communication connection is restored.

Notes:

- Communication traffic from a particular workstation to a particular RTU only occurs via one communication line at any one time. If a Local BSAP Line is active (as a temporary backup line) and then you restore the regular communication line, RTUs reachable via the Local BSAP Line are inaccessible via the regular line. Therefore, to use the regular communication line for these RTUs, you must shut down the Local BSAP Line.
- If an OpenBSI workstation (PC or laptop) uses the Local BSAP Line to communicate with a target RTU *other* than the one to which the Local BSAP Line is directly connected, that workstation must have a copy of the NETDEF files (*.NDF, *.MDB, *.LDB, *.DSN) which describe the portion of the network containing the target RTU. Also, the RTU you connect to must have a current copy of the node routing table which includes the target node. In addition, if you want to communicate with a master of the node to which you are connected you must check the **Allow Traffic to Master Nodes** option, and the value of the _SLAVE_PORT system variable in the node to which you are connected must indicate the port connected to the target master node.


Comm. Line Wizard : Step 2

Local BSAP Line

RTU Connection

Select RTU's Network: BSAPnet

RTU: CW1

Line Settings

□ Allow Traffic to Master Nodes

Enter the polling rate: 1 Seconds

Select the baud rate: 9600

Select the network, then select the RTU.

By default, communications is only possible with the node to which the workstation is connected, and the slaves of that node. Selecting this option allows access to a larger portion of the network.

Figure 6-61. Comm Line Wizard Step 2 (Local BSAP Line)

Field	Description
RTU Connection	
Select RTU's Network	Use this list box to select the BSAP network containing the RTU to which you want to connect.

Select RTU	Click the **Select RTU** button to choose the RTU you want to connect to using the local BSAP line. Initially this would be a direct connection.
RTU	Displays the name of the RTU you selected with the **Select RTU** button.
<u>Line Settings</u> **Allow Traffic to Master Node**	By default, the local BSAP line communicates with an RTU and that RTU's slave nodes. If you check this selection, however, you can access higher level RTUs; this allows you to examine a larger portion of the network.
Enter the polling rate	Specify the rate (in seconds) at which this OpenBSI workstation requests data from the selected RTU.
Select the baud rate	Choose the appropriate baud rate for the local BSAP line, using this list box. This baud rate must match the configured baud rate of the RTU serial port to which the local line connects.
Advanced Parameters	If you use a dial-up line for the connection, use the **Advanced Parameters** button to access the dialing parameters.

6.18.6 Switching the Local Line to a Different RTU

When the local BSAP line is active, you can easily disconnect from the current RTU on the line, and reconnect to a different RTU. To do this, *right*-click on the local line icon, and choose **Line>Change Target RTU**. Then specify the new RTU to which you want to communicate in the Select New Node dialog box. **Note**: You do NOT have to sign onto OpenBSI to make this change.

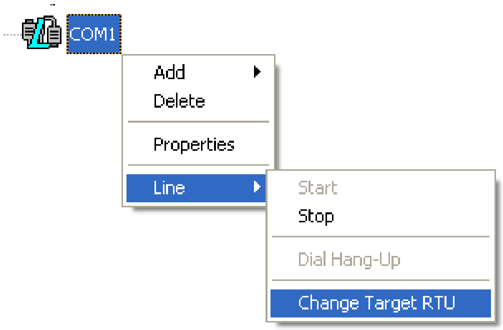
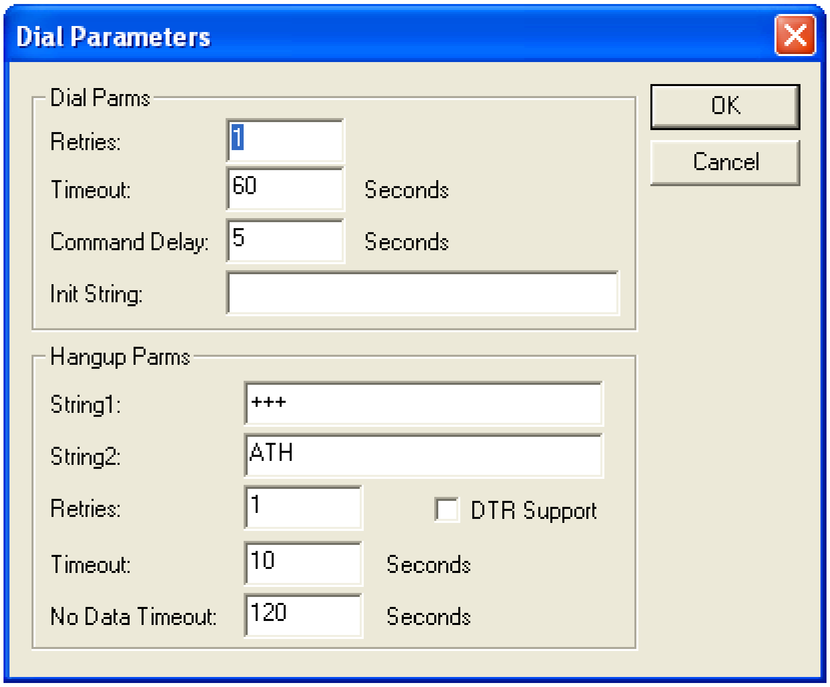


Figure 6-62. Changing the Target RTU of a Local BSAP Line

6.18.7 Specifying Dial Parameters (NetView or LocalView)

The Dial Parameters dialog box specifies both dial-up and hang-up parameters for modem communication on a BSAP line. You access it from the **Dial Parameters** button, which you can find in *either* the BSAP Line Advanced Parameters dialog box in NetView, the BSAP page of the Line Properties dialog box in NetView, or the Dial Setup (Step 3 of 3) dialog box in LocalView.

Note: For more information on dial-up configuration, see *Appendix D - Modem and Radio Configuration Tips*.



Dial Parms

Retries: 1

Timeout: 60 Seconds

Command Delay: 5 Seconds

Init String:

Hangup Parms

String1: +++

String2: ATH

Retries: 1

□ DTR Support

Timeout: 10 Seconds

No Data Timeout: 120 Seconds

Figure 6-63. Dial Parameters dialog box

The dial-up parameters are:

Field	Description
<u>Dial Parms</u>	
Retries	This is the number of attempts OpenBSI makes to dial a controller (RTU), before it declares the RTU “off-line.” This must be an integer from 0 to 10.
Timeout	This is the period of time (in seconds) OpenBSI waits before it declares a dialing attempt to be a failure.
Command Delay	This is the period of time (in seconds) OpenBSI waits between sending commands.
Init String	This is an initialization string for the modem. OpenBSI immediately precedes the initialization string with the “AT” modem command. OpenBSI sends the initialization string ahead of the dial-up string. (You define the dial-up string, for each RTU, in the RTU Wizard of NetView, or in the **Enter modem commands and phone number to be dialed** parameter in the Dial Setup dialog box of LocalView).

Hangup Parms	
String1	This is the first string sent to the modem when OpenBSI attempts to hang up.
String2	This is the second string sent to the modem when OpenBSI attempts to hang up.
Retries	This is the number of attempts OpenBSI makes to hang up the modem before it declares a hang-up failure. This value must range from 0 to 10.
Timeout	This is the amount of time OpenBSI waits before it declares a timeout on a hang-up.
No Data Timeout	This value specifies the amount of time (in seconds) after which the modem should hang up if there is no communication (other than poll messages) between the OpenBSI workstation and the controller.
DTR Support	If you check this box, OpenBSI drops DTR in order to hang up, before it sends the hang-up strings, and when OpenBSI raises DTR it dials out.

Click **OK** to save the dial-up and hang-up parameters.

Note: In NetView, you specify the actual dial strings for each RTU when you configure it. In LocalView, you define the dial strings for the RTU in the Dial Setup dialog box.

6.18.8 Forcing a Hang-up of the Dial-up Line

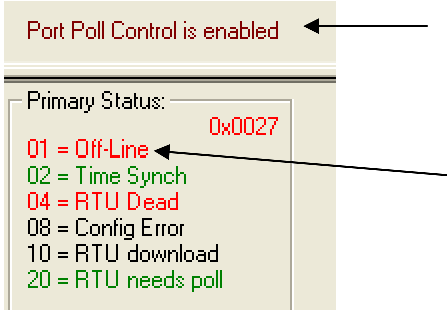
If a dial-up connection is currently established, you can force a hang-up if you right-click on the icon for the communication line, and choose **Line> Dial Hangup** from the pop-up menu.

6.18.9 Comm Line Wizard: Step 3 (Enable Port Poll Control - OPTIONAL)

Normally, a BSAP communication line polls for data continuously, according to the poll rate. This polling occurs whether or not the RTUs have data ready for collection. Beginning with OpenBSI 5.5, you have the option to shut down polling after the OpenBSI workstation receives a specified number of consecutive “ACK_NO_DATA” messages from the RTU. In other words, if the RTU responds with an “I have no data” message, OpenBSI’s Port Poll Control turns off polling until a data request occurs. This allows you to reduce network communications traffic.

For the period of time that the Port Poll Control disables polling for an RTU, NetView marks the RTU “Off-Line” in the Monitor pane. You cannot manually turn ON/OFF the “Off-Line” flag since the Port Poll control uses it whenever you activate the Port Poll Control feature.

If you subsequently disable the Port Poll Control for this line from the Line Properties page, you must go to the RTU Properties page for each RTU that the Port Poll Control marked off-line, and un-check the **Off-Line** flag.



Port Poll Control is enabled

Primary Status: 0x0027

01 = Off-Line
02 = Time Synch
04 = RTU Dead
08 = Config Error
10 = RTU download
20 = RTU needs poll

When Port Poll Control is active, this message appears in the monitor pane for its RTUs, and in the Comm Line pane.

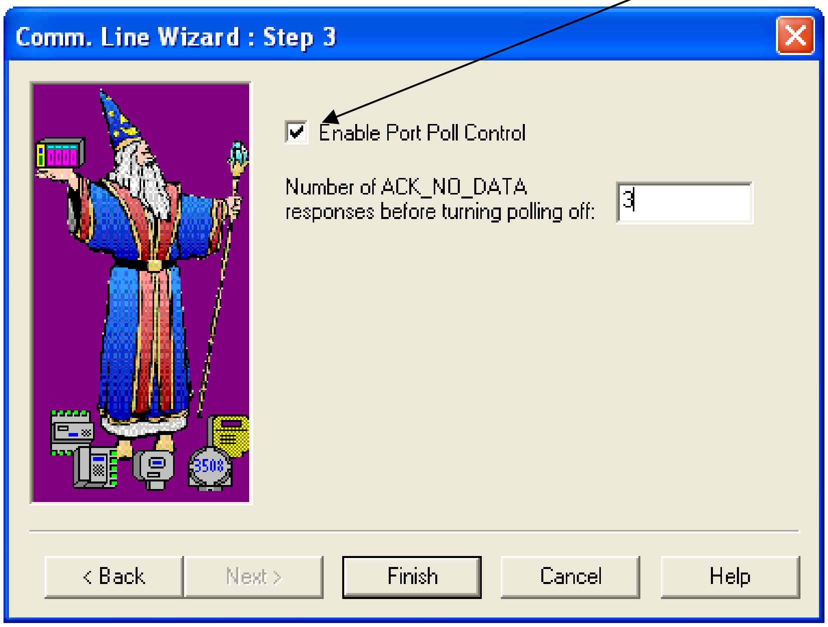
OpenBSI marks the RTU "Off-Line" whenever polling is not currently underway.

Figure 6-64. Port Poll Control

Note: You cannot use this feature on any port you configure as either a backup line or a dial-up line.

To enable the Port Poll Control, check the **Enable Port Poll Control** box on page 3 of the Comm Line Wizard, and enter how many "ACK_NO_DATA" messages you want to receive before the Port Poll Control turns off polling because there is currently no data to collect.

To turn on the Port Poll Control, select this.



Comm. Line Wizard : Step 3

☑ Enable Port Poll Control

Number of ACK_NO_DATA responses before turning polling off: 3

Figure 6-65. Comm Line Wizard – Step 3

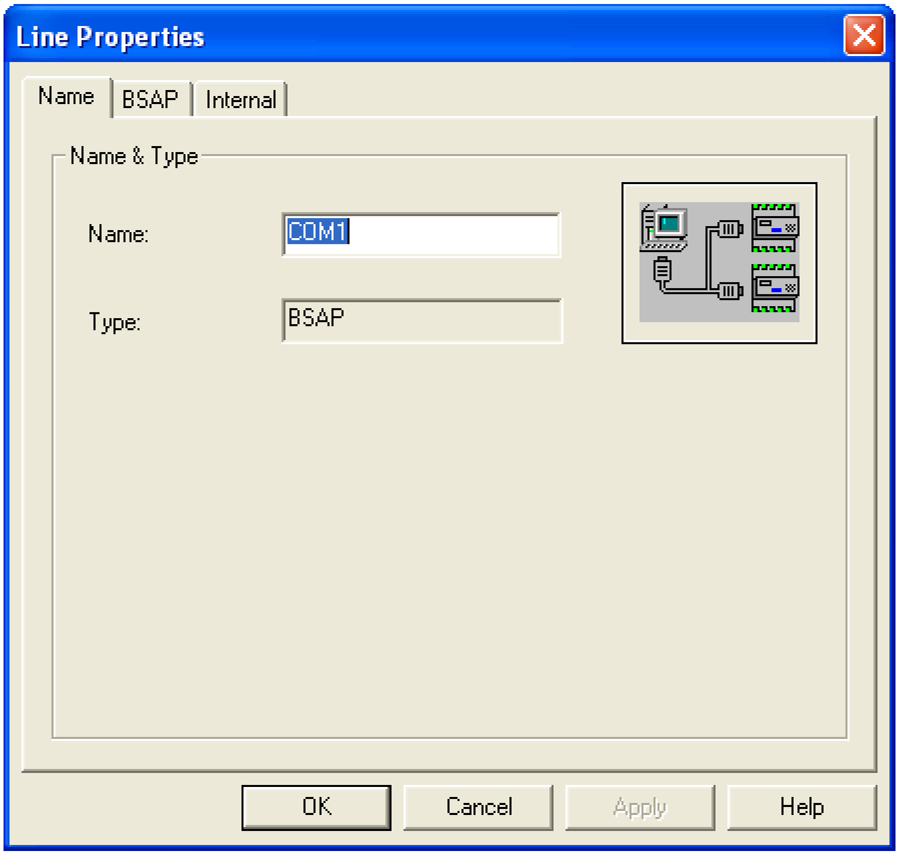
6.18.10 Exiting the Comm Line Wizard

Click **Finish** to exit the Comm Line Wizard.

6.18.11 Modifying the Characteristics of a BSAP Comm Line

Once you define a BSAP Communication Line in the Comm Line Wizard, you can alter the characteristics of the line, as needed, if you right-click on the icon for the communication line, then select **Properties** from the pop-up menu.

The Line Properties dialog box opens. This is a multi-page dialog box from which you can alter many of the characteristics of the BSAP Communication Line. The first page ("Name tab") allows you to change the name of the communication line. You cannot change the type of communication line.

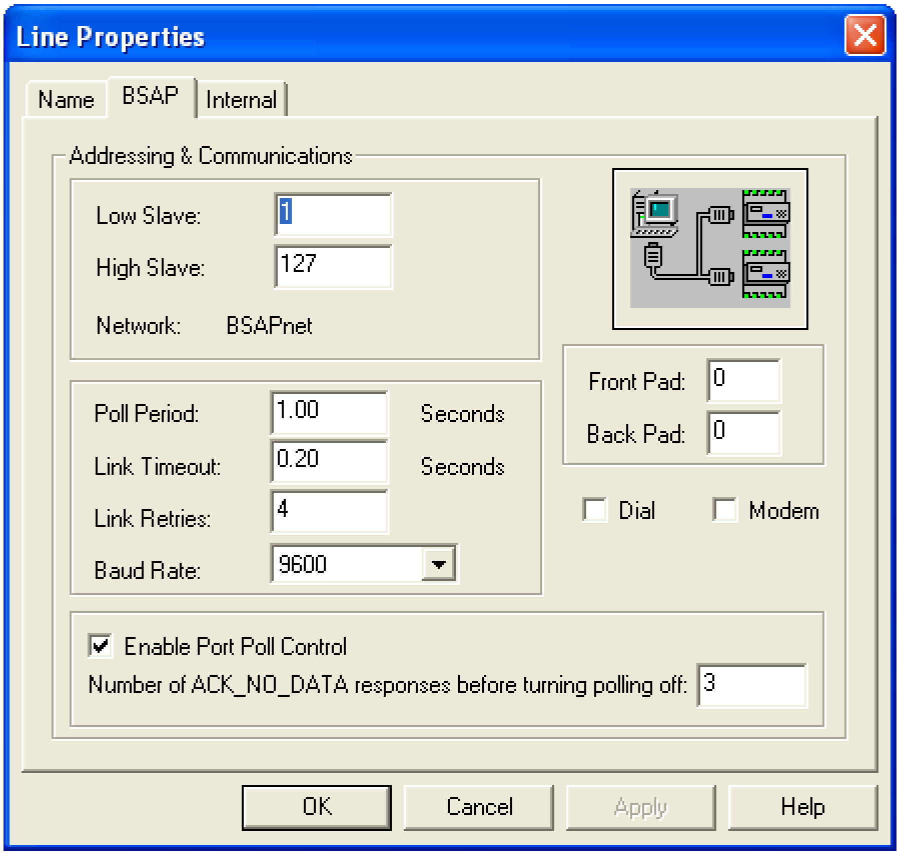


Name: COM1

Type: BSAP

Figure 6-66. Line Properties dialog box – Name tab

The second page ("BSAP tab") allows you to re-define the range of valid BSAP slave addresses for the line. The second page also allows you to change the following BSAP parameters: Polling Rate (Poll Period), Link Level Timeout Period, Link Level Retry Count, Baud Rate, Front/Back Null Padding, RTS/CTS (Modem) Control, Enable Port Poll Control, Number of ACK_NO_DATA responses. If this is a dial line, you can click the **Dial Parameters** button to view/change the dial parameters.



Low Slave: 1

High Slave: 127

Network: BSAPnet

Poll Period: 1.00 Seconds

Link Timeout: 0.20 Seconds

Link Retries: 4

Baud Rate: 9600

Front Pad: 0

Back Pad: 0

□ Dial □ Modem

☑ Enable Port Poll Control

Number of ACK_NO_DATA responses before turning polling off: 3

Figure 6-67. Line Properties dialog box – BSAP tab

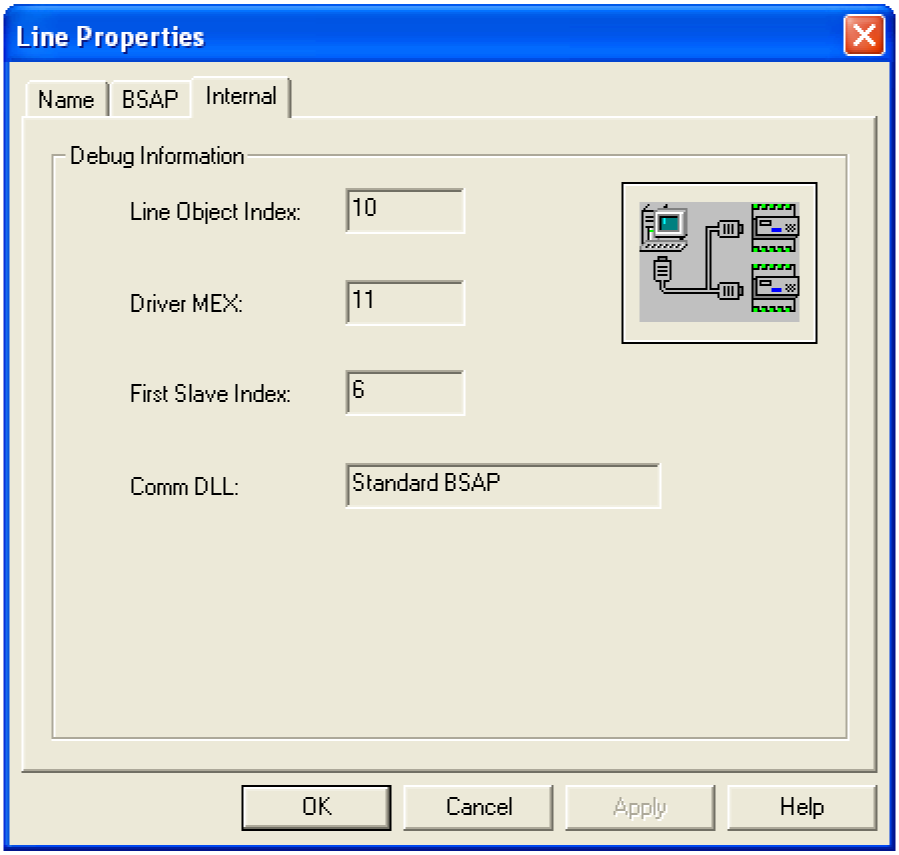
For information on what the various fields mean, see the descriptions of Comm Line Wizard fields in *6.18 Defining a Communication Line for a BSAP Network.*

The third page of the dialog box ("Internal" tab) displays certain debugging information. This information is primarily for use by Emerson development and support personnel.

Negative values for **Line Object Index** or **Driver MEX** indicate configuration errors. Re-check the parameters on the other two pages of the dialog box.

First Slave Index is an internal index for the first RTU on this line.

Comm DLL is the name of the communications DLL that the BSAP driver currently uses for this line. Typically, this is **Standard BSAP** but if you use the Port Arbitrator, it will show **Port Arbitrator**.



Debug Information

Line Object Index: 10

Driver MEX: 11

First Slave Index: 6

Comm DLL: Standard BSAP

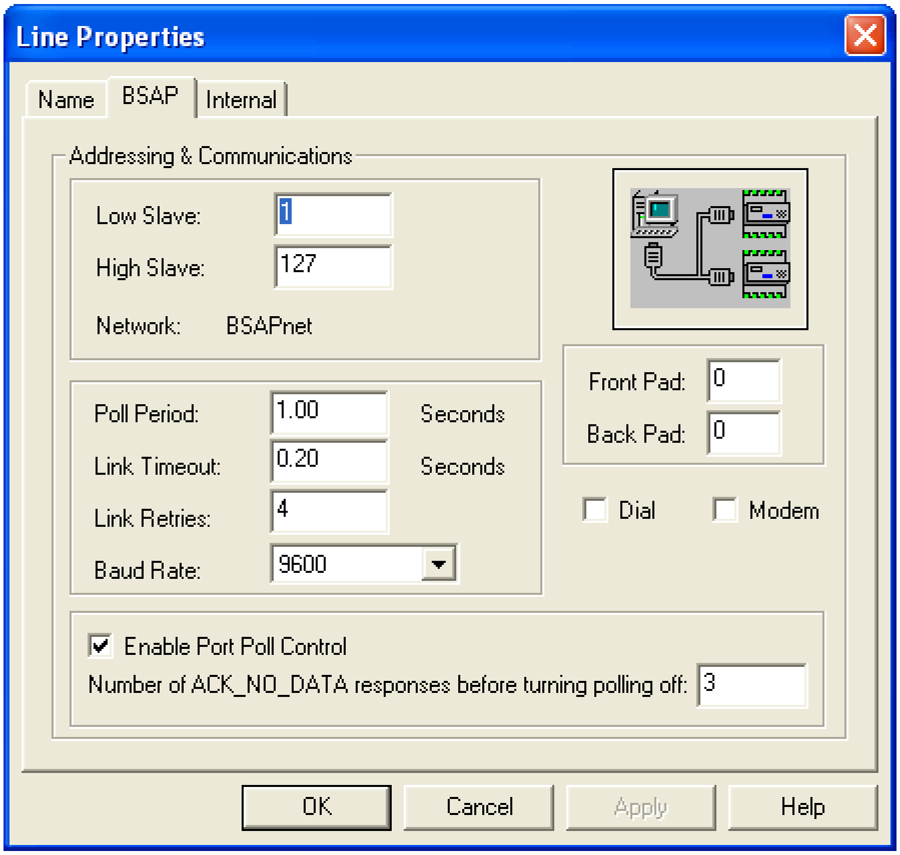
Figure 6-68. Line Properties dialog box – Internal tab

6.18.12 Modifying the Characteristics of a Local BSAP Line

Once you define a local BSAP line in the Comm Line Wizard, you can alter the characteristics of the line, as needed, if you right-click on the icon for the communication line, then select **Properties** from the pop-up menu.

The Line Properties dialog box opens. This multi-page dialog box allows you to alter many of the characteristics of the local BSAP communication line. The first page “Name” tab, and the third page “Internal” tab function identically to the standard BSAP line pages (see *Figures* 6-66 and *6-68*.)

The second page “Local” tab contains several fields specific to local BSAP lines only. It allows you to select which RTU you want to communicate with, using the **RTU** button. The second page also allows you to change the following BSAP parameters: Polling Period, Link Timeout period, Link Retries, Enable Port Poll Control, Number of ACK_NO_DATA responses, Baud Rate, Front/Back Null Padding, Dial Line, and RTS/CTS (Modem) Control.



Line Properties

Name | BSAP | Internal

Addressing & Communications

Low Slave: 1

High Slave: 127

Network: BSAPnet

Poll Period: 1.00 Seconds

Link Timeout: 0.20 Seconds

Link Retries: 4

Baud Rate: 9600

Front Pad: 0

Back Pad: 0

☐ Dial ☐ Modem

☑ Enable Port Poll Control

Number of ACK_NO_DATA responses before turning polling off: 3

Figure 6-69. Line Properties dialog box – Local tab

6.19 Defining a Communication Line for an IP Network

Communication Lines are one of the four basic components which you must configure in OpenBSI. You define a communication line in NetView using the Comm Line Wizard. You can only define a communication line after you define an NHP.

6.19.1 Activating the Comm Line Wizard

There are two ways to activate the Comm Line Wizard:

- One way is to right click on the NHP icon, and select **Add**>**Line** from the pop-up menu to start the Comm Line Wizard.

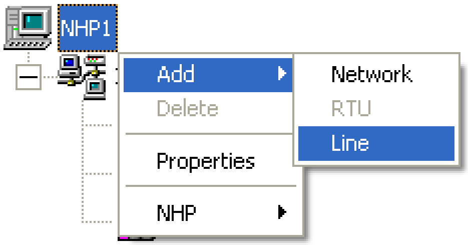
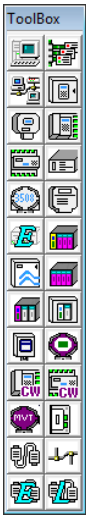


Figure 6-70. Starting the Comm Line Wizard – Method 1

The other way to start the Comm Line Wizard is to drag the IP comm line icon from the Toolbox, over to the NHP icon.



Drag the IP line icon over to the NHP

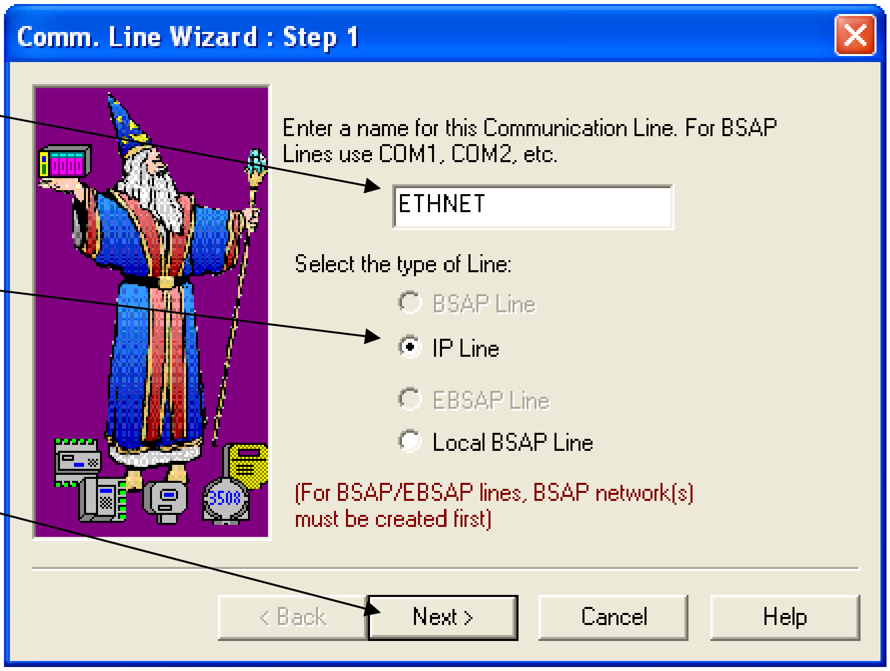
Figure 6-71. Starting the Comm Line Wizard – Method 2

6.19.2 Comm Line Wizard: Step 1 of 2

Enter a unique name for the communication line

Choose "IP Line"

Click here to go to page 2



Enter a name for this Communication Line. For BSAP Lines use COM1, COM2, etc.

ETHNET

Select the type of Line:

○ BSAP Line
● IP Line
○ EBSAP Line
○ Local BSAP Line

(For BSAP/EBSAP lines, BSAP network(s) must be created first)

Figure 6-72. Comm Line Wizard – Step 1

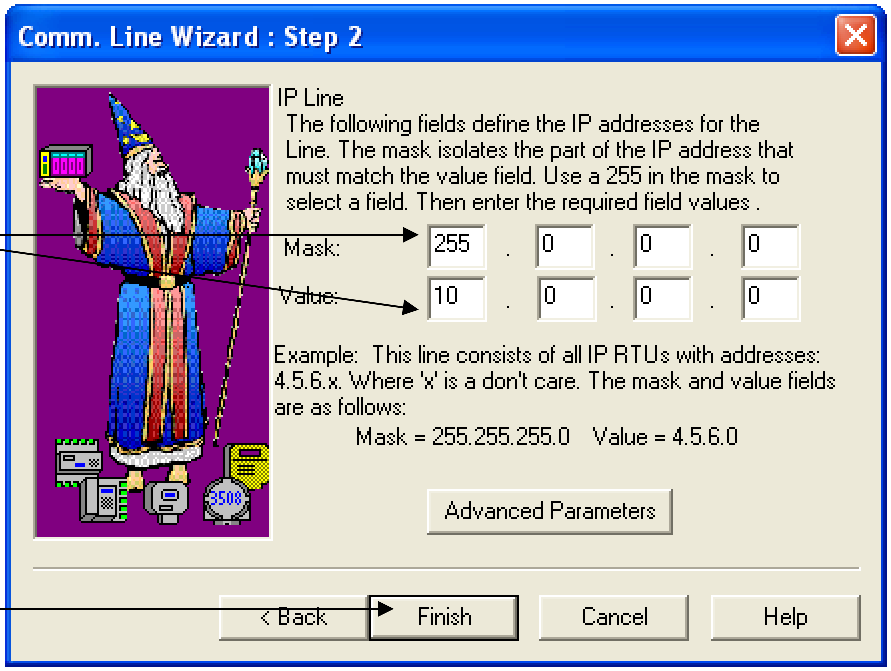
Field	Description
Enter a name for this Communication Line	Specify a name for the Communication Line (up to 5 characters in length). It doesn't matter what name you choose, so long as the name is unique in the system.
Select the type of Line	You must choose **IP Line**.

Click **Next** to go to Page 2 of the Comm Line Wizard.

6.19.3 Comm Line Wizard: Step 2 of 2

On the second page of the Comm Line Wizard, you need to fill in the **Mask** and **Value** fields in order to define the valid range of IP addresses for nodes that communicate on this communication line. Enter the IP addresses as a group of 4 integers (from 0 to 255) in dotted decimal format.

Basically, when you enter a non-zero value in any of the **Mask** fields it means that the corresponding **Value** field specifies a portion of the IP address which must identically match with every IP address that uses this communication line. A zero value in any of the **Mask** fields means that for this communication line, any integer from (0 to 255) is valid *for that corresponding portion* of the IP address. For more details on these subjects, see below:



Comm. Line Wizard : Step 2

IP Line
The following fields define the IP addresses for the Line. The mask isolates the part of the IP address that must match the value field. Use a 255 in the mask to select a field. Then enter the required field values .

Mask: 255 . 0 . 0 . 0

Value: 10 . 0 . 0 . 0

Example: This line consists of all IP RTUs with addresses: 4.5.6.x. Where 'x' is a don't care. The mask and value fields are as follows:

Mask = 255.255.255.0 Value = 4.5.6.0

Define the range of valid IP addresses for this line. In this example, any IP address beginning with "10" is valid.

Click Finish to exit the Comm Line Wizard

Figure 6-73. Comm Line Wizard – Step 2

Field	Description
Value	The **Value** field (together with the **Mask** field) specifies the valid range of IP addresses for this communication line. The range you specify must encompass the IP addresses you assign to the controllers (RTUs) and workstations that communicate on this line. Another rule you need to know, is that your IP addresses must begin with a common left-most portion which all IP addresses on the line share. You determine, using the mask, how large this common portion is, but no matter how large you make it, the common portion must be contiguous.

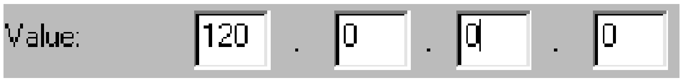
You must enter this common portion in the **Value** field. You must specify *the portion of the address which is NOT common as 0.*

Example 1:

If you define your NHP's primary IP address as:
120.0.210.0,

and you define three RTU's on the line with IP addresses of:
120.0.210.1,
120.1.210.2,
and 120.2.210.3,

then you want to accept any IP address that begins with "120" as valid since"120" is the common portion among all of these addresses. The only reason we don’t accept "210" as part of the common portion is because it is NOT contiguous with the left-most portion of the address. Therefore define the **"Value"** field as:



Value: 120 . 0 . 0 . 0

Example 2:

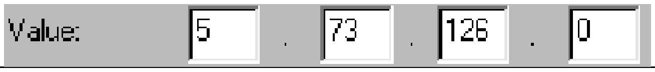
If you define your NHP's primary IP address to be:

5.73.126.1,

and you define three RTU's on the line with IP addresses of:

5.73.126.2,
5.73.126.3,
and 5.73.126.4,

then "5", "73" and "126" are common and contiguous among all of these addresses. Therefore, you define the **"Value"** field as:



Value: 5 . 73 . 126 . 0

Mask

The **Mask** field identifies which bits in the binary representation of the corresponding **Value** field are common to any valid IP address on this communication line.

Each part of the **Mask** can *only* be one of the following numbers: 255, 254, 252, 248, 240, 224, 192, 128, or 0. These values correspond to a decimal representation of the number of bits in the corresponding **Value** field which must match exactly for every node on this communication line.

255 = 11111111 (all 8 bits in the corresponding **"Value"** field

must match).

254 = 11111110 (highest order 7 bits in the corresponding **"Value"** field must match).

252 = 11111100 (highest order 6 bits in the **"Value"** field must match).

248 = 11111000 (highest order 5 bits in the corresponding **"Value"** field must match).

240 = 11110000 (highest order 4 bits in the corresponding **"Value"** field must match).

224 = 11100000 (highest order 3 bits in the corresponding **"Value"** field must match).

192 = 11000000 (highest order 2 bits in the corresponding **"Value"** field must match).

128 = 10000000 (highest order bit in the corresponding **"Value"** field must match).

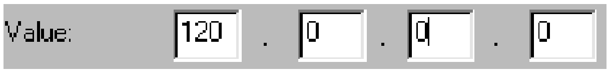
0 = 00000000 (none of the bits in the **"Value"** field must match).

One of the non-zero values must appear in the left-most **Mask** field.

If anything other than "255" appears in a particular **Mask** field, you must set all **Mask** fields to the right of it to 0.

<u>Example 1:</u>

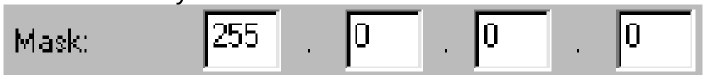
If you specify the **Value** fields for a particular communication line as:



Value: 120 . 0 . 0 . 0

This means that every RTU and workstation that uses this communication line must have an IP address that begins with "120", and each of the remaining parts of the address can be any value from 0 to 255.

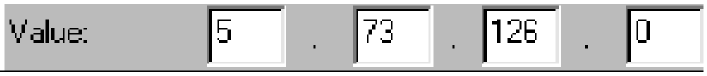
Enter “255” for the first **Mask** entry because that is the only part of the IP address which must match identically for all RTUs or workstations on this line.



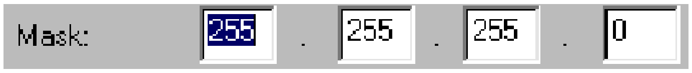
Mask: 255 . 0 . 0 . 0

<u>Example 2:</u>

If you specify the **Value** fields for a particular communication line as:

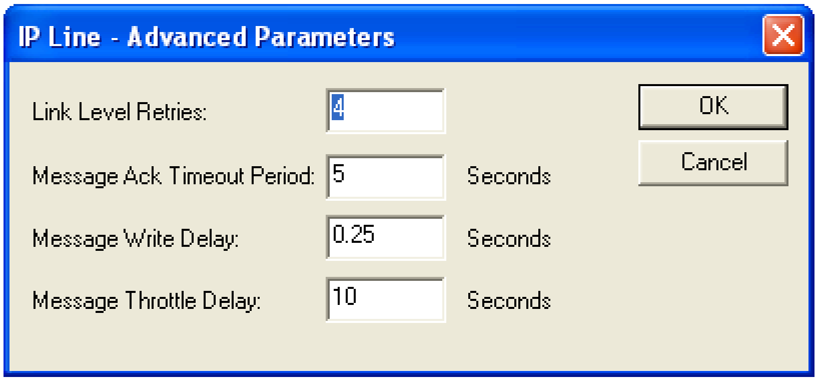


Value: 5 . 73 . 126 . 0

	This means that every RTU and workstation that uses this communication line must have an IP address that begins with "5.73.126", and the last part of the address can be any value from 0 to 255. Enter "255" for the first three corresponding **Mask** entries because those are the parts of the IP address which must match identically for all RTUs or workstations on this line.  Mask: 255 . 255 . 255 . 0

6.19.4 Advanced Parameters

You can call up the IP Line Advanced Parameters dialog box from the **Advanced Parameters** button in the Comm Line Wizard.



IP Line - Advanced Parameters

Link Level Retries: 4

Message Ack Timeout Period: 5 Seconds

Message Write Delay: 0.25 Seconds

Message Throttle Delay: 10 Seconds

Figure 6-74. IP Line – Advanced Parameters dialog box

In most cases, you do not need to edit the advanced parameters, however, you may them useful if you have a complex system which requires network "tuning" to achieve optimum performance.

Field	Description
Link Level Retries	This is the total number of attempts OpenBSI makes to send a message to an RTU on this line. If an ACK_TIMEOUT occurs, it means an attempt failed.
Message Ack Timeout Period	Set this to the maximum amount of time it takes for a node to receive the acknowledgment of a data request it sent to another node (i.e. after sending a message, how long should a node wait to hear that the request reached its destination.) You should base this entry on the maximum turn-around time between the NHP and any RTU in the address range for this communication line.
Message Write Delay	This is the amount of time (in seconds) the system waits before it sends a packet, if the packet has empty space to hold more data. This could occur, for example, if a data request for information about a single signal comes in, but there is additional room in

	the data packet to hold data for additional signals. If the **Message Write Delay** has not expired, the system waits for additional data requests for signal data to come in, and fills up the free space in the packet with responses to those requests. If additional requests do not come in before expiration of the delay, the system sends the packet "as is."
Message Throttle Delay	If the system runs out of buffers, it triggers the **Message Throttle Delay**. The system forces other nodes to wait for this delay time (which you specify in seconds) before they can send more messages. This delay allows buffers to be free up.

6.19.5 Navigating Between Pages of the Comm Line Wizard

Click on either the **Next** or **Back** button, whichever is appropriate.

6.19.6 Exiting the Comm Line Wizard

Click **Finish** to exit the Comm Line Wizard.

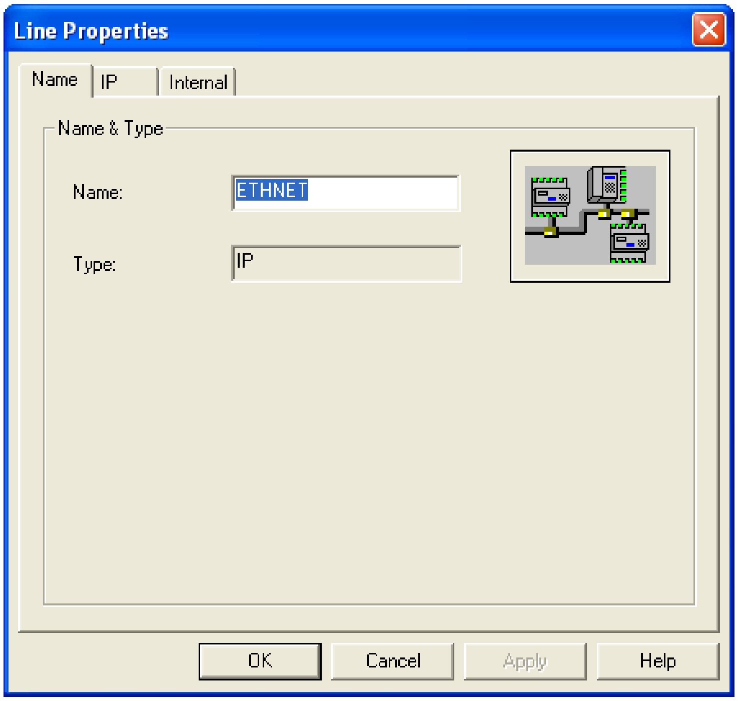
6.19.7 Modifying the Characteristics of an IP Comm Line

Once you define an IP Communication Line in the Comm Line Wizard, you can alter the characteristics of the line, as needed, if you right click on the icon for the communication line, and select **Properties** from the pop-up menu.

The Line Properties dialog box opens. This multi-page dialog box allows you to alter many of the characteristics of the IP Communication Line.

The first page ("Name tab") allows you to alter the name of the communication line.

You cannot change the type of communication line.



Name & Type

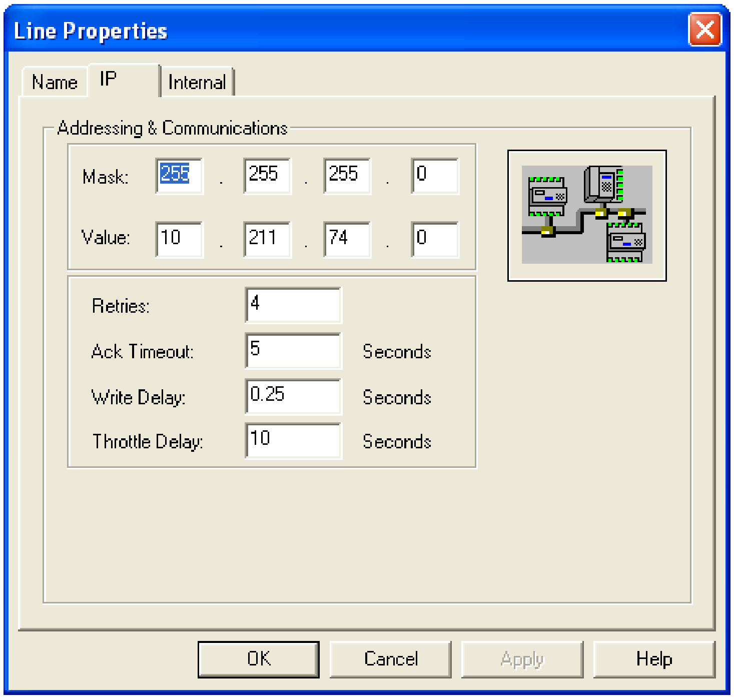
Name: ETHNET

Type: IP

Figure 6-75. Line Properties – Name tab

The second page ("IP tab") allows you to re-define the range of valid IP addresses for the line. The second page also allows you to change the following advanced IP parameters: Link Level Retries, Message Ack Timeout Period, Message Write Delay, and Message Throttle Delay.

For information on what the various fields mean, see the descriptions of Comm Line Wizard fields in *Section 6.19 Defining a Communication Line for an IP Network.*



Mask: 255 . 255 . 255 . 0

Value: 10 . 211 . 74 . 0

Retries: 4

Ack Timeout: 5 Seconds

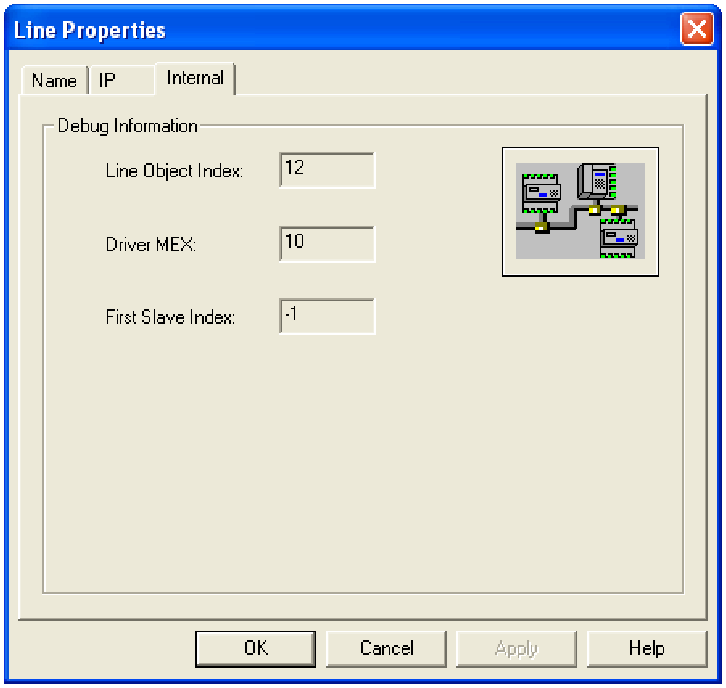
Write Delay: 0.25 Seconds

Throttle Delay: 10 Seconds

Figure 6-76. Line Properties – IP tab

The third page of the dialog box (“Internal” tab) displays certain debugging information. Emerson development and support personnel sometimes use this information.

Negative values for **Line Object Index** or **Driver MEX** indicate configuration errors; if you see these, re-check the parameters on the other two pages of the dialog box.



Line Object Index: 12

Driver MEX: 10

First Slave Index: -1

Figure 6-77. Line Properties – Internal tab

6.20 Deleting A Communication Line, RTU, or Network

To delete a communication line, RTU, or network, right click on the icon for the item you want to delete, and choose **Delete** from the pop-up menu. NetView prompts you to confirm that you want to delete the item. Click **Yes** to proceed with the deletion.

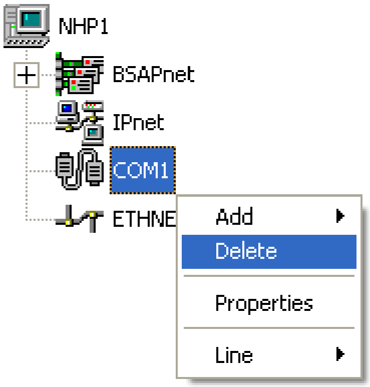


Figure 6-78. Deleting a Component

Notes:

- You cannot delete an NHP.
- You cannot delete a BSAP network until you first delete its associated COM line.

6.21 Monitoring the Status of OpenBSI Communications

The primary method you use to monitor OpenBSI communications within NetView is the NetView Monitor windows. A secondary, less comprehensive method for checking communications with RTUs is to look at the RTU icon; if the icon has a red “X” through it, it means NetView cannot communicate with that RTU. This section discusses the NetView Monitor windows; for information on the second method, see *RTU Communication Status Checking* later in this chapter.

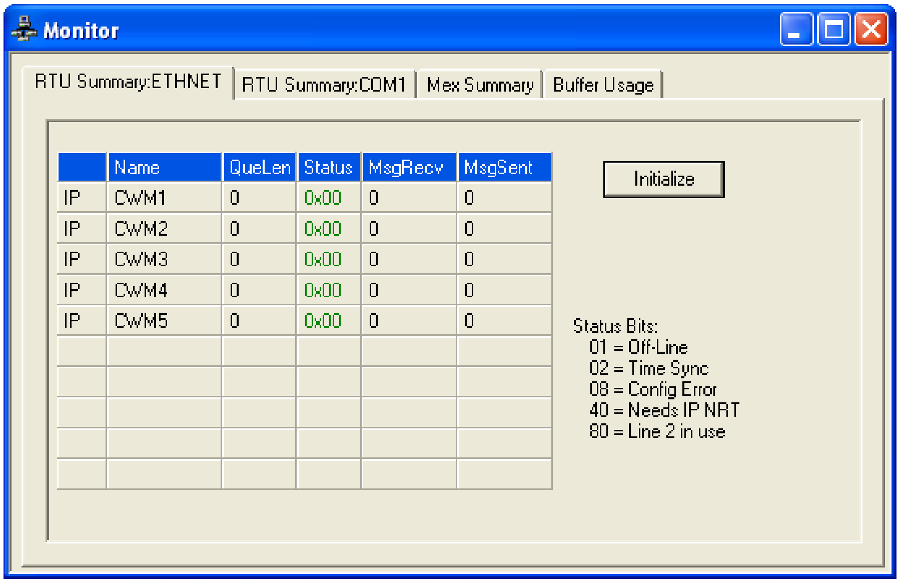
NetView's Monitor windows allow you to view information about the “health” of OpenBSI communication activity from the workstation end of the OpenBSI workstation end of the communication transaction. This is useful during system tuning, and when you need to debug communication problems. The Monitor windows display three different categories of communication statistics. These categories are: Message exchange information, RTU (controller) information, and buffer information.

6.21.1 Accessing the Monitor Windows

There are two types of monitor windows: Summary Display windows and Details Display windows. You can access the Summary Displays when you click on **View>Monitor** from the menu bar. To choose between the various Summary Displays, click on the file tab.

6.21.2 Using the RTU Summary Display

To call up the RTU Summary Display, click on the "RTU Summary" tab(s) in the Monitor Window. There is one RTU Summary Display for each communication line in your system. The figure, below, shows a summary for an IP communication line, and its associated RTUs:

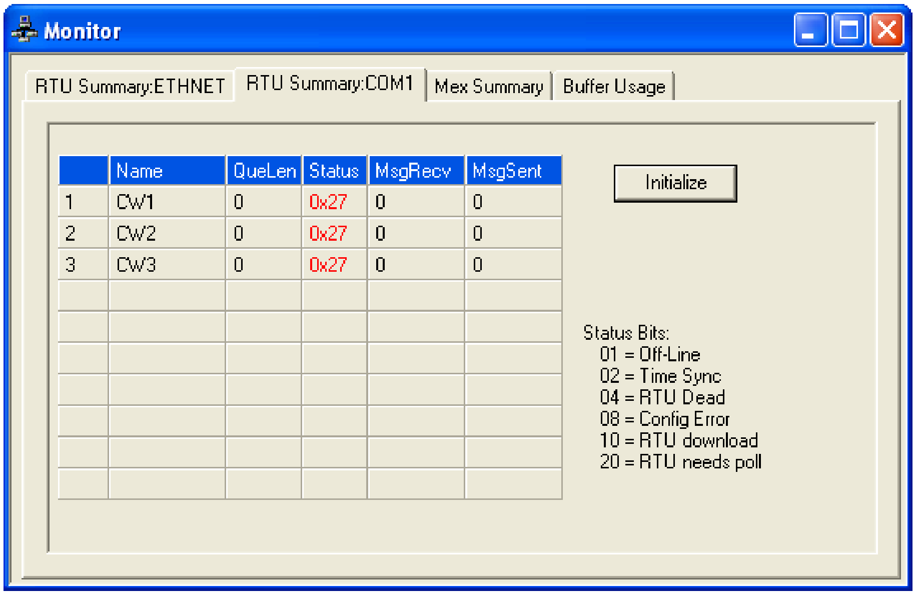


	Name	QueLen	Status	MsgRecv	MsgSent
IP	CWM1	0	0x00	0	0
IP	CWM2	0	0x00	0	0
IP	CWM3	0	0x00	0	0
IP	CWM4	0	0x00	0	0
IP	CWM5	0	0x00	0	0

Status Bits:
01 = Off-Line
02 = Time Sync
08 = Config Error
40 = Needs IP NRT
80 = Line 2 in use

Figure 6-79. RTU Summary Display – IP Line

The figure, below, shows a summary for a BSAP communication line and its RTUs:



	Name	QueLen	Status	MsgRecv	MsgSent
1	CW1	0	0x27	0	0
2	CW2	0	0x27	0	0
3	CW3	0	0x27	0	0

Status Bits:
01 = Off-Line
02 = Time Sync
04 = RTU Dead
08 = Config Error
10 = RTU download
20 = RTU needs poll

Figure 6-80. RTU Summary Display – BSAP Line

The **Name** column identifies each RTU. You can move the scroll bar to bring additional RTUs, which do not currently appear in the window, into view. For each RTU, you can see the following information:

Field	Description
Name	Shows the name of the RTU. (**Note**: for BSAP/EBSAP users, the page only shows top-level (Level 1) RTUs.)
QueueLen	Shows the output queue length, which is the number of messages waiting for transmission out this OpenBSI workstation communication line to this RTU.
Status	Shows the sum (in hex) of whichever status bits (listed in the lower right of the display) are currently set ON for this RTU.
MsgRecv	Shows the current count of messages received through this OpenBSI workstation communication line since the last initialization of statistics.
MsgSent	Shows the current count of messages sent by this OpenBSI workstation communication line since the last initialization of statistics.

6.21.3 Resetting the RTU Statistics:

You can reset the counts to 0 if you click the **Initialize** button. **Note**: This button clears statistics for **all RTUs** on both the summary and details displays.

6.21.4 Getting More Detailed Information about an RTU

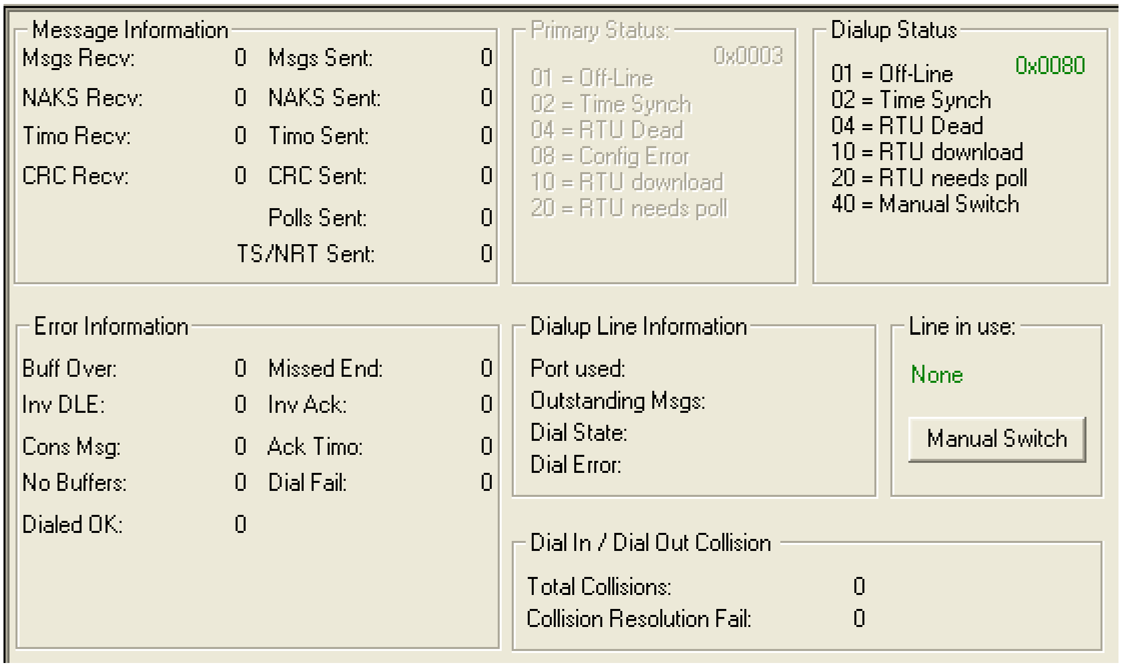
To obtain more detailed information about a particular RTU, click anywhere on its line in the RTU Summary Display. If you use IP, or standard BSAP communications, this brings up the RTU Details Display window for that RTU. (See *Using the RTU Details Display* below.) If you use expanded node addressing (EBSAP), this brings up the RTU Summary Display again, with summaries of the controllers that belong to the selected virtual node. Click on the line again to see the RTU Details Display for a particular node under the virtual node. (For a description of what virtual nodes are, see *Expanded Node Addressing* in the *ControlWave Designer Programmer's Handbook* (D5125)).

6.21.5 Using the RTU Details Display

To bring up more information about a single RTU, click anywhere on the line for that RTU in the RTU Summary Display. This activates the RTU Details Display. (Another way to call up the RTU Details for an RTU is to click on the icon for the RTU, and view the details in the right portion of the NetView window.)

The title bar of the RTU Details Display identifies the name of the RTU you are looking at.

6.21.6 Using the RTU Details Display for a BSAP/EBSAP RTU:



Message Information
Msgs Recv: 0 Msgs Sent: 0
NAKS Recv: 0 NAKS Sent: 0
Timo Recv: 0 Timo Sent: 0
CRC Recv: 0 CRC Sent: 0
Polls Sent: 0
TS/NRT Sent: 0

Primary Status: 0x0003
01 = Off-Line
02 = Time Synch
04 = RTU Dead
08 = Config Error
10 = RTU download
20 = RTU needs poll

Dialup Status 0x0080
01 = Off-Line
02 = Time Synch
04 = RTU Dead
10 = RTU download
20 = RTU needs poll
40 = Manual Switch

Error Information
Buff Over: 0 Missed End: 0
Inv DLE: 0 Inv Ack: 0
Cons Msg: 0 Ack Timo: 0
No Buffers: 0 Dial Fail: 0
Dialed OK: 0

Dialup Line Information
Port used:
Outstanding Msgs:
Dial State:
Dial Error:

Line in use:
None

Dial In / Dial Out Collision
Total Collisions: 0
Collision Resolution Fail: 0

Figure 6-81. RTU Details Display – BSAP/EBSAP RTU

The appearance of the RTU Details display varies slightly depending upon the types of COM lines you have configured (dial lines, backup lines, etc.). The various fields in the RTU Details display may include:

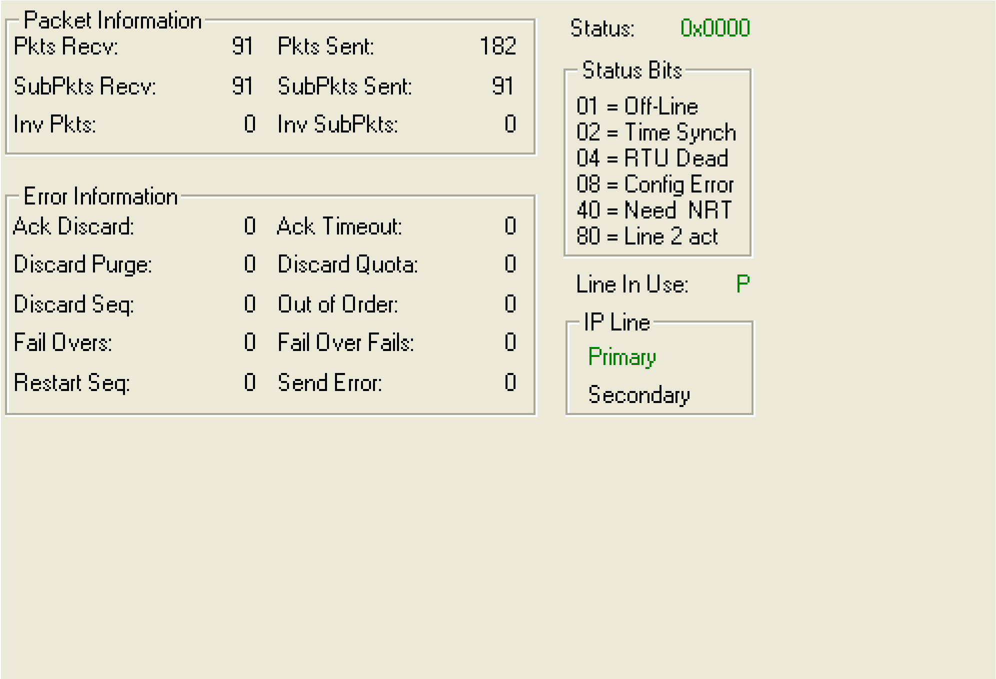
Field	Description
Message Information **Msgs Recv**	Shows the current number of messages received by this OpenBSI workstation from this RTU.
Msgs Sent	Shows the current number of messages sent from this OpenBSI workstation to the RTU.
NAKS Recv	Shows the current number of negative acknowledgments (NAKs) received at the OpenBSI workstation from this RTU. **Note**: A positive value for this number may indicate a shortage of buffers in this RTU.
NAKS Sent	(Reserved for future use)
Timo Recv	Shows the current number of message timeouts received at the OpenBSI workstation from this RTU.

Field	Description
	Message time outs occur after the data buffer starts.
Timo Sent	Shows the current number of message timeouts sent from the OpenBSI workstation to this RTU. A non-zero value may indicate an RTS/CTS problem.
CRC Recv	Shows the count of cyclical redundancy checks (CRCs) received at the OpenBSI workstation from this RTU.
CRC Sent	(Reserved for future use)
Polls Sent	Shows the number of poll messages sent out from the OpenBSI workstation.
TS/NRT Sent	Shows the number of time synchronization (TS) /node routing table (NRT) messages sent out from the OpenBSI workstation.
<u>**Error Information**</u> **Buff Over**	Shows the number of times the OpenBSI workstation detected a message from this RTU that was too long for a system buffer.
Missed End	Shows the number of times a buffer start marker was seen before a buffer end.
Inv DLE	Shows the number of invalid DLE sequences received by the OpenBSI workstation from this RTU.
Inv Ack	Shows the number of invalid acknowledgments (ACKs) received by the OpenBSI workstation from this RTU.
Cons Msg	Shows the number of times the OpenBSI workstation discarded a message from this RTU due to it having the same serial number as the previous message; this occurs when the other end of the communications link retransmits a message (usually due to not receiving the message ACK in time).
Ack Timo	Shows the number of ACK timeouts. This means that the RTU did not receive a response from the RTU within the timeout period. A positive value for this number can mean that you need to adjust the timeout parameters, or there may be noise on the line.
No Buffers	Shows the number of times in which the OpenBSI workstation could not allocate a system buffer to service a message arriving from this RTU.
Dial Fail	Shows the number of failed attempts the OpenBSI workstation made to dial out to this RTU.
Dialed OK	Shows the number of successful attempts the OpenBSI workstation made to establish a dial-up connection with this RTU.
Status	**Status** is a hexadecimal number which is the sum of the status bits which describe this port's current status. The definition of the status fields are: 0001 Off Line - When shown in red this status means that either this port is not configured or the RTU is turned “off-scan” with the equivalent of #NDARRAY.

Field	Description
	0002 Time Synch - When shown in green this status means that the next message sent out this port is a time synch. 0004 RTU Dead - When shown in red this status means that the RTU connected to this port does not respond. The communications system retries this operation at a relatively slow interval. 0008 Config Error - When shown in red this status means OpenBSI has a serious error when it tries to connect to the port. The communications system no longer tries to connect to this port. 0010 RTU download - When shown in green this status means a download to this RTU is in progress. 0020 RTU needs poll - When shown in green this status means the current RTU requires a poll at the current poll interval. 0040 Manual Switch. When shown in green this status means an operator clicked on the **Manual Switch** button to force a switch between the primary communication line and a backup communication line (dial-up).
Port Allocation Fail	Applies only when you use the Port Arbitrator (available in OpenBSI 5.5 or newer.) Indicates that the BSAP driver cannot obtain the port prior to expiration of the WaitForPort timeout.
Dialup Line Information **Port Used**	Displays the name of the port used to dial.
Outstanding Msgs	Displays a count of the number of outstanding messages waiting to be sent through this line.
Dial State	Shows the state of the dial operation. States include "Dialing," "Failed," or "Idle."
Dial Error	Shows whether there is an error in dialing.
Dial-in/Dial-Out Collision: **Total Collisions**	This is the number of times there was a conflict where the PC tried to dial out to an RTU and an RTU tried to dial into the PC at the same time on the same line.
Collision Resolution Fail	Shows a count of the number of collisions that couldn't be resolved.
Line In Use:	Displays the name of the communication line in use if you used backup lines.

Field	Description
Manual Switch	If you defined backup communication lines (see *Appendix H*), you can switch between the primary line and the backup line by clicking this button.

6.21.7 Using the RTU Details Display for an IP RTU:



Packet Information

Pkts Recv:	91	Pkts Sent:	182
SubPkts Recv:	91	SubPkts Sent:	91
Inv Pkts:	0	Inv SubPkts:	0

Error Information

Ack Discard:	0	Ack Timeout:	0
Discard Purge:	0	Discard Quota:	0
Discard Seq:	0	Out of Order:	0
Fail Overs:	0	Fail Over Fails:	0
Restart Seq:	0	Send Error:	0

Status: 0x0000

Status Bits
01 = Off-Line
02 = Time Synch
04 = RTU Dead
08 = Config Error
40 = Need NRT
80 = Line 2 act

Line In Use: P

IP Line
Primary
Secondary

Figure 6-82. RTU Details Display – IP RTU

The various fields in the RTU Details display are:

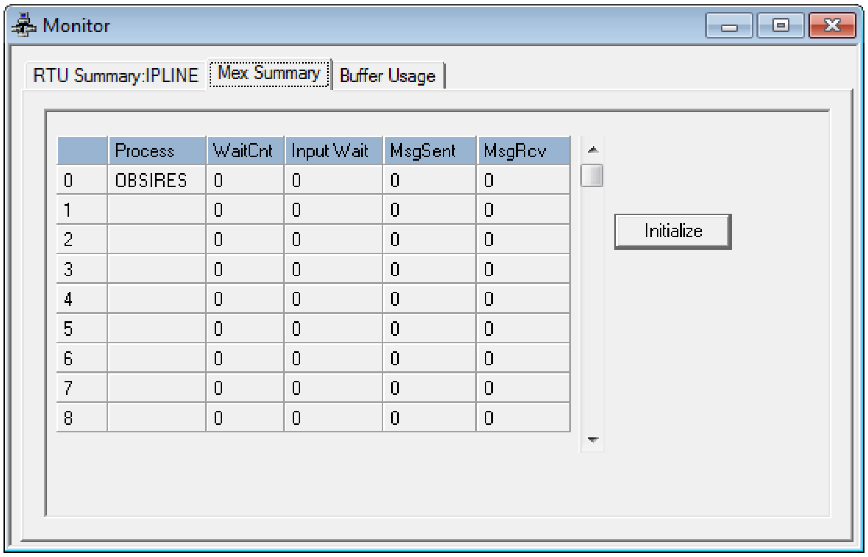
Field	Description
Packet Information	
Pkts Recv	Shows the number of packets received from this RTU at this OpenBSI workstation.
Pkts Sent	Shows the number of packets transmitted from this OpenBSI workstation to this RTU.
SubPkts Recv	Shows the current number of sub-packets this OpenBSI workstation received from this RTU.
SubPkts Sent	Show the current number of sub-packets this OpenBSI workstation sent out to this RTU.
Inv Pkts	Shows the number of invalid packets this OpenBSI workstation received from this RTU
Inv SubPkts	Shows the number of sub-packets this OpenBSI workstation received from this RTU that did not have a valid identifier.

Error Information	
Ack Discard	Shows the number of messages from this RTU discarded by the OpenBSI workstation because of multiple acknowledgment timeouts for the same message.
Ack Timeout	Shows the current number of acknowledgment message time outs. These occur when the OpenBSI workstation sends a message to this RTU but the RTU does not answer with the corresponding acknowledgment within the required time.
Discard Purge	Shows the number of messages from this RTU that the OpenBSI workstation discarded by a purge operation.
Discard Quota	Shows the number of messages from this RTU that the OpenBSI workstation discarded because the quota has been exceeded. This should always be zero.
Discard Seq	Shows the number of messages from this RTU that the OpenBSI workstation discarded due to receipt of an unexpected sequence number.
Out Of Order	Shows the number of packets the OpenBSI workstation received from this RTU that arrived out of order.
Fail Overs	Shows the number of fail-overs that have occurred between communication lines (primary and secondary) for this RTU.
Fail Over Fails	Shows the number of fail over operations that have failed (other line was not available.)
Restart Seq	Shows a count of the times the OpenBSI workstation restarted the connection to this RTU.
Send Error	Shows the number of errors the OpenBSI workstation had attempting to send a packet to this RTU.
Status/Status Bits	A hexadecimal number which is the sum of the IP Status Bits used to describe the RTU's current status. 0001 Off Line - This port was not configured or the RTU was turned "off-scan" with the equivalent of #NDARRAY. This bit displays in RED when ON. 0002 Time Synch - The next message sent out this port to this RTU will be a time synch. This bit displays in GREEN when ON. 0008 Config Error - OpenBSI encountered a serious

	error while trying to connect to the RTU through this port. OpenBSI no longer tries to connect to this port. This bit displays in RED when ON. 0040 Needs NRT - This RTU needs an IP Node Routing Table. This displays in GREEN when ON. 0080 Line 2 act - The secondary line index, if it exists, is active. This bit displays in GREEN when ON.
Line In Use	Displays the current IP line that is in use, "P" for primary and "S" for secondary. The active IP line displays in GREEN, below.

6.21.8 Using the Message Exchange Summary Display

Message exchanges serve as “mailboxes” for communication between specific programs within OpenBSI, and between OpenBSI programs and RTUs. Each program receives and sends messages through its specific message exchange. The message distribution system handles the transport of these messages to other mailboxes on the system. The Message Exchange Summary Display can help you troubleshoot problems with these various programs.



	Process	WaitCnt	Input Wait	MsgSent	MsgRcv
0	OBSIRES	0	0	0	0
1		0	0	0	0
2		0	0	0	0
3		0	0	0	0
4		0	0	0	0
5		0	0	0	0
6		0	0	0	0
7		0	0	0	0
8		0	0	0	0

Figure 6-83. Message Exchange Summary Display

To call up the Message Exchange Summary Display click the “Mex Summary” file tab in the NetView Monitor.

A number along the left-hand side of the window identifies each message exchange. Use the scroll bar to bring additional message exchanges, which do not fit in the window, into view.

The Message Exchange Summary display presents the following information for each message exchange.

Field	Description
Process	The name of the program using this message exchange.
WaitCnt	Shows the number of packets transmitted from this OpenBSI workstation to this RTU.
InputWait	The number of messages waiting on the input queue for processing.
MsgSent	The current count of messages sent by this message exchange.
MsgRcv	The current count of messages received by this message exchange.

6.21.9 Resetting the Message Exchange Statistics:

To reset counts to “0” click **Initialize**.

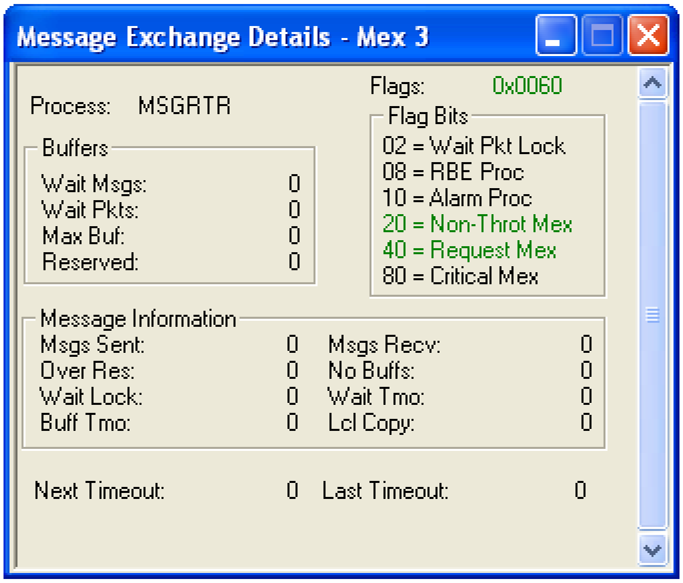
Note: This operation clears statistics for all message exchanges on both the summary and details displays.

6.21.10 Getting More Detailed Information about a Message Exchange

To obtain more detailed information about a particular message exchange, click anywhere on its line in the Message Exchange Summary Display. See *Using the Message Exchange Details Display*.

6.21.11 Using the Message Exchange Details Display

To bring up more information about a single message exchange, click anywhere on the line for that message exchange in the Message Exchange Summary Display. This activates the Message Exchange Details Display.



Message Exchange Details - Mex 3

Process: MSGRTR

Flags: 0x0060

Flag Bits
02 = Wait Pkt Lock
08 = RBE Proc
10 = Alarm Proc
20 = Non-Throt Mex
40 = Request Mex
80 = Critical Mex

Buffers
Wait Msgs: 0
Wait Pkts: 0
Max Buf: 0
Reserved: 0

Message Information
Msgs Sent: 0 Msgs Recv: 0
Over Res: 0 No Buffs: 0
Wait Lock: 0 Wait Tmo: 0
Buff Tmo: 0 Lcl Copy: 0

Next Timeout: 0 Last Timeout: 0

Figure 6-84. Message Exchange Details Display

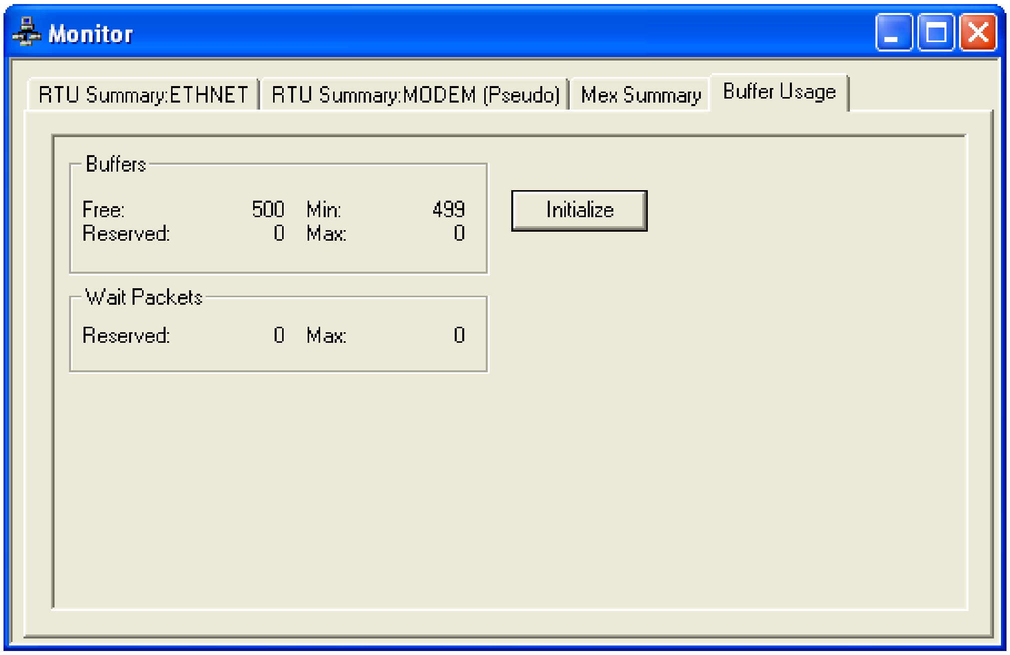
Field	Description
Process	Shows the name of the program using this message exchange.
Flags / Flag Bits	**Flags** represents the sum (in hexadecimal) of whichever **Flag Bits** listed in the right part of the display, are currently set ON for this message exchange. Bits which are ON display in GREEN.
<u>Buffers</u> **Wait Msgs**	Shows the number of buffers waiting to be processed by this message exchange.
Wait Pkts	Displays the number of messages already sent that await responses.
Max Buf	Shows the maximum number of response buffers reserved.
Reserved	Shows the number of response messages expected by the current message exchange.
<u>Message Information</u> **Msgs Sent**	Displays the current total count of messages sent out by this message exchange.
Msgs Recv	Displays the current total count of messages received by this message exchange.
Over Res	Shows the number of times that a message send was rejected because the number of buffers required for all outstanding requests (including the current one) exceeded the value of **Max Buf.** If this is a “non-throttled” message exchange, this statistic is not kept, and OpenBSI sends the message anyway.

No Buffs	Shows the count of times that OpenBSI suspended a program due to a buffer shortage in the system.
Wait Lock	Shows the number of times that OpenBSI skipped timeout processing on this message exchange because the wait pkts queue was locked.
Wait Tmo	Shows the number of pending responses for this message exchange that have timed out.
Buff Tmo	Shows the number of buffers that have timed out.
Lcl Copy	Displays the number of times OpenBSI copies the contents of a buffer to process local storage due to a shortage in the number of system buffers.
Next Timeout	Displays the number of timeout intervals for the first buffer on the wait queue.
Last Timeout	Shows the estimated timeout for the last buffer on the lists.

6.21.12 Buffer Usage Summary Display

Buffers are portions of memory set aside for a particular purpose - - holding communication messages. The Buffer Usage Summary display shows the status of buffers used by the OpenBSI messaging system. (Do not confuse this with buffers in an RTU, which is an entirely different subject.)

To call up the Buffer Usage Summary display, click the “Buffer Usage” file tab.



Buffers

Free: 500 Min: 499
Reserved: 0 Max: 0

Wait Packets

Reserved: 0 Max: 0

Figure 6-85. Buffer Usage Summary Display

Field	Description
Buffers	
Free	Shows the number of free buffers in the system. If no buffers are free, you may have a buffer shortage at the PC. You may need to increase the number of buffers defined in your NETDEF files.
Min	Shows the minimum number of free buffers since the system started.
Reserved	Shows the number of buffers reserved (the number of response buffers the system waits to use).
Max	Shows the maximum number of buffers in simultaneous use since the system started.
Wait Packets	
Reserved	Shows the current number of wait packets in use. (Each message OpenBSI sends, that waits for a response, requires a wait packet.)
Max	Shows the largest number of wait packets allocated since the system started.

6.21.13 Resetting the Buffer Statistics:

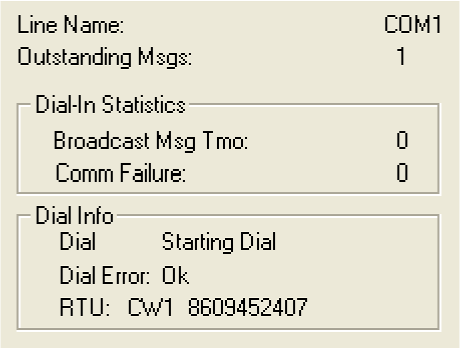
To reset counts to “0” click **Initialize**.

Note: This operation clears statistics for all buffers on the Buffer Summary display

6.21.14 Other Ways to View Communication Statistics

Even without starting the Monitor, you can see many of the same statistics by clicking on an RTU or communication line icon. Of particular interest is the information NetView displays for communication lines.

If you click on a dial-up line icon, NetView displays the following.



Line Name: COM1
Outstanding Msgs: 1

Dial-In Statistics
Broadcast Msg Tmo: 0
Comm Failure: 0

Dial Info
Dial Starting Dial
Dial Error: Ok
RTU: CW1 8609452407

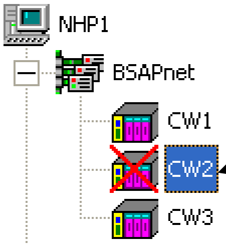
Figure 6-86. Communications Line Statistics

Field	Description
Line Name	Shows the name of the communication line, as defined in NetView. You may see an additional parameter if you configured this communication line for use by the BSAP to IP Redirector utility; “Primary” indicates the redirector sends communication messages to the RTU’s primary IP address; “Secondary” indicates the redirector sends communication messages to the RTUs’ secondary IP address.
Outstanding Msgs	Shows the number of outgoing communication messages waiting for transmission through this communication line.
Dial-In Statistics **Broadcast Msg Tmo**	When an RTU dials in, OpenBSI sends a broadcast message asking for the RTU’s identity, i.e. a ‘Who are you?’ message. If OpenBSI does not receive a response it declares a timeout. This is a count of the number of such timeouts that have occurred.
Comm Failure	Shows the number of RTU dial-in failures on this line.
Dial Info **Dial**	Shows the current state of dialing. This could be “Idle”, “Dialing” or “Failed”.
Dial Error	If dialing fails, this is the error message about the failure.
RTU	Shows the name of the RTU on this dial connection, and the dial string.

6.22 RTU Communication Status Checking

Normally, you use the Monitor windows, or the Remote Communication Statistics Tool to check on the health of OpenBSI communications. NetView, however, allows you to configure a simple graphical representation of communication health that alerts you of the loss of communications with a particular RTU.

RTU communication status checking shows the on-line / off-line status of communications with RTUs in the NetView tree. If communications with a particular RTU go off-line, the RTU icon appears “crossed out” with a red “X” through it. By default, only one RTU appears crossed out per minute therefore there may be a delay before OpenBSI marks all off-line RTUs off-line.



CW2 is off-line, as indicated by the read “X” through its icon.

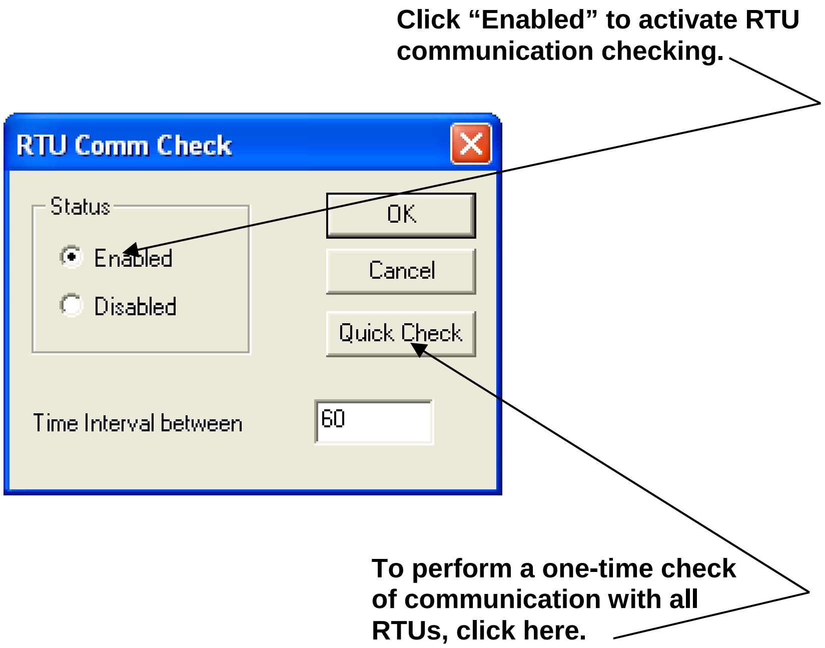
Figure 6-87. RTU Communications Check

Notes:

- Any changes you make to the properties of the RTU erase the “X” from the icon until the next communication check occurs. For example, if you right-click on the RTU icon and choose **Properties** from the pop-up menu, the “X” disappears until the next comm. status check. Do not mistake this for a restoration of communications to the RTU.
- If an RTU is on a dial-up line, OpenBSI shows it as off-line anytime the dial connection is NOT active.
- Only enable this feature if the RTUs reside on a relatively high speed network.

6.22.1 Activating / De-activating RTU Communication Status Checking

To activate RTU communication status checking, click on the NHP name, then choose **NHP > Rtu Comm Check**.



Click "Enabled" to activate RTU communication checking.

To perform a one-time check of communication with all RTUs, click here.

Figure 6-88. Activating RTU Communications Check

The RTU Comm Check dialog box opens. To activate RTU communication checking, select the **Enabled** button.

Because of the overhead required to perform the communication check, OpenBSI only checks one RTU every 60 seconds, therefore, depending upon the number of RTUs in your network(s), it may take a long time for the OpenBSI workstation to check communications with all of them. To increase the speed at which the checking occurs, you can set a smaller value for the **Time Interval between RTUs**, however, remember that this may negatively affect system performance if you make the value too small.

To do a one-time quick check of communications with all RTUs, click the **Quick Check** button.

Click **OK** to exit the dialog box, and start the RTU communication status checking.

To turn OFF the RTU communication status checking, call up the RTU Comm Check dialog box again, and click the **Disabled** button, then click **OK**.

6.23 Searching For A Particular RTU in A Large Network

If you have a large network, containing hundreds of different RTUs, it may be inconvenient for you to scroll through the NetView tree to locate a particular RTU. To find the RTU, click the NHP icon, then choose **NHP>Locate Rtu.**

The Select New Node dialog box opens. Enter the RTU's name (or use the scroll bar to select it) and click **OK.** NetView then displays the portion of the network tree which includes the selected RTU.

6.24 Starting Other Programs From Within NetView

Once you establish communications with a particular RTU, you can start other programs for use with that RTU if you right-click on the RTU icon, and choose "RTU" from the pop-up menu, and then choose the action you want to perform.

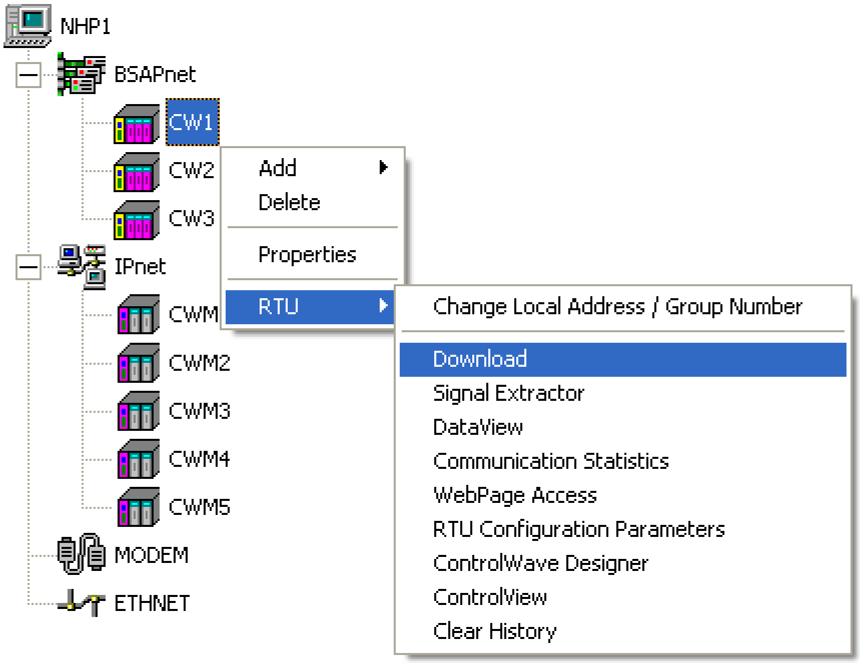


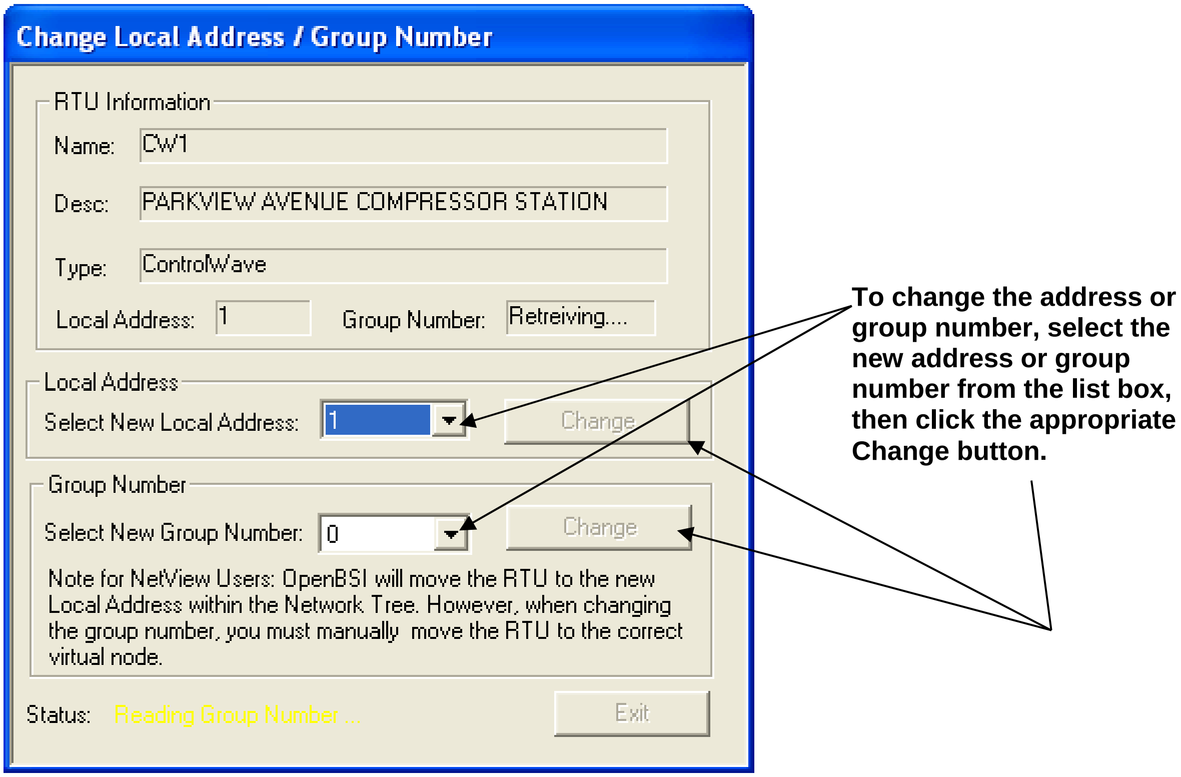
Figure 6-89. Starting Other Programs in NetView

Table 6-1 describes the choices. **Note:** The available options vary depending upon the type of RTU.

Table 6-1. Programs You Can Start in NetView

Menu Item	Utility Description
Change Local Address / Group Number	Choose **"Change Local Address/Group Number"** to change the local address or EBSAP group number of the attached 3530 TeleFlow / TeleRTU or ControlWave. Select the new address from the **Select New Local Address** list box or the new group number from the **Select New Group Number** list box and click on the associated **Change** button. See *Figure Figure 6-89* **Notes:** This option only applies to 3530-series devices, and

Menu Item	Utility Description
	ControlWave devices with 04.60 or newer firmware and actually changes the address within the device, not just in NetView. Although this operation can change the group number, it does **not** change the RTU's location in the network hierarchy. You must manually drag the icon for the controller under the correct Virtual Node.



Change Local Address / Group Number

RTU Information

Name: CW1

Desc: PARKVIEW AVENUE COMPRESSOR STATION

Type: ControlWave

Local Address: 1 Group Number: Retreiving....

Local Address

Select New Local Address: 1

Group Number

Select New Group Number: 0

Note for NetView Users: OpenBSI will move the RTU to the new Local Address within the Network Tree. However, when changing the group number, you must manually move the RTU to the correct virtual node.

Status: Reading Group Number ....

To change the address or group number, select the new address or group number from the list box, then click the appropriate Change button.

Figure 6-90. Changing the Local Address / Group Number

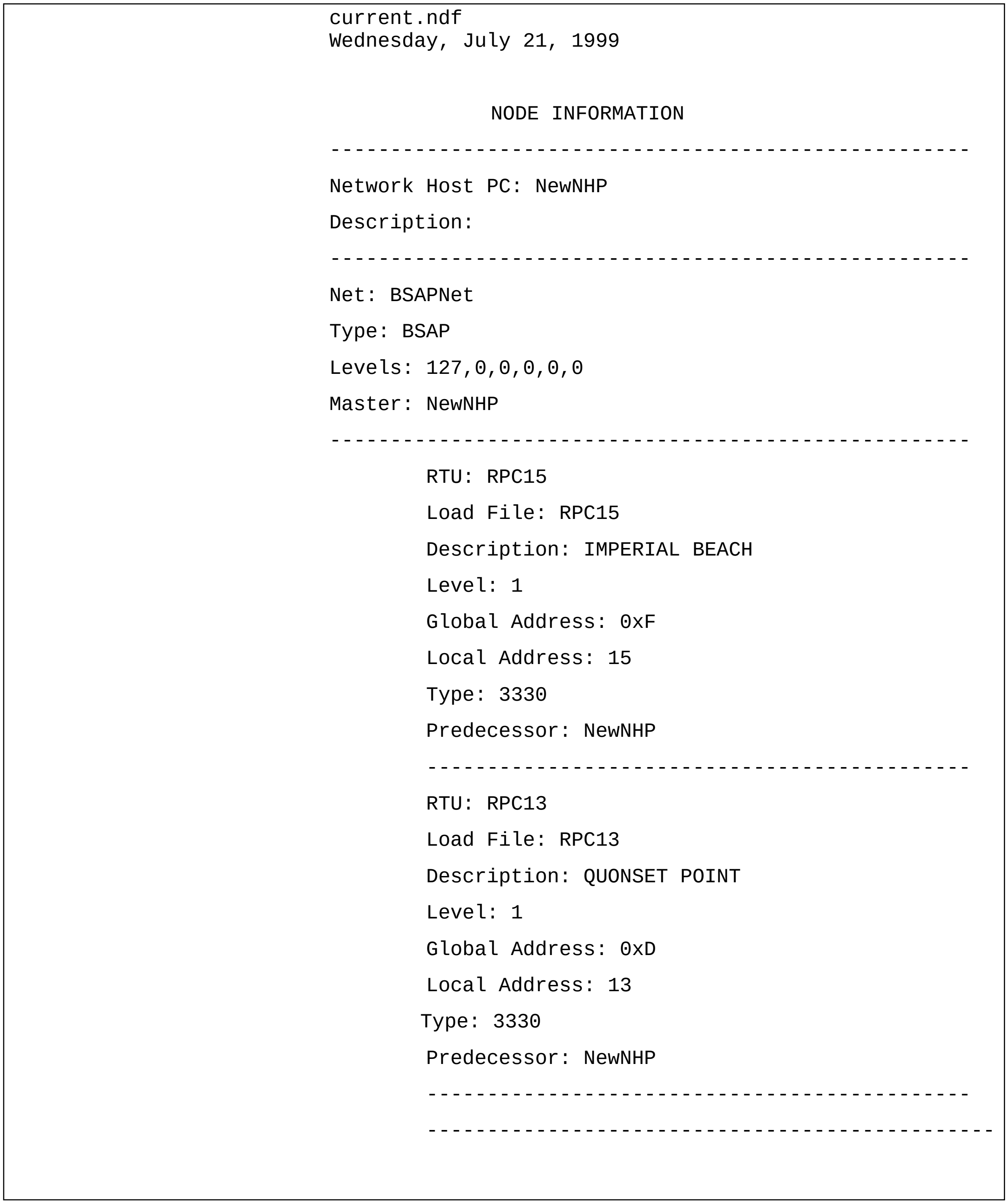
Download	This starts the Downloader. (See *Chapter 7* for details.)
Signal Extractor	This activates the Signal Extractor. (See *Chapter 12* for details.)
DataView	This starts DataView. (See *Chapter 8* for details.)
Communication Statistics	This starts the Remote Communication Statistics Tool. (See *Chapter 9* for details.)
Webpage Access	This activates Microsoft® Internet Explorer and opens the startup web page associated with this controller.

RTU Configuration Parameters	This starts the Flash Configuration Utility so you can set configuration parameters in the RTU. (See *Assigning IP Addresses and Cold Download Parameters for the Attached RTU (Configure Mode)* in *Chapter 5* for details.
WinUOI	This calls up the legacy Windows™ UOI/TMS/Smartkit shell. For information on this, see the addendum to the *UOI Configuration Manual* (document# D5074). **Note:** Not applicable for ControlWave users.
Workbench	This activates the ACCOL Workbench program. (See the *ACCOL Workbench User Manual* (document# D4051) for details.) **Note:** Not applicable for ControlWave users.
ControlWave Designer	This activates the ControlWave Designer tool so you can build your IEC 61131 control strategy program(s). For information on ControlWave Designer, see *Getting Started with ControlWave Designer* (document# D5085), as well as the on-line help in ControlWave Designer.
ControlView	This starts up the ControlView File Viewer utility.
Clear History	Choose this to delete historical data from a ControlWave controller. See *Deleting Archive Files and/or Audit Records from a ControlWave-series Controller* later in this chapter for more information.

6.25 Documenting Your Network Configuration

If desired, you can save details of your network configuration in an ASCII text file. To generate this file, click, from the menu bar, on **File>Document**. NetView stores the resulting file in a default directory used to store your NETDEF files, and the file will have the same file basename as the NETDEF file, with a file extension of .DOC.

The illustration, below, shows portions of a sample file:



```
current.ndf
Wednesday, July 21, 1999


             NODE INFORMATION
-----------------------------------------------------
Network Host PC: NewNHP
Description:
-----------------------------------------------------
Net: BSAPNet
Type: BSAP
Levels: 127,0,0,0,0,0
Master: NewNHP
-----------------------------------------------------
        RTU: RPC15
        Load File: RPC15
        Description: IMPERIAL BEACH
        Level: 1
        Global Address: 0xF
        Local Address: 15
        Type: 3330
        Predecessor: NewNHP
        ---------------------------------------------
        RTU: RPC13
        Load File: RPC13
        Description: QUONSET POINT
        Level: 1
        Global Address: 0xD
        Local Address: 13
        Type: 3330
        Predecessor: NewNHP
        ---------------------------------------------
        -----------------------------------------------
```

Figure 6-91. Sample Network Documentation File

6.26 Setting up Proxy Access

In order for an OpenBSI Workstation to communicate with a particular RTU in the network, it must either be the network host PC (NHP) for that RTU, or that RTU’s own NHP must grant it proxy access to the RTU.

There are two types of proxy access: **Proxy access** and **proxy direct access**.

Proxy access means that the workstation communicates with RTUs by sending messages through the NHP for that RTU.

Proxy direct access means that the workstation can communicate directly with the RTUs of another NHP.

Either type of access allows the workstation to communicate with the proxy RTUs, to call up data from them in DataView, etc.

6.26.1 Steps for Setting up Proxy Access

1. If an NHP has RTUs for which you want to grant proxy access, create and export a proxy (.PXY) file for that NHP. This proxy file contains the IP addresses of the NHP, and the names of that NHP's RTUs for which you want to grant proxy access. See *Creating and Exporting A Proxy File*.
2. Import the proxy file (.PXY) created in *Step 1* at any workstation which needs proxy access. See *Importing A Proxy File*.

Note: Any workstation that requests proxy access does **not** receive alarm/RBE reports from the proxy RTUs, even if the workstation is configured as an alarm/RBE destination at the proxy RTU's NHP.

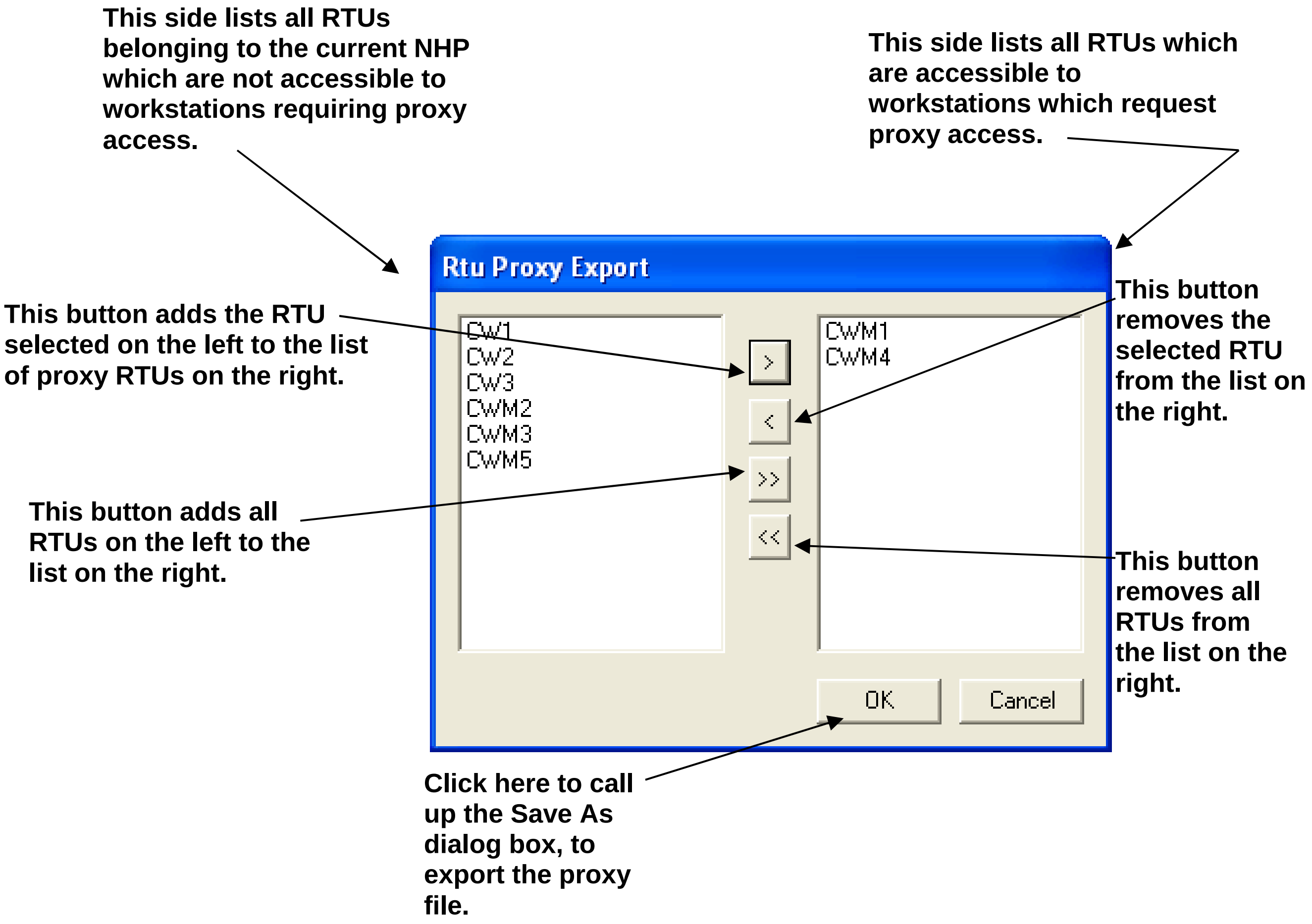
6.26.2 Steps for Setting up Proxy Direct Access (IP RTU's ONLY)

1. First Set up proxy access as described above under *Steps for Setting up Proxy Access*.
2. For any workstation which needs proxy direct access, specify that it wants proxy direct access during its NHP configuration. You do this in the IP Parameters dialog box in the System Wizard, by answering **Yes** to the question **"Would you like to access Proxy RTUs directly?"** (If you didn’t do that originally, just set PROXY_DIRECT=TRUE in the [CONSTANTS] section of NDF file at the NHP for this RTU.)
3. For any IP RTU which this workstation will access directly, specify **Yes** to the question “**Do you want this RTU to be accessed directly from Remote PCs?”** in the RTU Wizard.
4. Define an IP communication line at the workstation which can handle the range of IP addresses for the RTUs that it will communicate with using proxy direct access.

6.26.3 Creating and Exporting a Proxy File

To create and export a proxy file, go to the workstation which serves as an NHP for the RTUs which you want to make available for proxy access. Right click on the NHP icon in NetView, and choose **NHP>Proxy Export** to open the RTU Proxy Export dialog box.

The left side of the RTU Proxy Export dialog box shows a list of all RTUs that belong to the current NHP which other workstations that request proxy access cannot currently communicate with. The right hand side shows a list of all RTUs that belong to the current NHP which other workstations that request proxy access can communicate with.



CW1
CW2
CW3
CWM2
CWM3
CWM5

CWM1
CWM4

This side lists all RTUs belonging to the current NHP which are not accessible to workstations requiring proxy access.

This side lists all RTUs which are accessible to workstations which request proxy access.

This button adds the RTU selected on the left to the list of proxy RTUs on the right.

This button removes the selected RTU from the list on the right.

This button adds all RTUs on the left to the list on the right.

This button removes all RTUs from the list on the right.

Click here to call up the Save As dialog box, to export the proxy file.

Figure 6-92. RTU Proxy Export dialog box

- To add a single RTU to the list of proxy RTUs (which means that other workstations can access those RTUs) click the RTU name on the left side of the dialog box, then click the > button. This removes the RTU name from the list on the left, and adds the name to the list on the right. (You can select multiple RTUs for proxy access if you hold down the **[Ctrl]** key as you make your selections.) To add all RTUs of this NHP to the list of proxy RTUs, click the >> button.

- To remove an RTU from the list of proxy RTUs (the list on the right side of the dialog box), click on the RTU name, then click the **<** button. This adds the RTU to the list on the left. (You can select multiple RTUs for removal if you hold down the **[Ctrl]** key as you make your selections.)
- To remove all RTUs from the list of proxy RTUs, click on the **<<** button.

- When the proxy list (list on the right) reflects the RTUs for which you want to allow access by other workstations, click **OK** to open the Save As dialog box. Specify a name for the proxy (.PXY) file and click **Save**.

A typical proxy file appears below:

```
[NHP]
NETWORK_TYPE=IP
NAME=NHP1
IP_PRIMARY=120.0.210.4
IP_SECONDARY=0.0.0.0
RTU_1=RPU3
RTU_2=RPU5
```

Figure 6-93. Proxy File

6.26.4 Importing a Proxy File

If a workstation needs access to RTUs that belong to *another* NHP, it must have a copy of that NHP's proxy file. To import the proxy file, copy it to a disk or use some other means to transfer it to the hard disk of the workstation that requires access. Right click on the NHP icon for the workstation which requires proxy access and choose **NHP>Proxy Import** from the pop up menus. Then specify the location (path and filename) of the proxy file you just copied to the hard disk, using the Open file dialog box.

6.27 Sending a Time Synch/NRT (TS/NRT) Message

When a controller recovers from a power failure, receives a newly downloaded control strategy file, or resets, it automatically requests **a Node Routing Table (NRT)** and **Time Synchronization (TS)** message from the controller (or workstation) immediately above it in the network. Once the controller receives its TS/NRT message, it sends it on to its slave nodes in the network, thereby propagating the message.

The Node Routing Table (NRT) describes the topology of the BSAP network, and allows a controller to know on which level it resides, and where it should send messages. The time synchronization (TS) portion of the message contains the current date and time from the OpenBSI workstation, allowing the time at the various controllers to remain synchronized.

Beginning with OpenBSI 4.02, you can force the OpenBSI Workstation to transmit a TS/NRT message to the BSAP network.

To transmit the TS/NRT message, *right*-click on the network icon in the NetView tree, and choose **Send NRT / TimeSynch** from the pop-up menu. NetView sends the message to all controllers in the network.

Note: If you have a special network configuration in which you might want to prevent processing of either the TS and/or NRT portion of the message on a particular port, you can configure most controller models ignore to those portion(s) of the message.

6.28 Deleting Archive Files and/or Audit Records

A ControlWave-series controller stores archive files of historical data, and audit records of significant system events. Normally, the Harvester, or some other program periodically collects this data for export to OpenEnterprise or a third-party package, and eventually new data overwrites the existing data.

If, however, you want to permanently delete audit or archive data residing in the ControlWave, you can use the Clear History function.

Note: The ControlWave-series controller must have 04.80 or newer firmware to use this function. This operation requires OpenBSI 5.7 or newer.

6.28.1 Deleting Historical Data

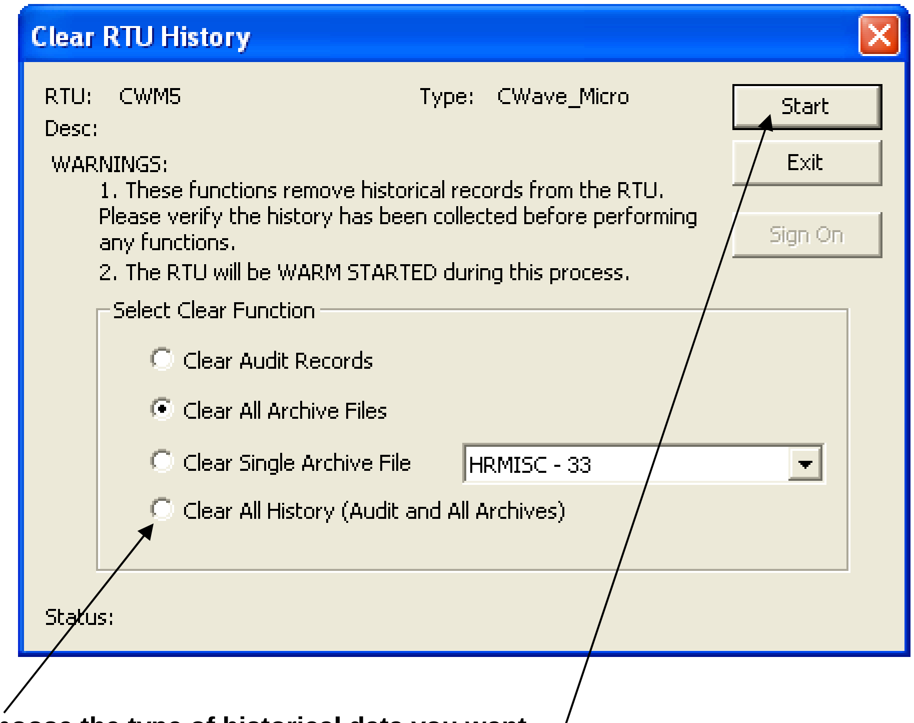
⚠ **Caution** **If there should be a power failure to the ControlWave during the "Clear History" operation, files will not delete properly.**

⚠ **Caution** **If you want to save any Audit or Archive data, you must do this before you use the Clear History function.**

We also recommend you save your current historical configuration to an FCP file prior to deleting audit or archive files, so that you can restore the structure (though not the data), if a failure occurs.

1. To delete historical data, *right*-click on the ControlWave in the NetView tree, and choose **Clear History** from the pop-up menu.

2. Now, sign on to the ControlWave and provide a valid **Username** and **Password** combination. The Clear RTU History dialog box opens.



Clear RTU History

RTU: CWM5 Type: CWave_Micro

Desc:

WARNINGS:
1. These functions remove historical records from the RTU. Please verify the history has been collected before performing any functions.
2. The RTU will be WARM STARTED during this process.

Select Clear Function

○ Clear Audit Records

● Clear All Archive Files

○ Clear Single Archive File HRMISC - 33

○ Clear All History (Audit and All Archives)

Status:

Choose the type of historical data you want to delete, then click "Start."

Figure 6-94. Deleting Historical Data

3. You have four possible choices on what to delete. See explanations for the fields, below.

Field	Description
Clear Audit Records	This choice deletes all Audit records residing in the ControlWave.
Clear All Archive Files	This choice deletes all Archive Files residing in the ControlWave.
Clear Single Archive File	This choice deletes a single Archive File. When choosing this, use the list box to specify which Archive File you want to delete.
Clear All History (Audit and All Archives)	This choice deletes all Audit Records and all Archive Files.

4. After you make your choice, click **OK** to proceed with the deletions, or **Cancel** to abort the operation. After you click **OK** NetView gives you a warning prompt and asks you to confirm that you want to perform the deletions.

⚠ **Caution** **Once you click OK to the deletion confirmation prompt, there is no way to reverse the deletion operation; the delete command removes the chosen files from the unit and the unit re-boots twice to accomplish the deletion operation.**

Note: If you see the status message *Not enough memory to complete parameter setting*, it means the flash memory area is full and the deletion could not be completed because files are shifted during the deletion. If this occurs during the Clear All History, try clearing audit files first, then clear archives; if this doesn't resolve the issue, use the Flash File Access tool to delete individual files and free up space. See the *ControlWave Designer Programmer's Handbook* (D5125) for information on the Flash File Access tool.

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Chapter 7 – Using the Downloaders

When you finish creating your control strategy file using ControlWave Designer or ACCOL Workbench, you have to transfer it to the actual controller; this process is called **downloading**.

In This Chapter

The ControlWave Downloader transfers an IEC 61131 ControlWave project from the OpenBSI workstation to a running ControlWave series RTU.

The ACCOL Downloader transfers a linked ACCOL load file (*.ACL) from the OpenBSI workstation to a running Network 3000-series RTU.

Both downloaders support batch files that allow file downloads to multiple RTUs.

⚠ **Warning** **Never attempt to download an *untested* program into an RTU currently running an industrial process or plant. Prior to downloading, isolate the RTU from the process and disconnect I/O. Failure to take such precautions could result in injury to persons or damage to property.**

7.1 Starting the ACCOL Downloader

Notes:

- Before attempting to download, you must establish communications with the controller using NetView, LocalView, or TechView.
- If sufficient memory is available, you can run multiple copies of the downloader simultaneously.

There are two different ways to start the Downloader:

Method 1:

Click **Start** > **Programs** > **OpenBSI Tools** > **ACCOL Tools** > **ACCOL Downloader**. The ACCOL Downloader opens.

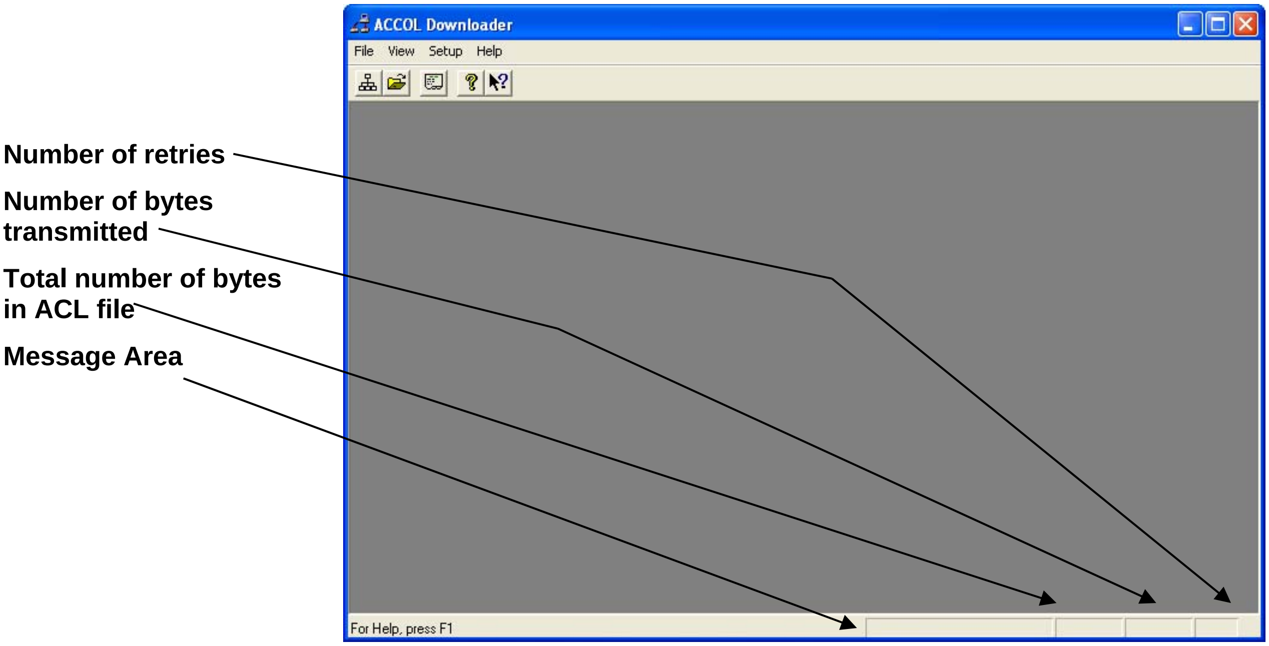


Figure 7-1. ACCOL Downloader

Method 2:

Right-click on the icon for the RTU you want to receive the download, then choose **RTU>Download** from the pop-up menus. The ACCOL Downloader opens. This method allows you to skip the Select New Node dialog box when you perform the download.

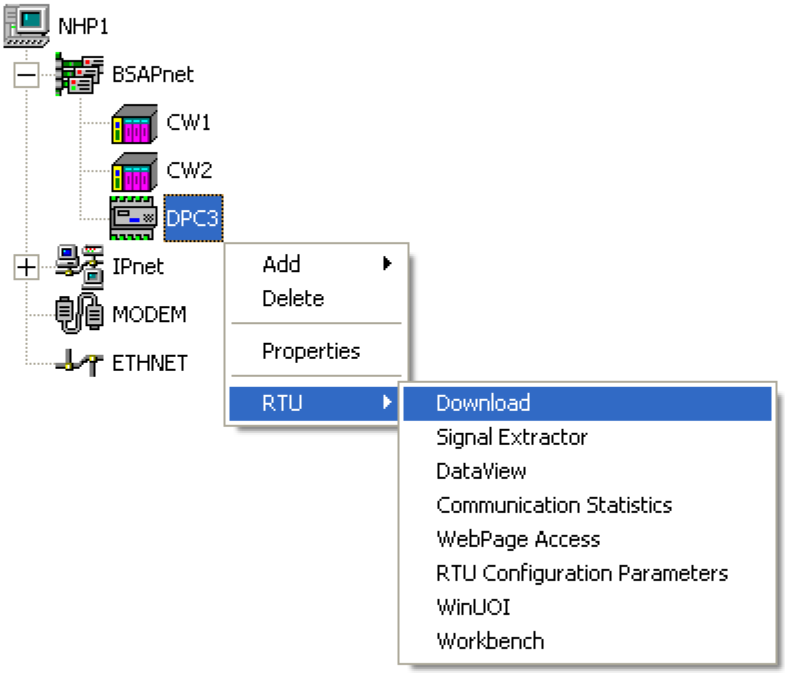


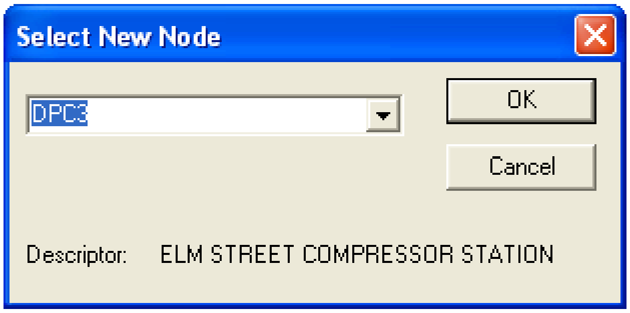
Figure 7-2. Starting the ACCOL Downloader

Either of these methods starts the ACCOL Downloader.

7.2 Downloading to a Single Network 3000 Node

To download to a single Network 3000 node, click on the icon, shown at left, or, from the menu bar, click **File>Single Node**.

This opens the Select New Node dialog box. Use the list box to select the Network 3000 node name, and click **OK**. (**Note**: The node name must exist in the currently released NETDEF files.)

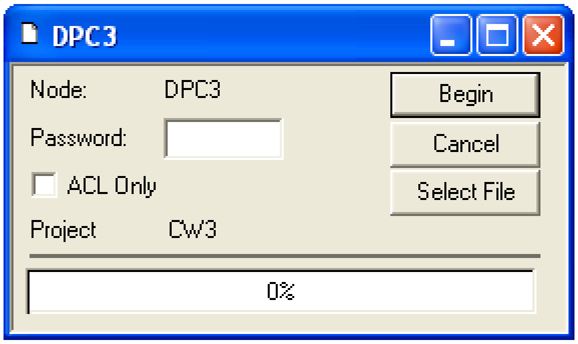


DPC3

Descriptor: ELM STREET COMPRESSOR STATION

Figure 7-3. Select New Node dialog box

A dialog box (*Figure 7-4*) with the node name in the title bar opens; type the password for the ACCOL load associated with this node in NetView, or select a different load using the **Select File** button *first*. As you type the password it appears as '*' characters on the screen. Click **Begin** to initiate a download of the file. A progress bar displays the percentage of the file which has been downloaded.



Node: DPC3

Password:

☐ ACL Only

Project CW3

0%

Figure 7-4. Download dialog box

While the download proceeds, you can open the Select New Node dialog box, again, and repeat the process to download *another* different Network 3000 node.

7.3 Downloading to a Group of Network 3000 Nodes

To download several ACCOL load files, use a text editor to create an ASCII file, with the extension (.RDL), in the directory containing your ACCOL loads. A sample RDL file is shown below.

```
! Sample Remote Download
(RDL) File

! Download nodes R1, R2,
and R3

R1

R2

R3

! Pause 15 seconds before
downloading R4

Wait 15

R4
```

Figure 7-5. Sample RDL File

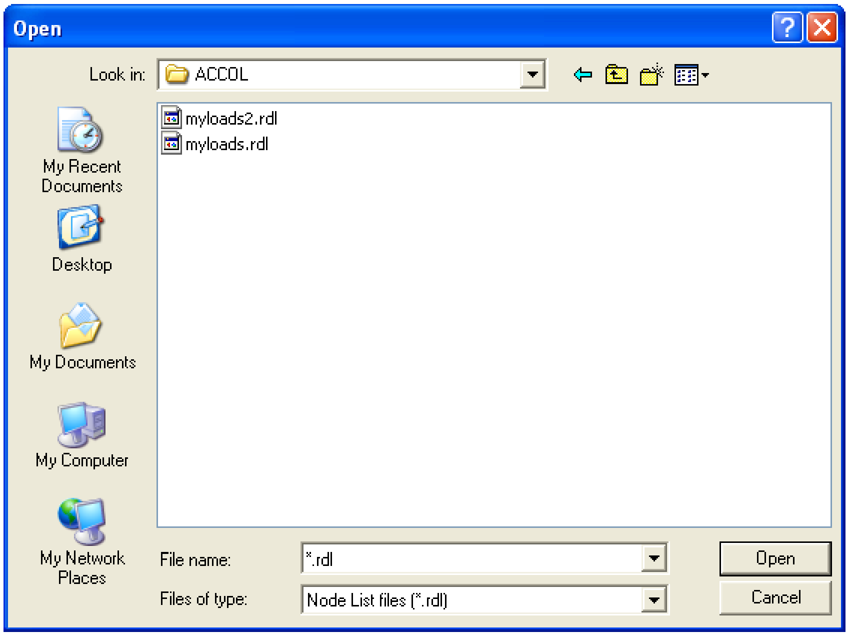
Each line of the file must contain a single Network 3000 controller node name, a wait statement, or a comment.

Wait statements are optional commands that cause the Downloader to pause between downloads; a "!" character indicates a comment.

Note: Wait statements are useful if you want to first download to a master node, and then download to one of its slave nodes. The master needs time to “wake up” and start executing before it can accept download messages to one of its slave nodes.

Start the Downloader using **Start** > **Programs** > **OpenBSI Tools** > **ACCOL Tools** > **ACCOL Downloader**.

In the Downloader, click the icon, shown at left, or, from the menu bar, click **File>Open List**. Select the RDL file using the Open file dialog box, and click **Open**.



Look in: ACCOL

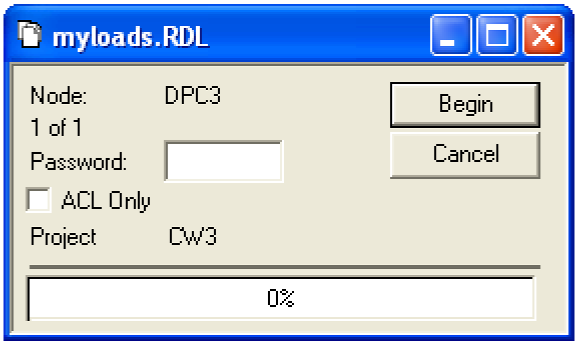
myloads2.rdl
myloads.rdl

File name: *.rdl

Files of type: Node List files (*.rdl)

Figure 7-6. Selecting an RDL File

Once you click **Open**, a dialog box opens with the name of the RDL file in the title bar. To initiate the download, enter a password for the first load in the list, only, and click **Begin**. The Downloader attempts to download, in order, each load listed in the RDL file.



Node: DPC3

1 of 1

Password:

□ ACL Only

Project CW3

0%

Figure 7-7. Entering a Password to Start the RDL Download

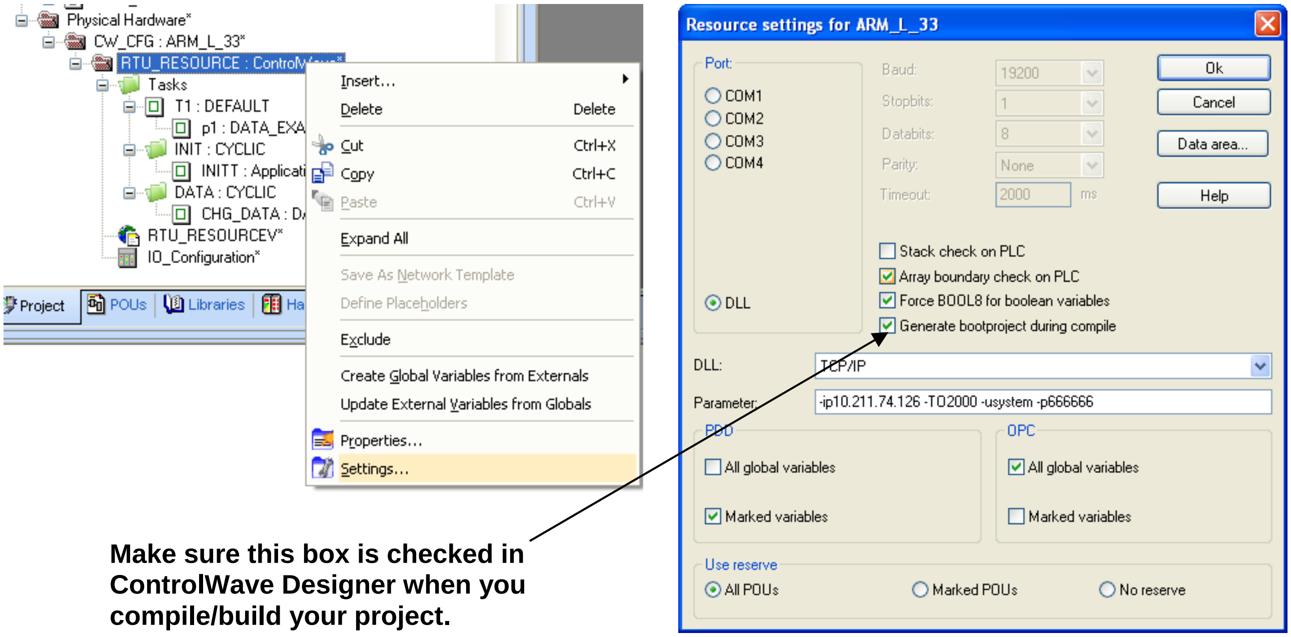
7.4 Downloading to a ControlWave-series Node:

Note: You can also download a project to a ControlWave directly from within ControlWave Designer. See the ControlWave Designer documentation for details.

7.4.1 Before You Begin

There are certain things you must do before you can download to a ControlWave-series controller.

- You must save your project as a ControlWave project *.MWT file.
- You must generate a boot project file during compilation in ControlWave Designer. To do this, you must check the **Generate bootproject during compile** box for your resource.



Resource settings for ARM_L_33

Port:
○ COM1
○ COM2
○ COM3
○ COM4
● DLL

Baud: 19200
Stopbits: 1
Databits: 8
Parity: None
Timeout: 2000 ms

Ok
Cancel
Data area...
Help

□ Stack check on PLC
☑ Array boundary check on PLC
☑ Force BOOL8 for boolean variables
☑ Generate bootproject during compile

DLL: TCP/IP
Parameter: -ip10.211.74.126 -T02000 -usystem -p666666

PDD
□ All global variables
☑ Marked variables

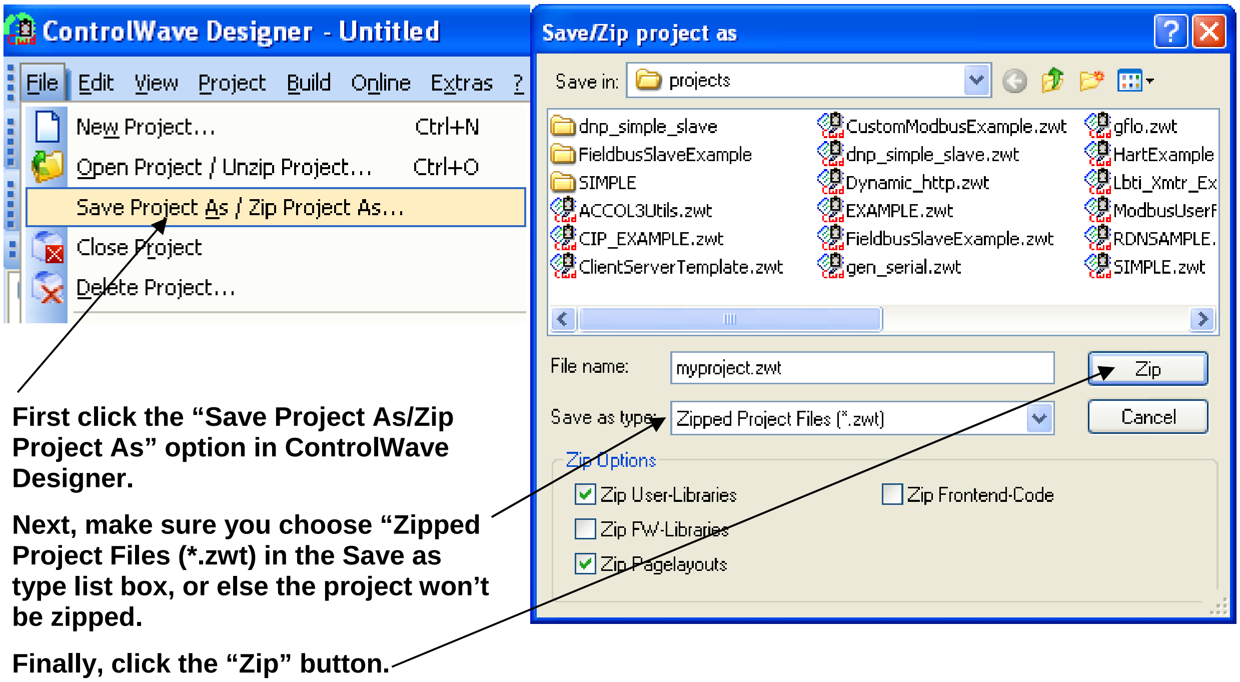
OPC
☑ All global variables
□ Marked variables

Use reserve
● All POUs ○ Marked POUs ○ No reserve

Make sure this box is checked in ControlWave Designer when you compile/build your project.

Figure 7-8. Generating a Bootproject During Compilation

- You must generate a zipped project file (*.ZWT) in ControlWave Designer. One way you can do this is to manually save your ControlWave project as a zip file:



File name: myproject.zwt

Save as type: Zipped Project Files (*.zwt)

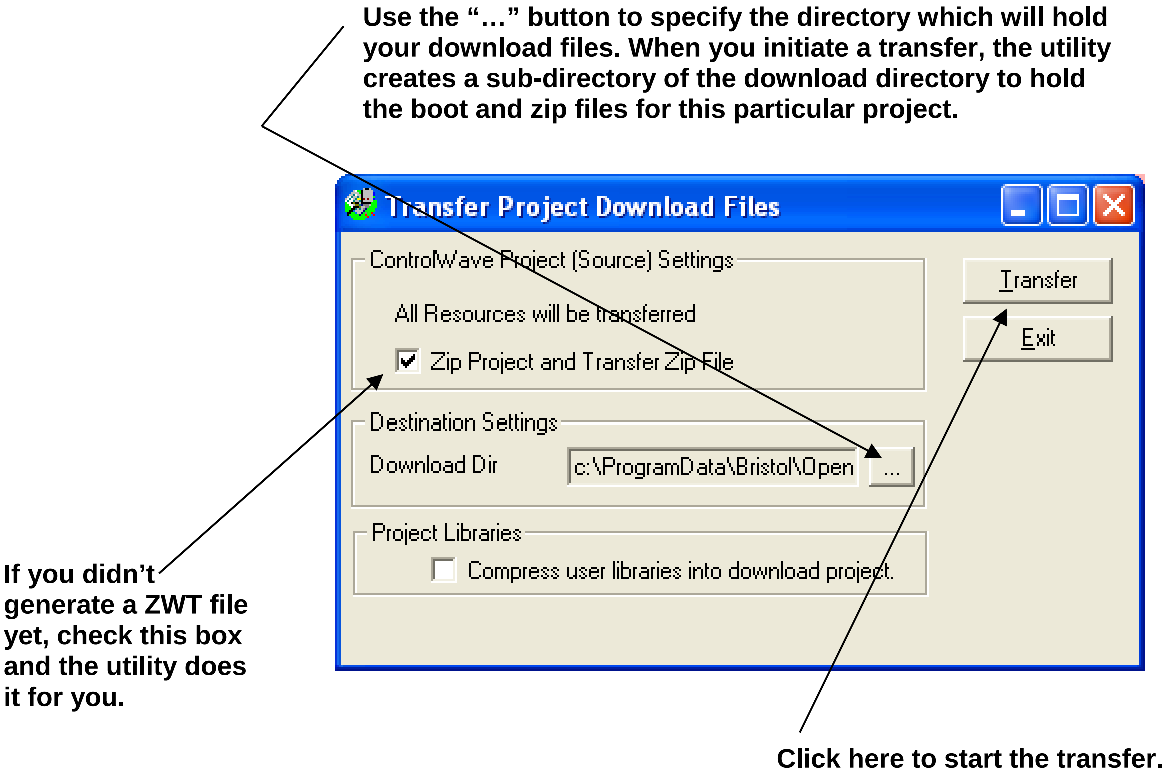
☑ Zip User-Libraries
☐ Zip Frontend-Code
☐ Zip FW-Libraries
☑ Zip Pagelayouts

First click the “Save Project As/Zip Project As” option in ControlWave Designer.

Next, make sure you choose “Zipped Project Files (*.zwt) in the Save as type list box, or else the project won’t be zipped.

Finally, click the “Zip” button.

Figure 7-9. Zipping Your ControlWave Project


Transfer Project Download Files
ControlWave Project (Source) Settings
Destination Settings
Project Libraries
Transfer
Exit
...

All Resources will be transferred

☑ Zip Project and Transfer Zip File

Download Dir c:\ProgramData\Bristol\Open

☐ Compress user libraries into download project.

Use the “…” button to specify the directory which will hold your download files. When you initiate a transfer, the utility creates a sub-directory of the download directory to hold the boot and zip files for this particular project.

If you didn’t generate a ZWT file yet, check this box and the utility does it for you.

Click here to start the transfer.

Figure 7-10. Transferring the Project File to the Download Directory

- You must transfer the bootfile and zip file for this project to a *sub-directory* of whichever directory you want to use for downloads. You can accomplish this if you click **Build > Transfer Download Files** in ControlWave Designer. In this utility, you must specify the download directory in the **Download dir** field. (See *Figure 7-10*.)

Note: Beginning with OpenBSI 5.8 Service Pack 1, if you use multiple configurations / resources in your project, OpenBSI can embed those in the PRO file name to differentiate between different PRO files from the same project. To do this, select the **Add 1131 Configuration name**… option in the Applications page of the Advanced Configuration utility. See *Appendix E* for more information on this option.

- If you check **Zip Project and Transfer Zip File** (default), the system zips the current project automatically, in preparation for the transfer. If you select the **Compress user libraries into download project** option, the system zips the user libraries and includes them in the zip project.

Note: **Zip Project and Transfer Zip** overwrites any pre-existing zip file for this project. To prevent this, you can disable the option, however, if you do, you must have a previously created zip available for transfer.

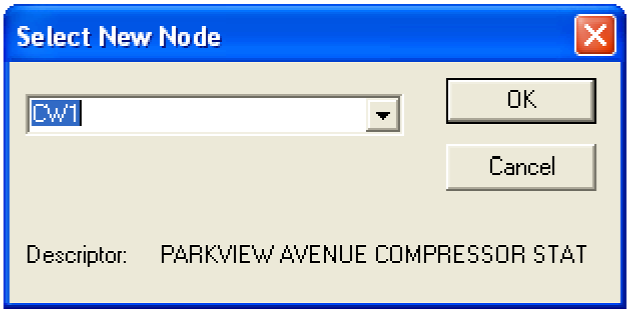
- When you finish making selections, click **Transfer** and the file transfer begins.
- If your ControlWave-series node includes a key operated RUN / REMOTE/ LOCAL switch, you must turn the switch to either the REMOTE or LOCAL position, depending upon how the PC connects to the ControlWave. Downloading CANNOT occur with the switch in the RUN position.

7.4.2 Starting the ControlWave Downloader

There are two methods for starting the ControlWave Downloader:

Method 1:

Click **Start** > **Programs** > **OpenBSI Tools** > **ControlWave Tools** > **ControlWave Downloader**. The Select New Node dialog box opens.



Select New Node

CW1

Descriptor: PARKVIEW AVENUE COMPRESSOR STAT

Figure 7-11. Select New Node Dialog Box

Use the list box to select the node which you want to download to; then click **OK**, and the Downloader opens.

Method 2:

The second method is to *right*-click on the icon for the controller you want to download, in the NetView tree, and choose **RTU>Download** from the pop-up menu.

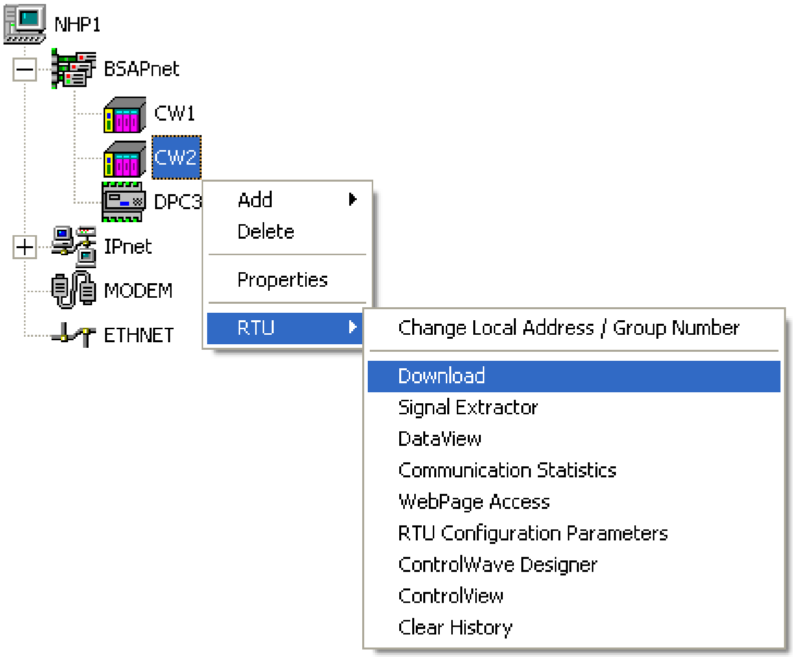
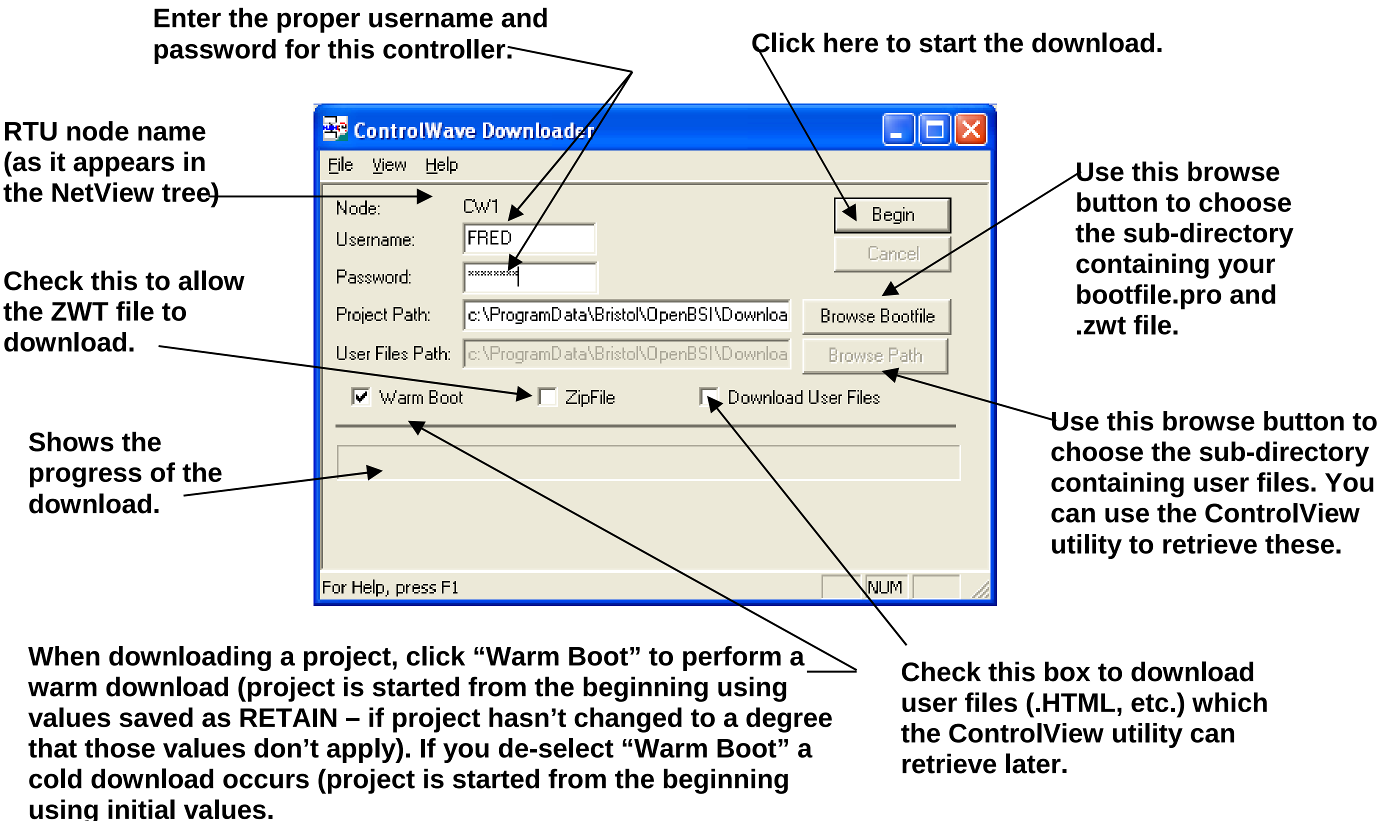


Figure 7-12. Calling Up the Downloader

7.4.3 Using the ControlWave Downloader

When the ControlWave Downloader dialog box opens, complete the fields as described, below:



Node: CW1
Username: FRED
Password: ********
Project Path: c:\ProgramData\Bristol\OpenBSI\Downloa
User Files Path: c:\ProgramData\Bristol\OpenBSI\Downloa
☑ Warm Boot □ ZipFile □ Download User Files

Enter the proper username and password for this controller.

Click here to start the download.

RTU node name (as it appears in the NetView tree)

Use this browse button to choose the sub-directory containing your bootfile.pro and .zwt file.

Check this to allow the ZWT file to download.

Use this browse button to choose the sub-directory containing user files. You can use the ControlView utility to retrieve these.

Shows the progress of the download.

When downloading a project, click “Warm Boot” to perform a warm download (project is started from the beginning using values saved as RETAIN – if project hasn’t changed to a degree that those values don’t apply). If you de-select “Warm Boot” a cold download occurs (project is started from the beginning using initial values.

Check this box to download user files (.HTML, etc.) which the ControlView utility can retrieve later.

Figure 7-13. ControlWave Downloader

When the fields are completed, click **Begin** to start the download. The fields/buttons in this dialog box are:

Field	Description
Node	This displays the node name (as it appears in the NetView tree) for this ControlWave-series controller.
Username, Password	Enter a valid username/password combination for this ControlWave-series controller.
Project Path	Enter the path of the project that the Downloader will download to this controller, or use the **Browse Bootfile** button to locate it. (The path must be a sub-directory of whichever directory you specified for downloads (**Download Dir**) in the Transfer Download Files dialog box, *Figure 7-10*) The project files consist of the .PRO boot file, generated when you compile your ControlWave project, and the zip file (*.zwt) containing the project source. **Note**: If your project includes multiple resources, each one has a different path, and you must choose the

	appropriate one. **Note**: Beginning with OpenBSI 5.8 Service Pack 1, if your project includes multiple configurations / resources, depending on application settings, your PRO file name may include the configuration / resource name to help differentiate between multiple PRO files for the same project.
User Files Path	Enter the path of the folder containing files you want to download to the user files area of the ControlWave, or use the **Browse Path** button to locate it. (See **Download User Files**, below).
Begin	Click here to start the download.
Cancel	Click here to exit down the 1131 Downloader.
Warm Boot	When you don't select this check box, all variables initialize as part of the download, and the project restarts. When you choose **Warm Boot**, any variables configured as RETAIN do not re-initialize as part of the download, however, all other variables initialize, and the project restarts from the beginning of its cycle.
ZipFile	When you select this option, the download operation includes the zipped project file (*.ZWT).
Download **User Files**	The ControlWave can store user files (*.ZIP, *.HTML, etc.) in flash memory, for later retrieval using the ControlView utility. You must place the user files you want to download to the ControlWave in the folder identified by the **User Files Path** field. **Note**: This feature was added in OpenBSI 5.3 Service Pack 2.

7.4.4 Creating Download Scripts for Batch Downloading of ControlWave Controllers

Optionally, you can create download scripts which allow you to download files to ControlWave controllers using a single command.

You create download scripts as ASCII text files, with the file extension of *.RDL, and store them in the **Downloads** sub-directory of your OpenBSI directory.

Each line of the download script, defines the downloading parameters for a single ControlWave controller. The syntax of a line of the download script is:

nodename,filetype,startup,includezip,source_path where:

nodename is the name of the ControlWave controller you want to download. This name must match the name you define in NetView. (This is the only required field.)

filetype specifies the kind of file you want to download. *filetype* must be either:

P Download a ControlWave project (default)

F Download a user file (used with ControlView)

startup specifies whether the system should perform a warm boot upon completion of the download. *startup* must be either:

Y Perform a warm boot (default)

N Do **not** perform a warm boot

includezip specifies whether or not the Downloader should also download the zipped ControlWave project (*.ZWT). *includezip* must be either:

Y Include *.ZWT with the download

N Do **not** include *.ZWT with the download (default).

path specifies the source folder containing the file you want to download. If you download a project, this must be the directory containing bootfile.pro. If you download user files for use with ControlView, this must be the folder containing those files. If the folder name contains spaces, you must surround it with quotation marks “ “. If you enter nothing here, the Downloader uses OpenBSI Application Parameter defaults.

Example RDL File:

```
RPC1,P,Y,Y,C:\”ProgramData”\Bristol\OpenBSI\rpc1
RPC2,P,Y,Y,C:\”ProgramData”\Bristol\OpenBSI\rpc2
RPC3,P,Y,Y,C:\”ProgramData”\Bristol\OpenBSI\rpc3
RPC4,P,Y,Y,C:\”ProgramData”\Bristol\OpenBSI\rpc4
```

Starting the Download Script

To start the download script you create, click on **File > Open Script** within the ControlWave Downloader, then choose the RDL file that contains the download script.

You can also run download scripts from the command line prompt according to the following syntax:

dl1131 *script_name username password*

where:

script_name is the name of the RDL file (omitting the RDL extension)

username

password is a valid username/password combination for the first RTU in the script. The named user must have privileges sufficient to download.

For example, to run the download script myloads.RDL where the first RTU in the RDL file has a username/password combination of THOMAS BOB276, type the following:

```
dl1131 myloads THOMAS BOB276
```

7.4.5 Running the ControlWave Downloader from the Command Line

Optionally, you can start ControlWave Downloader from the DOS command prompt. Follow the syntax rules below; optional switches appear in brackets "[ ]." The command for this is:

dl1131 *node* [*file*] [*username password*]

where:

node is the RTU node name as defined in the NETDEF files. If no *file* is specified, the Downloader uses the file specified in the RTU Properties in NetView.

File is the basename of the ControlWave project. You can omit the .PRO or .MWT extension. When you specify a file, you override any filename specified in the RTU Properties in NetView. If the filename includes spaces, you must surround it with quotation marks " ".

username

password

is a valid username/password combination for this RTU. The user you specify must have sufficient privileges to perform the download. If you omit this, you must have signed on previously or used automatic sign-on.

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Chapter 8 – Using DataView

DataView allows you to collect several types of data from a Network 3000-series or ControlWave series controller, including signal data, signal lists, archive data, analog data array values, and audit trail alarm/event information. In addition, it allows you to search for signals based on various criteria, and also allows you to send recipes (lists of signal values) to the controller.

In This Chapter

8.1 Starting DataView

Note: Before starting DataView, you must establish communications with the controller using NetView, LocalView, or TechView.

There are two different ways to start DataView.

Method 1:

Click **Start** > **Programs** > **OpenBSI Tools** > **Common Tools** > **DataView**. DataView starts.

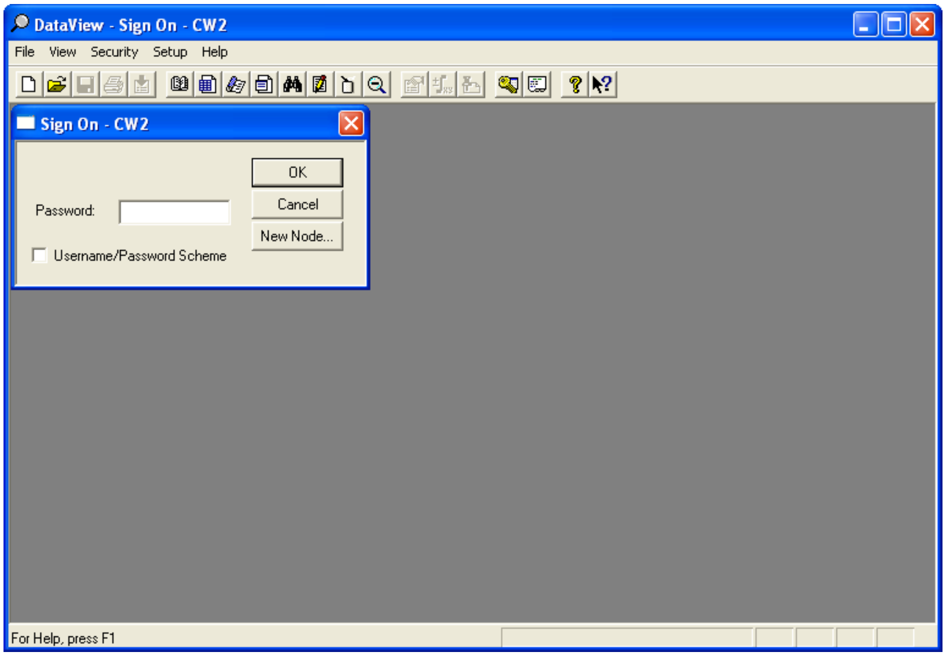


Figure 8-1. DataView

Method 2:

Right-click on the icon for the RTU you want to receive the view data from, then choose **RTU>DataView** from the pop-up menus. DataView opens.

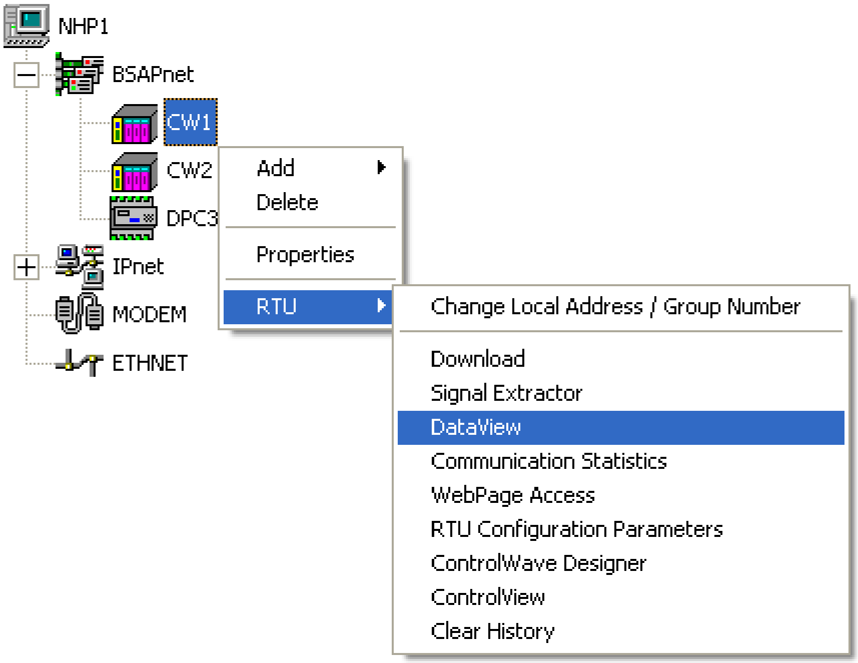


Figure 8-2. Starting DataView

Either of these methods starts the ACCOL Downloader.

8.2 Using the Tool Bar within DataView

Notes:

- You can run multiple DataView functions simultaneously in separate windows, if sufficient memory is available.
- If sufficient memory is available, you can run multiple copies of DataView simultaneously.

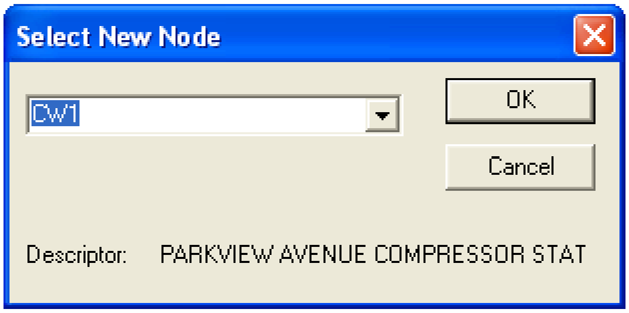
The DataView window includes a tool bar which provides you easy access to DataView's features and functions, and serves as an alternative to using the menu bar and pull down menus. If you position the mouse cursor over any tool bar icon you can see a label which identifies the icon's function. (**Note**: The number and function of active icons in the tool bar varies depending upon which DataView feature currently runs in the window.) A single click on the icon activates its feature. See the pages which follow for a description of the various DataView features.

8.3 Using the Select New Node Dialog Box, Signing on to a Node

If you did not configure Automatic Sign-On, or if you have not previously signed on to a particular node, you must sign on. To do this, click the “Sign On To Remote RTU” tool bar icon, shown above, or click **Security**>**Sign On** from the menu bar. In instances where you previously signed on to a node, DataView assumes a default choice of the last node you selected, and the Sign On dialog box opens; otherwise the Select New Node dialog box opens.

Using the Select New Node Dialog Box

Choose the name of the desired node from the list box, and click **OK**.



Descriptor: PARKVIEW AVENUE COMPRESSOR STAT

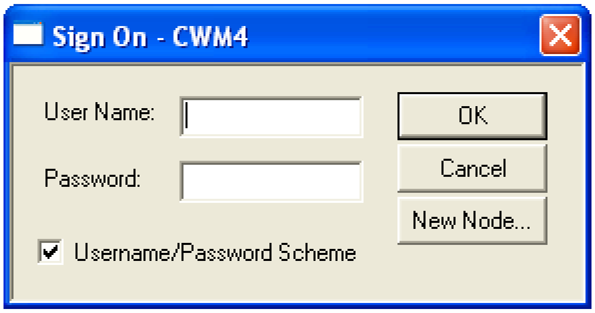
Figure 8-3. Select New Node dialog box

Notes:

- In order for you to select a node, it must exist in the currently released NETDEF files. The Sign On dialog box now opens, with the node name in the title bar.
- The Select New Node dialog box, and the Sign On dialog box appear throughout the OpenBSI Utilities, whenever you attempt to access a new node.

Using the Sign On Dialog Box

When the Sign On dialog box opens, type either the password for the node, or the user name and password combination for the node, depending upon which security scheme you use. When finished, click **OK**.



☑ Username/Password Scheme

Figure 8-4. Sign On dialog box

(You can change the security scheme used by selecting / de-selecting the **Username/Password Scheme** option.) When you sign on successfully to a Network 3000 RTU, you have access to all DataView features and functions, as well as ACCOL structures in the Network 3000 RTU which share a security level less than or equal to the level for your password. When you sign on successfully to a ControlWave RTU, you have access to whichever privileges are available for your username.

If you choose the wrong node, click **New Node** to return to the Select New Node dialog box, described above.

Note: If you communicate from an OpenBSI Workstation to a ControlWave controller using PPP (Point-to-Point Protocol), the password you use to establish communications using PPP requires a minimum of 8 characters; however, DataView in OpenBSI Version 5.8 and earlier only supports passwords of 6 characters or less. In this situation, the controller must have a user defined with a password for PPP, and then a second user with a shorter password to support DataView. You must establish PPP communications *first* using the longer password, *then* log on as the second user using the shorter password supported by DataView. Two alternatives to this solution are to use OpenBSI 5.8 Service Pack 1 (or newer) which supports passwords of up to 16 characters or to use Web_BSI data collection web pages, instead of DataView, since they support longer passwords and so would not require you to define a second user.

Configuring Automatic DataView Sign-On

You can configure DataView with an automatic sign-on capability. This capability is useful in applications where you must examine data from several different nodes, and it would be tedious to sign-on to each node individually. Automatic sign-on allows you to define a single common security code (password), or a user name/password combination for DataView.

For this feature to work, you must configure the same security code or user name/password combination within each and every RTU you want DataView to access.

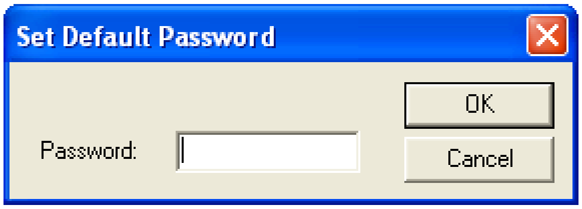


Figure 8-5. Set Default Password dialog box – Password Only

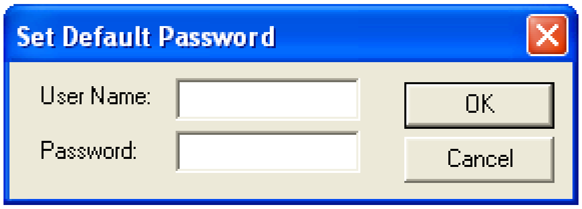


Figure 8-6. Set Default Password dialog box – Username and Password

To configure the automatic sign-on capability from the menu bar, click **Security**>**Default Security**. The Set Default Password dialog box opens. Enter either a default user name/password combination, or simply a password, depending upon the appearance of the dialog box. Click **OK** to save the defaults.

Once configured, when you sign-on to DataView you only need to select a node; and call up the Sign On dialog box; DataView sends the password, or user name/password combination to the node automatically.

Note: The appearance of the Set Default Password dialog box varies depending upon whether you select **Yes** or **No** for the **"Would you like to use the Username/Password scheme?"** question in NetView's System Wizard.. **"Yes"** causes DataView to use both the username and password, whereas **"No"** cause DataView to only use the password.

8.4 Printing the Entries in the Current DataView Window

You can print the textual data displayed in the various types of DataView Windows on a printer.

Notes:

- Before attempting to print, you must configure a printer and connect it to this workstation, either directly, or through a network. To access the Windows Print Setup dialog box, click **File > Print Setup**.
- The types of DataView windows which hold printable data include Signal windows (which are used to display Signal Searches, DataView Lists, or Remote Lists) as well as other types of windows such as Audit Trail windows, Archive windows, and Array windows. All of these types of windows will be discussed later in this manual.

To preview the data you want to print, click **File>Print Preview** from the menu bar.

To print the entries (data) in the current DataView window, click the printer icon, shown above, or click **File>Print**. The Windows Print dialog box opens. See your Windows documentation for further information.

8.5 Exporting Data Entries to the Windows™ Clipboard

As an alternative to sending data to the printer, described above, you can copy DataView window entries as text to the Windows™ Clipboard. From the Clipboard, you can export the data to other Windows™ applications such as spreadsheets or word processors. DataView formats its entries specifically for use in Microsoft® Excel.

To copy entries in the current DataView window to the Windows™ Clipboard, click **File>Copy to Clipboard**.

See your Windows™ documentation for more information on using the Clipboard.

8.6 Conducting a Signal Search

A signal search allows you to search for all signals (variables) which share one or more common characteristics. For example, you can define the search criteria to be all signals which share the same signal extension *and* are control-inhibited. Or you could search for all signals currently in the high-high alarm state. The following is a list of valid signal search criteria:

- Signal base name, extension, or attribute (Network 3000 or ControlWave configured to use ACCOL names)
- Variable/function block instance name (ControlWave only)
- String Search (ControlWave only)
- Current alarm state (logical alarm, high, high-high, low, low-low)
- Inhibit/enable bit status (alarm inhibit/enable, control inhibit/enable**,** manual inhibit/enable)
- Questionable data bit status

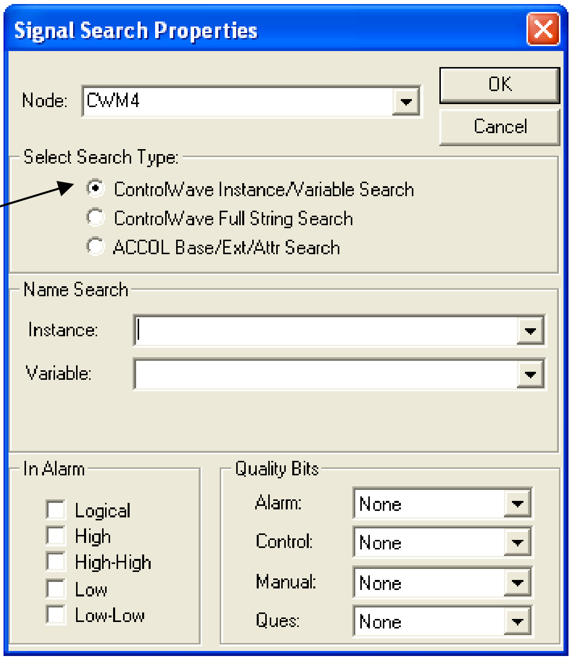
Starting the Signal Search

To start a Signal Search, click on the Signal Search tool bar icon (shown at left), *or* click **File** > **New**, and then click **Signal Search** in the New list box. Either method opens the Signal Search Properties dialog box.

Use the **Node** list box to identify the RTU you want to search. Then use the other fields to specify the parameters of your search.

Notes:

- Some of the searches support wildcard characters. Wildcard characters allow you to search for items for which you don't know the exact name, or for which there may be several possible matches. There are two wildcard characters supported, "*" and "?"
- The ***** indicates that DataView should automatically consider any characters in the position where the * appears as valid matches for this search. For example, if you search for "COMP*," items like "COMP4," "COMPRESSOR" and "COMPORT" are all considered valid matches.
- The **?** indicates that DataView should accept the substitution of any one single character for the question mark as a valid match for this search. For example, if you search for "PUMP?RUN" then "PUMP1RUN," "PUMP2RUN" or "PUMPNRUN" are all considered valid matches.



Node: CWM4

Select Search Type:
● ControlWave Instance/Variable Search
○ ControlWave Full String Search
○ ACCOL Base/Ext/Attr Search

Name Search
Instance:
Variable:

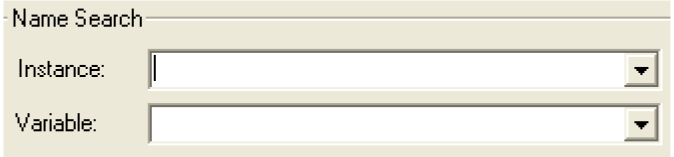
In Alarm
□ Logical
□ High
□ High-High
□ Low
□ Low-Low

Quality Bits
Alarm: None
Control: None
Manual: None
Ques: None

Choose the type of search you want to conduct.

Figure 8-7. Signal Search Properties dialog box

Instance/Variable Search Mode: For ControlWave controllers you can search based on the POU **Instance** name(s)**,** and/or the **Variable** name. You can use wildcards in either of these fields.


Name Search
Instance:
Variable:

The same variable can have multiple instance names associated with it, for example, an instance for the program, followed by the instance for a function block, etc. A period "." character follows each instance therefore an instance name is always to the *left* of the last period. DataView considers the portion to the *right* of the last period to be the variable name. The signal search can only find variables which you previously marked as "PDD."

Field	Description
Instance	You can enter up to 32 characters in the **Instance** name portion. If you do NOT use wildcard characters, the instance name must match *exactly* to be considered a valid match. For global variables the POU instance name must be "@GV." If you leave the **Instance** field blank, DataView considers any instance name to be valid, and it only uses the **Variable** field in the search.
Variable	You can enter up to 32 characters in the **Variable** name portion. If you do NOT use wildcard characters, the variable name must match *exactly* to be considered a valid match. If you leave the **Variable** field blank, DataView only uses the **Instance** field in the search

Some Examples:

Let’s say you have a set of variables with the following names *(Figure 8-8)*.

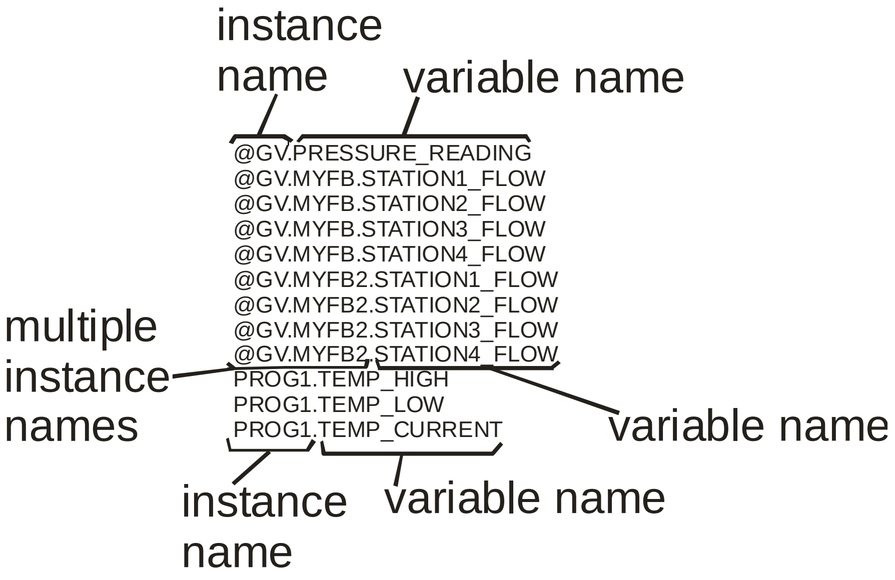


Figure 8-8. Sample Set of Variables

Table 8-1 lists some resulting matches for searches based on this set of variables:

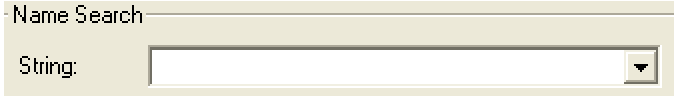
Table 8-1. Sample Search Results – Instance / Variable

If you enter this in the Instance field	**And you enter this in the Variable field**	**DataView returns the following variables from the set of variables shown in Figure 8-8.**
*	STATION1*	@GV.MYFB.STATION1_FLOW @GV.MYFB2.STATION1_FLOW
leave blank	TEMP*	PROG1.TEMP_HIGH PROG1.TEMP_LOW PROG1.TEMP_CURRENT
@GV.MYFB*	STATION2*	@GV.MYFB.STATION2_FLOW @GV.MYFB2.STATION2_FLOW
PROG	TEMP*	*No matches; because no wildcard following ‘PROG’.*
PROG*	*leave blank*	PROG1.TEMP_HIGH PROG1.TEMP_LOW PROG1.TEMP_CURRENT
@GV.MYFB2	*leave blank*	@GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW
.	STATION3*	@GV.MYFB.STATION3_FLOW @GV.MYFB2.STATION3_FLOW

If you enter this in the Instance field	And you enter this in the Variable field	DataView returns the following variables from the set of variables shown in Figure 8-8.
*	*leave blank*	@GV.PRESSURE_READING @GV.MYFB.STATION1_FLOW @GV.MYFB.STATION2_FLOW @GV.MYFB.STATION3_FLOW @GV.MYFB.STATION4_FLOW @GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW PROG1.TEMP_HIGH PROG1.TEMP_LOW PROG1.TEMP_CURRENT
.	*leave blank*	@GV.MYFB.STATION1_FLOW @GV.MYFB.STATION2_FLOW @GV.MYFB.STATION3_FLOW @GV.MYFB.STATION4_FLOW @GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW
*.MYFB2	*leave blank*	@GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW
leave blank *or* *	STATION?_FLOW	@GV.MYFB.STATION1_FLOW @GV.MYFB.STATION2_FLOW @GV.MYFB.STATION3_FLOW @GV.MYFB.STATION4_FLOW @GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW
.MYFB2	STATION2_FL?W	@GV.MYFB2.STATION2_FLOW
PROG?	*leave blank*	PROG1.TEMP_HIGH PROG1.TEMP_LOW PROG1.TEMP_CURRENT
@GV.MYFB?	*leave blank*	@GV.MYFB.STATION1_FLOW @GV.MYFB.STATION2_FLOW @GV.MYFB.STATION3_FLOW @GV.MYFB.STATION4_FLOW @GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW

ControlWave Full String Search Mode:

For this search, you can enter a string that is in *either* the instance name or variable name.



The search string you enter can include wildcards to establish a pattern for DataView to match.

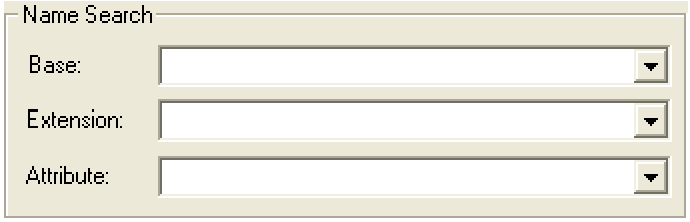
Table 8-2 shows some examples, using the same set of variables from *Figure 8-8*.

Table 8-2. Sample Search Results – String

If you enter this in the String field	DataView returns the following variables from the set of variables shown in Figure 8-8.
*STATION?_F *	@GV.MYFB.STATION1_FLOW @GV.MYFB.STATION2_FLOW @GV.MYFB.STATION3_FLOW @GV.MYFB.STATION4_FLOW @GV.MYFB2.STATION1_FLOW @GV.MYFB2.STATION2_FLOW @GV.MYFB2.STATION3_FLOW @GV.MYFB2.STATION4_FLOW
MYFB?.STA TION2	@GV.MYFB.STATION2_FLOW @GV.MYFB2.STATION2_FLOW
1	@GV.MYFB.STATION1_FLOW @GV.MYFB2.STATION1_FLOW PROG1.TEMP_HIGH PROG1.TEMP_LOW PROG1.TEMP_CURRENT
@GV.P*	@GV.PRESSURE_READING

ACCOL Base, Extension, and Attribute Search Mode

For Network 3000 controllers, you can search based on a portion of the signal’s name. The **Base**, **Extension** and **Attribute** fields include list boxes which allow easy selection from the available base names, extensions, and attributes in a given ACCOL load.



Notes:

- Do not enter wildcard characters in this mode.
- You must search using the complete, Base, Extension, or Attribute, not part of it. For example, to search for an attribute of “FLOW,” you must enter “FLOW,” not “FLO,” “FL,” or “F.”
- Network 3000 User Note: DataView uses the ACO and ACL files on the PC hard disk to create the Node, Base, Extension, and Attribute lists. Because not all versions of the EGM 3530 TeleFlow™ include an ACCOL load, some TeleFlow™ users must type the Node, Base, Extension, or Attribute directly; there is no list to choose from. This situation also occurs if the ACO/ACL file base name has not been specified as the Node Load File Name in the currently released NETDEF files.

If DataView communicates with a ControlWave and you set the _USE_ACCOL_NAME system variable in your ControlWave project to TRUE, you can also use the **Base**, **Extension** and **Attribute** fields. To work properly in this case, though, the signal names you search for must fit the ACCOL II signal naming convention, i.e. no more than eight alpha-numeric characters for the base, no more than six for the extension, and no more than four for the attribute. In addition, characters such as the at sign “@” cannot be included. The underscore “_” may work if it’s at the end of the search parameter, but it will not work at the beginning of the search parameter.

Signal Search Notes for ControlWave Users

To see all variables in the project (both global and local variables marked as “PDD”) only specify the **Node** name when you start the search; leave all other fields blank. Because your signals must follow naming conventions carefully in this mode, we recommend that when you communicate with ControlWave that you use one of the other search modes, and leave **_USE_ACCOL_NAME** set at FALSE.

Notes about STRING variables

The standard IEC62591 STRING data type allows up to 80 characters. You can also create string variables using user-defined STRING data types of varying lengths. Be aware that in either case, there are restrictions on displaying strings in programs outside of ControlWave Designer:

- ControlWave RTUs do not report strings that exceed 127 characters and behave as if the variable does not exist when data requests come in for that variable from software.
- OpenBSI tools such as DataView can only display the first 64 characters of a ControlWave string variable.

In Alarm and Quality Bits

The In Alarm check boxes let you select signals which share the same alarm status.

The Quality Bits area list boxes allow you to select signals based on the inhibit/enable status for each alarm, control, or manual inhibit/enable bit. You can also select based on the Questionable data status.

Select the desired search criteria, and click **OK** to execute the search. A signal window opens to display all signals/variables which share the selected characteristics. See *Viewing Entries in the Signal Window* for information on using the entries in this window to change signal values, or to alter inhibit / enable bits. See *Viewing Data for a Single Signal* for information on viewing more detailed signal information. **Note**: The window can only display the first 5000 signals found..

Saving Search Criteria

Once the Signal Window opens you can save its associated signal search criteria in a file by clicking on the icon, shown at left, or you can click **File>Save As**. Enter a name for the search criteria file, with an extension of .SCH. You can save subsequent modifications to the SCH file if you click on the same icon, or click **File>Save**.

Retrieving Search Criteria

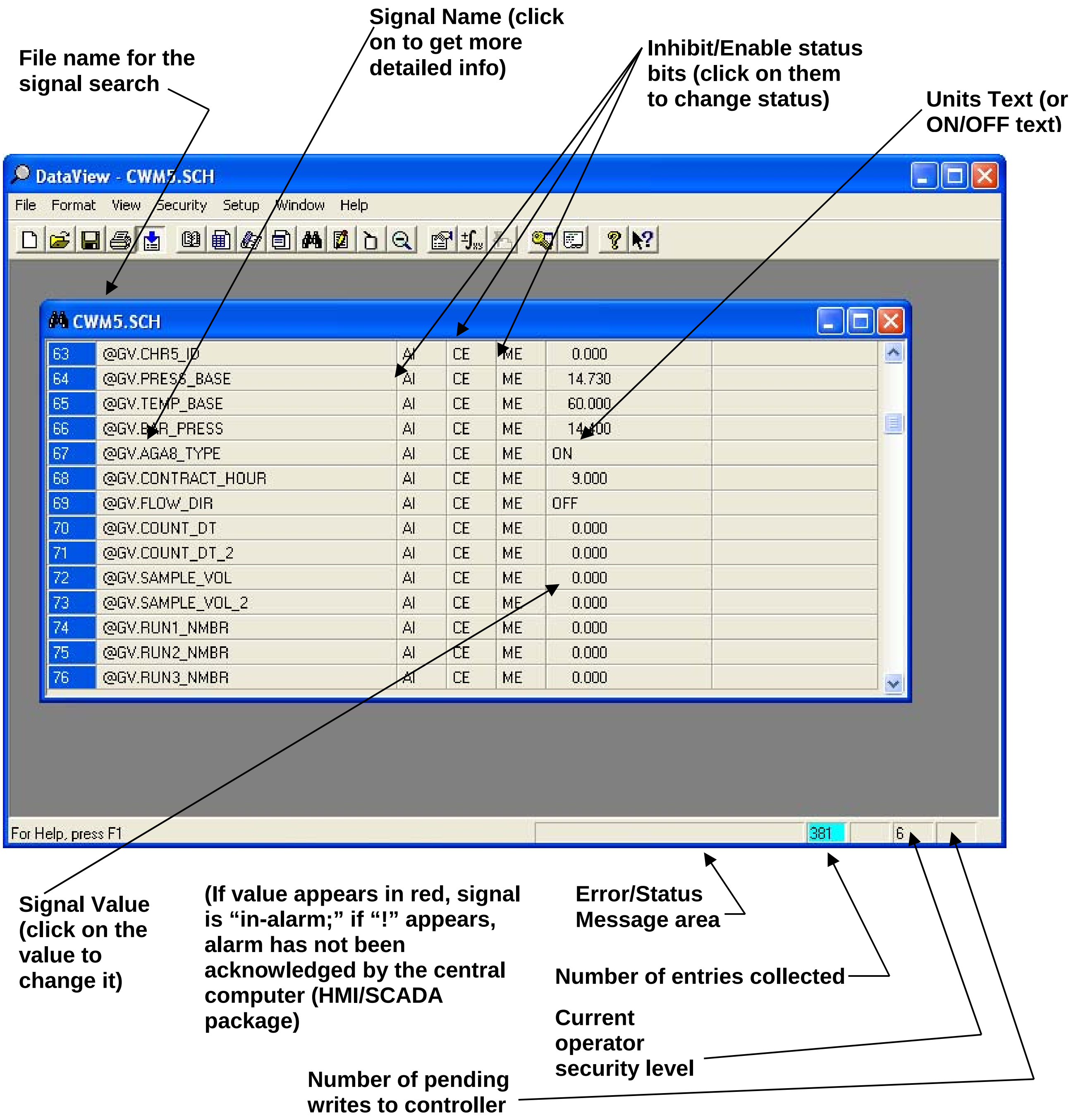
DataView lists the names of the last four files viewed (of all file types) in the File pull down menu. If the search criteria (.SCH) file you want to view appears in the menu, you can open the file by simply clicking on the file name. To call up any other search criteria (SCH) file, click the icon, shown at left, or click **File>Open**. Select the desired SCH file from the windows Open File dialog box, and click the **Open** button.

Altering Search Criteria

Once the Signal Window opens, you can change the search criteria by clicking on the Properties tool bar icon, shown at left, or by clicking on **Format>Properties**. The Signal Search dialog box re-opens to allow you to define new search criteria.

8.7 Viewing Entries in a Signal Window

DataView displays Remote Signal Lists, DataView Lists, and Signal Searches in a signal window. You can view detailed signal information, change signal values, or alter the inhibit/enable bits by clicking on those fields for a particular entry in the signal window. Use the scroll bar to view any entries not currently visible on the screen. The figure below summarizes the elements in a signal window.



Signal Name (click on to get more detailed info)

File name for the signal search

Inhibit/Enable status bits (click on them to change status)

Units Text (or ON/OFF text)

63	@GV.CHR5_ID	AI	CE	ME	0.000	
64	@GV.PRESS_BASE	AI	CE	ME	14.730	
65	@GV.TEMP_BASE	AI	CE	ME	60.000	
66	@GV.BAR_PRESS	AI	CE	ME	14.400	
67	@GV.AGA8_TYPE	AI	CE	ME	ON	
68	@GV.CONTRACT_HOUR	AI	CE	ME	9.000	
69	@GV.FLOW_DIR	AI	CE	ME	OFF	
70	@GV.COUNT_DT	AI	CE	ME	0.000	
71	@GV.COUNT_DT_2	AI	CE	ME	0.000	
72	@GV.SAMPLE_VOL	AI	CE	ME	0.000	
73	@GV.SAMPLE_VOL_2	AI	CE	ME	0.000	
74	@GV.RUN1_NMBR	AI	CE	ME	0.000	
75	@GV.RUN2_NMBR	AI	CE	ME	0.000	
76	@GV.RUN3_NMBR	AI	CE	ME	0.000	

For Help, press F1 | 381 | 6

Signal Value (click on the value to change it)

(If value appears in red, signal is “in-alarm;” if “!” appears, alarm has not been acknowledged by the central computer (HMI/SCADA package)

Error/Status Message area

Number of entries collected

Current operator security level

Number of pending writes to controller

Figure 8- 9. Signal Window

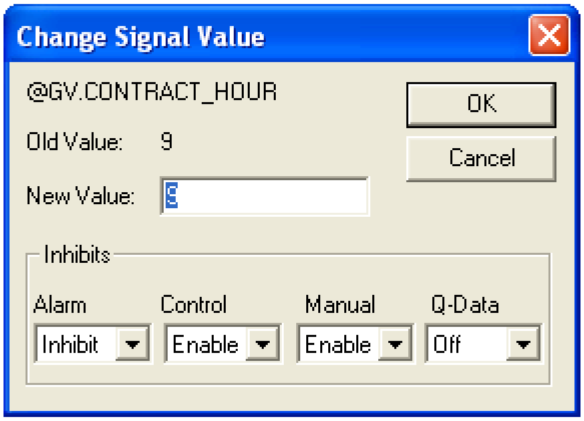
Notes:

- For information on viewing detailed signal information, see *Viewing Data for a Single Signal*, later in this section.
- For Remote Signal Lists, and Signal Searches, the number of entries which have been collected are displayed at the bottom of the window in the status bar. If this value appears with a cyan (light blue) background, then there are additional entries in the controller which have not yet been collected

Changing Signal Values in the Signal Window

Click on the signal value you want to change. The Change Signal Value dialog box opens to allow you to change the signal value, as well as the manual, control, and alarm inhibit/enable bits, and the questionable data bit.

Note To change a signal value, you must manually enable the signal (if it isn't already).



@GV.CONTRACT_HOUR

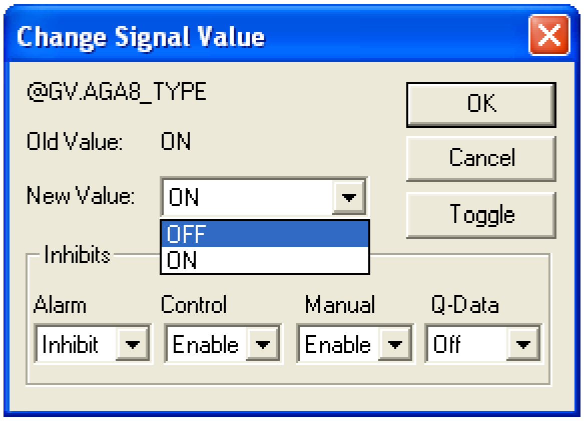
Old Value: 9

New Value: 9

Alarm	Control	Manual	Q-Data
Inhibit	Enable	Enable	Off

Figure 8-10. Change Signal Value – Analog

If the signal you want to change is a logical signal, you can either use the list box to select the new state, or you can simply click on the **Toggle** push button.



@GV.AGA8_TYPE

Old Value: ON

New Value: ON

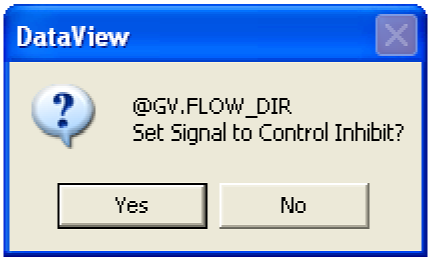
Alarm	Control	Manual	Q-Data
Inhibit	Enable	Enable	Off

Figure 8-11. Change Signal Value – Logical

Note: The questionable data bit for logical signals can only be changed through this dialog box; there is no automatic questionable checking from the discrete I/O boards.

Changing Signal Inhibit/Enable Bits in the Signal Window

Click the inhibit/enable bit you would like to change. DataView prompts you to confirm that you want to change the inhibit/enable status. You can also change the inhibit/enable status using the Change Signal Value dialog box, above.

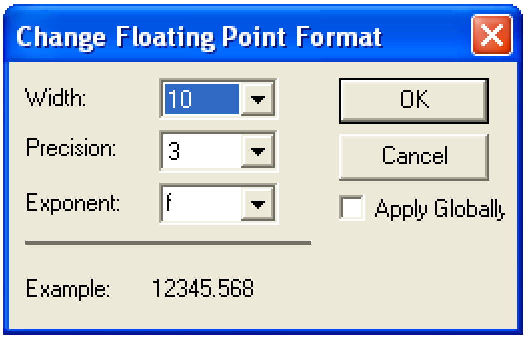

DataView

@GV.FLOW_DIR
Set Signal to Control Inhibit?

Figure 8-12. Change Inhibit/Enable Status

Changing the Floating Point Format of Data in the Signal Window

The Signal Window (and certain other types of windows) displays analog values according to a default floating point format. To alter this default format, click on the Change Floating Point Format tool bar icon (shown at left) *or* click **Format Floating Point**. The Change Floating Point Format dialog box opens. Use the **Width** list box to specify the total number of characters in the field (including the decimal point) used to display a floating point number.


Change Floating Point Format

Width: 10

Precision: 3

Exponent: f

□ Apply Globally

Example: 12345.568

Figure 8-13. Change Floating Point Format dialog box

Use the **Precision** list box to choose the number of places to the right of the decimal point which the window should display.

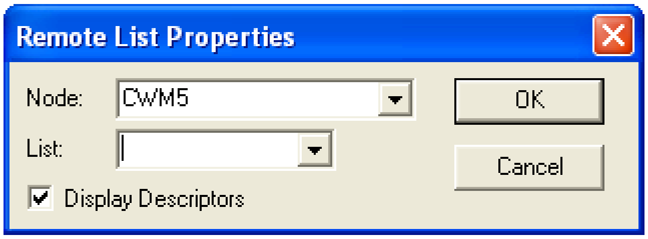
Use the **Exponent** list box to choose floating point format **f**, exponential notation **e** or choose **g** to have DataView choose the "best fit" format.

If you want the floating point format defined here to apply throughout the DataView windows, check the **Apply Globally** check box.

8.8 Displaying a Remote Signal List

The Signal Window (and certain other types of windows) displays analog values according to a default floating point format. To alter this default format, click on the Change Floating Point Format tool bar icon (shown at left) *or* click **Format Floating Point**. The Change Floating Point Format dialog box opens. Use the **Width** list box to specify the total number of characters in the field (including the decimal point) used to display a floating point number.

To view a signal list in the remote process controller, click the Remote List tool bar icon, shown at left *or* click **File**>**New**. Choose **Remote List** from the New list box.



Remote List Properties

Node: CWM5

List:

☑ Display Descriptors

Figure 8-14. Remote List Properties dialog box

You can use the **List** list box to see which signal lists exist in the controller, and then select a list from it**,** or you can just type the list number in the box; then click **OK**. A signal window opens containing the signal list entries.

Beginning with OpenBSI Version 5.8, if you check **Display Descriptors,** signal descriptive text, if it exists, appears in the signal window instead of the signal name.

Notes:

- DataView cannot display more than 10,000 signals from a particular signal list. (5,000 for versions *prior* to OpenBSI 5.8 Service Pack 1.)
- Beginning with OpenBSI 5.9 Service Pack 3, DataView can display lists numbered higher than 255.
- Network 3000 Users: DataView uses the ACO/ACL files on the PC hard disk to create the list of available remote signal lists. Because not all versions of the EGM 3530 TeleFlow include an ACCOL load, some TeleFlow users must type the remote list number directly; there is no list to choose from. This situation also occurs if the ACO/ACL file base name has not been specified as the Node Load File Name in the currently released NETDEF files.

Selecting a Different Remote Signal List

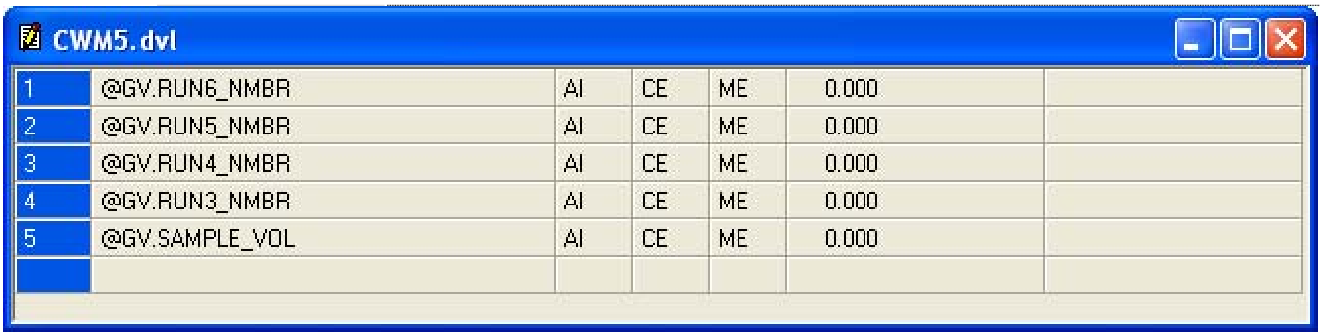
Once the Signal Window opens, you can recall the Remote List Properties dialog box to call up a different list by clicking the Properties icon, shown at left, or by clicking **Format>Properties**.

Changing Remote List Signal Values, Altering Inhibit/Enable Bits

See *Section 8.7* for information on using the entries in this window to change signal values, or to alter inhibit/enable bits. See *Viewing Data for a Single Signal* (later in this manual) for information on viewing more detailed signal information.

8.9 Creating and Using DataView Lists

A DataView List is a file, stored on the PC, that contains the names of signals, from a single controller, from which you would like to collect data. You can open the DataView list file in DataView to collect and display data for the designated signals.



1	@GV.RUN6_NMBR	AI	CE	ME	0.000	
2	@GV.RUN5_NMBR	AI	CE	ME	0.000	
3	@GV.RUN4_NMBR	AI	CE	ME	0.000	
4	@GV.RUN3_NMBR	AI	CE	ME	0.000	
5	@GV.SAMPLE_VOL	AI	CE	ME	0.000	

Figure 8-15. DataView List

Creating a DataView List

Click the DView List icon, shown above, or click **File**>**New** and then click **DView List** in the New list box; in either case, an empty DataView List signal window opens.

From the menu bar, click **Edit**>**Insert**, and the Signal Properties dialog box opens.

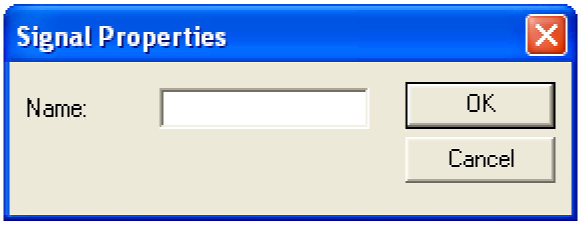


Figure 8-16. Remote List Properties dialog box

Enter a signal name in the **Name** field, and click **OK**; the dialog box inserts the signal on the currently highlighted line, and pushes down any entries that begin on that line. Repeat this step for each additional signal you want to include in the DataView List. **Note**: Be sure you include the proper punctuation for the signal/variable.

If you make a mistake on a particular line, click on the line you want to change, then click **Edit**>**Modify**; the Signal Properties dialog box re-opens, allowing you to edit the signal name.

If you want to delete a particular line, click the line you want to delete, and then click **Edit**>**Delete**. The system prompts you to confirm that you want to delete the line from the DataView List; click **Yes** and the system removes that signal from the DataView List.

Collecting Live Data into the DataView List

The system suspends collection of DataView List data while you create or modify the DataView List, or if certain error conditions exist. When you finish creating/editing the list, you can activate collection if you click **View**>**Refresh.**

Saving the DataView List

If this is a *new* DataView List, you must save it by clicking on the icon, shown at left, or by clicking **File>Save As**. Assign a name to the DataView List file using the Windows Save As dialog box. All DataView Lists have a file extension of (.DVL).

To save modifications to a *previously saved* DataView List, click on Save toolbar icon, shown above, or click **File>Save**.

Viewing a Previously Saved DataView List

The File pull down menu shows the names of the last four files viewed (of all file types). If the DataView List (.DVL) file you want to view appears in the menu, you can open the file simply by clicking on the file name. To view any other DataView List (.DVL file), click the Open File tool bar icon, shown above, or click **File>Open**. The Windows Open File dialog box opens. Select the DataView List file, and click the **Open** button. The selected DataView List displays on the screen. Assuming OpenBSI is already running, you can also open a DataView list by double-clicking on the DVL filename in Windows.

Note: DataView cannot display more than 100 signals from a DataView list.

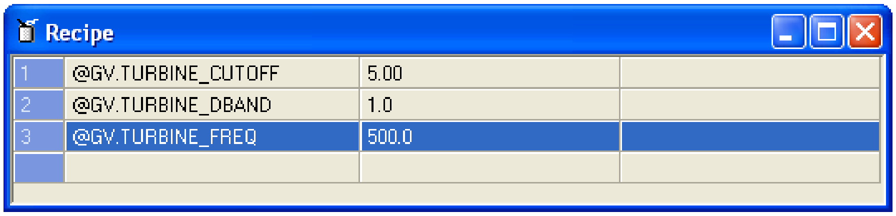
See *Section 8.7* for information on using the entries in this window to change signal values, or to alter inhibit/enable bits. See *Viewing Data for a Single Signal* (later in this manual) for information on viewing more detailed signal information.

8.10 Creating and Using Recipes

A recipe is a list of signals, together with signal values, which DataView stores in a file, on the PC. You call up the recipe file, within DataView, and you can send the signal values to the remote process controller, to update the current values of those signals in the controller. This provides a quick way to change the values of several signals in a running load at the same time.

Creating a Recipe

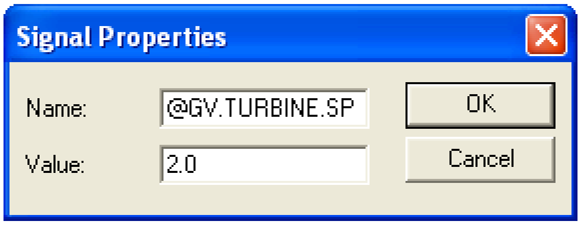
Click the Recipe icon, shown above, or click **File>New**, and select **Recipe** from the New list box. An empty recipe window opens.



1	@GV.TURBINE_CUTOFF	5.00	
2	@GV.TURBINE_DBAND	1.0	
3	@GV.TURBINE_FREQ	500.0	

Figure 8-17. Recipe Window

Click **Edit>Insert** and the Signal Properties dialog box opens. Enter a signal name in the **Name** field, and a value for the signal in the **Value** field, then click **OK**. DataView inserts the signal on the currently highlighted line, and pushes down any entries that begin on that line. Repeat this step for each additional signal you want to include in the Recipe.



Name: @GV.TURBINE.SP

Value: 2.0

Figure 8-18. Adding Signals to the Recipe

Although DataView performs no verification with the remote load when you create the recipe, you should remember that *if you enter a logical signal in the recipe, only two values are valid:1.0 for ON, 0.0 for OFF.*

If you make a mistake on a particular line, click on the line you want to change, then click **Edit>Modify**; the Signal Properties dialog box opens, allowing you to edit the signal name and/or value.

If you want to delete a particular line, click on the line you want to delete, then click **Edit>Delete**. DataView prompts you to confirm that you want to delete the line from the Recipe; click **Yes** and DataView removes that signal from the Recipe.

Notes:

- OpenBSI 5.8 Service Pack 1 supports recipes up to 10,000 lines.
- OpenBSI 5.6 through 5.8 supported recipes up to 5000 lines.
- OpenBSI 5.4 through 5.5 supported recipes up to 1000 lines; earlier versions supported 500 lines.

Saving the Recipe

When the Recipe is complete, you must save it by clicking on the icon, shown at left, or click **File>Save As**. Assign a name to the Recipe file using the Windows Save As dialog box. All Recipes have a file extension of (.RCP). To save modifications to a previously saved Recipe, click the Save toolbar icon, shown above, or click **File>Save**.

To View/Modify an Existing Recipe File

The File pull down menu displays the names of the last four files viewed (of all file types). If the Recipe (.RCP) file you want to view appears in the menu, you can open the file by simply clicking on the file name. To view any other Recipe (.RCP) file, click the Open File tool bar icon, shown above, *or* click **File>Open**. Select the recipe file from the Open File dialog box, and the recipe displays on the screen in a recipe window. Assuming OpenBSI is already running, you can also open a Recipe if you double-click on the RCP filename in Windows.

You can make modifications to signal names in the recipe by clicking on the line you want to change, and choose **Edit>Modify**. You can then change the signal name and/or value using the Signal Properties dialog box. You can also change recipe values by overwriting the values with the current values in the controller (see *To Read the Current Signal Values from the Controller into the Recipe Window*).

To Update Signals in the Controller with the Recipe Values

Bring up the recipe to view (described above under *To View/Modify an Existing Recipe File*) and click **Recipe**>**Write to RTU**. The Select New Node dialog box opens. Select the node which you want to receive the new values and sign-on to that node; DataView writes the values to the corresponding signals in the node. Note: In order to update the signals, you must manually enable them.

To Read the Current Signal Values From the Controller Into the Recipe Window

Bring up the recipe to view (described above under *To View/Modify an Existing Recipe File*). Next, click on **Recipe>Read from RTU**. The Select New Node dialog box opens. Select the node which will provide the new values and sign-on to that node. DataView copies the values in the node, for the signals in the recipe, into the window.

To Cancel *Unsaved* Modifications to the Recipe Values

If you made changes to recipe values in the recipe window, *but have not saved them,* and you want to cancel the changes, and return to the *previously saved* recipe values, click **Recipe>Reload**. DataView restores the previously saved recipe values into the recipe window.

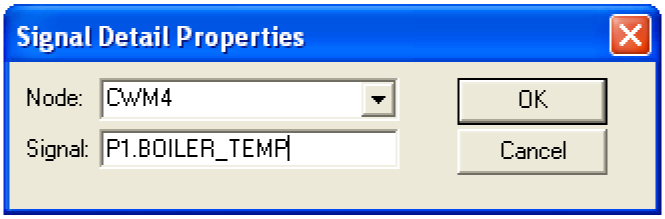
Changing the Floating Point Format of Data in the Recipe Window

You can change the floating point format in which DataView presents signal values. See the sub-section on floating point formats in the *Viewing Entries in the Signal Window* section.

8.11 Viewing Data for a Single Signal

You can view detailed signal information by clicking on a signal *name* in any Signal Window you open using DataView's Signal Search, DataView List, or Remote List features. Alternatively you may also view detailed information on a single signal by clicking on the Signal Detail toolbar icon (shown above) *or* you can click **File**>**New**, and then select **Signal Detail** from the list box. The Signal Detail Properties dialog box opens.

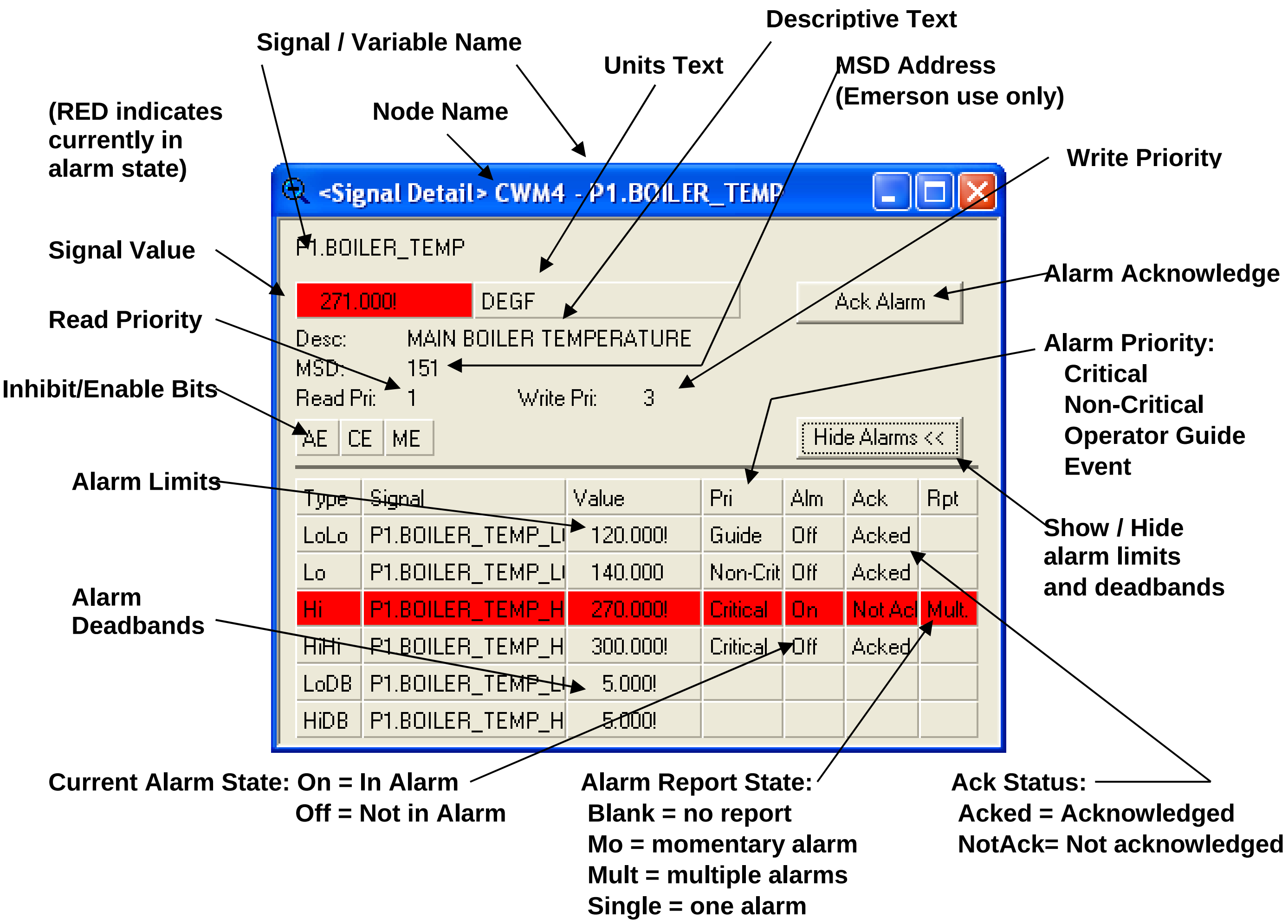
Choose the RTU name from the **Node** list box, then enter the complete signal name i.e. *base.extension.attribute* and click **OK**.



Node: CWM4

Signal: P1.BOILER_TEMP

Figure 8-19. Signal Detail Properties dialog box



P1.BOILER_TEMP

271.000! DEGF

Desc: MAIN BOILER TEMPERATURE

MSD: 151

Read Pri: 1 Write Pri: 3

Type	Signal	Value	Pri	Alm	Ack	Rpt
LoLo	P1.BOILER_TEMP_LI	120.000!	Guide	Off	Acked	
Lo	P1.BOILER_TEMP_LI	140.000	Non-Crit	Off	Acked	
Hi	P1.BOILER_TEMP_H	270.000!	Critical	On	Not Acl	Mult.
HiHi	P1.BOILER_TEMP_H	300.000!	Critical	Off	Acked	
LoDB	P1.BOILER_TEMP_LI	5.000!				
HiDB	P1.BOILER_TEMP_H	5.000!				

Figure 8-20. Signal Detail Window

A Signal Detail window contains the signal name, base name descriptive text, inhibit/enable bit values, signal value, units text or ON/OFF text, read priority, write priority, and other data. The figure above shows the window for an analog alarm signal. If you want, you can change the signal's value, or alter the inhibit/enable bits by clicking on those fields, and entering the new data via a dialog box.

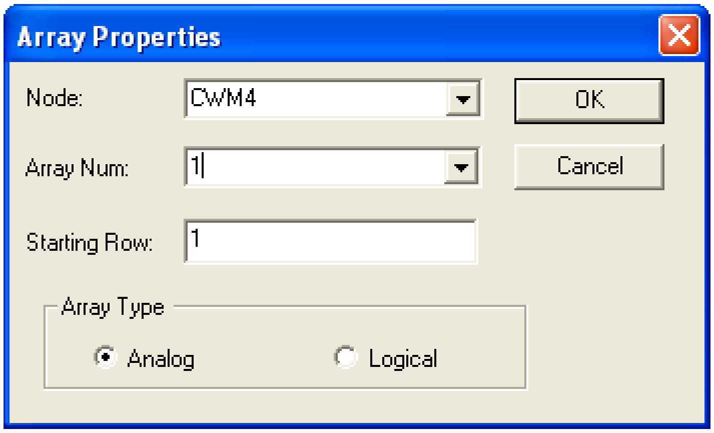
Acknowledging an Alarm

If the signal you view is an alarm signal in an alarm state, and this alarm has not been acknowledged (as indicated by an exclamation point "!" next to the signal's value) you can acknowledge the alarm if you click on the **Ack Alarm** button. A message box opens indicating the status of the acknowledgment operation.

8.12 Viewing Data Arrays

To view a Data Array in the controller, click on the Array tool bar icon (shown above) *or* click **File>New**, then select **Array**.

The Array Properties dialog box opens. Choose the node which contains the array using the **Node** list box. Specify the **Array Type** as either analog or logical.



Array Properties

Node: CWM4

Array Num: 1

Starting Row: 1

Array Type

● Analog ○ Logical

Figure 8-21. Array Properties dialog box

Use the **Array Num** list box to determine which arrays exist in the controller. Select the array from the list box, or enter the array number in the box. If the array is large, and you want to begin viewing from some row other than 1, enter that row in the **Starting Row** field.

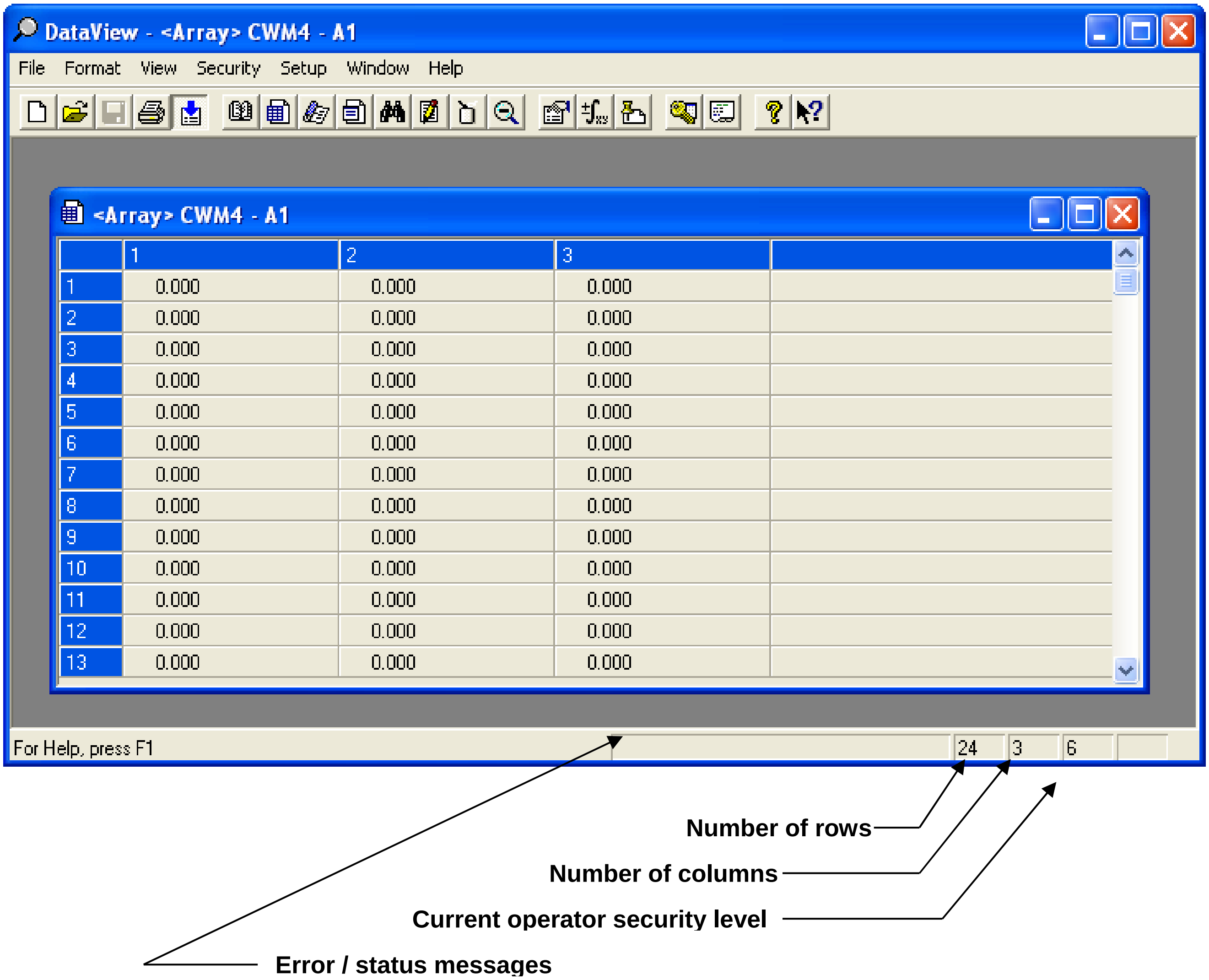
Click **OK**; and DataView displays the array.

Notes:

- Some versions of the 3530 TeleFlow do not support data arrays, and use archive files exclusively.
- If you cannot see a list of arrays using the **Array Num** list box, it means DataView does not have access to your control strategy file.

If this is a large array, a scroll bar appears to let you view portions which do not currently fit in the window.

The lower right corner of the window displays the total number of array rows, total number of array columns, and the current operator security level.


DataView - <Array> CWM4 - A1
File Format View Security Setup Window Help
<Array> CWM4 - A1

	1	2	3
1	0.000	0.000	0.000
2	0.000	0.000	0.000
3	0.000	0.000	0.000
4	0.000	0.000	0.000
5	0.000	0.000	0.000
6	0.000	0.000	0.000
7	0.000	0.000	0.000
8	0.000	0.000	0.000
9	0.000	0.000	0.000
10	0.000	0.000	0.000
11	0.000	0.000	0.000
12	0.000	0.000	0.000
13	0.000	0.000	0.000

For Help, press F1 | 24 | 3 | 6

Number of rows

Number of columns

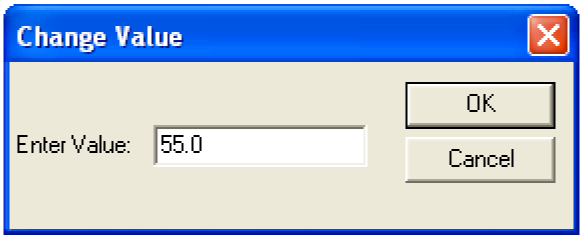
Current operator security level

Error / status messages

Figure 8-22. Array Window

Changing Values in the Data Array

If this is a read-write array, you can alter data array values if you click on the array cell you want to change, and enter a new value using the Change Value dialog box.



Enter Value: 55.0

Figure 8-23. Change Value dialog box

Toggling the Time/Value Format

Depending upon how you configure the data array, it may include Julian date/time stamps in the first column. To convert these time/date stamps to the numerical total used by the system to store the date and time, and vice versa, click **Format> View First Column as Date/Time**.

Keeping Column 1 Visible While Scrolling Through the Array

As you scroll through columns of the data array, the first column (which may contain date/time stamps) may disappear from the window as higher numbered columns come into the window. To prevent this, click the icon, shown above, or click **Format>Freeze First Column**.

Calling Up a Different Data Array

Once a data array opens in the window, you can replace it with a *different* data array by clicking on the Properties tool bar icon, or by clicking **Format>Properties**. Either of these actions will re-open the Array Properties dialog box, from which you can select a different array.

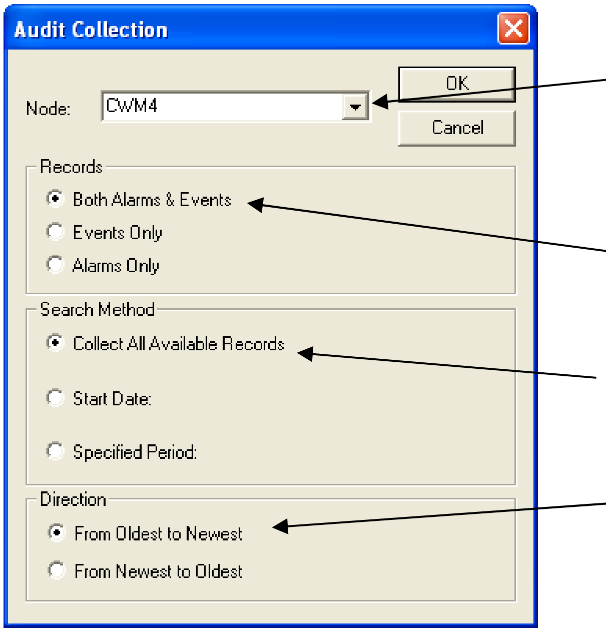
Changing the Floating Point Format

Like analog data presented in a signal window, you can alter the floating point format for data in array windows. (See *Changing the Floating Point Format of Data in the Signal Window* in the *Viewing Entries in a Signal Window* section.)

8.13 Viewing Audit Trail Records

To view Audit Trail buffer entries from the EAudit Module or Audit function block, click the Audit tool bar icon, shown at left, *or* click File>New, then select Audit from the New list box.

The Audit Collection dialog box opens.



Audit Collection

Node: CWM4

Records
- ● Both Alarms & Events
- ○ Events Only
- ○ Alarms Only

Search Method
- ● Collect All Available Records
- ○ Start Date:
- ○ Specified Period:

Direction
- ● From Oldest to Newest
- ○ From Newest to Oldest

Choose the controller containing the audit records you want to view.

Choose the type of audit information you want to collect.

Choose how much audit information you want to collect.

Choose the order in which audit records are displayed.

Figure 8-24. Audit Collection dialog box

First, choose the controller (RTU) from which you want to collect audit records using the Node list box.

Then choose whether you want to retrieve alarms, events, or both.

If you choose Collect All Available Records, DataView collects all audit records in the RTU.

Use the Start Date to specify the first date from which data will be displayed. Depending on the Direction you choose, all following lines of data will either be from *before* that date, or *since* that date.

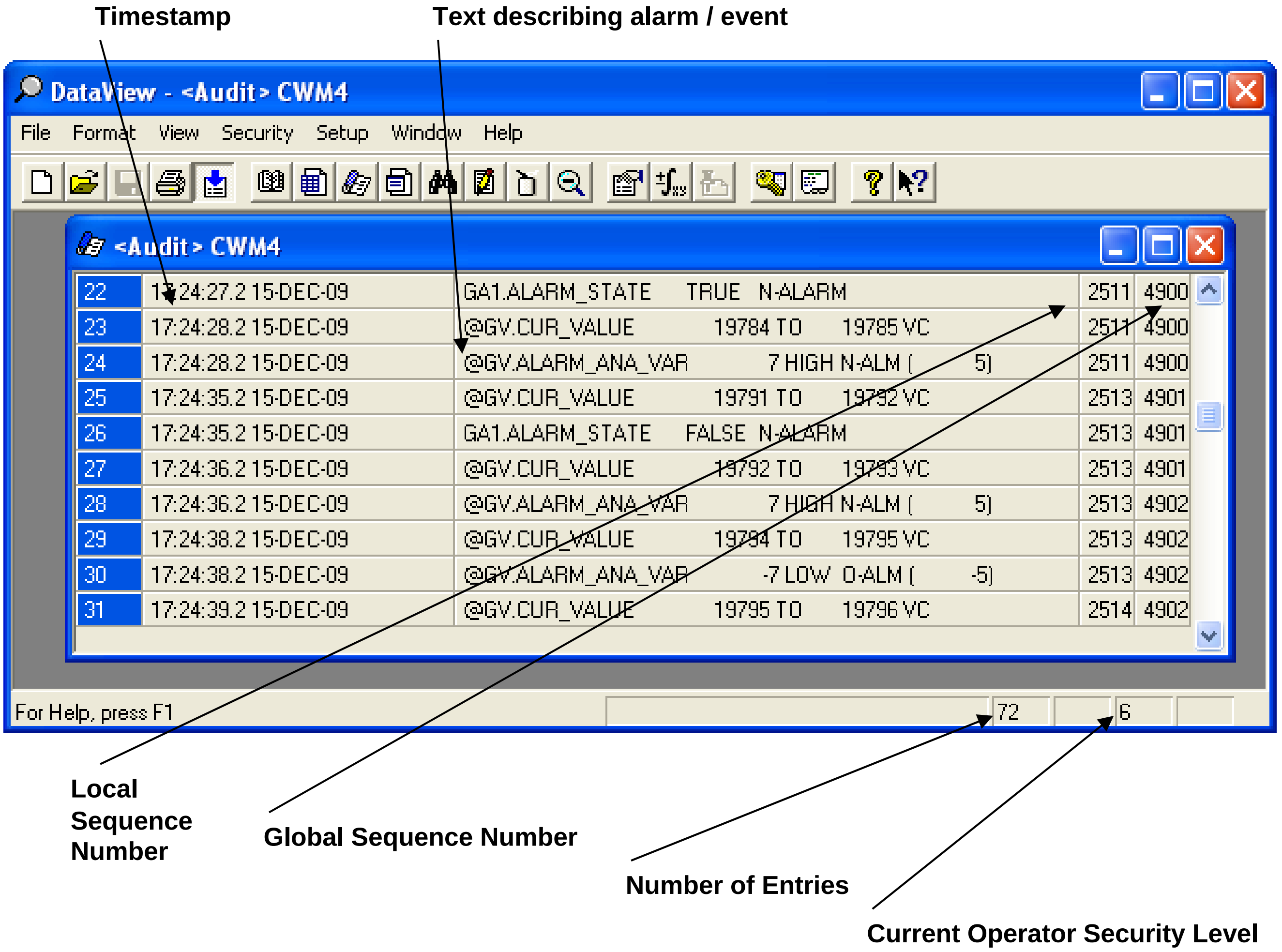
If you choose Specified Period you can request audit records only from a set period of time. Choices are records from Today, This Week or This Month.

The Direction specifies the order in which the window displays the audit records. From Oldest to Newest displays the earliest records first. From Newest to Oldest displays the most recent audit records first.

Click **OK** to begin the collection. DataView displays the Audit Trail buffer entries in a window on the screen. Use the scroll bar to view any portions not currently visible.

Notes:

- The total number of entries which have been collected appears in the status bar at the bottom of the window. If this number appears with a cyan (light blue) background, then additional entries have not yet been collected from the controller.
- DataView cannot show more than 1,000 Audit Trail buffer entries.
- Any audit entries *already* collected using the OpenBSI Harvester, or the Historical Log Storage control, are inaccessible to DataView.



22	17:24:27.2 15-DEC-09	GA1.ALARM_STATE TRUE N-ALARM	2511	4900
23	17:24:28.2 15-DEC-09	@GV.CUR_VALUE 19784 TO 19785 VC	2511	4900
24	17:24:28.2 15-DEC-09	@GV.ALARM_ANA_VAR 7 HIGH N-ALM (5)	2511	4900
25	17:24:35.2 15-DEC-09	@GV.CUR_VALUE 19791 TO 19792 VC	2513	4901
26	17:24:35.2 15-DEC-09	GA1.ALARM_STATE FALSE N-ALARM	2513	4901
27	17:24:36.2 15-DEC-09	@GV.CUR_VALUE 19792 TO 19793 VC	2513	4901
28	17:24:36.2 15-DEC-09	@GV.ALARM_ANA_VAR 7 HIGH N-ALM (5)	2513	4902
29	17:24:38.2 15-DEC-09	@GV.CUR_VALUE 19794 TO 19795 VC	2513	4902
30	17:24:38.2 15-DEC-09	@GV.ALARM_ANA_VAR -7 LOW 0-ALM (-5)	2513	4902
31	17:24:39.2 15-DEC-09	@GV.CUR_VALUE 19795 TO 19796 VC	2514	4902

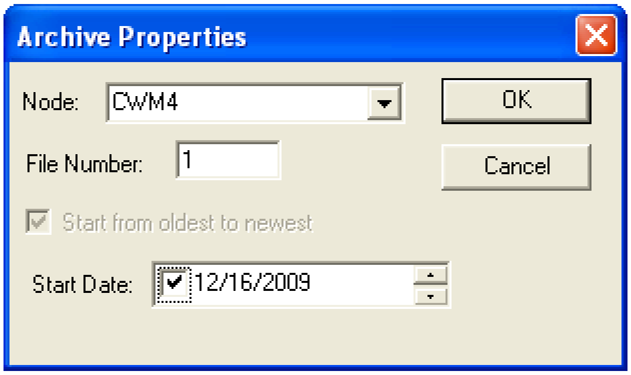
For Help, press F1 | 72 | 6

Figure 8-25. Viewing Audit Records

To re-open the Select New Node dialog box to choose a different node, click the Properties tool bar icon, shown above, *or* click **Format>Properties**.

8.14 Viewing Archive Data Files

If your controller has archive data, you can view it, in DataView, if you click on the Archive tool bar icon, shown at left. Alternatively, you can click **File>New**, and then select **Archive** from the list box. Either of these methods opens up the Archive Properties dialog box.



Archive Properties

Node: CWM4

File Number: 1

☑ Start from oldest to newest

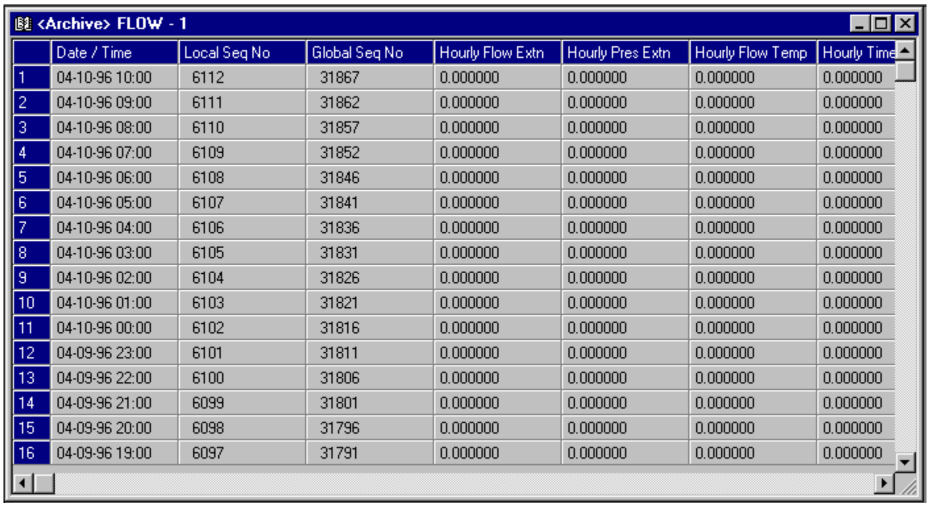
Start Date: ☑ 12/16/2009

Figure 8-26. Archive Properties dialog box

Select the RTU name from the **Node** list box, and enter the number of the archive file you would like to view in the **File Number** field. If you would like the oldest archive file entries to appear first, check the **Start from oldest record** box.

After you choose the **Node** and **File Number**, click **OK** to display the selected archive file.

The archive file opens in a window. Use the scroll bar to view portions of the file not currently visible.



<Archive> FLOW - 1

	Date / Time	Local Seq No	Global Seq No	Hourly Flow Extn	Hourly Pres Extn	Hourly Flow Temp	Hourly Time
1	04-10-96 10:00	6112	31867	0.000000	0.000000	0.000000	0.000000
2	04-10-96 09:00	6111	31862	0.000000	0.000000	0.000000	0.000000
3	04-10-96 08:00	6110	31857	0.000000	0.000000	0.000000	0.000000
4	04-10-96 07:00	6109	31852	0.000000	0.000000	0.000000	0.000000
5	04-10-96 06:00	6108	31846	0.000000	0.000000	0.000000	0.000000
6	04-10-96 05:00	6107	31841	0.000000	0.000000	0.000000	0.000000
7	04-10-96 04:00	6106	31836	0.000000	0.000000	0.000000	0.000000
8	04-10-96 03:00	6105	31831	0.000000	0.000000	0.000000	0.000000
9	04-10-96 02:00	6104	31826	0.000000	0.000000	0.000000	0.000000
10	04-10-96 01:00	6103	31821	0.000000	0.000000	0.000000	0.000000
11	04-10-96 00:00	6102	31816	0.000000	0.000000	0.000000	0.000000
12	04-09-96 23:00	6101	31811	0.000000	0.000000	0.000000	0.000000
13	04-09-96 22:00	6100	31806	0.000000	0.000000	0.000000	0.000000
14	04-09-96 21:00	6099	31801	0.000000	0.000000	0.000000	0.000000
15	04-09-96 20:00	6098	31796	0.000000	0.000000	0.000000	0.000000
16	04-09-96 19:00	6097	31791	0.000000	0.000000	0.000000	0.000000

Figure 8-27. Archive File

Notes:

- DataView cannot display more than 1000 archive records from a particular archive file.
- The total number of entries which have been collected appears in the status bar at the bottom of the window. If this number appears with a cyan (light blue) background, then additional entries have not yet been collected from the controller.
- Beginning with OpenBSI 5.8, DataView can display string-based archives.

Keeping Column 1 Visible While Scrolling Through the Archive File

As you scroll through the archive file window, the first column (which may contain date/time stamps) may disappear from the window as you bring higher numbered columns into the window. To prevent this, click the icon, shown at left, or click **Format>Freeze First Column**.

Calling Up a Different Archive File

Once you open an archive file in the window, you can replace it with a *different* archive file if you click the Properties tool bar icon, or click **Format>Properties**. Either of these actions re-opens the Archive Properties dialog box, from which you can select a different archive file.

Changing the Floating Point Format

Like analog data presented in a signal window, you can alter the floating point format for data in the archive window. (See *Changing the Floating Point Format of Data in the Signal Window* in the *Viewing Entries in a Signal Window* section.)

Restrictions on Archive File Size

When you use DataView to collect Archive files in a BSAP network, you can only display archive records that are 220 bytes or less. The system uses a total of four bytes of the 220 to display the timestamp, plus two bytes to store the local sequence number, and two bytes to store the global sequence number. This leaves 212 bytes for other columns of data. This could include up to 53 columns of floating point data.

Table 8-3. Archive File Sizing

Type of Data	Number of Bytes Required
Timestamp	4
Local Sequence Number	2
Global Sequence Number	2
Analog Floating Point value	4
Logical / BOOL value	1

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Chapter 9 – Using the Communication Statistics Tool

The Remote Communication Statistics Tool collects information on the current state of communications with one or more controllers (RTU).

In This Chapter

Some of the information can help you optimize communication performance of the running control strategy file. Other information is primarily of use to Emerson Application Support and Field Service personnel, when they attempt to diagnose problems. You can view the following information:

- Statistics on the usage of communication buffers (Network 3000 only)
- Statistics on the usage of communication ports
- Details on the structure of the Node Routing Table (NRT)
- Details on the contents of the Custom PROM area
- Details on the contents of the Crash Block area

- Details on the version of ACCOL Tools used to create this load (if applicable)

9.1 Starting the Remote Communication Statistics Tool

Before you use the Remote Communication Statistics Tool, OpenBSI communications must be active through NetView, LocalView, or TechView. There are two methods for starting the tool.

Method 1:

Click **Start** > **Programs** > **OpenBSI Tools** > **Common Programs** > **Communications Stats**.

Method 2:

In the network tree in NetView, right click on the icon for the RTU you want to access. Then choose **RTU> Communication Statistics**.

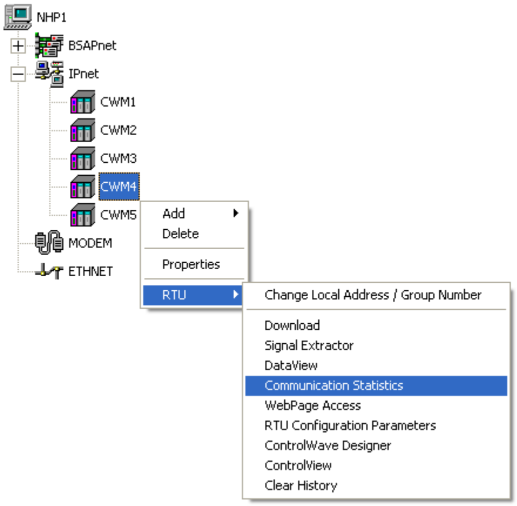
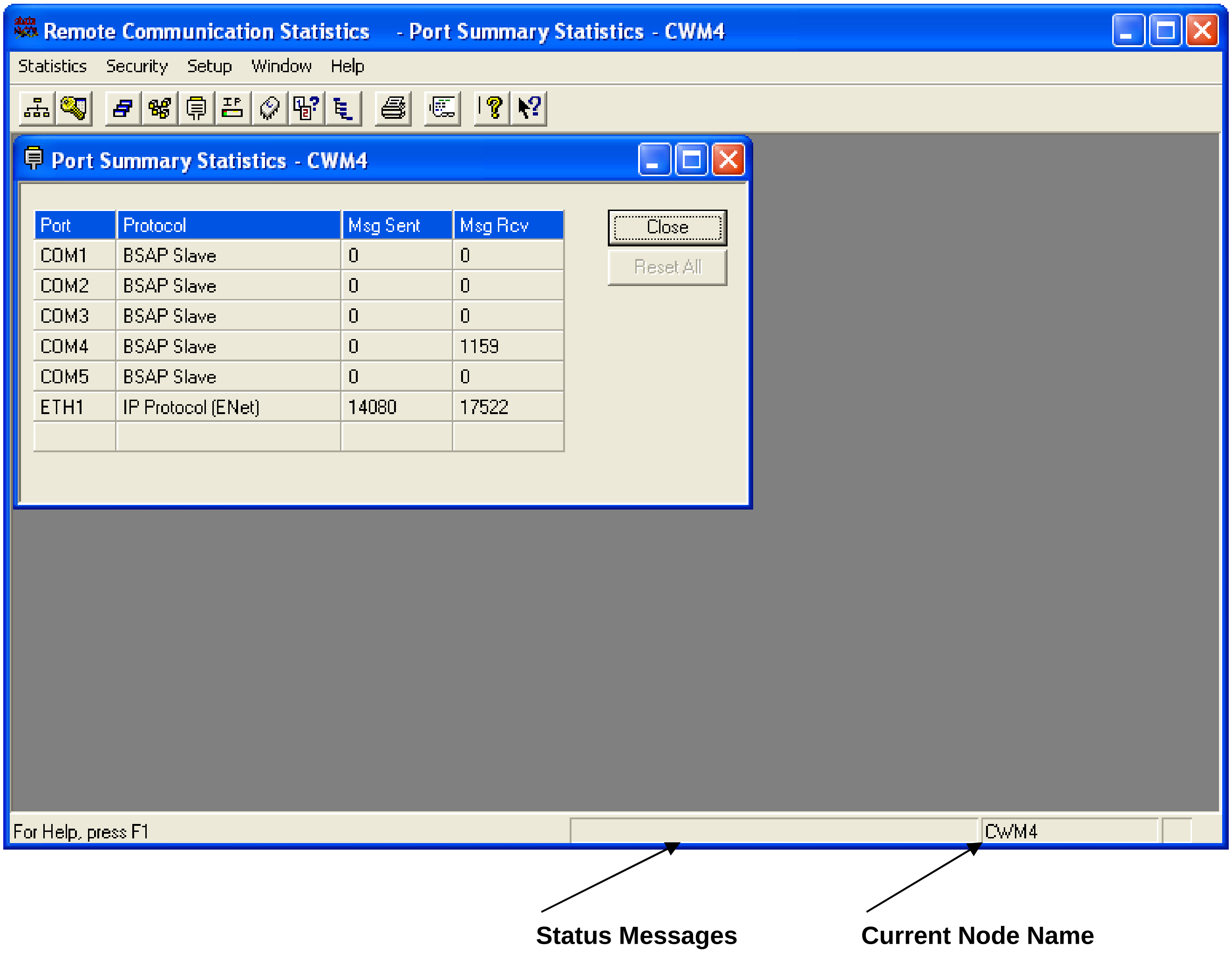


Figure 9-1. Calling up the Comm Stats Tool

In either method, the Remote Communication Statistics window opens.



Port	Protocol	Msg Sent	Msg Rcv
COM1	BSAP Slave	0	0
COM2	BSAP Slave	0	0
COM3	BSAP Slave	0	0
COM4	BSAP Slave	0	1159
COM5	BSAP Slave	0	0
ETH1	IP Protocol (ENet)	14080	17522

Figure 9-2. Remote Communication Statistics Tool

For either method, after you sign on to a particular node, choose from the icons in the tool bar, or click **Statistics** in the menu bar, to select the category of information you want to view.

For information on changing the refresh rate of statistics in the Remote Communication Statistics Tool, see *Chapter 6*.

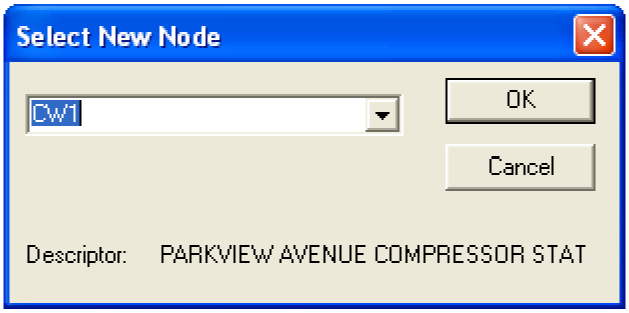
9.2 Using the Select New Node Dialog Box, Signing On to a Node

If you did not configure Automatic Sign-On, or if you have not previously signed on to a particular node, you must sign on. To sign on, click the Sign On To Remote RTU tool bar icon, shown above, or click **Security** > **Sign On** from the menu bar. In instances where you previously signed on to a node, the tool uses the last node you signed into as a default choice, and the Sign On dialog box opens; otherwise the Select New Node dialog box opens.

Note: The Select New Node dialog box, and the Sign On dialog box appear throughout the OpenBSI Utilities, whenever the user attempts to access a different node.

Using the Select New Node Dialog Box

If the Select New Node dialog is not visible, you can call it up by clicking on the icon, at left. Choose the name of the desired node from the list box, and click **OK**. (**Note**: In order for you to select a node, it must exist in the currently released NETDEF files.) The Sign On dialog box now opens, with the node name in the title bar.



CW1

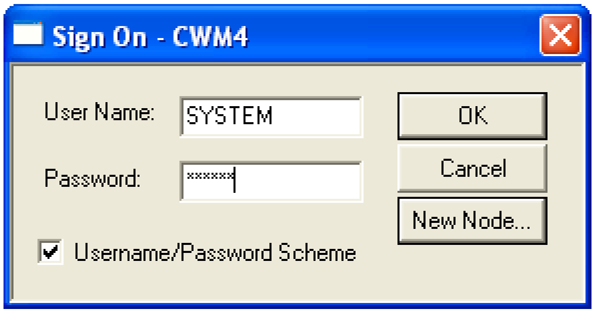
Descriptor: PARKVIEW AVENUE COMPRESSOR STAT

Figure 9-3. Select New Node dialog box

Using the Sign On Dialog Box

To call up the Sign On dialog box, click the icon shown at left.

When the Sign On dialog box opens, type either the password for the node, or the user name and password combination for the node, depending upon which security scheme you chose in NetView's System Wizard. When finished, click **OK**. (You can change the security scheme used for this session by selecting / de-selecting the **"Username / Password Scheme"** option.)



User Name: SYSTEM

Password: ******

☑ Username/Password Scheme

Figure 9-4. Sign On dialog box

Successfully signing on at security level six allows you to view statistics, as well as to reset certain statistics. Security levels lower than six do not allow you to reset any statistics. If you chose the wrong node, click the **New Node** button to return to the Select New Node dialog box, described previously.

Configuring Automatic Sign-On

You can configure the Remote Communication Statistics Tool for automatic sign-on capability. This capability is useful in applications where you must examine data from several *different* nodes, and it would be tedious to sign-on to each node individually. Automatic sign-on allows you to define a single security code (password), or a user name/password combination for the tool.

For this feature to work, you must configure the same security code or user name/password combination for each and every node you want to examine.

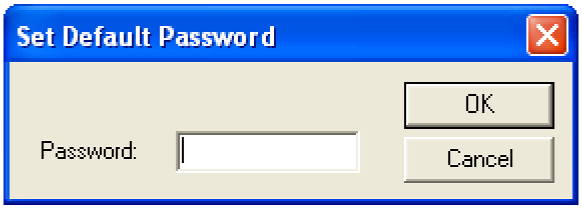


Figure 9-5. Set Default Password dialog box – Password Only

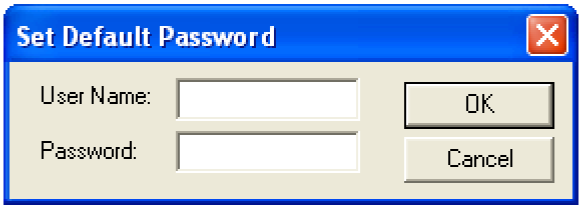


Figure 9-6. Set Default Password dialog box – Username and Password

To configure the automatic sign-on capability, click **Security**>**Default Security**. The Set Default Password dialog box opens.

Enter either a default user name/password combination, or simply a password, depending upon the appearance of the dialog box. Click **OK** to save the defaults.

Once configured, when you sign on to this tool, you only need to select a node, and call up the Sign On dialog box; OpenBSI sends the password or user name/password combination to the node automatically.

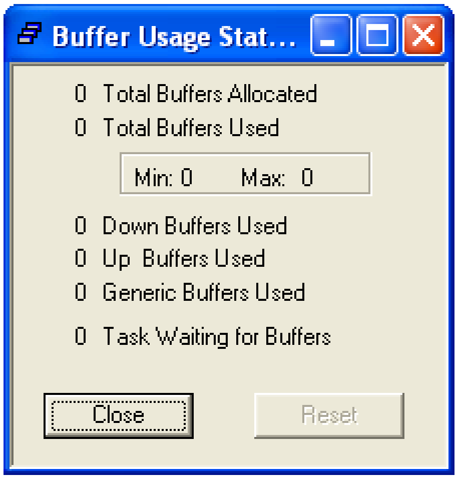
Notes:

- The appearance of the Set Default Password dialog box varies depending upon whether you selected “Yes” or “No” for the **“Would you like to use the Username/Password scheme?”** item on the Security page of the Application Parameters dialog box. **“Yes”** causes the system to use both the username and password , whereas **“No”** causes the system to only use the password.
- OpenBSI 5.8 Service Pack 1 (and newer) allow up to 16 characters in the password; earlier versions only allow six characters.

9.3 Buffer Usage Statistics Window (Network 3000 ONLY)

Communication buffers are pre-allocated portions of memory, in the Network 3000 controller, that hold communication input / output (I/O) messages. The system automatically allocates a certain number of buffers. You define the total number of additional buffers in the *COMMUNICATIONS section of the ACCOL source file. The Buffer Usage Statistics window presents information on how many communication buffers are in use, at a given time.

To access the Buffer Usage Statistics Window, click the icon, shown above, or click **Statistics**>**Buffers**.



0 Total Buffers Allocated
0 Total Buffers Used
Min: 0 Max: 0
0 Down Buffers Used
0 Up Buffers Used
0 Generic Buffers Used
0 Task Waiting for Buffers

Figure 9-7. Buffer Usage Statistics dialog box

The fields in the window represent a snapshot of the current buffer usage in the ACCOL load:

Field	Description
Total Buffers Allocated	This represents the total number of communication I/O buffers in the Network 3000 unit. To alter this value, edit the *COMMUNICATIONS section of the ACCOL source file, and re-download the unit.
Total Buffers Used	This represents the total number of buffers currently in use.
Up Buffers Used, Down Buffers Used, Generic Buffers Used	Each of the buffers currently being used is either an **Up Buffer**, a **Down Buffer**, or a **Generic Buffer**.
Min, Max	The **Min** and **Max** values represent the minimum and maximum number of buffers used since the last time the Network 3000 unit was downloaded, or the counts were reset using the **Reset** button.
Tasks Waiting for Buffer	This represents the number of ACCOL and/or system tasks waiting for buffers to be freed-up for their use.

Indications of Buffer Shortages

If the **Total Buffers Used** is *consistently* close to the **Total Buffers Allocated** value, you probably need to allocate some additional buffers. Similarly, if the **Task Waiting for Buffers** is *frequently* a non-zero value, you may need to allocate more buffers. Edit the number of Communication I/O Buffers defined in the *COMMUNICATIONS section of the ACCOL Load, and re-download the Network 3000 unit.

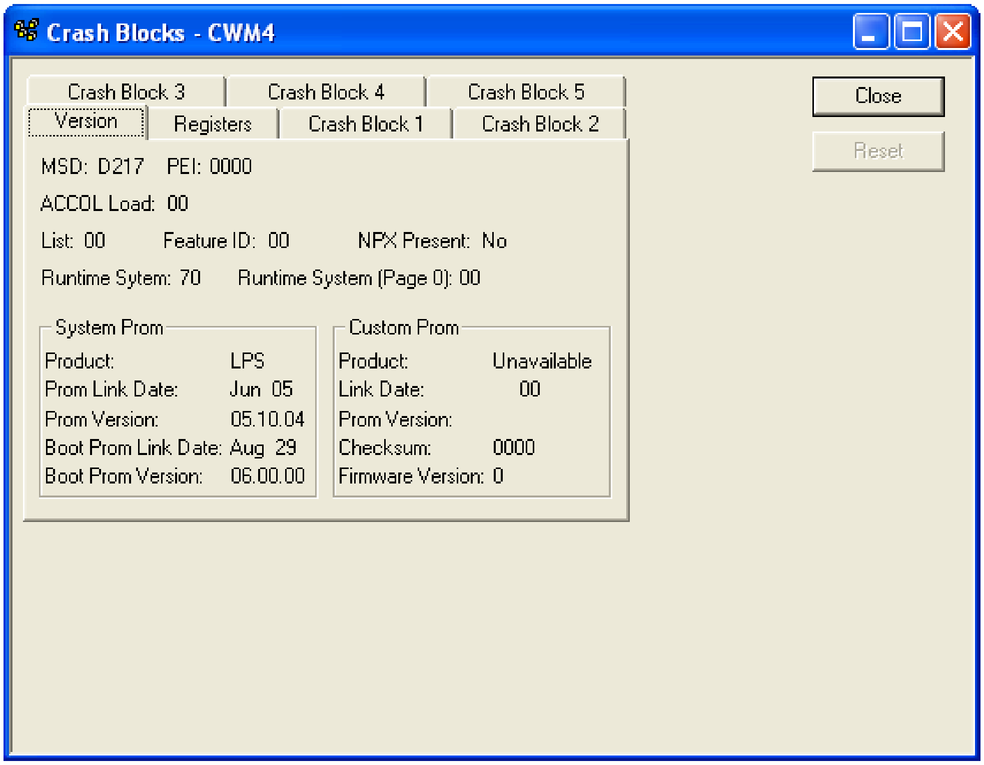
Resetting the Min, Max Counts

You can reset the count of the **Min** and **Max** buffers used to 0 by clicking the **Reset** button. You must sign on at security level six, in order to perform the reset.

Crash Block Statistics Window

A crash block is an area of memory in the controller which retains a “snapshot” of the state of the unit immediately prior to a system failure. Emerson Application Support and/or Development personnel can use this information to help diagnose the cause of the failure. **Note:** Not all failures result in useable crash block information.

To access the Crash Block Statistics Window, click the icon, shown above, or click **Statistics>Crash Blocks.**



MSD: D217 PEI: 0000

ACCOL Load: 00

List: 00 Feature ID: 00 NPX Present: No

Runtime Sytem: 70 Runtime System (Page 0): 00

System Prom

Product: LPS
Prom Link Date: Jun 05
Prom Version: 05.10.04
Boot Prom Link Date: Aug 29
Boot Prom Version: 06.00.00

Custom Prom

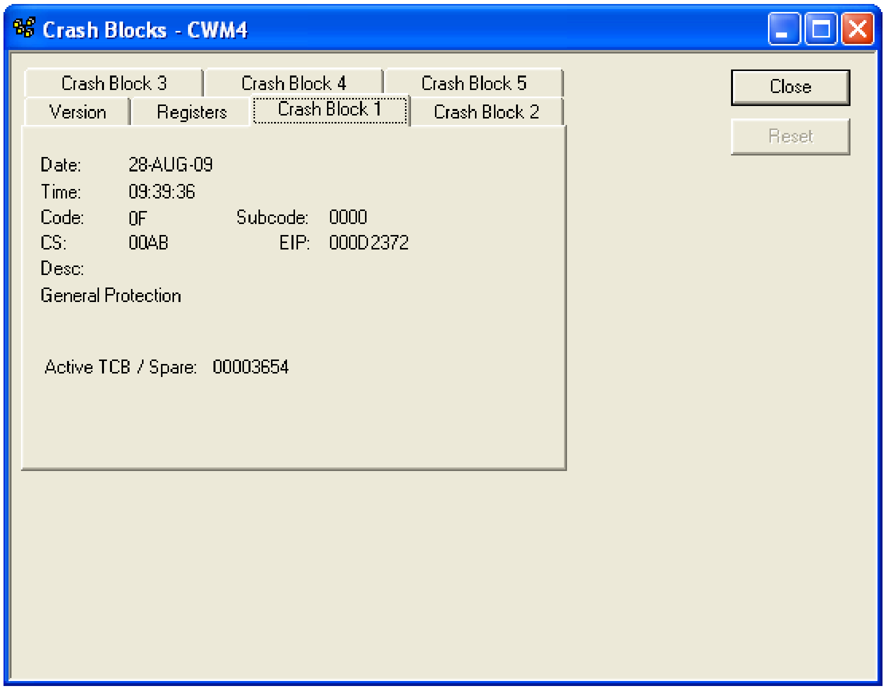
Product: Unavailable
Link Date: 00
Prom Version:
Checksum: 0000
Firmware Version: 0

Figure 9-8. Crash Block Window

The appearance of the screen varies depending upon the firmware and software version. To move between the various pages, click the tab(s).

Individual crash block pages of the window display the five most recent crashes, including the **Date** and **Time** that the crash occurred. To access one, click the **Crash Block *n*** file tab. **Note:** If there have been no crashes, the tabs won’t exist.

You should record the contents of the crash block displayed in the window and provide it to Emerson support personnel for analysis. Once you do this, you can click **Reset** to clear *all five* of the crash blocks; this allows the system to capture any new crash information as it occurs. You must sign on at security level six in order to perform the reset operation.



Date: 28-AUG-09
Time: 09:39:36
Code: 0F Subcode: 0000
CS: 00AB EIP: 000D2372
Desc:
General Protection

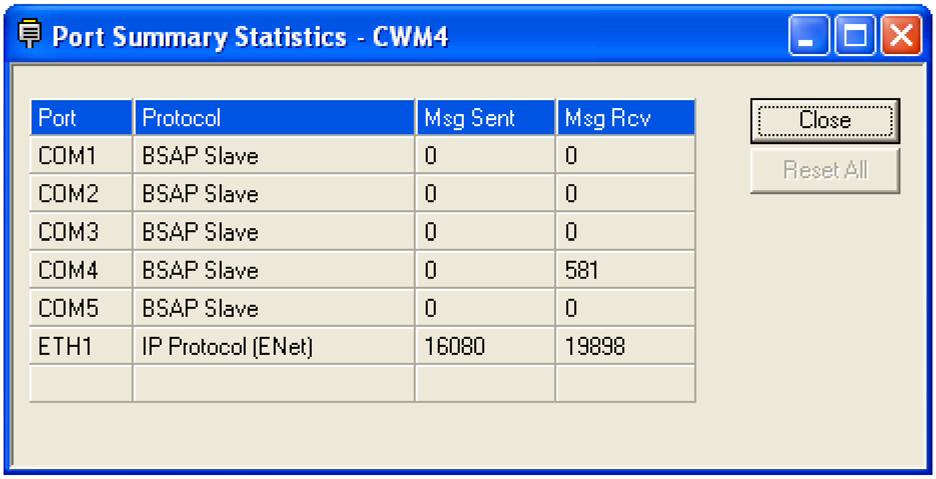
Active TCB / Spare: 00003654

Figure 9-9. Crash Blocks

9.4 Port Summary Statistics Window

You can view information on the communication ports of a controller through the Port Summary Statistics window.

To access the Port Summary Statistics Window, click the icon, shown above, or click **Statistics>Port Summary**.



Port	Protocol	Msg Sent	Msg Rcv
COM1	BSAP Slave	0	0
COM2	BSAP Slave	0	0
COM3	BSAP Slave	0	0
COM4	BSAP Slave	0	581
COM5	BSAP Slave	0	0
ETH1	IP Protocol (ENet)	16080	19898

Figure 9-10. Port Summary Statistics

The fields in the window are:

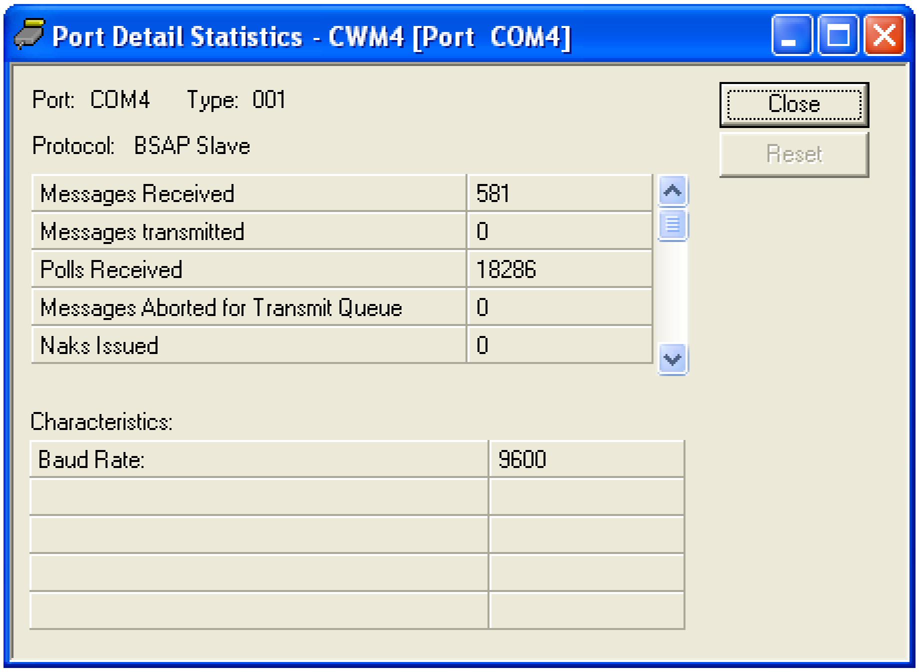
Field	Description
Port	This shows the name of the port. If you did not configure a particular port, it does not appear in the Port Summary Statistics window. **Note:** For ControlWave-series controllers, the window shows UNUSED ports as BSAP Slave, since that is the default for unused ports in ControlWave.
Protocol	This shows the type of port configuration. For ports configured with a Custom Protocol, the window shows the name “Custom,” followed by the mode value for the particular type of custom protocol.
MsgSent	This shows the total number of messages sent out through this port. **Note**: Not all port types maintain this statistic. If they do not, the value remains zero.
MsgRcv	This shows the total number of messages received through this port. **Note**: Not all port types maintain this statistic. If they do not, the value remains zero.
Reset All	You can reset the send and receive counts for **all** ports in the window. To do this, click **Reset All**. You must sign on at security level six to perform the reset operation.

Port Detail Statistics Window

For more detailed information on a particular port, click anywhere on the line for that port, and the Port Detail Statistics Window opens. Information in this window varies depending upon what type of port you examine.

The Port Detail Statistics Window has two parts. The top part of the window displays statistics about the messages going through the port. To reset these statistics click **Reset**. (You must sign on at security level six to perform the reset.) The bottom part of the window displays port characteristics, such as the baud rate.

The pages that follow describe the statistics maintained for the various port types.



Port: COM4 Type: 001

Protocol: BSAP Slave

Messages Received	581
Messages transmitted	0
Polls Received	18286
Messages Aborted for Transmit Queue	0
Naks Issued	0

Characteristics:

Baud Rate:	9600

Figure 9-11. Port Detail Statistics

Master/Expanded Addressing Master Port Statistics

Field	Description
Messages Sent	This shows the total number of data and poll messages sent out through this port.
Messages Received	This shows the total number of data messages received through this port.
Response Timeouts	This shows the number of response timeouts since the last response received
Consecutive Response Timeouts	This shows a condition similar to response timeouts (see above). If this number exceeds the number of slaves on the line, the line has failed.
NAKs Received	A NAK means that the slave node discards a message from the master node because there is no empty buffer available. Increasing the number of buffers in the slave node may help. Ensure that you set the master's poll period appropriately to achieve maximum throughput.
CRC Errors	The master port receives a message with correct framing; however, the message fails the CRC check and so the master port discards the message. Usually this occurs due to noise on the line. The message is not lost; the slave will repeat the message because it did not receive an ACK.

Message Discarded ACKs Received	If the master does not receive an ACK from the slave node for a message the slave receives *from* the master, the master re-transmits the message. The slave discards the duplicate message and advises the master by issuing an “ACK, msg discarded” response. Usually this results from noise on the line.
Protocol Errors, Overflow Errors, **Serial Number Errors**	These are miscellaneous problems usually caused by noise on the line. Setting the master’s timeout too short can also cause these problems.

Slave, Pseudo-Slave, Pseudo-Slave with Alarms, Serial CFE or VSAT Slave Port Statistics

Field	**Description**
Messages Sent	This shows the total number of data messages sent out through this port.
Messages Received	This shows the total number of data messages received through this port.
Polls Received	This shows the total number of poll messages received by this port.
Messages Aborted for Transmit Queue	When the poll period for the slave line expires without reception of a poll message from the master, the slave port discards messages on its queue in order to free up buffers. Set the slave port's poll period to 1.5 to 3 times the poll period for the master node on this line to avoid unnecessary errors of this type.
NAKS issued	If the slave node does not have an available buffer to process a message it receives from the master node, it discards the message and sends a NAK to the master. Try increasing the number of buffers to solve this problem. Ensure that you set the master's poll period appropriately to achieve maximum throughput.
Message Discarded **ACKs Issued**	If the master does not receive an ACK from the slave for a message the master sent to the slave, the master assumes the slave did not receive the message, and the master re-transmits the message. The slave discards the duplicate message and advises the master by issuing an “ACK, msg discarded” response. Usually this results from noise on the line.

Custom Port Statistics (ControlWave-series Users ONLY)

Only ControlWave-series controllers maintain custom port statistics. Other controllers may show 0 in these fields.

Field	Description
Messages Sent	This shows the total number of messages sent out through this port.
Messages Received	This shows the total number of messages received through this port.

RIOR Master Port Statistics

Only DPC 3330, DPC 3335, or RTU 3310 units which support synchronous communication, and have AD or newer firmware support RIO 3331 Remote I/O Racks (RIOR).

When you view the Port Detail Statistics for an RIOR Master Port, a “transaction” refers to a message sequence in which the RIOR master node transmits a data request (or other message) to the RIO 3331, for which it expects an appropriate response. A “transaction attempt” typically consists of one to three tries to complete a single transaction. A “successful completion” means the transaction attempt was successful - i.e. the RIOR master node receives a valid response from the slave. The system displays an increased error count in cases where the number of transaction attempts exceeds the number of successful completions.

The other statistics are:

Field	Description
CRC Events	The RIOR master receives a message that fails its CRC check. Noise on the line can cause this. **CRC Events** indicates the number of tries made to complete a single message transaction which failed on the CRC check. The RIO system makes up to three tries to complete a single transaction for any particular message. If three CRC events occur for any particular message, the CRC Errors count increases by one, and the Transaction Attempts count increases by one.
CRC Errors	The CRC check has failed on three occasions to complete a transaction (for a particular message) and so the RIOR master port discards the message. Usually this occurs because of noise on the line. When an error such as this occurs, the system declares the transaction attempt unsuccessful.
Overflow Events	Indicate a situation where data arrives at the RIOR master node faster than the node can process it. **Overflow Events** shows the number of tries made to complete a message transaction which failed because of an overflow. If three such events occur for a message, the Overflow Errors count increases by one, and the Transaction Attempts count increases by one.
Overflow Errors	After three **Overflow Event**s occur for a particular message transaction, the RIOR master port declares an **Overflow Error** and discards that message. This condition is almost always caused by a hardware failure in the RIOR master node. When an error such as this

	occurs, the system declares the transaction attempt unsuccessful.
Timeout Events	These occur when the RIOR master node transmits a data request (or other message) to an RIO 3331 node, and the master does not receive a response within the specified timeout period. This can be caused by many things -- the 3331 node is not powered on, the communication line is unplugged, noise on the line, etc. Depending upon the number of Timeout Events which occur for any particular message, the system may generate a Timeout Error, which increases *both* the Transaction Attempts and Timeout Errors counts by one.
Timeout Errors	A number of attempts to complete a message transaction with an RIO 331 Remote I/O Rack fail (Timeout Events) and the master node declares a Timeout Error. This can be caused by many things -- the 3331 node is not powered on, the communication line is unplugged, noise on the line, etc. The number of Timeout Events which generate a Timeout Error varies depending on the circumstances. If an RIO 3331 node has been unresponsive on several previous transaction attempts, a single Timeout Event at the start of a transaction causes the RIOR master node to abandon the transaction attempt without retries; this generates a Timeout Error, and increases both the Timeout Errors and Transaction Attempts counts by one. If the RIO 3331 node is only occasionally unresponsive, the RIOR master node makes retries after a single Timeout Event, and up to three Timeout Events can occur before the RIOR master declares a the Timeout Errors and increases both the Timeout Errors and Transaction Attempts counts by one. In either case, a timeout error indicates failure of the transaction attempt.

RIOR Slave Port Statistics

Only DPC 3330, DPC 3335, or RTU 3310 units which support synchronous communication, and have AD or newer firmware support RIO 3331 Remote I/O Racks (RIOR).

You can only view RIOR Slave Port statistics when you plug the OpenBSI Workstation in locally to Port A of the RIO 3331.

The statistics are:

Field	Description
Configuration Messages Received	Typically this number should be 1, since the RIOR Master only sends configuration messages when communication starts up.
Data Request Messages Received	This is the number of requests from the host RTU for input data. It is a normal communication transaction.
Set Output Messages Received	This is the number of messages received from the host RTU to set outputs. This is a normal communication transaction for RIO 3331 nodes with outputs.
Set PDM Data Messages Received	This is the number of messages received from the host RTU to set PDMs. This is a normal communication transaction for RIO 3331 nodes that have pulse duration modulation inputs.
Set PDO Pulses Messages Received	This is the number of messages received from the host RTU to set a pulse duration output. This is a normal communication transaction for RIO 3331 nodes that have pulse duration outputs.
Messages with Communications Errors	The RIO 3331 could not successfully receive a message due to a CRC check failure (typically caused by noise on the line), an overflow error or some other unspecified problem.
Invalid Messages	The RIO 3331 received an unrecognizable message and discarded it. Noise on the line can cause this.
Heartbeat Timeouts	The RIO 3331 has not heard the once per second heartbeat (data request) from the 3310/3330/3335 RIOR master node.

LIU Master Port Statistics

Note: Only UCS 3380 / CFE 3385 units support LIU Master Ports, and they require Aux 1 and Aux 2 ports.

Field	Description
Timeouts due to No Ack	The LIU Master sends a message to an LIU slave but does not receive the automatic ACK the LIU slave hardware generates. This can occur if the LIU Slave loses power or is disconnected from the network.
Consecutive Response Timeouts	This problem is similar to the preceding case, however, if this number exceeds the number of slaves on the line, it indicates a failure of the communication line.
Poll Timeout Errors	The LIU slave node generates an automatic hardware ACK on reception of a poll (i.e., it exists and is powered up), but the LIU slave did not generate a response. The LIU slave

	probably requires a download.
Frame Check Errors	A message was received which failed a consistency check which uses a CRC code. Usually this is due to a loose connector or noise on the line (arc welder nearby, etc.).
Transmit Underruns	A data byte was not available quickly enough. Typically this is a problem with the LIU hardware.
Transmit Link 1 Errors	The LIU found a difference between the information it was attempting to transmit and the information it actually transmitted. Typically this is a problem with the LIU or modem hardware.
Transmit Link 2 Errors	This is similar to the preceding error, but affects the alternate link's hardware in a system which uses dual redundant communications hardware.
Receive Overruns	A data byte was received before the hardware was ready to accept it. Since all data transfers are via DMA, this is a hardware error.
Receive Aborts	A message abort request was detected. Usually this is due to noise; Bristol devices never deliberately transmit an abort.
Receive Buffer Overflows	More data was received than would fit in the buffer supplied. Usually this is due to noise on the line.
Receive Link 1 Errors	Carrier detect was present on link 2 but not on link 1. This will cause failover of communications to the alternate link. This may be a bad transmitter (this error will then occur at all nodes with which it communicates) or due to a bad receiver.
Receive Link 2 Errors	Carrier detect was present on link 1 but not on link 2. This is similar to the preceding error, but for the alternate link.

LIU Slave Port Statistics

Note: LIU Slave Ports are ONLY available on the Auxiliary Ports (Aux 1 and Aux 2) of a CFE 3385 or UCS 3380 unit.

Field	Description
Messages Aborted for Transmit Queue	When the poll period for the slave line expires without reception of a poll message from the master, the slave node discards messages queued to the

	slave port in order to free up buffers. The slave port's poll period setting should be 1.5 to 3 times the poll period for the master node on this line to avoid errors of this type.
Transmit Underruns	A data byte is not available quickly enough. Typically this is a problem with the LIU hardware.
No Acknowledges	A message was sent to a slave but was not acknowledged by the slave. The target node may be off line or it may be out of buffers.
Transmit Link 1 Errors	The LIU found a difference between the information it was attempting to transmit and the information it actually transmitted. Typically this is a problem with the LIU or modem hardware.
Transmit Link 2 Errors	This is similar to the preceding error, but affects the alternate link's hardware in a system which uses dual redundant communications hardware.
Receive Frame **Check Errors**	A message was received which failed a consistency check which uses a CRC code. Usually this is due to a loose connector or noise on the line (arc welder nearby, etc.).
Receive Overruns	A data byte was received before the hardware was ready to accept it. Since all data transfers are via DMA, this is a hardware error.
Receive Aborts	A message abort request was detected. Usually this is due to noise; Network 3000 devices never deliberately transmit an abort.
Receive Buffer **Overflows**	More data was received than would fit in the buffer supplied. Usually this is due to noise on the line.
Receive Link 1 Errors	Carrier detect was present on link 2 but not on link 1. This causes a failover of communications to the alternate link. This may be a bad transmitter (this error will then occur at all nodes with which it communicates) or due to a bad receiver.
Receive Link 2 Errors	Carrier detect was present on link 1 but not on link 2. This is similar to the preceding error, but for the alternate link.

Communications Front End (CFE) AUX Port Statistics

Note:` The CFE statistics described, below, are strictly for CFE 3385 or UCS 3380 units which use the IEEE-488 interface. Statistics for serial CFEs are identical to those for BSAP Slave units.

Field	Description
NAKs issued	A message from the Console node is NAKed if it must be discarded because a buffer is unavailable. Increasing the number of buffers may help. Unfortunately, the VAX systems can overrun the CFE. The VAX knows it did not get through and will retry; nothing is lost.
Message Discarded ACKs Issued	A message which is received by the CFE but whose ACK is not received by the Console is retransmitted by the Console. When the CFE detects this, it discards the duplicate message and advises the Console by issuing an 'ACK, msg discarded' response. This can be caused by noise on the line.
CRC Errors	An incorrect CRC was received from the Console. The message was discarded and therefore retried from the Console. This is probably caused by noise or a temporarily unplugged cable.
Timeout Hardware Resets	The CFE has not received any message from the Console for 3 poll periods. All upgoing messages are flushed (like “aborted for transmit queue”) and the IEEE hardware is reset. This is probably caused by the cable being unplugged or the VAX Communications Task going down.
Out of Memory	The IEEE multibus interface is having a memory access problem. This is a serious hardware problem with the CFE system or the IEEE 488 card.

Internet Protocol (IP) Port Statistics

The RTU maintains Internet Protocol (IP) statistics for each of its IP communications ports (either serial or Ethernet). In addition, the IP Statistics Window (later in this section) maintains RTU-wide statistics for IP communications.

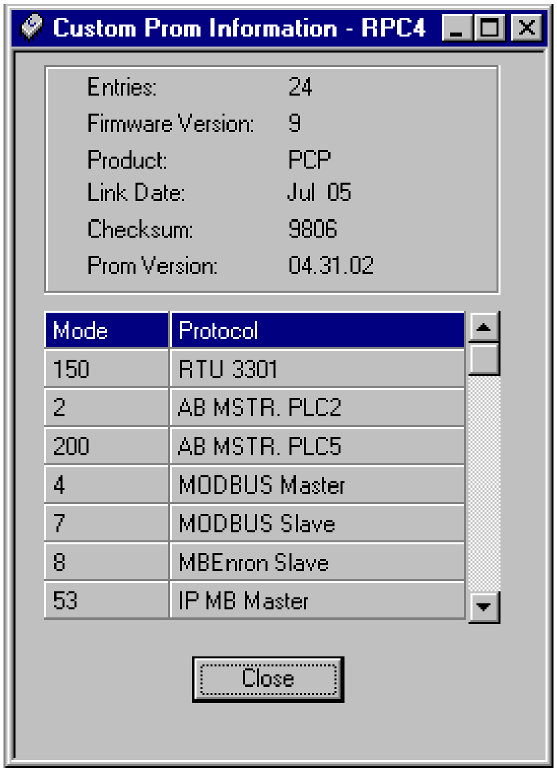
Field	Description
Packets Received (Unicast)	The number of non-broadcast packets received at the current port. **Packets Received** includes both invalid packets (see RCV errors, below), and packets being routed

	through the RTU, in addition to packets intended for this RTU.
Packets Sent (Unicast)	The number of non-broadcast packets sent from the current port.
Characters Received	The number of characters received at the port. This includes all protocol characters, and characters included within badly formed packets.
Packets Received (Multi)	The number of broadcast packets received. These are most likely ARP requests on an Ethernet. ARP requests are used to determine the hardware (MAC) address for an IP address.
Rcv Messages Discarded	The number of packets discarded due to frame-check errors (such as invalid check-sums). For a serial I/O expansion rack on an RS-485 line this indicates CRC errors.
Rcv Messages (Errors)	This is a catch-all error for invalid frames, which have been discarded. For a ControlWave host of serial I/O expansion racks on an RS-485 line this indicates a count of protocol errors, which are unexpected responses from the I/O expansion rack.
Rcv Messages (Bad Protocol)	The number of messages, with valid format and checksums, which have been discarded due to containing a protocol not supported by this RTU. For a serial I/O expansion rack on an RS-485 line this indicates a count of the number of non-I/O expansion rack messages forwarded to the current “Serial EXP Rack” port.
Characters Transmitted	The number of characters sent out the port. This includes all protocol characters.
Packets Sent (Multi)	The number of broadcast packets sent. These are most likely ARP requests on an Ethernet. ARP requests are used to determine the hardware (MAC) address for an IP address.
Send Errors	A catch-all error for invalid send frames. These frames are discarded. Errors in this type include attempting to send a packet which is too large. For a ControlWave host of serial I/O expansion racks on an RS-485 line this indicates the number of times a timeout was seen while waiting for a response to a poll of an I/O expansion rack.

9.5 Custom PROM Information Window (Network 3000)

The Custom PROM Information Window displays the contents of the Custom PROM area of a Network 3000 controller.

To access the Custom PROM Information Window, click the icon, shown above, or click **Statistics > Custom Prom.**



Entries: 24
Firmware Version: 9
Product: PCP
Link Date: Jul 05
Checksum: 9806
Prom Version: 04.31.02

Mode	Protocol
150	RTU 3301
2	AB MSTR. PLC2
200	AB MSTR. PLC5
4	MODBUS Master
7	MODBUS Slave
8	MBEnron Slave
53	IP MB Master

Figure 9-12. Custom Prom Information dialog box

The window displays, in abbreviated form, the name of each custom communication **Protocol** which is installed in the custom area of the Network 3000 controller. The number of protocols installed appears in the **Entries** field. Use the scroll bar to view entries which do not fit in the window. The **Mode** value is the number you must enter in the ACCOL Custom Module to designate which protocol you want to use. For the mode values of the most popular protocols, and configuration information for those protocols see the *ACCOL II Custom Protocols Manual* (document# D4066).

Product is an identification string for the custom firmware, as specified in the Custom PROM area. **PCP** is the proper identification string for custom firmware.

Firmware Version provides information about the type of custom firmware, and is typically one of the following values:

3	firmware is 186-based pre-version AE.00
5	firmware is 186-based, version AE.00 through AJ.10
7	firmware is 186-based AK or newer or 386EX Real Mode
8	firmware is 386EX Protected Mode

Link Date and **Checksum** are the firmware link date and data checksum value. Support personnel can use this information to verify PROM revision information.

Prom Version version is encoded as:

aa.bb.cc

where:

aa is the firmware version

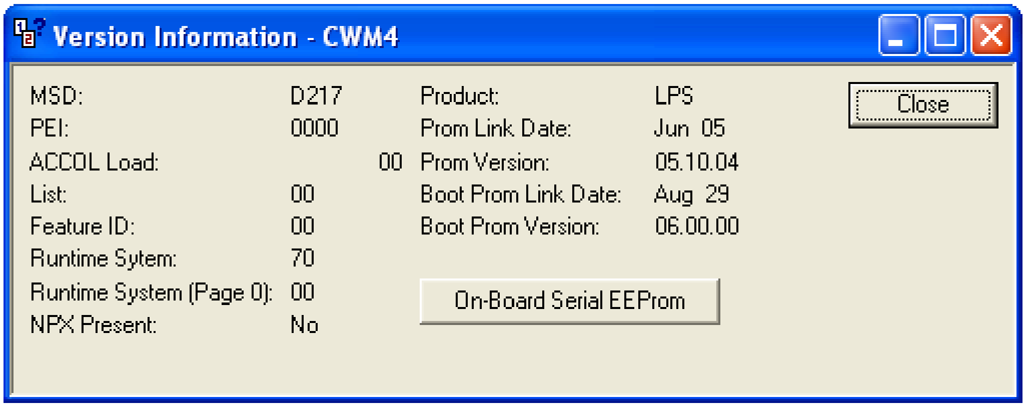
bb is the update revision

cc indicates the beta revision

for example PCP00 with no updates or beta revisions appears as 00.00.00.

9.6 Version Information Window

The Version Information Window displays details on the version of software and firmware used with the given controller. Support personnel may request this information to determine the revision of software and firmware used at a particular customer site. To access the Version Information Window, click the icon, shown above, or click **Statistics>Version Info**.



Version Information - CWM4

MSD:	D217	Product:	LPS
PEI:	0000	Prom Link Date:	Jun 05
ACCOL Load:	00	Prom Version:	05.10.04
List:	00	Boot Prom Link Date:	Aug 29
Feature ID:	00	Boot Prom Version:	06.00.00
Runtime Sytem:	70		
Runtime System (Page 0):	00		
NPX Present:	No		

Figure 9-13. Version Information dialog box

The **MSD** and **PEI** values are used, respectively, to identify discrepancies between the file version of the control strategy executing in the controller, and the version originally downloaded. In general, these values are the same. If they are different, the discrepancy indicates that either an on-line edit has been made, or a file has become corrupted.

ACCOL Load indicates the version of ACCOL Tools software used to create this ACCOL load. (Only applies if this device uses ACCOL II.)**List** is the list version (used by legacy Trolltalk PC Network Monitor software).

Feature ID is used by old versions of the ACCOL Tools, to coordinate firmware revisions. Possible values are:

FE - AA firmware and newer

0 - S.1 through S.3 firmware (3350/3380/3385)

FF - Pre-S firmware (3350/3380/3385)

Not applicable

Runtime System refers to the firmware version installed, and **Runtime System [Page 0]** refers to the firmware revision of the control strategy file. In general, for all features to work, these should match; a discrepancy may indicate a *possible* incompatibility. Possible hexadecimal values for these fields are:

1 - 3350/3380/3385 loads (4.2 Tools/S3 firmware, or earlier)

2 - 3330 - version 4.2 Tools / S3 firmware

3 - 3350/3380/3385 loads (5.0 through 5.2 Tools, AA through AC firmware) 4 - 3330/3335 (5.0+ Tools, AA through AD firmware)

5 - 3350/3380/3385 (5.4 Tools; no firmware release associated)

6 - 3330/3335 (5.4+ Tools, AE through AJ.xx firmware)

8 - 3310/3330/3335 (5.9 Tools, AK firmware)

9 - 3310/3330/3335 (386EX Real Mode)

10- 3310/3330/3335 (386EX Protected Mode)

55- 3305 firmware

6A- 3308 firmware (A.01 to A.02 firmware)

6B- 3308 firmware (A.03 to C.04 firmware)

70 – ControlWave LP / RTU 3340 firmware

80 – ControlWave firmware

84 – ControlWave MICRO firmware

8C – ControlWave I/O Expansion Rack

3530 firmware (fixed ‘C’ load)

A0 – TeleFlow / 3530 (ACCOL load)

If **NPX Present** is **Yes**, it indicates that this ACCOL load expects to be installed in a Network 3000 unit with the NPX math co-processor.

The version prefix appears in the **Product** field. NOTE: 186 and 386EX Real mode units do NOT use the **Product** field. The valid prefixes are:

CWM	ControlWave MICRO
CWP	ControlWave firmware
CWR	ControlWave I/O Expansion Rack
LPS	ControlWave LP firmware
PES	386EX Protected Mode firmware with Ethernet
PEX	386EX Protected Mode firmware with Ethernet and NPX math co-processor
PLS	386EX Protected Mode firmware
PLX	386EX Protected Mode firmware with NPX math co-processor

Prom Link Date indicates the month and day this firmware was created. The firmware version appears in the **Prom Version** field. For 186 and 386EX Real Mode units, the full version name appears such as **AK.03** or **RMS02**. For Protected Mode users, the prefix is not included, and the version is encoded as: *aa.bb.cc* where: *aa* is the firmware version

bb is the update revision

cc indicates the beta revision

for example PLS00 with no updates or beta revisions would appear as **00.00.00.**

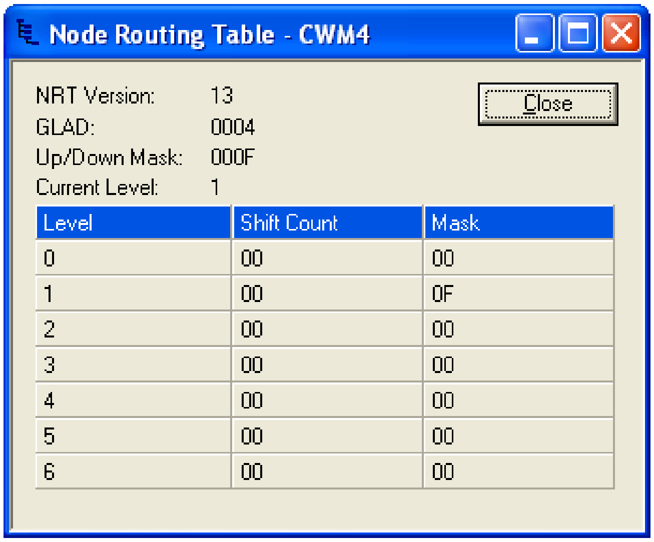
Protected mode units also contain the **Boot Prom Version** and **Boot Prom Link Date**.

The **On-Board Serial EEProm** button allows you to view identification strings associated with I/O boards in a ControlWave-series controller. (NOTE: These identification strings must already exist as system variables in the ControlWave Designer project _S*n*_IO_BOARD_ID_STR where *n* is the slot number of the I/O board.) For more information on these please see *System Variables* in the *ControlWave Designer Programmer's Handbook* (document# D5125).

9.7 Node Routing Table Window

NetView software generates a Node Routing Table (NRT) that includes the addresses of each node in the network. This information is essential for network communications to function. Each node in the network holds a *unique* copy of the Node Routing Table, which the system specifically modifies for that node. The Node Routing Table Window presents details on the Node Routing Table residing in the controller including the current node's global address, NRT version number, as well as up/down routing information for global messages.

To access the Node Routing Table Window, click the icon, shown above, or click **Statistics>Node Routing Table.**



NRT Version: 13
GLAD: 0004
Up/Down Mask: 000F
Current Level: 1

Level	Shift Count	Mask
0	00	00
1	00	0F
2	00	00
3	00	00
4	00	00
5	00	00
6	00	00

Figure 9-14. Node Routing Table dialog box

The global address of this controller (node) appears in the **GLAD** field. The level of the node appears in the **Current Level** field.

Support personnel may use the remaining information in the window may for trouble-shooting network communication problems.

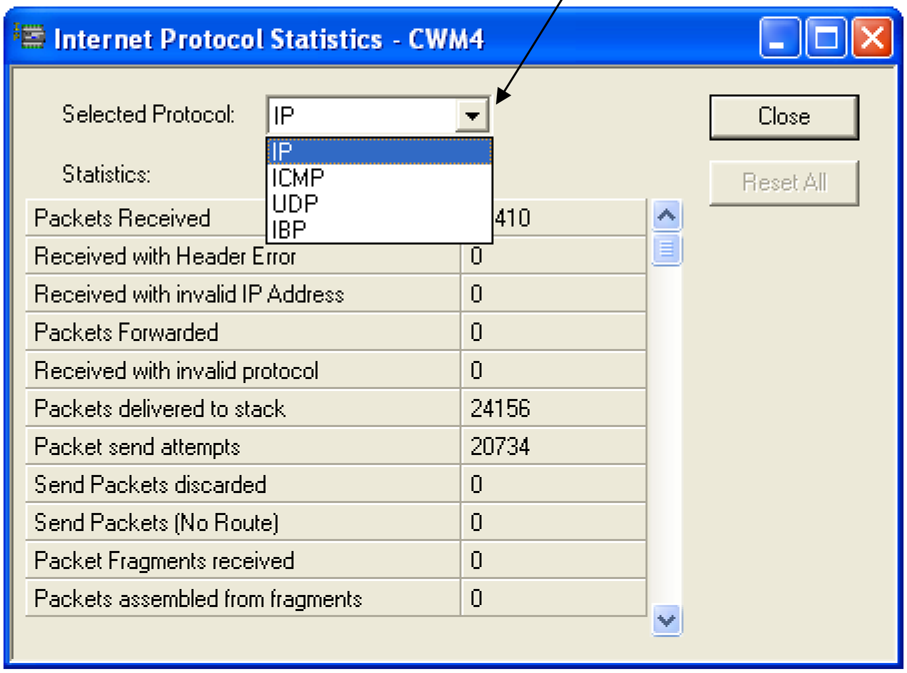
9.8 Internet Protocol (IP) Statistics Window

The Internet Protocol (IP) Statistics Window displays information on IP communication activity.

Note: Typically, you only need to concern yourself with this information if you need to implement a non-standard IP network configuration.

To access the IP Statistics Window, click the icon, shown above, or click **Statistics>IP Statistics**.

Use this list box to select the type of IP protocol for which you want to view statistics.



Selected Protocol: IP

Statistics:

Packets Received	410
Received with Header Error	0
Received with invalid IP Address	0
Packets Forwarded	0
Received with invalid protocol	0
Packets delivered to stack	24156
Packet send attempts	20734
Send Packets discarded	0
Send Packets (No Route)	0
Packet Fragments received	0
Packets assembled from fragments	0

Figure 9-15. Internet Protocol Statistics dialog box

IP statistics are divided up into categories because IP communications involves several different inter-related communication protocols. All of these protocols must function together properly in order for data to be transferred through the network intact.

The **Selected Protocol** list box allows you to choose which portion of the IP statistics you want to access.

If you signed on at security level six, you can reset all Internet Protocol statistics using the **Reset All**.

The various categories of statistics are described, below:

IP Statistics Decription

IP stands for Internet Protocol; it is a specification which defines the most basic packets of information transported in a TCP/IP network. IP provides addressing and packet routing mechanisms. The statistics maintained are:

Statistic	Description
Packets Received	Shows the number of data packets received from the MAC layer. This count includes invalid packets and packets destined for "pass-thru." This count does not include packets discarded by the data-link due to checksums or length checks performed at that layer.
Received with Header Error	Shows a count of discards due to header errors. These include invalid IP data length, invalid IP version, and IP header checksum errors.
Received with invalid IP Address	Shows the number of times a packet was received which is not for the current RTU and the current RTU does not know how to route the packet to the contained address.
Packets Forwarded	Shows the number of receive packets not for the current RTU, which have been forwarded to another machine for processing.
Received with invalid Protocol	Shows the number of discards due to an unrecognized protocol code in the header.
Packets delivered to stack	Shows the number of packets properly received, and sent on to be processed by a protocol handler.
Packet send attempts	Shows the number of packets which the IP layer has been asked to send. This includes discards. Note: This count does not include send attempts which are discarded by UDP or other higher-level layers.
Send Packets Discarded	Shows the number of packets discarded due to badly formed packets (length errors, bad destination, etc.)
Send Packets (No Route)	Shows the number of packets discarded because there is no known route to the destination address. Also, increments the "discarded" statistic.
Packet Fragments Received	A data-link does not support sending of an entire large packet in one section; therefore, the source machine has broken it into fragments. This is the total number of these fragments received.
Packets assembled from fragments	Shows the number of packets which have been put together from fragments.

Reassembly of packet failed	Shows the number of times a packet has been discarded due to not receiving all of its fragments within the allotted time.
Send Packet fragmented OK	A MAC layer (PPP on serial or Ethernet) on the current RTU cannot support sending of full-size packets. This is the number of packets which have been split into fragments for sending.
Failed to get packet for fragment	Shows the number of times a packet has been discarded due to the IP layer not being able to allocate a send packet for the fragment.
Number of send Fragments	Shows the number of packet fragments which have been sent out a data-link.
Default time to live	Shows the number of "hops" (sends over data-links) a packet can have before it is discarded. This is not a statistic; but, a display of the default value used by this RTU.
Timeout for packet Reassembly	Shows the time between the arrival of the first fragment of a packet to when all fragments must arrive. If the fragments all do not arrive, the fragments are discarded. This is not a statistic; but, a display of the default value used by this RTU.

ICMP Statistics Description

ICMP is a low-level IP protocol which performs notification of communications events. The statistics defined are:

Statistic	Description
Packets received	Shows a count of protocol packets received by this RTU. This includes discards.
Receive packets discarded	Shows a count of packets this RTU discarded due to length error, ICMP checksum, or invalid request type.
Destination unreachable packet received	Shows a count of instances where a packet was sent from this RTU to a destination (either IP address or Protocol Port) which could not be reached.
Time to Live Exceeded packet received"	Shows a count of instances where a packet was sent from this RTU which was transmitted over too many data-links on the way to its destination (and was discarded).
Redirect packets received	Shows a count of requests received by this RTU to modify internal routing information based on a routing machine determining a better path for a previously sent message.

Echo Request packets received	Shows a count of PING requests received by this RTU. PING is a program which sends a simple ECHO packet to another IP machine to determine if communications is possible.
Echo Reply packets received	Shows the number of replies received to “PING” requests made by this RTU.
Time stamp request packet received	Shows the number of requests for a timestamp received by this RTU. Note: This is not the RTU time-synch request.
Packets Sent	Shows the total number of ICMP packets sent by this RTU. Does not include discards.
Out packets discarded	Show the count of messages discarded by this RTU due to not being able to allocate send packet.
Destination unreachable packets sent	Shows a count of packets that could not be delivered or forwarded. A notification was sent back to the originator of the packet.
Time to live exceeded packets sent	Shows a count of instances where when forwarding a packet, its time-to-live count was exhausted; a notification was sent back to the originator of the packet.
Redirect packets sent	Shows a count of instances where, when forwarding a packet out the same line it was received over, a notification is sent back to the originating node that a better path is available.
Echo request packets sent	Shows a count of PING requests sent by this RTU.
Echo reply packets sent	Shows a count of PING responses sent by this RTU.

UDP Statistics Description

UDP stands for User Datagram Protocol. UDP is a method of transmitting user data from one Protocol Port on a computer to another (either on the same or another computer). UDP provides a checksum on the data sent; but, does not guarantee delivery. UDP is connectionless, there is no need to establish a connection before sending data.

Statistics available are as follows:

Statistic	Description
Packets received	Shows a count of packets received and processed. Does not include discards.

Port not present	Shows a count of instances where a packet was discarded because it was destined for an undefined Port. An ICMP error packet is returned.
Receive packet discarded	Shows a count of packets discarded due to header or checksum errors.
Packets sent	Shows a count of packets sent to the IP layer for processing.

IBP Statistics Description

IBP stands for Internet Bristol Protocol. It is the protocol used inside UDP packets to perform reliable data communication between OpenBSI workstations and ControlWave or Network 3000 IP RTUs. This communication method allows both detection and retry of missed packets, and proper ordering of requests. In addition, multiple requests (sub-packets) can be combined into a single network packet.

The statistics defined are:

Statistic	Description
No connection available	Shows a count of the number of packets dropped due to not being able to find an inactive connection.
Total discards based on mult ACK tmo	Shows a count of the number of packets discarded due to exceeding the ACK timeout limit.
ACK timeouts	Shows a count of the number of times that an ACK for a packet was not received within the timeout.
Discarded by purge operations	Shows a count of the number of packets discarded due to connection inactivity.
Discarded due to quota	Shows a count of the number of packets discarded at this RTU due to a shortage of available network packets.
Discarded due to sequence #	Shows a count of the number of packets discarded at this RTU due to sequence #s which were not in the proper range. Note: This can include packets which were re-sent due to timeout, but already received.
Invalid form for packet	Shows a count of the number of packets received with an invalid header length.
Invalid identifier for sub-packet	Shows a count of the number of sub-packets detected with invalid type code.
Packets received out-of-order	Shows a count of the number of packets which were received out of sequence (and thus loaded onto the out-of-order list). Items are removed from the list when the preceding packets are received.

Packets accepted	Shows a count of the number of IBP packets accepted for processing.
Packets sent	Shows a count of the number of IBP packets given to the IP stack for send.
Restart connection	Shows a count of the number of times an IBP packet was received which indicated that the local sequence number should be reset.
Errors attempting to send packet	Shows a count of the number of times the IP stack issued an error while trying to send a packet
Sub-packets received	Shows a count of the number of IBP sub-packets received from the IP stack.
Sub-packets sent	Shows a count of the number of IBP sub-packets given to the IP stack for sending.

9.9 Printing the Entries in the Current Window

You can print the textual data collected in the various Communication Statistics window on a printer.

Note: Before attempting to print, a printer must be properly configured, and connected to this workstation, either directly, or through a network. The Windows Print Setup dialog box, which is used for this configuration, is accessible by clicking on **Statistics>Print Setup**.

To print the entries (data) in the window, click the printer icon, shown above, or click **Statistics>Print**. The Windows Print dialog box opens. See your Windows documentation for further information.

9.10 Exporting Data Entries to the Windows® Clipboard

As an alternative to sending data to the printer, described above, you can copy entries as text into the WindowsJ Clipboard. From the Clipboard, you can export the data to other WindowsJ applications such as spreadsheets or word processors. The data is specifically formatted for use in Microsoft7 Excel.

To copy entries to the Windows® Clipboard, click **Statistics>Copy to Clipboard**.

See your Windows® documentation for more information on using the Clipboard.

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Chapter 10 – Using Signal Writer

Signal Writer allows the OpenBSI workstation to automatically send signal values to a controller, at a pre-defined interval. This provides a way for external applications to send data to the controller.

In This Chapter

You specify the signal values to be sent in ASCII text files, either as a group of individual signals, or as a list of signals. In either case, all signals in a given file must be for the same controller. At a pre-defined interval, the Signal Writer utility scans a specified directory for these ASCII text files; for each such file it finds, Signal Writer writes those signal values in the file to corresponding signals in the controller. After Signal Writer performs the write operation, it deletes the file.

10.1 Starting Signal Writer

Note: Before starting Signal Writer, you must sign on using NetView with sufficient security privileges (Engineer or Administrator). Otherwise, OpenBSI prevents you from using this utility.

Click **Start>Programs>OpenBSI Tools>Common Programs >Signal Writer**. The Signal Writer Tool starts in a minimized state. Restore the window on the screen. The Signal Writer window displays data on the execution of Signal Writer and provides access to Signal Writer Configuration Parameters.

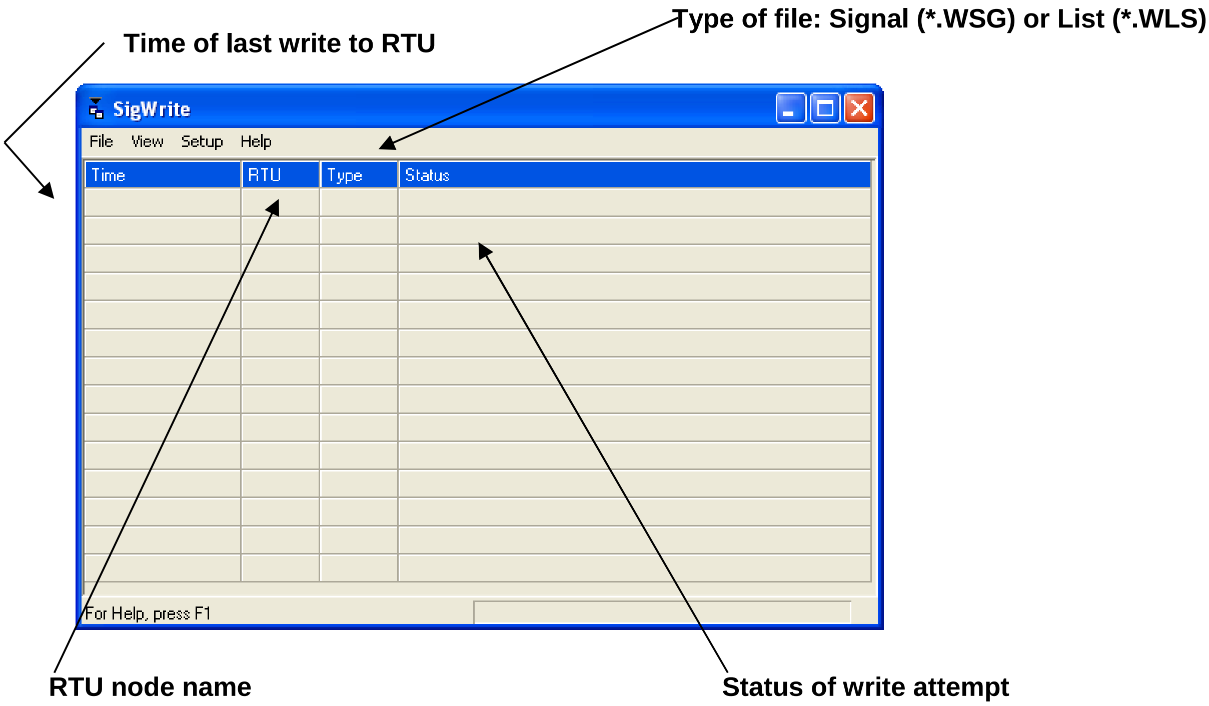
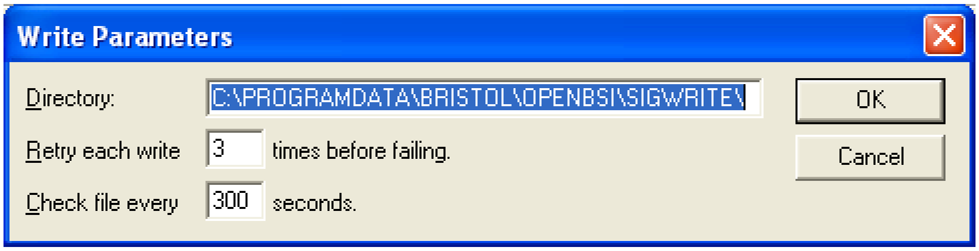


Figure 10-1. Signal Writer

10.2 Setting Up Signal Writer Configuration Parameters

You define Signal Writer configuration parameters in the Write Parameters dialog box. To access this dialog box, click **Setup>Write Parameters**.



Directory: C:\PROGRAMDATA\BRISTOL\OPENBSI\SIGWRITE\

Retry each write 3 times before failing.

Check file every 300 seconds.

Figure 10-2. Write Parameters dialog box

The Signal Writer configuration parameters are:

Field	Description
Directory	Specifies the drive and directory (folder path) which Signal Writer scans for ASCII files containing signal data. (The formats for these files are discussed later.) Once Signal Writer completes writing file data to a controller, it automatically deletes the file.
Retry times before failing	Shows the number of attempts Signal Writer makes to write data to the controller. Once Signal Writer makes this number of attempts without success, it declares a failure in the Status field.

Check file every # seconds	Shows the scan interval, in seconds, at which Signal Writer checks the Directory for new ASCII fileS.

10.3 Signal Writer File Formats

Each ASCII signal data file which Signal Writer uses must be in either write list file or write signal file format. You can use both types of files but you cannot mix both formats in the same file.

10.3.1 Write Signal File

A Write Signal file must be named

node.**WSG**

where the file base name of *node* is the node name of the controller to be written to, and WSG is the file extension. The first line of the WSG file must be an integer specifying the number of signals in the file. Each of the remaining lines of the file must consist of a signal name, and a signal value, separated by a space. You can enter either analog or logical signals; string signals are not supported. If you use a logical signal, its value must be either ON/OFF or TRUE/FALSE.

The example file, below, shows a Write Signal file created for the node called DPU5. Its Write Signal file must therefore be named DPU5.WSG.

```
3
VALVE01.OPEN.NOW  TRUE
PUMP01.POWER.ON  ON
SETPOINT.WATER.TEMP  32
```

Figure 10-3. Sample WSG File

10.3.2 Write List File

To use a Write List file, the signals being written to must exist in a signal list, and you must know their position in the list.

A Write List file must be named

node.WLS

where the file base name of *node* is the node name of the controller which will be written to, and WLS is the file extension.

The format of the Write List File is presented below:

n number of list definitions in this Write List File
list definition 1

list definition 2
:
list definition *n*

where a list definition consists of:
the number of the signal list
the starting index into the list
x number of signals being written to
value 1
value 2
.
value *x*

Values in the definition must be consecutive. They can be analog values; or for logical signals, either ON/OFF or TRUE/FALSE.

The example below shows a Write List file created for the node called RTU3. Its Write List File must therefore be named RTU3.WLS.

The first line of the RTU3.WLS file indicates that it contains two list definitions.

The first list definition applies to signal list 1 in RTU3, and will write to two consecutive list entries, starting with the fifth entry in the list. It will write a value of 1.9 to the fifth entry in list 1, and a value of TRUE to the sixth entry in list 1.

The second list definition applies to signal list 27 in RTU3. It will write to 3 consecutive list entries, starting with the eighth entry in the list. It will write a value of ON to the eighth entry of list 27, a value of 1001 to the ninth entry of list 27, and a value of 45 to the tenth entry of list 27.

File Entry in RTU3.WLS	Explanation
2	number of list definitions
1	list definition for signal list 1
5	start with 5th signal in signal list 1
2	write values to 2 consecutive signals, i.e. signal 5 and 6 in list1
1.9	signal 5 value
TRUE	signal 6 value
27	list definition for signal list 27
8	start with 8th signal in signal list 27
3	write values to 3 consecutive signals, i.e. signals 8, 9, and 10
ON	signal 8 value
1001	signal 9 value
45	signal 10 value

Chapter 11 – Using Alarm Router

The Alarm Router allows you to view alarms, on the screen, in an **Alarm Window**. It also provides a capability to export alarm data to files, or to other HMI/SCADA packages which support alarm management, such as Iconics AlarmWorX+™ software.

In This Chapter

You accomplish export of alarm data through one or more special sub-programs, called DLLs, which are specifically configured for alarm export. If an error occurs during an attempt to export alarm data, Alarm Router makes additional attempts, based on user-specified parameters. If these attempts fail, Alarm Router disables the DLL causing the error, and saves the pending alarm data in a file for later retrieval.

Note: DLLs is an abbreviation for Dynamic Link Libraries. DLLs are software procedures and sub-routines which are activated to perform a certain function; in this case, they are used to export alarm data

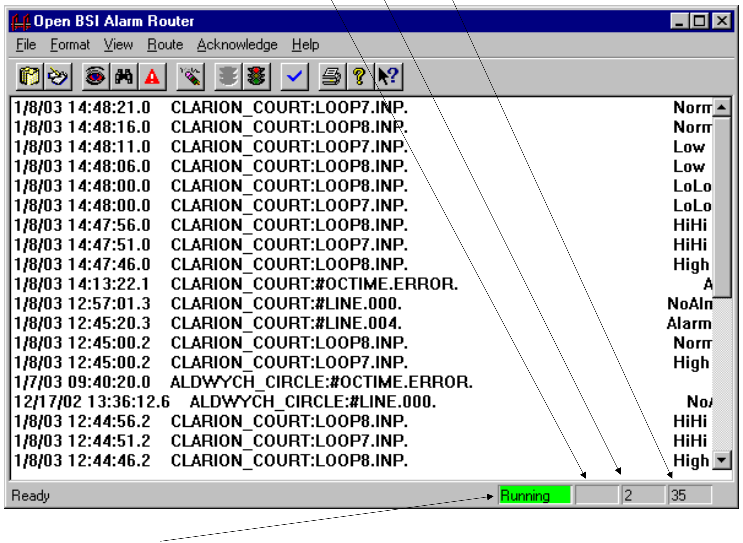
Status messages concerning operation of the Alarm Router are reported in the **Monitor Window**.

11.1 Starting Alarm Router

number of error messages
(if this appears in RED there are more
errors than can be displayed.)

number of status messages

number of alarms



```
1/8/03 14:48:21.0    CLARION_COURT:LOOP7.INP.             Norm
1/8/03 14:48:16.0    CLARION_COURT:LOOP8.INP.             Norm
1/8/03 14:48:11.0    CLARION_COURT:LOOP7.INP.             Low
1/8/03 14:48:06.0    CLARION_COURT:LOOP8.INP.             Low
1/8/03 14:48:00.0    CLARION_COURT:LOOP8.INP.             LoLo
1/8/03 14:48:00.0    CLARION_COURT:LOOP7.INP.             LoLo
1/8/03 14:47:56.0    CLARION_COURT:LOOP8.INP.             HiHi
1/8/03 14:47:51.0    CLARION_COURT:LOOP7.INP.             HiHi
1/8/03 14:47:46.0    CLARION_COURT:LOOP8.INP.             High
1/8/03 14:13:22.1    CLARION_COURT:#OCTIME.ERROR.            A
1/8/03 12:57:01.3    CLARION_COURT:#LINE.000.             NoAln
1/8/03 12:45:20.3    CLARION_COURT:#LINE.004.             Alarm
1/8/03 12:45:00.2    CLARION_COURT:LOOP8.INP.             Norm
1/8/03 12:45:00.2    CLARION_COURT:LOOP7.INP.             High
1/7/03 09:40:20.0    ALDWYCH_CIRCLE:#OCTIME.ERROR.
12/17/02 13:36:12.6    ALDWYCH_CIRCLE:#LINE.000.            No/
1/8/03 12:44:56.2    CLARION_COURT:LOOP8.INP.             HiHi
1/8/03 12:44:51.2    CLARION_COURT:LOOP7.INP.             HiHi
1/8/03 12:44:46.2    CLARION_COURT:LOOP8.INP.             High
```

```
Ready                                   Running |     | 2 | 35
```

Running - Alarm exporting is active
Starting - Alarm exporting is starting.
Stopped - Alarm exporting is turned OFF.
Stopping - Alarm exporting is stopping.

Figure 11-1. Alarm Router

Before you start Alarm Router, OpenBSI communications must already be active through either NetView, LocalView, or TechView.

Click **Start** > **Programs** > **OpenBSI Tools** > **Common Tools** > **Alarm Router**. Alarm Router starts collecting and processing alarm information. In addition, if AlarmWorX+ software is configured, and the ALMWORX DLL is installed, ALMWORX also starts.

11.2 How is the Alarm Router Configured?

Configuring the Alarm Router involves specifying certain setup parameters, and choosing which DLLs to use for alarm export. See *Specifying Initialization Parameters and Choosing DLLs* for details.

In addition, you may need to enter some DLL-specific parameters; they vary depending upon which DLLs you choose. See *Configuring Alarm Router DLLs* for details.

If desired, you can edit the configuration files directly, with a text editor, *instead of* using the dialog boxes described in this section. See *Editing the Configuration Files* for more information.

11.3 Specifying Initialization Parameters and Choosing DLLs

The Alarm Router Configuration Setup dialog box is divided into two pages. You specify initialization parameters on the Parameter Configuration Page, and you select DLLs from the DLL Configuration Page. Use the file tabs to switch back and forth between the pages.

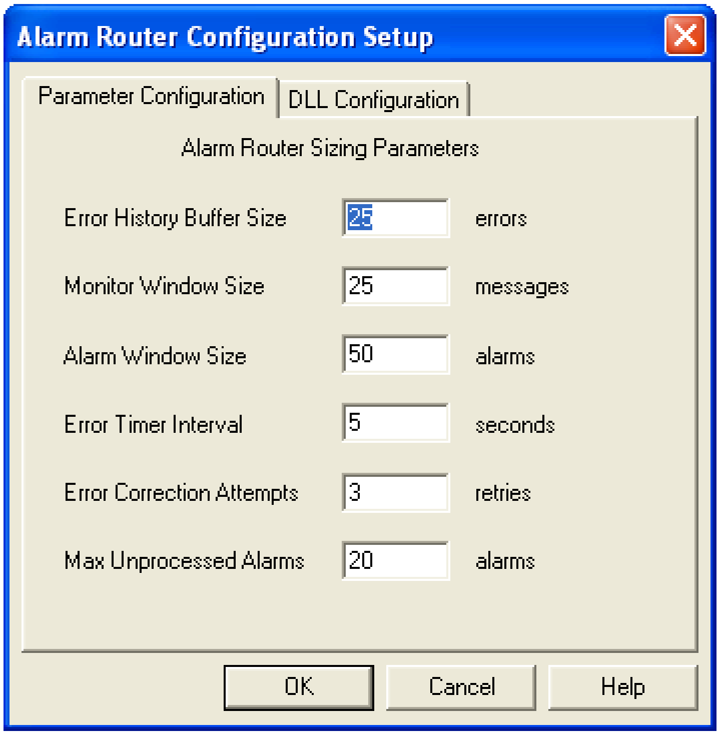
Before attempting to use this dialog box, you must halt all alarm processing. See *Stopping Alarm Processing* on page 11-19.

Note: If fields in the dialog box cannot be edited, it means you did NOT stop alarm processing prior to invoking this dialog box. Stop alarm processing, and then call up this dialog box again insert text

To access the Alarm Router Configuration Setup dialog box, click the **Configure Application** icon, shown above, *-or-* click **File>Initialize**. The Parameter Configuration page opens (see *Figure 11-2*.)

When finished editing *both* pages, click **OK**, on either page, to save all entries, or click **Cancel** to discard any changes.

You can now re-start alarm processing as described under *Starting Alarm Processing* on page 11-19.



Alarm Router Sizing Parameters

Error History Buffer Size 25 errors

Monitor Window Size 25 messages

Alarm Window Size 50 alarms

Error Timer Interval 5 seconds

Error Correction Attempts 3 retries

Max Unprocessed Alarms 20 alarms

Figure 11-2. Alarm Router Configuration Setup – Parameter Configuration

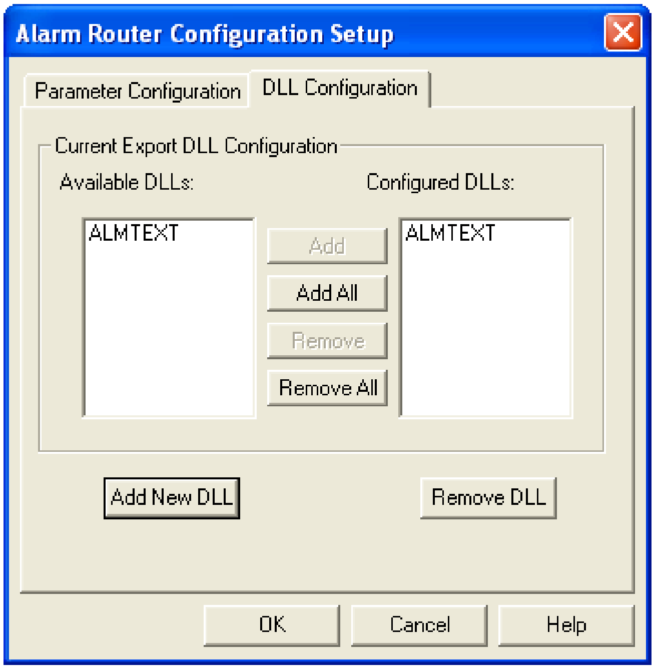
11.3.1 Parameter Configuration Page

The fields in the Parameter Configuration page of the dialog box are shown below:

Field	Description
Error History Buffer Size	This specifies the number of Alarm Router errors to be displayed in the Error Window. This must be an integer from 10 to 100; the default is 25. These errors relate to execution of the Alarm Router program, and its export of alarm data using whichever DLLs you configure. The Alarm Router status bar displays the total number of errors. If the error total in the status bar appears in RED, it indicates that **Error History Buffer Size** (the size of the error window) is too small to display the number of active errors. This condition also causes a status message to be reported in the Monitor window. (For more information on the Error Window, and a list of error messages, see *Viewing Errors in the Error Window*.)
Monitor Window Size	This specifies the number of status messages which should be displayed in the Monitor Window. This must be an integer from 10 to 100; the default is 25. Status messages are indicators that certain Alarm Router operations are occurring, such as starting or stopping of alarm processing, configuration changes to DLLs, etc. Once the number of status messages exceeds the **Monitor Window Size**, Alarm Router deletes the oldest messages to accommodate new messages as they come in. (For more information on status messages, see *Viewing Status Messages in the Monitor Window*.)
Alarm Window Size	This specifies the number of alarms which may be displayed in the Alarm Window. This must be an integer from 10 to 200; the default is 50. (See *Viewing Alarms in the Alarm Window* for more information.)
Error Timer Interval	This specifies, in seconds, the length of time between **Error Correction Attempts**. This must be an integer from 1 to 30; the default is 5. The same **Error Timer Interval** applies to all active DLLs.
Error Correction Attempts	This specifies the number of times the Alarm Router attempts to export alarm data using a given DLL. This must be an integer from 1 to 15; the default is 3. If still unsuccessful after this number of attempts, Alarm Router disables the DLL which generated the error, and any pending alarm data is stored in a file for later retrieval. The same **Error Correction Attempts** value applies to all active DLLs.
Max Unprocessed Alarms	This specifies another criteria for disabling a DLL, and storing pending alarm data in a file for later retrieval. If a number of alarms greater than the value of **Max Unprocessed Alarms** remains unprocessed (i.e. not exported) by a given DLL, Alarm Router disables that DLL. This value must be an integer from 10 to 25; the default is 20.

DLL Configuration Page

You use the DLL Configuration Page to view a list of available DLLs, and to activate them after you configure them.



Available DLLs: ALMTEXT

Configured DLLs: ALMTEXT

Figure 11-3. Alarm Router Configuration Setup – DLL Configuration

The **Available DLLs** list box shows which DLLs are present. Both the ALMTEXT DLL and the ALMWORX DLL come with the Alarm Router software. You can only configure the ALMWORX DLL, however, if the AlarmWorX+ software is already installed on the PC.

11.3.2 Activating A DLL

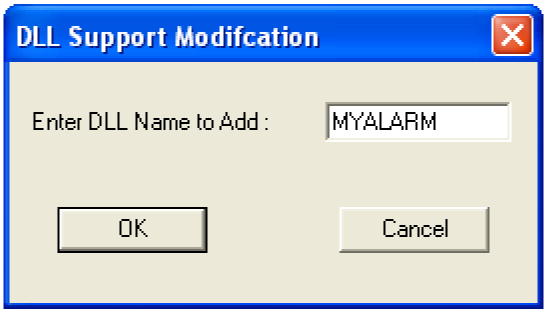
You should only activate DLLs if they have already been configured (see *Configuring Alarm Router DLLs*). To activate an existing DLL, click on its name in the **Available DLLs** list box, and click **Add**. If the DLL exists, Alarm Router adds it to the **Configured DLLs** list box. To activate all available DLLs, make sure no DLLs are selected, then click **Add All**. All DLLs in the **Available DLLs** list box are activated, and displayed in the **Configured DLLs** list box.

11.3.3 Removing A DLL From the Configured DLLs List Box

If you have to disable a DLL, click on its name in the **Configured DLLs** list box, then click **Remove**. To remove all DLLs from the **Configured DLLs** list box, make sure none are selected, then click **Remove All**. Alarm Router prompts you to confirm that all DLLs should be removed.

11.3.4 Installing An All New DLL

If you develop a DLL of your own, and need to install it, copy it in into whichever directory is used for the OPENBSI program files. Next, click **Add New DLL**.


DLL Support Modifcation

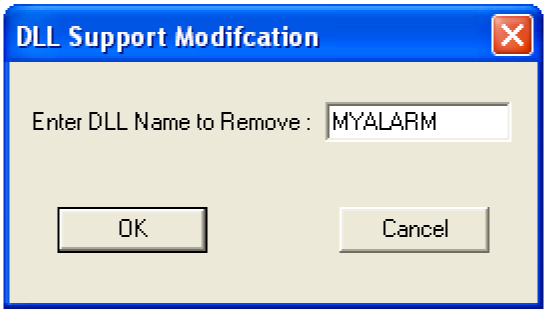
Enter DLL Name to Add : MYALARM

Figure 11-4. Installing an all New Alarm RouterDLL

Alarm Router prompts you to enter the name of the new DLL in the DLL Support Modification dialog box. Type its name and click **OK**. Alarm Router adds the DLL to the **Available DLLs** list box. Now you must configure it according to instructions in *Configuring Alarm Router DLLs*.

11.3.5 Removing A DLL from the Available DLLs List Box

To remove a DLL from the **Available DLLs** list box, first remove it from the **Configured DLLs** list box, as described above, then click **Remove DLL**. Alarm Router prompts you to enter the name of the DLL you want to remove in the DLL Support Modification list box, then click **OK**.


DLL Support Modifcation

Enter DLL Name to Remove : MYALARM

Figure 11-5. Removing an Alarm Router DLL

11.4 Configuring Alarm Router DLLs

Before activating a DLL, you must configure it. For the ALMTEXT and ALMWORX DLLs, the Alarm Router automatically performs the configuration for you; you need not change it unless you want to alter the defaults.

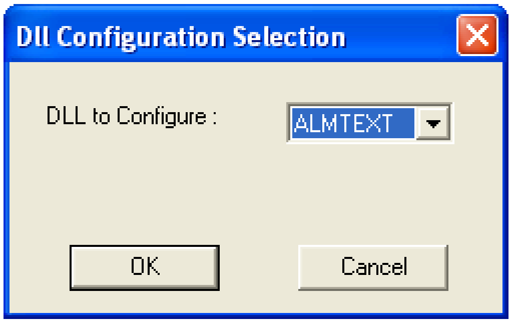
11.4.1 ALMTEXT DLL

This DLL collects alarm data, and exports it to a text file in the format shown below.

```
19-MAR-2007 09:35:30.1 ????:#OCTIME.ERROR.
Alarm Single Crit ON   T-ALM

19-MAR-2007 09:35:30.1 ????:#OCTIME.ERROR.
Alarm Single Crit ON   T-ALM

19-MAR-2007 09:51:30.0 L1C2:#LINE.000.
Alarm Single Crit ON   T-ALM

19-MAR-2007 13:06:56.4 L1C2:#LINE.000.
NoAlm             OFF  T-ALM

19-MAR-2007 13:06:55.5 L1C2:#OCTIME.ERROR.
NoAlm             OFF  T-ALM
```

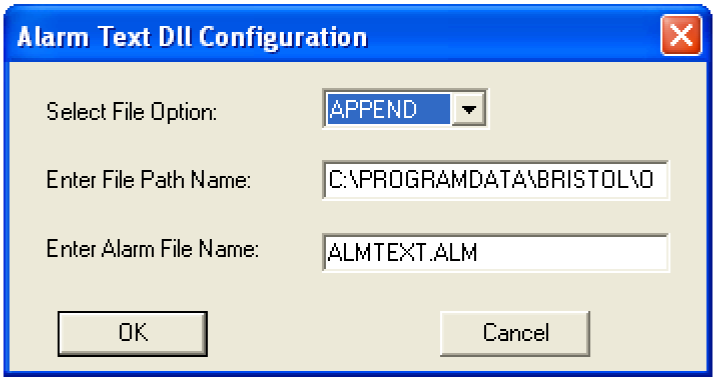
Figure 11-6. Sample ALMTEXT output

To change the defaults for this DLL, click the **Configure DLL** icon, shown above, *-or-* click **File> Configure**. The Dll Configuration Selection dialog box opens. Choose **ALMTEXT** from the list box and click **OK**.



DLL to Configure : ALMTEXT

Figure 11-7. DLL Configuration Selection



Select File Option: APPEND

Enter File Path Name: C:\PROGRAMDATA\BRISTOL\O

Enter Alarm File Name: ALMTEXT.ALM

Figure 11-8. Alarm Text DLL Configuration dialog box

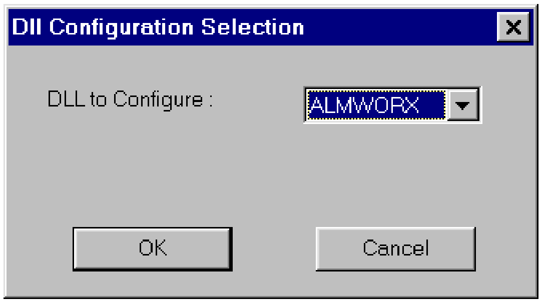
The Alarm Text Dll Configuration dialog box opens. The **Enter File Path Name** field allows you to specify the drive and directory which will contain the alarm data text file. The **Enter Alarm File Name** field allows you to specify the name of the alarm data file; the default name is ALMTEXT.ALM.

The **Select File Option** list box lets you specify whether Alarm Router should create a new alarm data text file for each execution of the ALMTEXT DLL, or whether it should append the existing file when new data is exported.

Click **OK** to save your changes.

11.4.2 ALMWORX DLL

The ALMWORX DLL requires Iconics AlarmWorX+™ software. You must configure it as described, below, and then add it to the list of **Configured DLLs** in the Alarm Router Configuration Setup dialog box.



DLL to Configure : ALMWORX

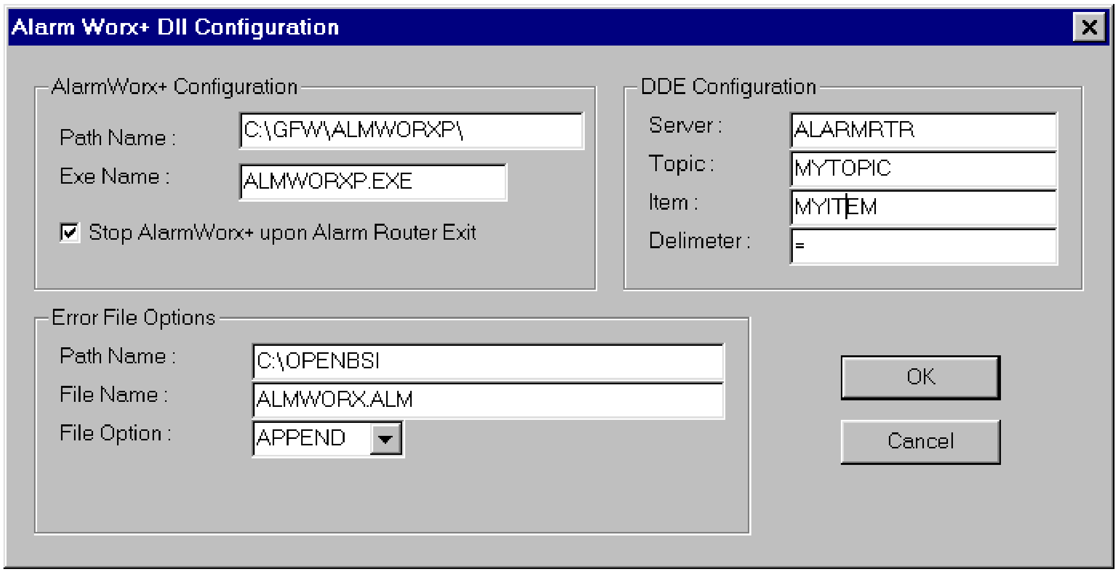
Figure 11-9. DLL Configuration Selection

To change the defaults for this DLL, click the **Configure DLL** icon, shown previously, *-or-* click **File >Configure**. The Dll Configuration Selection dialog box opens. Choose **ALMWORX** from the list box and click **OK**.

In the “**AlarmWorX+ Configuration”** section, use the **Path Name** field to specify the drive and directory where the AlarmWorX+ software is installed. Use the **File Name** field to specify the executable file used by AlarmWorX+. If you check the **Stop AlarmWorx+ upon Alarm Router Exit** box, the AlarmWorX+ package shuts down whenever the Alarm Router is shutdown.

Use the **DDE Configuration** section to set up DDE communications with the Iconics AlarmWorX+ package.

Note: Do NOT confuse DDE Configuration with the OpenBSI DDE Server. These DDE parameters are used only by the AlarmWorX+ package; they are totally unrelated to the OpenBSI DDE Server software.



Alarm Worx+ Dll Configuration

AlarmWorx+ Configuration

Path Name : C:\GFW\ALMWORXP\

Exe Name : ALMWORXP.EXE

☑ Stop AlarmWorx+ upon Alarm Router Exit

DDE Configuration

Server : ALARMRTR

Topic : MYTOPIC

Item : MYITEM

Delimeter : =

Error File Options

Path Name : C:\OPENBSI

File Name : ALMWORX.ALM

File Option : APPEND

Figure 11-10. Alarm WorX+ DLL Configuration

You must specify **ALARMRTR** as the **Server;** you must also specify this in the **MUX Link Source** field in the Input Page of the System Preferences Screen in AlarmWorX+. Similarly, configure the **Topic** and **Item** fields to match the **MUX Link Topic** and **MUX Link Item** fields in AlarmWorX+.

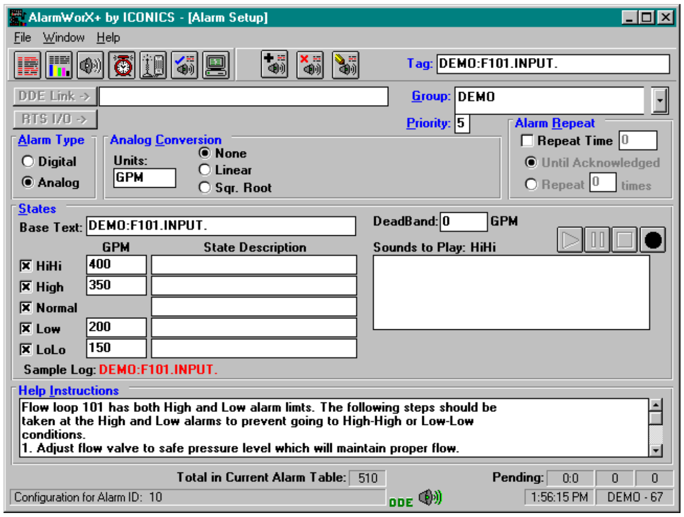
Use the **Error File Options** fields to specify an error file the Alarm Router uses to store un-processed alarm data as text in the event exporting using the ALMWORX DLL fails. The **Path Name** specifies the drive and directory in which Alarm Router creates the error file, and **File Name** specifies the name of the error file. Choose either **APPEND** or **NEW** from the **File Option** list box to determine whether Alarm Router should create a new error file on each failed execution of the ALMWORX DLL, or whether it should append the existing error file.

After you make these entries, you must perform additional configuration within AlarmWorX+. You must define each ACCOL analog or logical alarm signal name (*node.base.extension.attr)* as a “Tag” within AlarmWorX+. Some notes about configuring tags are included below;

see the Iconics AlarmWorX+ documentation for more information on these subjects.

Notes About Configuring Alarms in Iconics AlarmWorX+

Two methods are available for configuring the AlarmWorX+ data base. The first method allows you to enter signals into the alarm configuration page on a signal by signal basis which creates a Microsoft Access® data base. The second, and somewhat faster method, is to directly enter the alarm parameters in the Access table.



Tag: DEMO:F101.INPUT.

Group: DEMO

Priority: 5

Alarm Type: ○ Digital ● Analog

Analog Conversion: Units: GPM ● None ○ Linear ○ Sqr. Root

Alarm Repeat: □ Repeat Time 0 ● Until Acknowledged ○ Repeat 0 times

States

Base Text: DEMO:F101.INPUT.

DeadBand: 0 GPM

Sounds to Play: HiHi

	GPM	State Description
☒ HiHi	400	
☒ High	350	
☒ Normal		
☒ Low	200	
☒ LoLo	150	

Sample Log: DEMO:F101.INPUT.

Help Instructions

Flow loop 101 has both High and Low alarm limts. The following steps should be taken at the High and Low alarms to prevent going to High-High or Low-Low conditions.
1. Adjust flow valve to safe pressure level which will maintain proper flow.

Total in Current Alarm Table: 510

Pending: 0:0 0 0

Configuration for Alarm ID: 10

DDE

1:56:15 PM DEMO - 67

Figure 11-11. Iconics Alarm WorX+ Configuration

Configuring an alarm is a simple fill-in-the-blanks procedure:

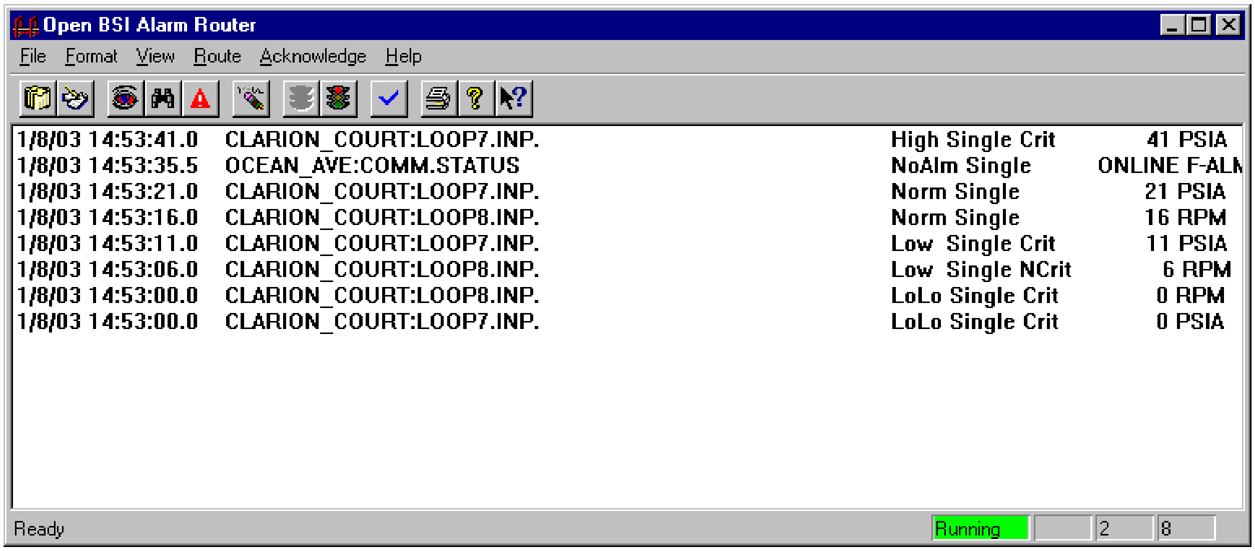
The **Tag** field is the ACCOL signal name connection point which the Alarm Router uses to pass the ACCOL alarm to AlarmWorX+. Its format is *node.base.extension.attr*. The **Base Text** field can be any text or alarm descriptor, typically the ACCOL signal name is used in the same form as the **Tag**.

You can change all parameters, including the alarm limits, at any time from the menu or through the Access table database.

Alarms reported to AlarmWorX+ which are not in the data base are still displayed in the Alarm Summary display, with all parameters, including the ACCOL signal name, but they are identified as “Unknown Tags” in the description field. All alarms, whether or not they are in the data base, are time-stamped.

11.5 Viewing Alarms in the Alarm Window

To call up the Alarm Window, click the **View Alarm Window** icon, shown at left, -or- click **View>Alarm Window**. The Alarm Window opens. The most recent alarms always appear at the top of the window. The **Alarm Window Size** parameter in the Alarm Router Configuration Setup dialog box determines the number of alarms visible in the window.



```
1/8/03 14:53:41.0   CLARION_COURT:LOOP7.INP.        High Single Crit      41 PSIA
1/8/03 14:53:35.5   OCEAN_AVE:COMM.STATUS           NoAlm Single      ONLINE F-ALM
1/8/03 14:53:21.0   CLARION_COURT:LOOP7.INP.        Norm Single           21 PSIA
1/8/03 14:53:16.0   CLARION_COURT:LOOP8.INP.        Norm Single           16 RPM
1/8/03 14:53:11.0   CLARION_COURT:LOOP7.INP.        Low  Single Crit      11 PSIA
1/8/03 14:53:06.0   CLARION_COURT:LOOP8.INP.        Low  Single NCrit      6 RPM
1/8/03 14:53:00.0   CLARION_COURT:LOOP8.INP.        LoLo Single Crit       0 RPM
1/8/03 14:53:00.0   CLARION_COURT:LOOP7.INP.        LoLo Single Crit       0 PSIA
```

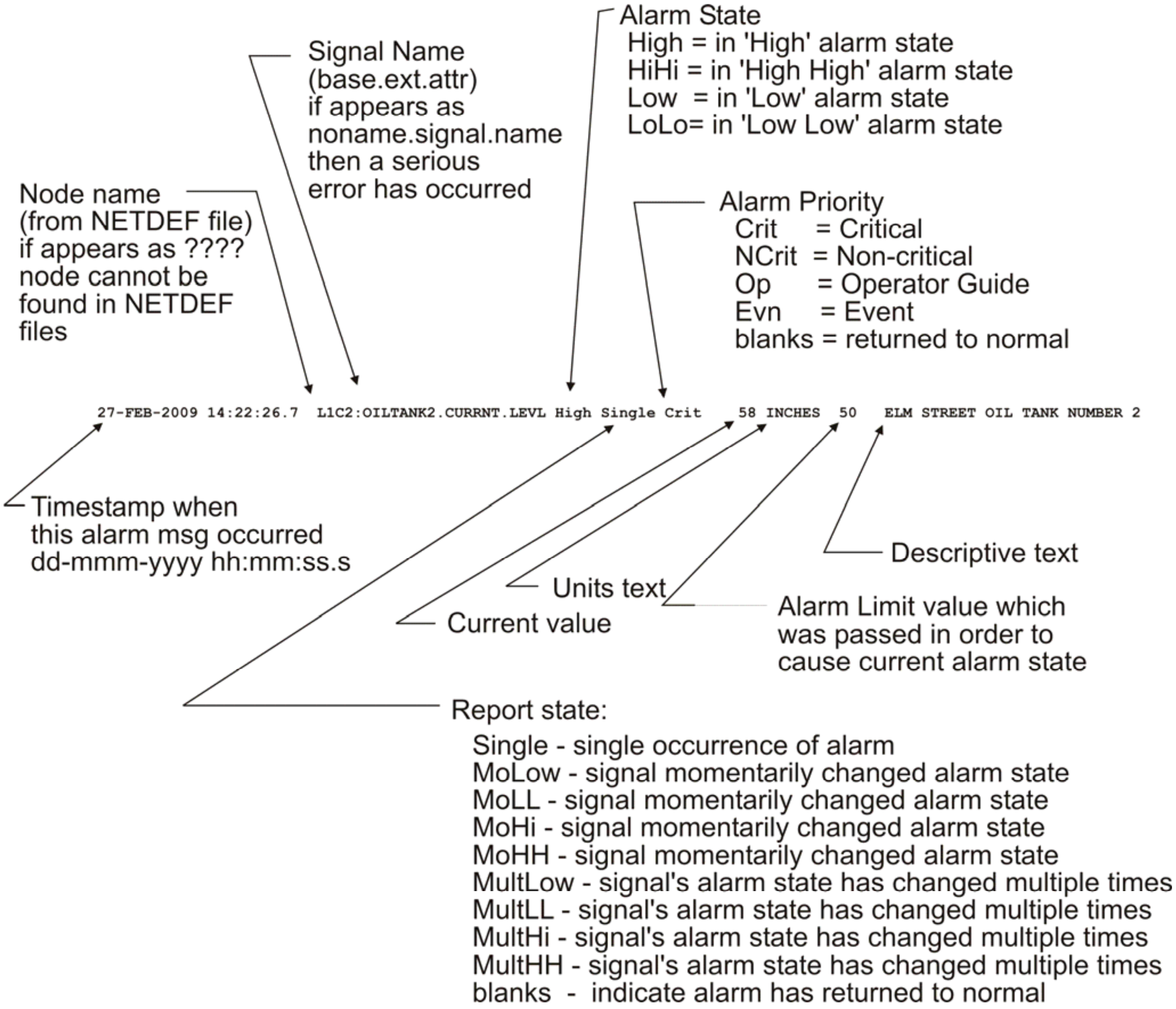
Figure 11-12. Alarm Window

If you see a signal in an alarm state named *nodename*:**COMM.STATUS.** this is a signal from OpenBSI (not from the RTU) that communications have been lost with the top level RTU named *nodename*.

For Network 3000 users, the entries in the alarm window vary depending upon the value of the #ALARM.FORMAT. and #ALARM.FORMAT.001 system signals in the ACCOL load.

The full extended signal formats for analog and logical signals are shown on the next two pages.

The format of an analog alarm message is:



```
27-FEB-2009 14:22:26.7  L1C2:OILTANK2.CURRNT.LEVL High Single Crit    58 INCHES  50   ELM STREET OIL TANK NUMBER 2
```

Node name
(from NETDEF file)
if appears as ????
node cannot be
found in NETDEF
files

Signal Name
(base.ext.attr)
if appears as
noname.signal.name
then a serious
error has occurred

Alarm State
High = in 'High' alarm state
HiHi = in 'High High' alarm state
Low = in 'Low' alarm state
LoLo= in 'Low Low' alarm state

Alarm Priority
Crit = Critical
NCrit = Non-critical
Op = Operator Guide
Evn = Event
blanks = returned to normal

Timestamp when
this alarm msg occurred
dd-mmm-yyyy hh:mm:ss.s

Descriptive text

Units text

Current value

Alarm Limit value which
was passed in order to
cause current alarm state

Report state:
Single - single occurrence of alarm
MoLow - signal momentarily changed alarm state
MoLL - signal momentarily changed alarm state
MoHi - signal momentarily changed alarm state
MoHH - signal momentarily changed alarm state
MultLow - signal's alarm state has changed multiple times
MultLL - signal's alarm state has changed multiple times
MultHi - signal's alarm state has changed multiple times
MultHH - signal's alarm state has changed multiple times
blanks - indicate alarm has returned to normal

Figure 11-13 Analog Alarm Message Format

The format of a logical alarm message is:

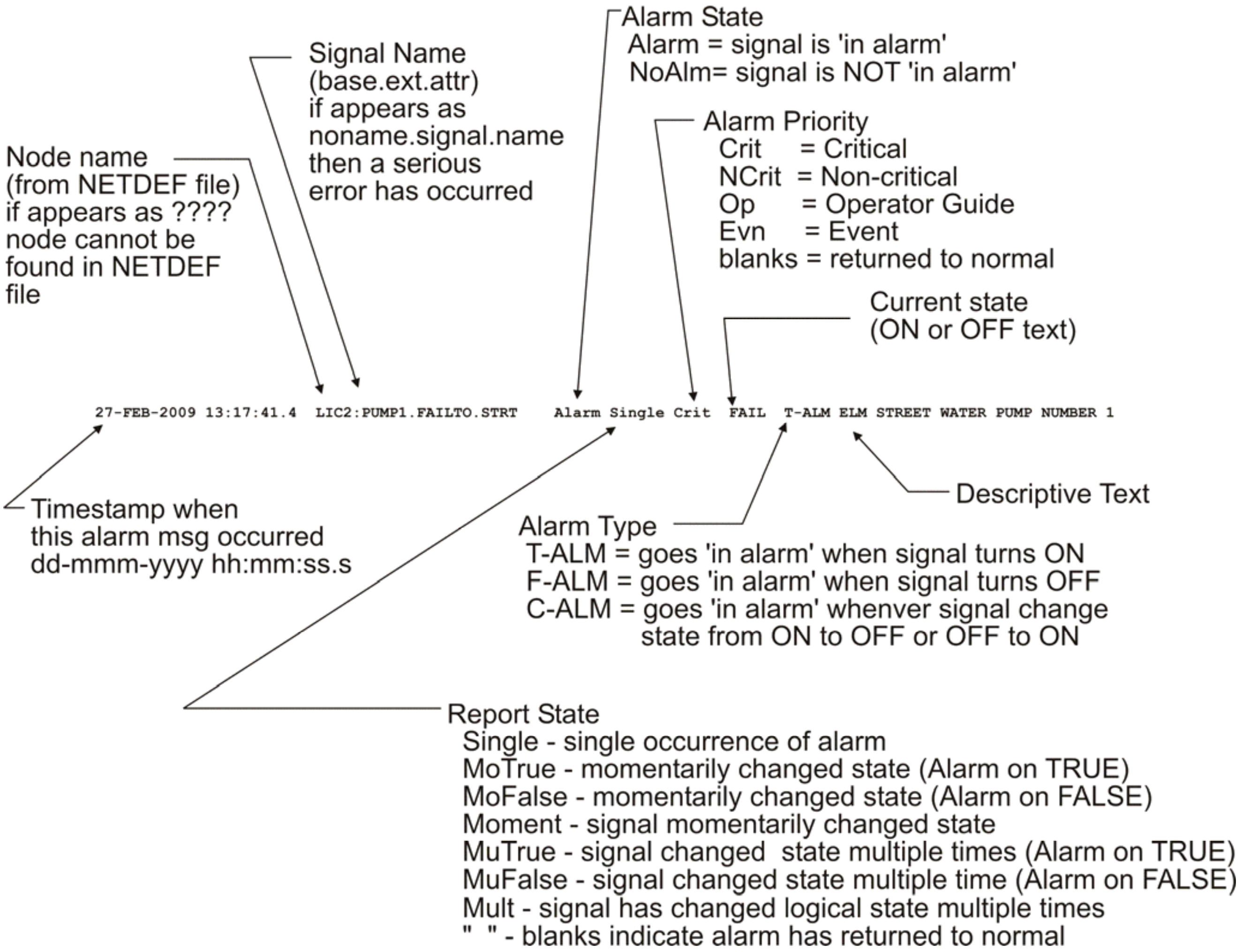

Alarm State
Alarm = signal is 'in alarm'
NoAlm= signal is NOT 'in alarm'
Signal Name
(base.ext.attr)
if appears as
noname.signal.name
then a serious
error has occurred
Alarm Priority
Crit = Critical
NCrit = Non-critical
Op = Operator Guide
Evn = Event
blanks = returned to normal
Node name
(from NETDEF file)
if appears as ????
node cannot be
found in NETDEF
file
Current state
(ON or OFF text)
27-FEB-2009 13:17:41.4 LIC2:PUMP1.FAILTO.STRT Alarm Single Crit FAIL T-ALM ELM STREET WATER PUMP NUMBER 1
Descriptive Text
Timestamp when
this alarm msg occurred
dd-mmm-yyyy hh:mm:ss.s
Alarm Type
T-ALM = goes 'in alarm' when signal turns ON
F-ALM = goes 'in alarm' when signal turns OFF
C-ALM = goes 'in alarm' whenver signal change
state from ON to OFF or OFF to ON
Report State
Single - single occurrence of alarm
MoTrue - momentarily changed state (Alarm on TRUE)
MoFalse - momentarily changed state (Alarm on FALSE)
Moment - signal momentarily changed state
MuTrue - signal changed state multiple times (Alarm on TRUE)
MuFalse - signal changed state multiple time (Alarm on FALSE)
Mult - signal has changed logical state multiple times
" " - blanks indicate alarm has returned to normal

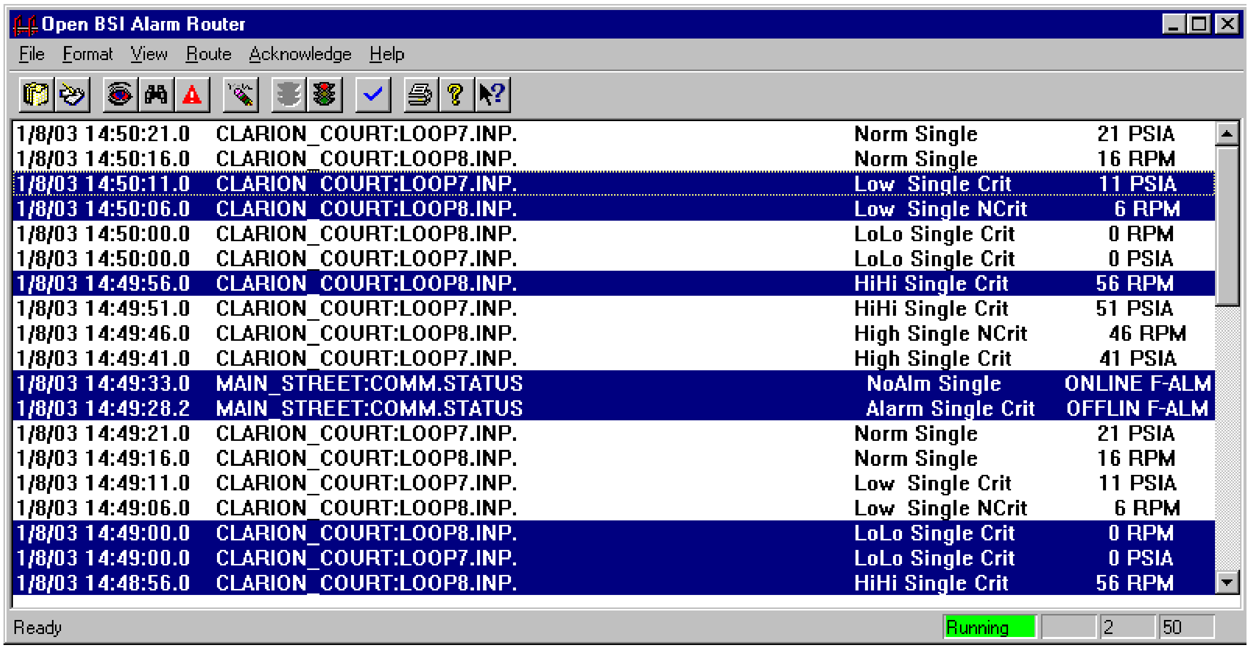
Figure 11-14. Logical Alarm Format

11.5.1 Acknowledging Selected Alarms in the Alarm Window

Before you can do any alarm acknowledgment through Alarm Router, you must sign on, in NetView, with either Engineer or Administrator privileges. Otherwise, you cannot acknowledge alarms.

Selecting the Alarms

To select a single alarm, click on the alarm in the Alarm Window. To select multiple alarms, hold down the **[Ctrl]** key, and click on each alarm you want to select. If there are multiple alarms which are contiguous, drag the mouse to highlight them.



```
1/8/03 14:50:21.0   CLARION_COURT:LOOP7.INP.        Norm Single          21 PSIA
1/8/03 14:50:16.0   CLARION_COURT:LOOP8.INP.        Norm Single          16 RPM
1/8/03 14:50:11.0   CLARION_COURT:LOOP7.INP.        Low  Single Crit     11 PSIA
1/8/03 14:50:06.0   CLARION_COURT:LOOP8.INP.        Low  Single NCrit     6 RPM
1/8/03 14:50:00.0   CLARION_COURT:LOOP8.INP.        LoLo Single Crit      0 RPM
1/8/03 14:50:00.0   CLARION_COURT:LOOP7.INP.        LoLo Single Crit      0 PSIA
1/8/03 14:49:56.0   CLARION_COURT:LOOP8.INP.        HiHi Single Crit     56 RPM
1/8/03 14:49:51.0   CLARION_COURT:LOOP7.INP.        HiHi Single Crit     51 PSIA
1/8/03 14:49:46.0   CLARION_COURT:LOOP8.INP.        High Single NCrit     46 RPM
1/8/03 14:49:41.0   CLARION_COURT:LOOP7.INP.        High Single Crit     41 PSIA
1/8/03 14:49:33.0   MAIN_STREET:COMM.STATUS          NoAlm Single     ONLINE F-ALM
1/8/03 14:49:28.2   MAIN_STREET:COMM.STATUS          Alarm Single Crit OFFLIN F-ALM
1/8/03 14:49:21.0   CLARION_COURT:LOOP7.INP.        Norm Single          21 PSIA
1/8/03 14:49:16.0   CLARION_COURT:LOOP8.INP.        Norm Single          16 RPM
1/8/03 14:49:11.0   CLARION_COURT:LOOP7.INP.        Low  Single Crit     11 PSIA
1/8/03 14:49:06.0   CLARION_COURT:LOOP8.INP.        Low  Single NCrit     6 RPM
1/8/03 14:49:00.0   CLARION_COURT:LOOP8.INP.        LoLo Single Crit      0 RPM
1/8/03 14:49:00.0   CLARION_COURT:LOOP7.INP.        LoLo Single Crit      0 PSIA
1/8/03 14:48:56.0   CLARION_COURT:LOOP8.INP.        HiHi Single Crit     56 RPM
```

Figure 11-15. Selecting Alarms

Acknowledging all of the Alarms You Select

To acknowledge the currently selected alarms, click the **Ack Selected Alarms** icon, or click **Acknowledge>Selected**.

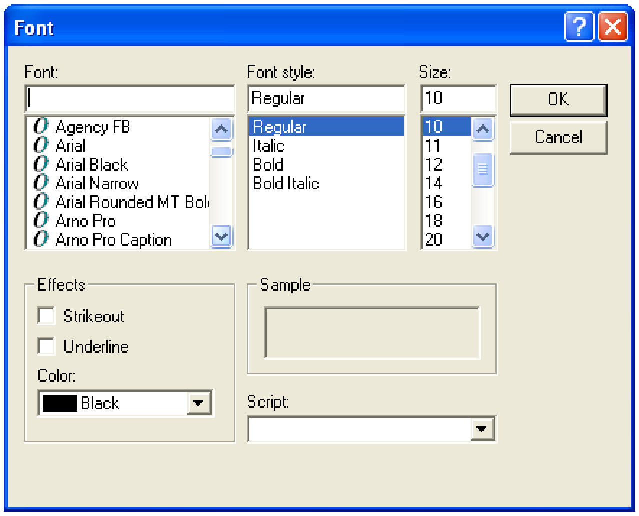
✓

The Monitor Window (not the Alarm Window) displays a message confirming the acknowledgment for alarms from a particular RTU.

Note: Alarm processing need not be active in order to perform acknowledgments.

11.5.2 Changing the Font Used in the Alarm, Error, and Monitor Windows

You can change the font, point size, etc. of data appearing in the Alarm, Error, and Monitor windows for the current session by clicking **Format>Font**. Make your selections and click **OK** when finished.

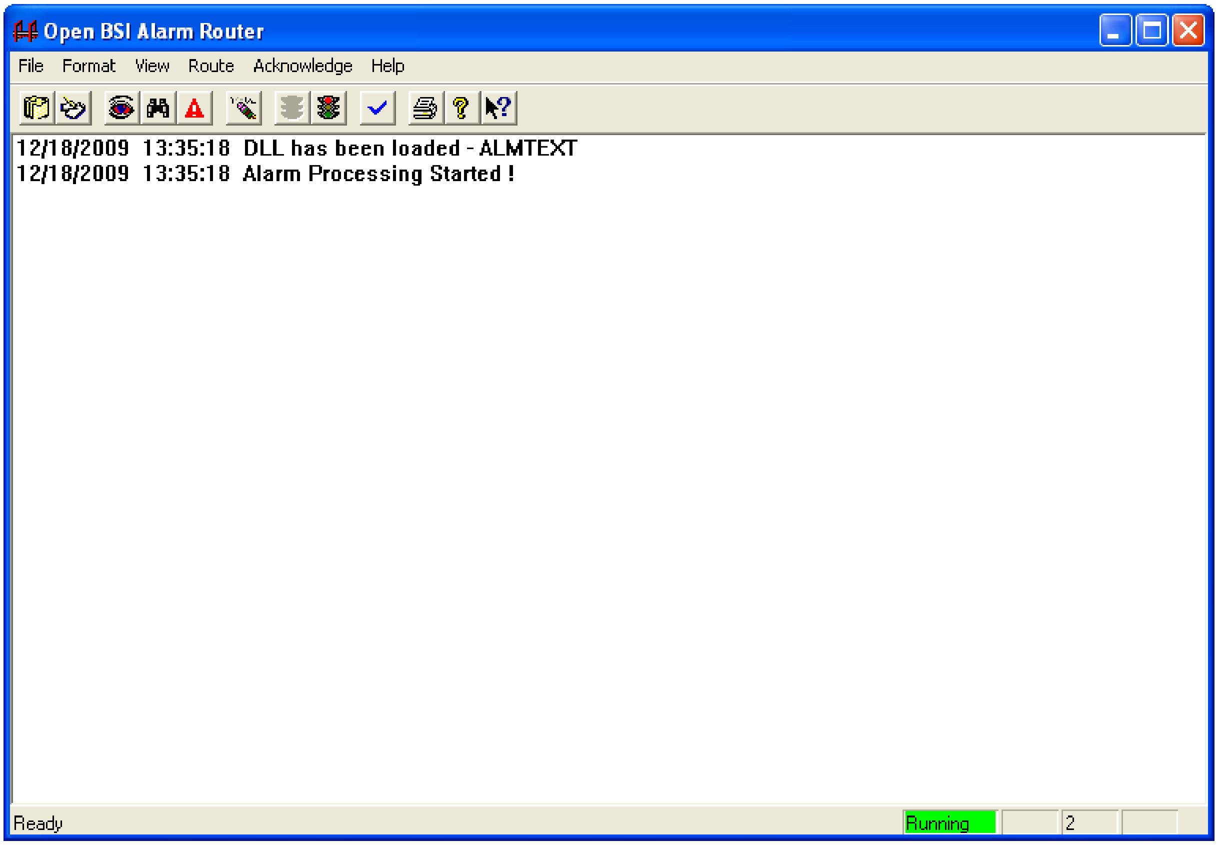


Font style: Regular
Size: 10
Color: Black

Figure 11-16. Font dialog box

11.6 Viewing Status Messages in the Monitor Window

The Monitor Window displays status information about the operation of the Alarm Router. To open the Monitor Window, click the **View Monitor Window** icon, -or- click **View>Monitor Window**. The Monitor Window opens:



```
12/18/2009  13:35:18  DLL has been loaded - ALMTEXT
12/18/2009  13:35:18  Alarm Processing Started !
```

Figure 11-17. Alarm Router Monitor Window

Older status messages appear at the top of the window; newer ones appear towards the bottom. Each message is preceded by a timestamp showing when it was initially sent.

The **Monitor Window Size** parameter in the Alarm Router Configuration Setup dialog box determines the number of status messages appearing in the window.

11.6.1 List of Monitor Window Status Messages and Their Meanings

Status Message:	**Meaning:**
Alarm Processing Started!	The Alarm Router is active and ready to export alarm data using configured DLLs.
Alarm Processing Stopped!	All export of alarm data is stopped.
Alarms were successfully acknowledged at node *nodename*.	One or more alarms from RTU *nodename* were acknowledged.
DLL added to the configuration list - *DLLname*	A DLL has been added to the **Configured DLLs** list box in the Alarm Router Configuration Setup dialog box.
DLL has been loaded - *DLLname*	Alarm processing is beginning using this DLL.
DLL has been unloaded - *DLLname*	Alarm processing using this DLL is being stopped.
DLL removed from configuration list - *DLLname*	A DLL has been removed from the **Configured DLLs** list box in the Alarm Router Configuration Setup dialog box.
Error Informing Driver to Stop Routing Alarms! Process is Continuing to Shutdown.	Alarm processing is being stopped, and an error has occurred. Alarm processing will still be stopped.
An error occurred sending an alarm ack message to node *nodename*.	An alarm at RTU *nodename* could not be acknowledged due to either the RTU, or the top-level RTU for this part of the network, being off-line.
The Error Window is Full! Please Clear It.	There are more errors than can fit in the Error Window. Review the errors, then clear errors as described under *Clearing Errors From the Error Window.*
Invalid node name encountered while acking alarms. Node = *nodename*	Alarms cannot be acknowledged from RTU *nodename* because the node routing table (NRT) at the RTU and at the PC are inconsistent (Node Routing Table mismatch).
A load version error occurred while acking alarms at node *nodename*.	A load version mismatch has occurred between the alarm being acknowledged and the ACCOL load at RTU *nodename*. This may occur if a new ACCOL load was downloaded at the RTU, and the alarm being acknowledged was from the previous load version.

Status Message:	Meaning:
Max attempts to write to DLL exceeded - *DLLname.* Check file FAILURE.ALM for unprocessed alarms.	The number of attempts to export using the named DLL has exceeded the **Error Correction Attempts** value in the Alarm Router Configuration Setup dialog box. This DLL will be disabled, and the unprocessed alarms will be stored in the file FAILURE.ALM.
No Dll's configured for export!!! Alarm Router Stopping!	This error occurs if *all* DLLs have been disabled because of export errors. Alarm processing will cease.
Number of unprocessed alarms for DLL has been exceeded - *DLLname*. Check file FAILURE.ALM for unprocessed alarms.	The number of unprocessed alarms has exceeded the **Max Unprocessed Alarms** value specified in the Alarm Router Configuration Setup dialog box. This DLL will be disabled, and the unprocessed alarms will be stored in the file FAILURE.ALM.
On-line reconfiguration of DLL has taken place - *DLLname*	A change has been made in the configuration of this DLL.
A timeout occurred while acknowledging alarms at node *nodename*.	One or more messages indicating the acceptance of the operator alarm acknowledgment from RTU *nodename* have not been received within the expected time period.

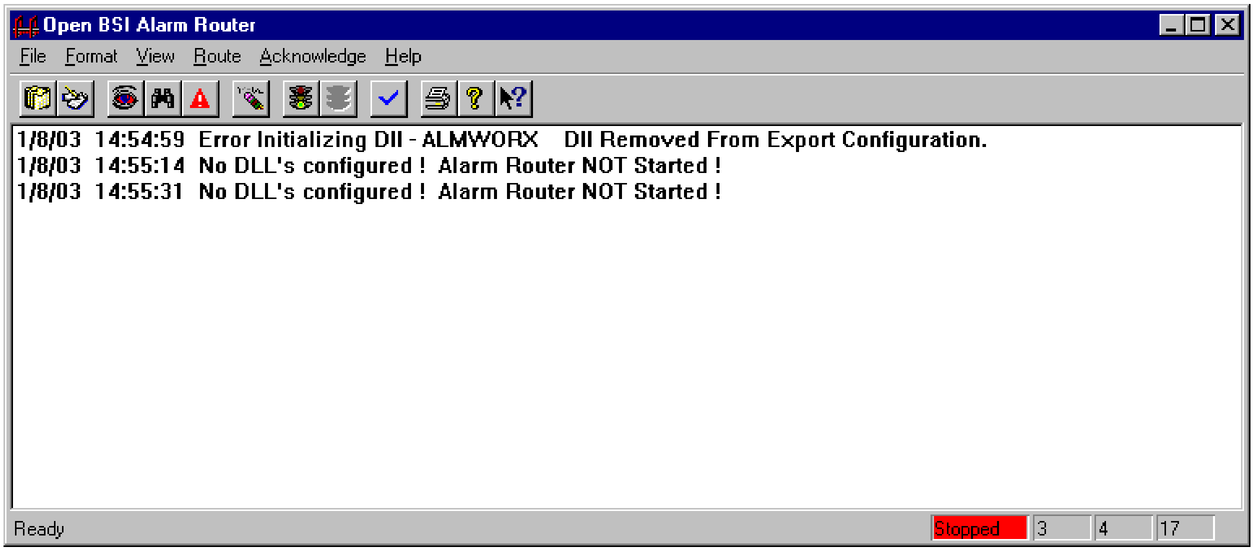
11.7 Viewing Error Messages in the Error Window

To call up the Error Window, click the **View Error Window** icon, shown at left, -or- click **View**>**Error Window**. The Error Window opens. The Error Window displays error messages concerning operation of the alarm export DLLs.

If the number of pending error messages is too large to display in the window, as currently configured, the error message total shown in the status bar appears in RED.

Errors are **not** deleted, until the operator explicitly clears the errors in the window. Once the error window is cleared, errors which have not yet been viewed will begin to appear in the window. The size of the Error Window (number of errors which can be displayed) is determined by the **Error History Buffer Size** parameter in the Alarm Router Configuration Setup dialog box.

All error messages are preceded by a timestamp showing when they occurred.



```
1/8/03  14:54:59  Error Initializing Dll - ALMWORX    Dll Removed From Export Configuration.
1/8/03  14:55:14  No DLL's configured !  Alarm Router NOT Started !
1/8/03  14:55:31  No DLL's configured !  Alarm Router NOT Started !
```

Ready | Stopped | 3 | 4 | 17

Figure 11-18. Alarm Router Error Window

11.7.1 Clearing Errors from the Error Window

You should only clear errors from the window after you view them, and take any appropriate action to correct them. To clear them, and thereby free up space in the window, click the **Clear Error Window** icon, shown above, *-or-* click **View>Reset Error Log**.

11.7.2 List of Error Messages and Their Meanings

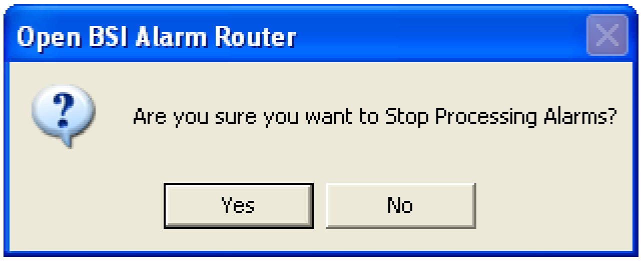
Error Message:	**Meaning:**
DLL NOT FOUND – *DLLName*	When Alarm Router attempted to activate the DLL specified in the **Configured DLLs** list box, it could not find it.
Error Informing Driver to Stop Routing Alarms! Process is Continuing to Shutdown.	Alarm processing is being stopped, and an error has occurred. Alarm processing will still be stopped.
Error Initializing Alarm Routing Task!	The Alarm Router encountered difficulty starting alarm processing.
Error Initializing DLL - *DLLName* DLL removed from Export Configuration.	The Alarm Router encountered difficulty starting a particular DLL, and so it must disable it, by removing it from the **Configured DLLs** list box.
Error Loading DLL - *DLLName*. Missing DLL function.	The DLL named (generally a user-supplied DLL) does not have all necessary functions, and so cannot be used.

11.8 Starting Alarm Processing

Alarm processing starts automatically when the Alarm Router starts. If you stop alarm processing, however, in order to change configuration parameters, you must re-start alarm processing as follows: Click the **Start Alarm Process** icon, *-or-* click **Route>Start**.

11.9 Stopping Alarm Processing

To stop alarm processing, click the **Stop Alarm Process** icon, *-or-* click **Route>Stop**. Alarm Router prompts you to confirm that you want to stop alarm processing. Click **Yes**. The Alarm Router ceases all collection and export of alarm data until alarm processing is re-started.



Open BSI Alarm Router

Are you sure you want to Stop Processing Alarms?

Figure 11-19. Prompt to Stop Alarm Processing

11.10 Printing Entries in Alarm Router Windows

To print textual entries from the currently active window (Alarm Window, Error Window, or Monitor Window) click the **Print Window** icon, shown at left.

11.11 Shutting Down the Alarm Router

The exit from the Alarm Router, click **File>Exit**.

11.12 Editing the Configuration Files

You can edit Alarm Router Configuration files directly using any ASCII text editor, as an alternative to entering information in dialog boxes. All configuration files reside in the C:\WINDOWS directory.

11.12.1 ALARMRTR.INI File

Alarm Router has a configuration file to define its configuration parameters, and to list which DLLs are configured. A typical file, with notes added in *italics*, appears below:

```
[PARAMETER_SECTION]
Error_Window=25     see Error History Buffer Size
Event_Window=25   see Monitor Window Size
Alarm_Window=50   see Alarm Window Size
Timer_Interval=5  see Error Timer Interval
Error_Retries=3     see Error Correction Attempts
Queue_Size=20       see Max Unprocessed Alarms
[DLL_SECTION]
DLL0=ALMTEXT      name of DLL
DLL1=ALMWORX      name of DLL

[EXPORT_SECTION]
EXPORT0=0
```

Figure 11-20. ALARMRTR.INI File

11.12.2 ALMTEXT.INI File

This file defines the file name and path for the alarm text data exported using the ALMTEXT DLL.

```
[CONFIGURATION_SECTION]
File_Option=APPEND      value can be either APPEND or NEW
Path_Name=C:\ProgramData\Bristol\OPENBSI
                        path where file containing alarm
                        data should be stored
File_Name=ALMTEXT.ALM   name of the file containing the
                        alarm data
```

Figure 11-21. ALMTEXT.INI File

11.12.3 ALMWRX.INI File

This file defines the parameters for the ALMWORX DLL. This includes:

- ∀the location and name of the Iconics AlarmWorX+ executable file.

- ∀whether AlarmWorX+ should shut down when Alarm Router shuts down.
- ∀the DDE parameters to allow communication between Alarm Router and Iconics AlarmWorX+.
- ∀the path and file name where unprocessed alarms are stored if the DDE link between Alarm Router and AlarmWorX+ is broken, or if AlarmWorX+ is accidentally shutdown.

The file appears as follows:

```
[CONFIGURATION_SECTION]
Path_Name=C:\GENESIS\ALMWORXP\
Exe_Name=AlmWorxP.exe
Stop_ON_Exit=TRUE

[DDECONFIG_SECTION]
Mux_Server=ALARMRTR
Mux_Topic=AlmWorxMuxTopic
Mux_Item=AlmWorxMuxItem
Item_Delimeter==

[FILE_SECTION]
Path_Name=C:\ProgramData\Bristol\OpenBSI
File_Name=AlmWorx.ALM
File_Option=APPEND
```

Figure 11-22. ALMWRX.INI File

11.13 Program Messages

The following is a list of program messages which appear in Alarm Router message boxes:

Program Message:	**Meaning:**
Alarm Handler has Already been Initialized. Process is Exiting!	This occurs if Alarm Router is running, and you accidentally try to start another copy of Alarm Router. Only one copy can be running at any one time, so the new attempt to start will be abandoned.
Are you sure you want to Stop Processing Alarms? Yes/No	This is to confirm that you truly want to shut down alarm processing, and did not accidentally try to shut it down.
Cannot Load DLL! DLL Not	When Alarm Router attempted to

Program Message:	**Meaning:**
Found - *name*	activate the DLL specified in the **Configured DLLs** list box, it could not find it.
Closing the Application will Stop Alarm Routing! Proceed anyway? Yes/No	This is to confirm that you truly want to exit the Alarm Router and shut down alarm processing.
DLL is already configured!	This occurs if you attempt to add a DLL which already exists in the **Configured DLLs** list box.
DLL is Currently Configured and CANNOT be Removed! Remove from the Configuration List and try again.	This occurs if you attempt to remove a DLL from the **Available DLLs** list box which already exists in the **Configured DLLs** list box. You must first remove the DLL from the **Configured DLLs** list box.
Error Informing Driver to Stop Routing Alarms! -*status* Process is Continuing to Shutdown.	Alarm processing is being stopped, and an error has occurred. Alarm processing will still be stopped.
Error Initializing Alarm Routing Task! *status*	The Alarm Router encountered difficulty starting alarm processing
Error Loading DLL! Missing DLL Function - *function name*	The DLL named (generally a user-supplied DLL) does not have all necessary functions, and so cannot be used.
Error Removing DLL from list. Name not found!	This error occurs if you attempt to remove a DLL name from the **Available DLLs** list box which doesn't appear in it.
Error Returned from DLL Initialize function! DLL Removed from Configuration - *name*	The Alarm Router encountered difficulty starting a particular DLL, and so it must disable it, by removing it from the **Configured DLLs** list box.
Error Returned from DLL (Start/Stop) Function! DLL Removed from Configuration - *name*	An error occurred while attempting to start or stop the named DLL. Alarm Router must disable it, by removing it from the **Configured DLLs** list box.
Failed to Initialize Communications. Process Exiting with Status -*xx*	This message occurs if you attempt to start Alarm Router when OpenBSI communications have not yet been established. Start OpenBSI communications using NetView prior to starting Alarm Router.
No DLL's configured! Alarm Router NOT Started!	This error occurs if *all* DLLs have been disabled because of export errors. Alarm processing ceases.
Remove all DLLs from the list of configured DLLs? Yes/No	This message requires you to confirm that all DLLs should be removed from the **Configured DLLs** list box.

Chapter 12 – Using the Signal Extractor

The Signal Extractor takes signal / variable names from a control strategy file, and generates an ASCII file that can be used to generate a database.

In This Chapter

For ControlWave process automation controllers, the Signal Extractor reads an MWT file (*.MWT), and generates an ASCII file from it, containing information about all variables marked as "OPC" in the variable declaration page(s), and optionally, all global variables if they have automatically been marked for "OPC". This ASCII file may be used to construct a database for a user-specific application.

Notes:

- In order for this to work, you must select the OPC option(s) in the RTU_Resource Settings which are accessible from the project tree of ControlWave Designer.
- You must also check **"Generate bootproject during compile"** otherwise, Signal Extractor will not write any signals to the output file.
- In versions of ControlWave Designer prior to 3.3, signals were marked as **"CSV"** instead of **"OPC."**

For Network 3000-series controllers, the Signal Extractor reads an ACCOL Object (*.ACO) file, and generates an ASCII text file from it. This ASCII file contains information about all global, alarm, and report by exception (RBE) signals defined in the ACO file, and may be used to construct a database, for a user-specific application.

12.1 Starting the Signal Extractor

Click **Start>Programs>OpenBSI Tools>Common Tools>Signal Extractor**. The Signal Extract Options dialog box opens.

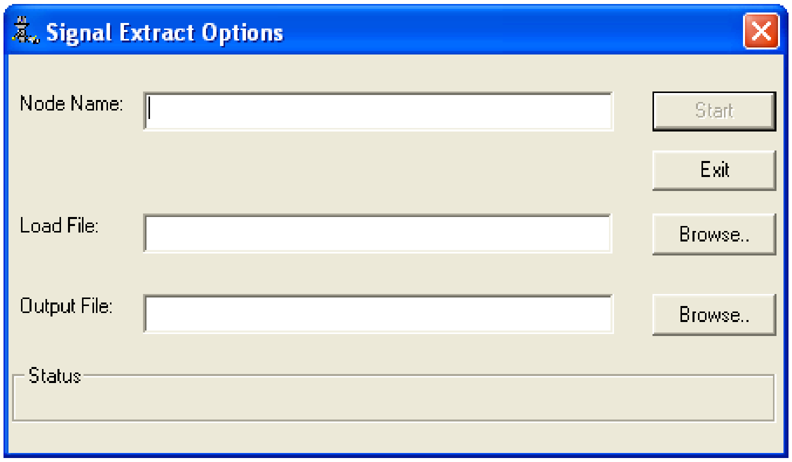
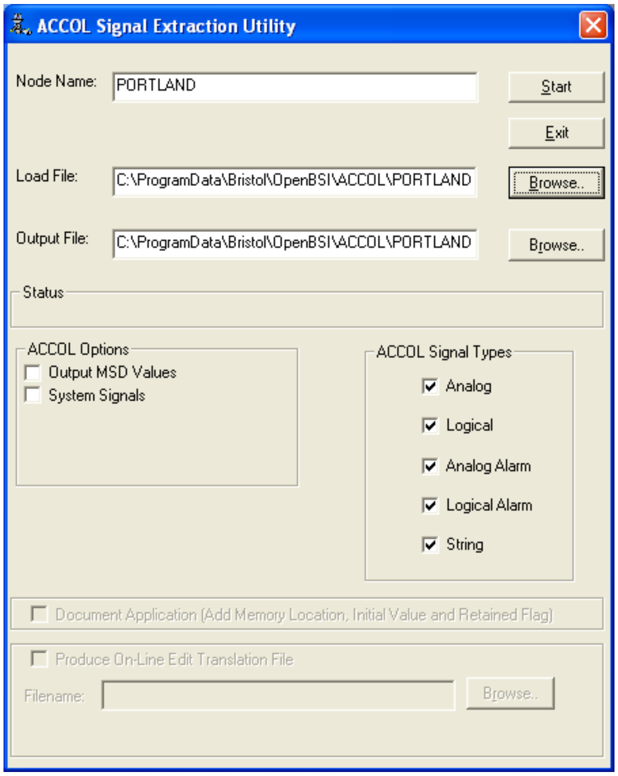


Figure 12-1. Signal Extract Options dialog box

Alternatively, in the NetView tree, *right*-click on an RTU for which you would like to perform signal extraction, and choose **RTU>Signal Extractor** from the pop-up menus.

Note: This method uses default choices for the signal extraction, so the dialog box only opens momentarily.

12.2 Signal Extract Options for Network 3000 Nodes



Node Name: PORTLAND

Load File: C:\ProgramData\Bristol\OpenBSI\ACCOL\PORTLAND

Output File: C:\ProgramData\Bristol\OpenBSI\ACCOL\PORTLAND

□ Output MSD Values
□ System Signals

☑ Analog
☑ Logical
☑ Analog Alarm
☑ Logical Alarm
☑ String

□ Document Application (Add Memory Location, Initial Value and Retained Flag)

□ Produce On-Line Edit Translation File

Figure 12-2. ACCOL Signal Extraction Utility

In the Signal Extract Options dialog box, enter the path and file name of the ACCOL object file to be read in the **Load File** field. Be sure to include the .ACO file extension. (Alternatively, click **Browse** to locate the file using the Open dialog box. When using this method, be sure to select “Accol object files (*.aco)” in the **Files of Type** list box.)

The dialog box enlarges to include additional fields, and the title bar now shows “ACCOL Signal Extraction Utility.”

By default, the **Output File** resides in the same directory as the ACCOL Object File, and shares the same file basename. You can optionally choose a different path and basename by typing it in, or using the **Browse** button. Output files must always have an extension of *.SIG.

Optionally, you can enter a node name in the **Node Name** field which is used to limit changes made using the SIGEXT.INI file to a single node. (See *Altered File Format* later in this chapter.)

Select **Output MSD Values** if you need MSD address information.

Note: MSD stands for Master Signal Directory. If you select **"Output MSD Values"**, the directory entry number for a given ACCOL signal will be included in the resulting *.SIG file insert text

Select **System Signals** if you want to include ACCOL system signals.

If you only want to extract certain types of signals, choose the desired signal types. The default is all signal types (analog, analog alarm, logical, logical alarm, and string).

Click **Start** to begin the signal extraction. The extracted data is stored in the file previously specified in the **Output File** field. The file includes descriptive information for all global, alarm, and RBE signals in the ACO file.

You can now proceed to perform *another* extraction from a different ACO file, or you can exit the Signal Extractor by clicking **Exit**.

12.2.1 Standard File Format – Network 3000 Series Controllers

The (*.SIG) file created by running Signal Extractor is in an ASCII format, and consists of a series of blocks. Each block consists of one or more of the standard file keywords. The keywords can be presented in any order, except that the “SIG” keyword must be the first in a block. The value of the keyword is separated from the keyword by an equals sign. The value itself is terminated by a space or end-of-line; unless the value starts with a double-quote character (") in which case the value is the characters inside the quotes (including any spaces). *Table 12-1* lists the various keywords:

Table 12-1. SIG File Keywords

Keyword:	**Value:**
SIG	Signal Name; less than or equal to 20 characters.
UNIT	Units text, in double quotes, if this is an analog or analog alarm signal. ON/OFF text in double quotes, if this a logical or logical alarm signal. (ON/OFF text is formatted as 6 characters of ON text, followed by a slash (/) and 6 characters of OFF text; both are padded with blanks, if necessary.)
RSEC	Read security level of this signal. (Integer value from 1 to 4.)
WSEC	Write security level of this signal. (Integer value from 1 to 4.)
MSD	The Master Signal Directory (MSD) address of this signal in the controller's memory. If you are using this value, be sure that you are using the correct MSDVER (appears at the top of the file).
DESCR	Base name descriptor text in double quotes.
TYPE	3 characters are used to specify the TYPE 1st Character: Signal Type (A=Analog; L=Logical) 2nd Character: A=Alarm; R=RBE 3rd Character: R=RBE (if second character is A)
LIST	Integer value. The Network Monitor list number which contains the signal. This is used to indicate data which will be collected by list.
LOFF	Integer value. The offset within the Network Monitor list for this signal. 1 is the first element in the list.

Example 1 – Standard Format

Figure 12-3 shows an example of a typical SIG file generated from an ACO file.

```
MSDVERS=664e

SIG=#DIAG.001.          TYPE=LA  RSEC=1 WSEC=4 MSD=01bc
UNIT="ON   /OFF   "

SIG=#LINE.000.          TYPE=LA  RSEC=1 WSEC=4 MSD=01bf
UNIT="ON   /OFF   "

SIG=#LINE.001.          TYPE=LA  RSEC=1 WSEC=4 MSD=01c2
UNIT="ON   /OFF   "

SIG=#LINE.002.          TYPE=LA  RSEC=1 WSEC=4 MSD=01c5
UNIT="ON   /OFF   "

SIG=#LINE.003.          TYPE=LA  RSEC=1 WSEC=4 MSD=01c8
UNIT="ON   /OFF   "

SIG=#LINE.004.          TYPE=LA  RSEC=1 WSEC=4 MSD=01cb
UNIT="ON   /OFF   "

SIG=#LINE.005.          TYPE=LA  RSEC=1 WSEC=4 MSD=01ce
UNIT="ON   /OFF   "

SIG=#LINE.006.          TYPE=LA  RSEC=1 WSEC=4 MSD=01d1
UNIT="ON   /OFF   "

SIG=#LINE.007.          TYPE=LA  RSEC=1 WSEC=4 MSD=01d4
UNIT="ON   /OFF   "

SIG=#LINE.008.          TYPE=LA  RSEC=1 WSEC=4 MSD=01d7
UNIT="ON   /OFF   "

SIG=#LINE.009.          TYPE=LA  RSEC=1 WSEC=4 MSD=01da
UNIT="ON   /OFF   "

SIG=#LINE.010.          TYPE=LA  RSEC=1 WSEC=4 MSD=01dd
UNIT="ON   /OFF   "

SIG=#LINE.011.          TYPE=LA  RSEC=1 WSEC=4 MSD=01e0
UNIT="ON   /OFF   "

SIG=#LINE.012.          TYPE=LA  RSEC=1 WSEC=4 MSD=01e3
UNIT="ON   /OFF   "
```

Figure 12-3. Standard ACCOL SIG File

12.2.2 Altered File Formats – Network 3000 / ControlWave

Other applications sometimes use the file created by the Signal Extractor to construct user-specific data bases of signal data. Depending upon how these applications work, it may be helpful to alter somewhat, the format of the file generated by the Signal Extractor. You can optionally do this by creating an ASCII file called SIGEXT.INI, which must reside in the same directory as the ACCOL or MWT files. The SIGEXT.INI file contains directives which initiate text substitutions within the file output by the Signal Extractor.

Table 12-2 shows the commands for textual substitutions in the SIGEXT.INI file:

Table 12-2 SIGEXT.INI Substitution Command Keywords

Command	Explanation
!	indicates the start of a comment in the SIGEXT.INI file.
[*node*]	indicates that the changes which follow apply only to the portion of the file for a given *node.* [*node*] serves as a “label” in the SIGEXT.INI file. You can select an individual *node* in the file for modification by specifying the *node* name in the **Node Name** field in the Signal Extract Options dialog box.
+sigtype add_text	indicates that all signals of type *sigtype* should have the text *add_text* added to their file entries. *sigtype* can be any of the types defined for the TYPE keyword.
-sigtype replace_text	indicates that all signals of type *sigtype* should have the text *add_text* (see above) removed from their file entries, and replaced with *replace_text.*

Example 2 – Altered File Format

Figure 12-4 shows an example of a SIG file that has been altered by the SIGEXT.INI file.

If the SIGEXT.INI file has the following entries:

```
     ! sample SIGEXT.INI file
     +AR POLLOFF=3
```

this will result in the text "POLLOFF=3" being added to all analog RBE signal entries.

In other words, an entry which would have been output as:

```
SIG=AIR.TEMP.  TYPE=AR RSEC=1 WSEC=3 UNIT="DEGF" DESCR="OUTSIDE
AIR TEMPERATURE”
```

will now be output as:

```
SIG=AIR.TEMP.  TYPE=AR RSEC=1 WSEC=3 UNIT="DEGF" DESCR="OUTSIDE
AIR TEMPERATURE" POLLOFF=3
```

Figure 12-4. Altered File Format

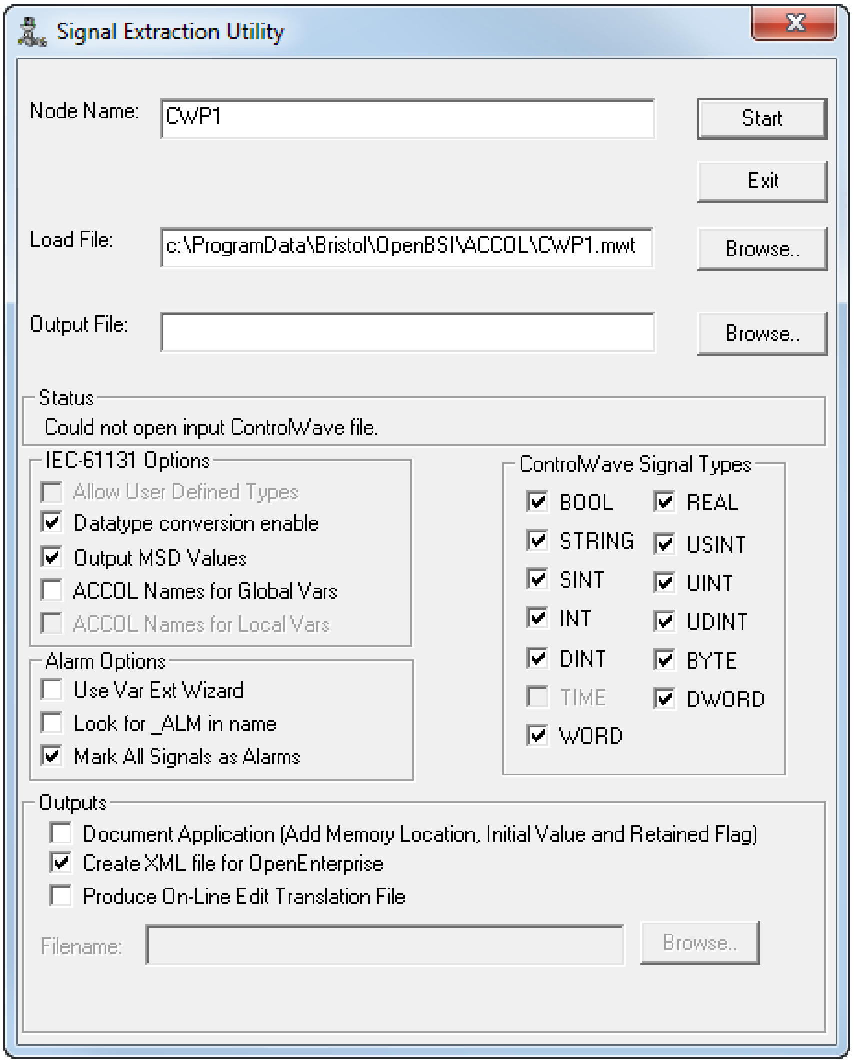
12.3 Signal Extract Options for ControlWave

In the Signal Extract Options dialog box, enter the path and file name of the MWT file to be read in the **Load File** field. Be sure to include the .MWT file extension. (Alternatively, click **Browse** to locate the file using the Open dialog box. When using this method, be sure to select MWT files (*.mwt) in the **Files of Type** list box.)

The dialog box enlarges to include additional fields, and the title bar now says “Signal Extraction Utility.”

By default, the **Output File** resides in the same directory as the MWT file, and shares the same file basename. You can optionally choose a different path and basename by typing it in, or by using the **Browse** button. Output files must always have an extension of *.SIG.

Optionally, you can enter a node name in the **Node Name** field which is used to limit changes made using the SIGEXT.INI file to a single node. (See *Section 12.2.2* for details.)



Signal Extraction Utility

Node Name: CWP1

Load File: c:\ProgramData\Bristol\OpenBSI\ACCOL\CWP1.mwt

Output File:

Status
Could not open input ControlWave file.

IEC-61131 Options
- ☐ Allow User Defined Types
- ☑ Datatype conversion enable
- ☑ Output MSD Values
- ☐ ACCOL Names for Global Vars
- ☐ ACCOL Names for Local Vars

Alarm Options
- ☐ Use Var Ext Wizard
- ☐ Look for _ALM in name
- ☑ Mark All Signals as Alarms

ControlWave Signal Types
- ☑ BOOL
- ☑ STRING
- ☑ SINT
- ☑ INT
- ☑ DINT
- ☐ TIME
- ☑ WORD
- ☑ REAL
- ☑ USINT
- ☑ UINT
- ☑ UDINT
- ☑ BYTE
- ☑ DWORD

Outputs
- ☐ Document Application (Add Memory Location, Initial Value and Retained Flag)
- ☑ Create XML file for OpenEnterprise
- ☐ Produce On-Line Edit Translation File

Filename:

Figure 12-5. Signal Extraction Utility

IEC-61131 Options:

Allow user defined types (NOT AVAILABLE - RESERVED FOR FUTURE USE)

By default, data types in the *.SIG file are those defined in the MWT file (BOOL, REAL, etc .) If you select **Datatype conversion enable**, however, Signal Extractor converts the data types to the standard data types used in *.SIG files for Network 3000 series controllers, e.g. analog (A), logical (L), and string (S).

Note: If you use OpenEnterprise, or a third-party package such as Intellution® FIX®, Iconics Genesis, etc., you MUST check the **Datatype conversion enable** box or the resulting *.SIG file will be incompatible.

Select **Output MSD Values** to include internal MSD memory addresses in the .SIG file. This is a default option. You must select **PDD** for each of these variables in ControlWave Designer for this to function.

If you select **ACCOL Names for Global Vars**, Signal Extractor converts all global ControlWave variable names (those beginning with @GV) to ACCOL-style signal names in the SIG file, by changing underscores "_" to periods ".", and system signal underscores to pound "#" signs.

If you select **ACCOL Names for Local Vars**, Signal Extractor converts all ControlWave variable names with instance names other than "@GV" to ACCOL-style signal names in the SIG file, by changing underscores "_" to periods ".", and system signal underscores to pound "#" signs.

Note: The variable name must you want to convert to ACCOL format must meet ACCOL signal name sizing requirements, or the Signal Extractor will not translate the variable.

Alarm Options:

If you choose the **Use Var Ext Wizard** Alarm option, the Signal Extractor looks for alarm definitions in the _VARDEFS.INI file.

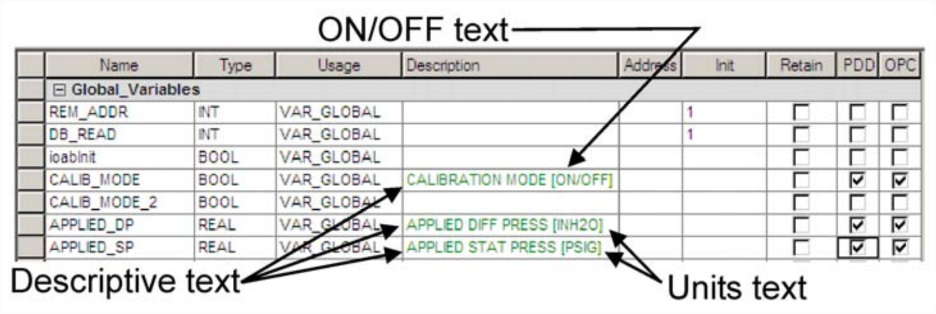
If you choose the **Look for _ALM in name** Alarm option, Signal Extractor automatically converts any variable name you create in ControlWave Designer which ends in the text "_ALM" to an alarm signal (AA or LA as appropriate).

If you choose the **Mark All Signals as Alarms** Alarm option (default), Signal Extractor converts all BOOL variables into logical alarms (LA) and all SINT, INT, DINT, WORD, REAL, USINT, UINT, UDINT, BYTE, and DWORD variables to analog alarms (AA).

Descriptive Text:

Signal descriptive text may be extracted from the **Description** field in ControlWave Designer's variable worksheets. Beginning with Open BSI 5.5, you can also include either units text or on/off text enclosed in square brackets [ ] within the **Description** field in ControlWave Designer. The units or on/off text will then be included in the .SIG file.

Note: For this to function, you must select **OPC** for these signals in ControlWave Designer.



Name	Type	Usage	Description	Address	Init	Retain	PDD	OPC
⊟ Global_Variables								
REM_ADDR	INT	VAR_GLOBAL			1	□	□	□
DB_READ	INT	VAR_GLOBAL			1	□	□	□
ioabInit	BOOL	VAR_GLOBAL				□	□	□
CALIB_MODE	BOOL	VAR_GLOBAL	CALIBRATION MODE [ON/OFF]			□	☑	☑
CALIB_MODE_2	BOOL	VAR_GLOBAL				□	□	□
APPLIED_DP	REAL	VAR_GLOBAL	APPLIED DIFF PRESS [INH2O]			□	☑	☑
APPLIED_SP	REAL	VAR_GLOBAL	APPLIED STAT PRESS [PSIG]			□	☑	☑

Figure 12-6. Setting Descriptive Text in ControlWave Designer

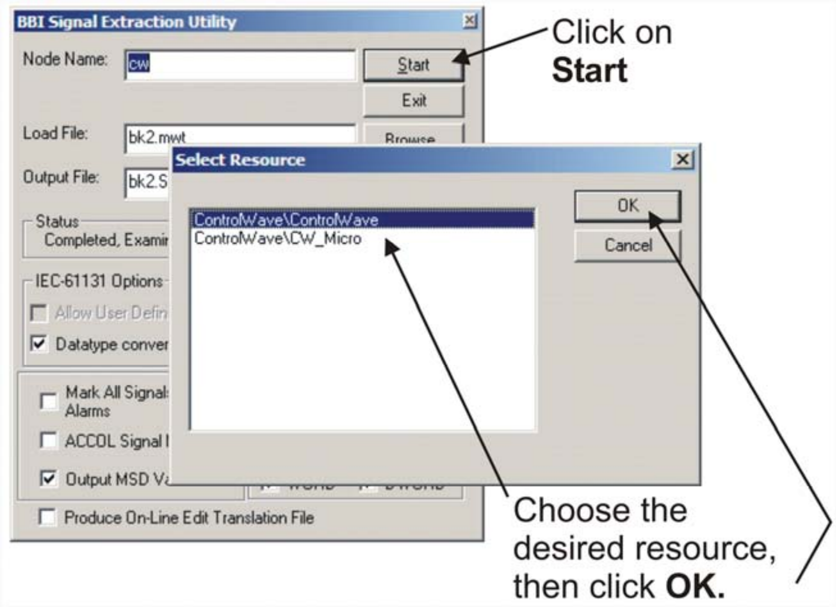
Note: If this is an alarm signal, alarm text defined in an ALARM function block or the Variable Extension Wizard takes precedence, and appears here instead of description information entered in ControlWave Designer.

If you only want to extract certain types of signals, choose the desired signal types. The default is all types (BOOL, STRING, SINT, INT, DINT, WORD, REAL, USINT, UINT, UDINT, BYTE, DWORD). **Note:**: The TIME type is currently unsupported.

If you want to add additional information to the SIG file that documents each signal’s memory address, initial value, and retain flag status, check the **Document Application** box. **Note:** Requires OpenBSI 5.8 Service Pack 1 and newer.

If you are using OpenEnterprise 3.1 (or newer) check **Create XML file for OpenEnterprise** to allow Signal Extractor to generate an RTU definition for this device in XML that can be incorporated into the OE database. **Note:** Requires OpenBSI 5.9 Service Pack 1 or newer.

If you plan on using the TechView program to perform on-line editing of lists, you can have the Signal Extractor create the required TRANSLATION.INI file automatically. To do this, check the **Produce On-Line Edit Translation File** box. The default filename is TRANSLATION.INI, though you can specify a different path and name using the **Browse** button and **Filename** field, if desired.



BBI Signal Extraction Utility

Node Name: cw

Load File: bk2.mwt

Output File: bk2.S

Status
Completed, Examir

IEC-61131 Options

□ Allow User Defin

☑ Datatype conver

□ Mark All Signal: Alarms

□ ACCOL Signal I

☑ Output MSD Va

□ Produce On-Line Edit Translation File

Select Resource

ControlWave\ControlWave
ControlWave\CW_Micro

Click on **Start**

Choose the desired resource, then click **OK.**

Figure 12-7. Selecting the Resource

Click **Start** to begin the extraction.

Note:: If you start Signal Extractor from the **Start > Programs** menu (not in NetView or from the command line) and there are multiple resources in your ControlWave project, for example, one for the standard ControlWave (IPC_40), and another for ControlWave Micro (ARM_L_40), Signal Extractor prompts you to select the resource for which you want the signals extracted and click **OK** to proceed (*Figure 12-7*). If Signal Extractor is started any other way, and there are multiple resources, Signal Extractor automatically chooses the *first* resource.

In either case, Signal Extractor stores the extracted data in the file previously specified in the **Output File** field. If both OPC options were selected in the RTU_Resource settings page of ControlWave Designer, the file includes descriptive information for all global variables, as well as all variables explicitly marked as **OPC** in the variable declaration page(s) of ControlWave Designer.

Note: Most users choose to select only those variables explicitly marked as **OPC** because choosing to automatically mark all global variables as **OPC** causes every global variable to be collected, including many variables which are unnecessary in your database.

You can now proceed to perform *another* extraction from a different MWT file, or you can exit the Signal Extractor by clicking **Exit**.

12.4 Standard File Format – ControlWave Controllers

The (*.SIG) file created by running Signal Extractor is in an ASCII format, and consists of a series of blocks. Each block consists of one or more of the standard file keywords. The keywords can be presented in any order, except that the "SIG" keyword must be the first in a block. The value of the keyword is separated from the keyword by an equals sign. The value itself is terminated by a space or end-of-line; unless the value starts with a double-quote character (") in which case the value is the characters inside the quotes (including any spaces.) The various keywords are described below:

Table 12-3. SIG File Keywords

Keyword:	Value:
SIG	Signal (Variable) Name; less than or equal to 63 characters. Global variables are proceeded by the text **"@GV.**" For example: **SIG=@GV.F101_TEMP** refers to a global variable named "F101_TEMP". Local variables are preceded by the instance name of the POU in which they are used, followed by a dot. For example: **SIG=Prog1.V003** refers to a local variable named "V003" in a POU instance called "Prog1".
RSEC	Read security level of this variable. This is always one.
WSEC	Write security level of this variable. This is always three.
TYPE	If you selected **Datatype conversion enable**, two characters specify the TYPE: 1st Character: Signal Type (A=Analog; L=Logical, S=String) 2nd Character: A=Alarm (does not apply to String). Otherwise, the data type presented is the same data type specified in the MWT file (BOOL, STRING, SINT, INT, DINT, WORD, REAL, USINT, UINT, UDINT, BYTE, DWORD).
DESCR	Signal description information, as entered in the **Description** field in ControlWave Designer. **NOTE:** If this is an alarm signal, alarm text defined in an ALARM function block or the Variable Extension Wizard takes precedence, and appears here instead of description information entered in ControlWave Designer.

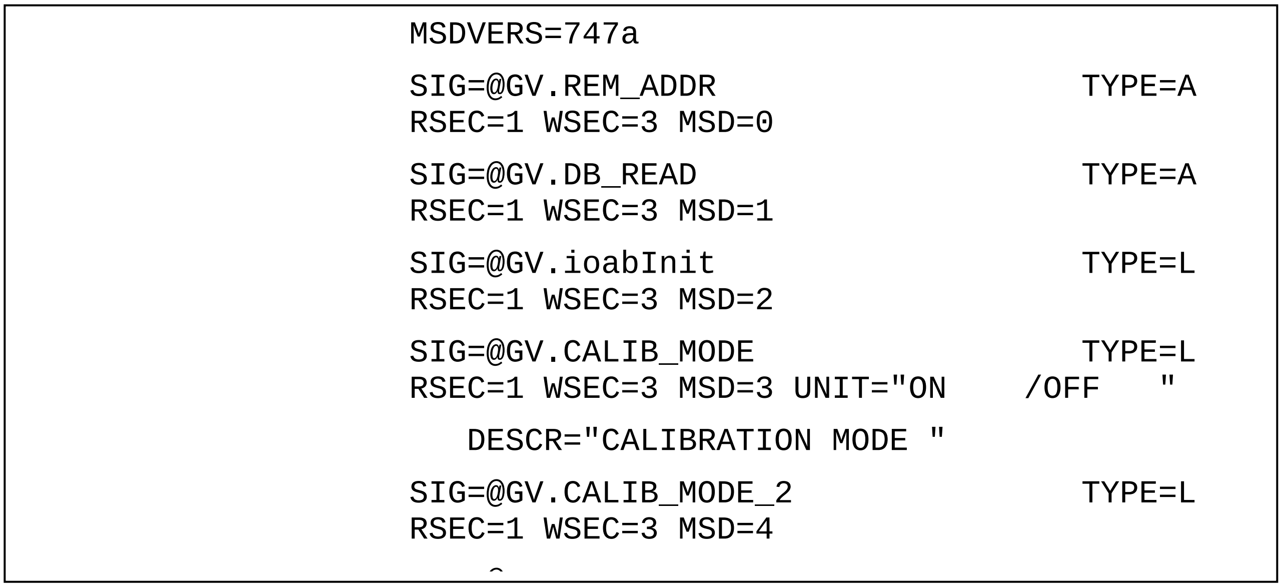
Keyword:	Value:
UNIT	Displays text taken from within square brackets of the **Description** field in ControlWave Designer. If this is a BOOL variable, ON/OFF text for the TRUE/FALSE status of the variable are included. If this is NOT a BOOL variable, engineering units are included.
MSD	The Master Signal Directory (MSD) memory address for this variable.
MemAddr	The memory location of this variable. (OpenBSI 5.8 Service Pack 1 and newer.) For an explanation of variable addresses, see the *Variables and Data Types* section of the *ControlWave Designer Programmer's Handbook* (D5125). Example: `MemAddr=MD 3.32`

InitVal	The initial value of this variable. (OpenBSI 5.8 Service Pack 1 and newer.)
	Examples:
	`InitVal= FALSE`
	`InitVal= 50`

Retain	If present shows that this is a retain variable. (OpenBSI 5.8 Service Pack 1 and newer.) Example: `Retain`

12.4.1 Example 1 - Standard Format

Figure 12-8 shows a typical SIG file generated from a ControlWave file.



```
MSDVERS=747a

SIG=@GV.REM_ADDR                   TYPE=A
RSEC=1 WSEC=3 MSD=0

SIG=@GV.DB_READ                    TYPE=A
RSEC=1 WSEC=3 MSD=1

SIG=@GV.ioabInit                   TYPE=L
RSEC=1 WSEC=3 MSD=2

SIG=@GV.CALIB_MODE                 TYPE=L
RSEC=1 WSEC=3 MSD=3 UNIT="ON    /OFF   "

   DESCR="CALIBRATION MODE "

SIG=@GV.CALIB_MODE_2               TYPE=L
RSEC=1 WSEC=3 MSD=4
```

Figure 12-8. ControlWave SIG File

12.5 Running Signal Extractor from the DOS Command Line

If desired, you can start Signal Extractor from the DOS command line using the following command. Items in brackets are optional, depending on usage.

Sigext *filename [rtu_name [resource_name]] [option(s)]*

Where

filename is the file basename of the ACO file, *or* the file basename and an MWT extension for a ControlWave file. If you include spaces in the *filename*, you must place quotation marks “ “ around *filename*.

rtu_name identifies the RTU for which the signal extraction is to be performed. (Requires Open BSI 5.7 Service Pack1 and newer.)

resource_name identifies the resource name (ControlWave only). If you specify a resource name, the RTU name must be present. (Requires Open BSI 5.7 Service Pack1 and newer.)

Options(s) is any of the following options, which may be entered as either an UPPER or lower case letter:

-a allow translation of @GV (global) instance names.

-i allow translation of instance names other than @GV to ACCOL II signal format. (Requires Open BSI 5.7 Service Pack1 and newer.)

-m include MSD addresses in the output file. (Used with ACO files only.)

-s include system signals in the output file. (Applies to ACO files only.)

-u look for the text “_ALM” at the end of a variable name to determine whether it is an alarm. (Requires Open BSI 5.7 Service Pack 1 and newer).

-v read the __VARDEFS.INI file, generated via the Variable Extension Wizard to determine which signals should be made alarms. (Requires Open BSI 5.7 Service Pack 1 and newer).

-x turn OFF the **Mark All Signals as alarms** option. This switch disables the default functionality. (Requires Open BSI 5.7 Service Pack 1 and newer.)

For example,

```
Sigext  LPC4  -m  -s
```

generates a SIG file from the file LPC4.ACO, and the SIG file would include both MSD addresses and system signals.

As another example,

```
Sigext  RPU3  -m
```

generates a SIG file from the file RPU3.ACO, and the SIG file would include MSD addresses.

Entering,

```
Sigext  RPC5.MWT
```

would generate a SIG file from the ControlWave file RPC5.MWT.

12.6 Troubleshooting Tips for Using Signal Extractor with ControlWave

Problem: ControlWave variable types come out as “L”, “LA”, “A”, “AA”, or “S” and I want to see “BOOL”, “REAL”, etc.

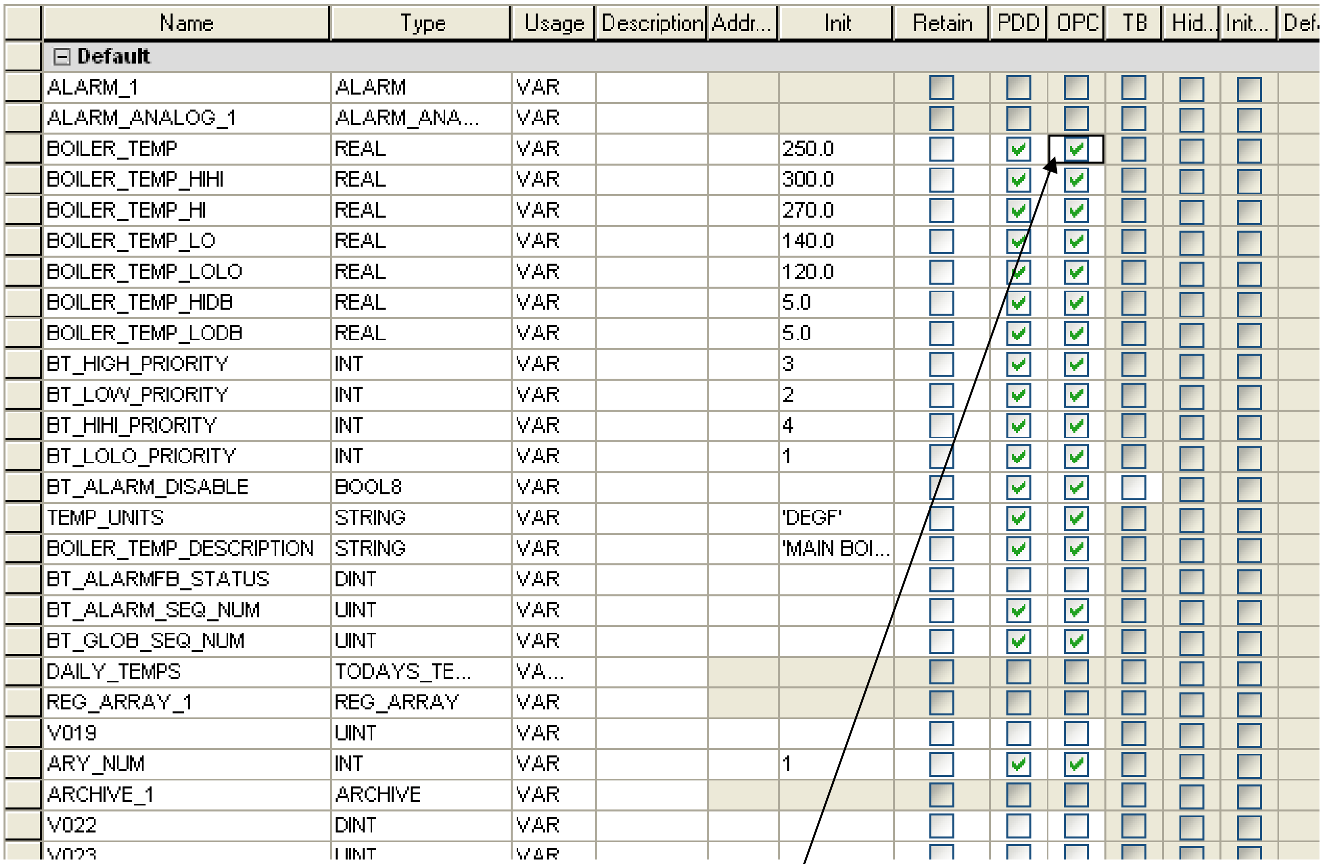
Answer: De-select **“Datatype conversion enable”** in the Signal Extraction Utility dialog box, and re-run Signal Extractor.

Problem: ControlWave variable types come out as “BOOL”, “REAL”, “INT”, etc. and I want to see “L”, “LA”, “A”, “AA”, or “S”.

Answer: Select **“Datatype conversion enable”** in the Signal Extraction Utility dialog box, and re-run Signal Extractor.

Problem: My resulting SIG file is empty. This happens for one of the following reasons.

Answer: None of your variables have been marked as **OPC**. Go back into ControlWave Designer and make sure you mark any variable you want to extract as **OPC**.



Name	Type	Usage	Description	Addr...	Init	Retain	PDD	OPC	TB	Hid...	Init...	Def...
⊟ **Default**												
ALARM_1	ALARM	VAR				□	□	□	□	□	□	
ALARM_ANALOG_1	ALARM_ANA...	VAR				□	□	□	□	□	□	
BOILER_TEMP	REAL	VAR			250.0	□	☑	☑	□	□	□	
BOILER_TEMP_HIHI	REAL	VAR			300.0	□	☑	☑	□	□	□	
BOILER_TEMP_HI	REAL	VAR			270.0	□	☑	☑	□	□	□	
BOILER_TEMP_LO	REAL	VAR			140.0	□	☑	☑	□	□	□	
BOILER_TEMP_LOLO	REAL	VAR			120.0	□	☑	☑	□	□	□	
BOILER_TEMP_HIDB	REAL	VAR			5.0	□	☑	☑	□	□	□	
BOILER_TEMP_LODB	REAL	VAR			5.0	□	☑	☑	□	□	□	
BT_HIGH_PRIORITY	INT	VAR			3	□	☑	☑	□	□	□	
BT_LOW_PRIORITY	INT	VAR			2	□	☑	☑	□	□	□	
BT_HIHI_PRIORITY	INT	VAR			4	□	☑	☑	□	□	□	
BT_LOLO_PRIORITY	INT	VAR			1	□	☑	☑	□	□	□	
BT_ALARM_DISABLE	BOOL8	VAR				□	☑	☑	□	□	□	
TEMP_UNITS	STRING	VAR			'DEGF'	□	☑	☑	□	□	□	
BOILER_TEMP_DESCRIPTION	STRING	VAR			'MAIN BOI...	□	☑	☑	□	□	□	
BT_ALARMFB_STATUS	DINT	VAR				□	□	□	□	□	□	
BT_ALARM_SEQ_NUM	UINT	VAR				□	☑	☑	□	□	□	
BT_GLOB_SEQ_NUM	UINT	VAR				□	☑	☑	□	□	□	
DAILY_TEMPS	TODAYS_TE...	VA...				□	□	□	□	□	□	
REG_ARRAY_1	REG_ARRAY	VAR				□	□	□	□	□	□	
V019	UINT	VAR				□	□	□	□	□	□	
ARY_NUM	INT	VAR			1	□	☑	☑	□	□	□	
ARCHIVE_1	ARCHIVE	VAR				□	□	□	□	□	□	
V022	DINT	VAR				□	□	□	□	□	□	
V023	UINT	VAR				□	□	□	□	□	□	

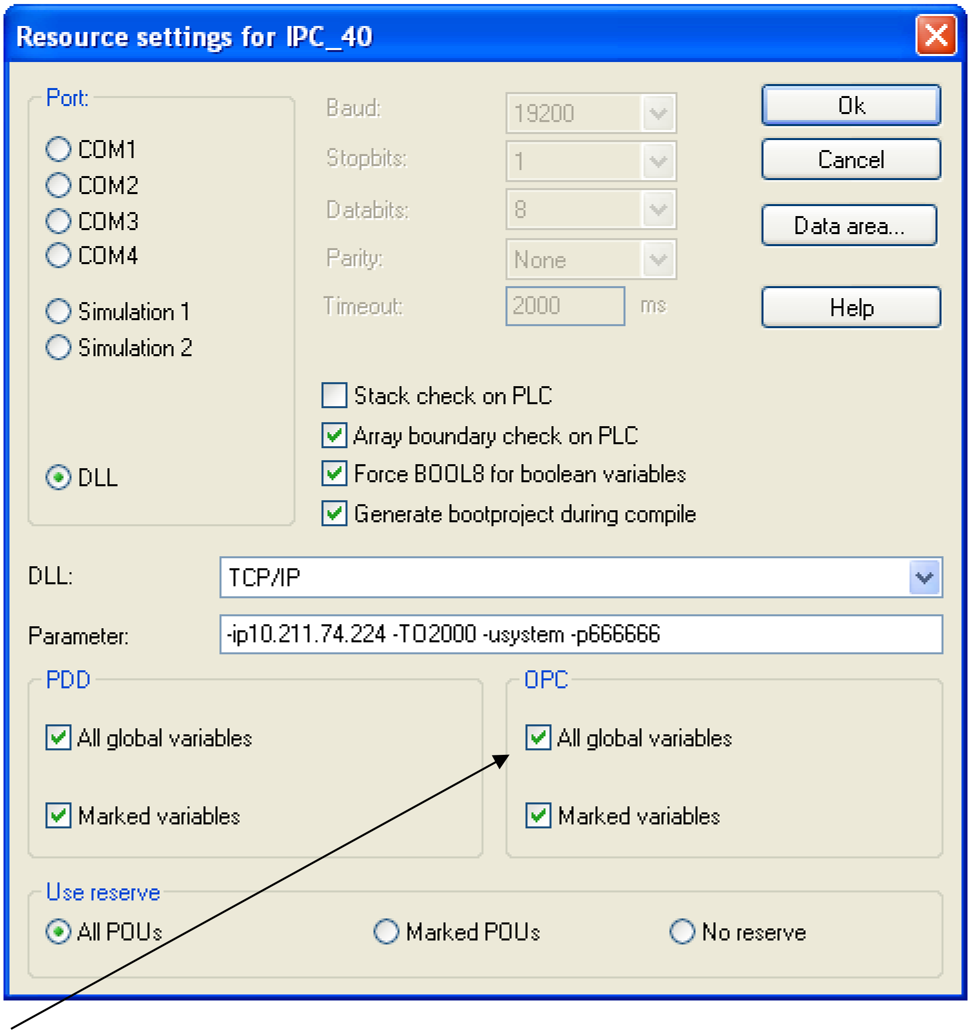
Use the check box in the “OPC” column to mark variables for collection by OPC.

Figure 12-9. Marking Variables for OPC Collection

Another possibility is that the RTU_RESOURCE settings are incorrect. You can change these settings by right-clicking on the RTU_RESOURCE item in the ControlWave Designer project tree, and choosing **Settings** from the pop-up menu.

Choosing **Marked variables** is the appropriate setting for most users.

You *could* choose **All global variables**, which *automatically* marks all global variables for OPC collection, however this can result in excessive amounts of data being collected into your *.SIG file, much of which is unnecessary.



Resource settings for IPC_40

Port:
○ COM1
○ COM2
○ COM3
○ COM4
○ Simulation 1
○ Simulation 2
● DLL

Baud: 19200
Stopbits: 1
Databits: 8
Parity: None
Timeout: 2000 ms

□ Stack check on PLC
☑ Array boundary check on PLC
☑ Force BOOL8 for boolean variables
☑ Generate bootproject during compile

DLL: TCP/IP
Parameter: -ip10.211.74.224 -TO2000 -usystem -p666666

PDD
☑ All global variables
☑ Marked variables

OPC
☑ All global variables
☑ Marked variables

Use reserve
● All POUs ○ Marked POUs ○ No reserve

Resource settings for OPC collection.

Figure 12-10. Resource Settings in ControlWave Designer

Chapter 13 – Using the Data Array Save / Restore Utility

The Data Array Save / Restore Utility allows you to collect data from selected data arrays in the remote process controller (RTU), and store it in disk file(s) at the OpenBSI Workstation.

In This Chapter

You can later retrieve the file for a particular array and restore the original array values from the file into the array at the RTU.

This capability can be useful in situations where an RTU is to be taken out of service, and you would like to save the state of selected arrays, and then restore them later when the controller is put back on-line.

Note: You cannot view the format of the disk file(s).

Starting the Data Array Save / Restore Utility

With OpenBSI communications active, click **Start>Programs>Common Tools> Data Array Utility.**

13.1 Saving the Contents of a Single Array to Disk

To save the contents (values) of a single data array to disk, you can use the “Single Method” portion of the Data Array Save / Restore dialog box.

1. Use the **Rtu** list box to select the RTU which contains the array you want to save, or simply type in the RTU node name.
2. Specify the **Type** of array you want to save (**analog** or **logical**).
3. Use the **Array** list box to select from the arrays in the RTU, or simply type in the array number. Note: In general, you should only save data from read-write data arrays; because read-only data array data CANNOT be restored because it is by definition, read-only.
4. If you don’t want to collect the entire array, specify the first row number you want to collect from in the **Row number to begin collecting from** field, otherwise leave “1” as the default to collect the entire array.

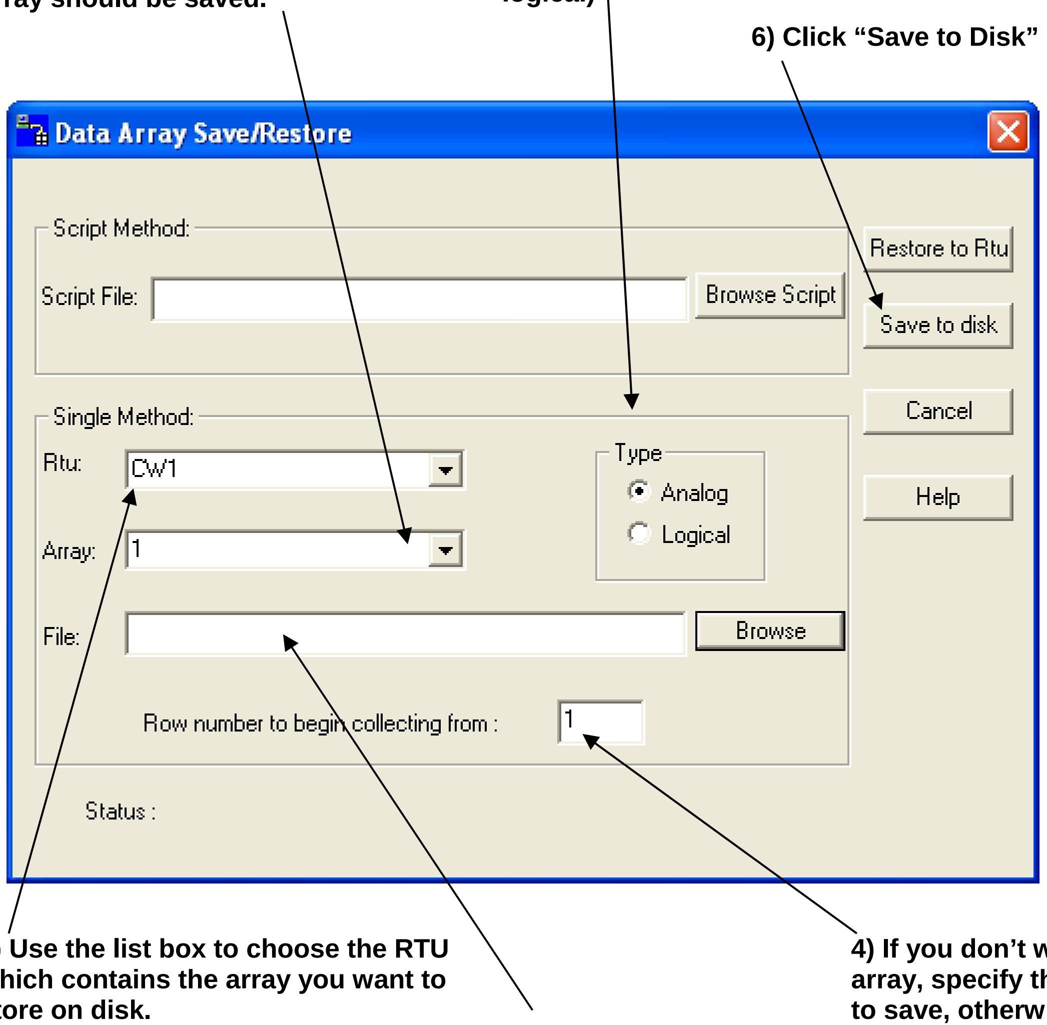
5. In the **File** field, specify the path and filename of the file which will hold the contents of the array. You must assign the filename an extension of ARR. If necessary, click **Browse** to search for the proper path.

6. Click **Save to disk** and the utility prompts you to sign on to the RTU. Once you successfully sign on, the utility saves the array contents in the specified file.

3) Use the list box to select which array should be saved.

2) Specify the type of array (analog or logical)

6) Click “Save to Disk”



Data Array Save/Restore

Script Method:

Script File:

Single Method:

Rtu: CW1

Array: 1

Type

● Analog

○ Logical

File:

Row number to begin collecting from : 1

Status :

1) Use the list box to choose the RTU which contains the array you want to store on disk.

5) Specify the path and filename which will hold the contents of the saved array. It must have an extension of .ARR. Use the “Browse” button, if necessary, to locate the correct path.

4) If you don’t want to save the entire array, specify the first row you want to save, otherwise, leave the default of 1.

Figure 13-1. Data Array Save/Restore Utility

13.2 Restoring the Values in a Single Array from a Previously Saved File

To restore a single array follow these steps:

1. Use the **Rtu** list box to select the RTU containing the array for which you want to restore values from a disk file.
2. Specify the **Type** of array you want to restore values to (analog or logical).
3. Use the **Array** list box to select from the arrays in the RTU, or simply type in the array number. Note: You can only restore to read-write arrays.
4. Ignore the **Row number to begin collecting from** field; it does not apply during the restore operation.
5. In the **File** field, specify the path and filename of the disk file which holds the array values to be restored to the RTU. The filename must have an extension of ARR. If necessary, click **Browse** to search for the proper path.
6. Click **Restore to Rtu** and the utility prompts you to sign-on to the RTU. Once you successfully sign on, the utility copies the array contents from the disk file into the specified array in the RTU.

13.3 Creating a Script File to Save Multiple Arrays from One or More RTUs

If you want to save more than one array at a time, you can create a script file to specify multiple array(s) and RTU(s).

13.3.1 Creating a Script File

The script file must have an extension of SCR, and must follow the format described on the next page.

```
[NODES]
RTU1=RTU_1
RTU2=RTU_2
  :
RTUn=RTU_n

[RTU_n]
Array1=array_1,<A / L>,filename_1,row_number
Array2=array_2,<A / L>,filename_2,row_number
  :
Arrayn=array_n,<A / L>,filename_n,row_number
```

where: *RTU_1 …*
RTU_n are controller (RTU) node names.

array_1 …
array_n identify data arrays to be saved / restored.

A indicates that this is an analog array.

L indicates that this is a logical array.

filename_1…
filename_n indicates the name of the ARR file.

row_number is the first row to be saved. By default this is 1. The utility ignores this field during restore operations.

Figure 13-2. Script File Syntax

For example, if you want to save the contents of logical array 2 and analog arrays 4 and 7 from an RTU called RPC5, and you also want to save the contents of analog array 62 from an RTU called RPC8, but you only want to save beginning with row 3, then you must create a script file similar to the one described, below:

```
[NODES]
RTU1=RPC5
RTU2=RPC8

[RPC5]
Array1=2, L, RPC5LAR2.ARR, 1
Array2=4, A, RPC5AAR4.ARR, 1
Array3=7, A, RPC5AAR7.ARR, 1

[RPC8]
Array1=62, A, RPC8LA62.ARR, 3
```

Figure 13-3. Example Script File

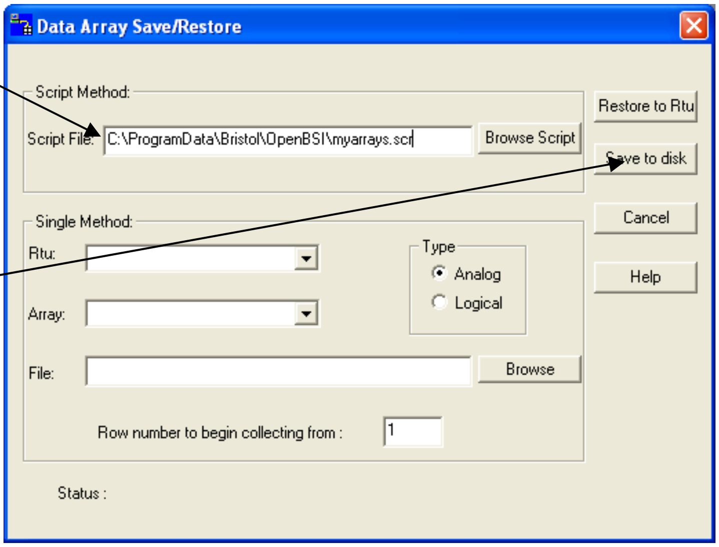
13.3.2 Executing the Script File to Save Multiple Arrays to Disk Files

Specify the path and filename of the script file (.SCR) you created previously. If necessary, click **Browse** to locate it.

Click **Save to disk** and the utility prompts you to sign on to the *first* of the specified RTUs. When you have successfully done so, the utility saves the arrays specified in the script file to disk files.

First, specify the path and filename of the script file you want to execute. It must have an extension of SCR. Use the "Browse" button if necessary to locate the correct path.

Next, click "Save to disk".



Script File: C:\ProgramData\Bristol\OpenBSI\myarrays.scr

Type: ● Analog ○ Logical

Row number to begin collecting from : 1

Figure 13-4. Running a Script File

13.4 Executing a Script to Restore Multiple Arrays from Previously Saved Disk Files

To restore the contents of multiple arrays which the utility previously saved on disk, specify the path and filename of the script file (.SCR) you want to execute. If necessary, click **Browse** to locate it.

Click **Restore to Rtu** and the utility prompts you to sign on to the *first* of the specified RTUs. When you successfully sign on, the utility executes the script file restores the array data, previously saved in disk files, to the corresponding arrays in the RTUs.

13.5 Running a Script from the Command Line

If desired, you can start the Data Array Save/Restore utility from the command line. The syntax for command line operation is:

darryutl *scriptname*.scr *mode* *username* *password*

where:

scriptname is the name of your script file. If you include spaces in the *scriptname*, you must place quotation marks " " around *scriptname*.

mode is either **SAVE** to save one or more arrays to disk or **RESTORE** to restore one or more arrays to the RTU.

username is a valid user name defined in the RTU

password is a valid password associated with the *username* entered above.

For example:

```
darryutl myscript.scr SAVE bob 12345678
```

```
darryutl script4.scr RESTORE cindy asdflmpa
```

Chapter 14– Using the Network Troubleshooting Wizard

The Network Troubleshooting Wizard analyzes network communication traffic, and examines configuration parameters for BSAP network communications. The Network Troubleshooting Wizard then recommends changes to your communications configuration, which may help improve the speed and efficiency of your OpenBSI system communications.

In This Chapter

Note: This feature requires OpenBSI 5.0 or newer.

14.1 Before you Begin

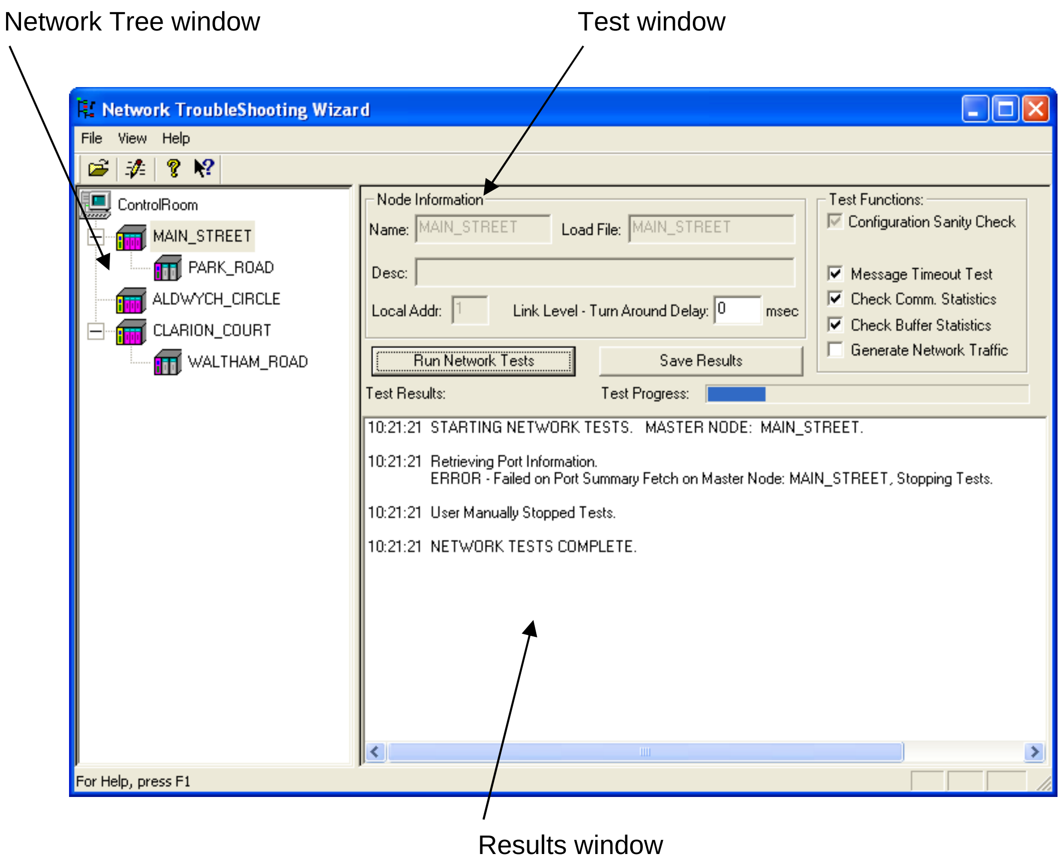
- The Network Troubleshooting Wizard can only examine a single BSAP master, and its slaves, at any one time. Therefore, if you have a large BSAP network, one or more BSAP sub-networks, or are using more than two levels, you can only analyze a single branch of the network at one time.

- You should only use the Network Troubleshooting Wizard if all of your nodes are on-line, and able to communicate. NetView must be running. Each RTU must have an executing control strategy file (ACCOL load or ControlWave project), and a copy of the file must reside on the PC, for access by the Network Troubleshooting Wizard. If FLASH parameters have been set in the RTU(s), make sure they have been activated by resetting (powering off and back on) the RTU.
- If your BSAP network or sub-network includes ControlWave controllers, each ControlWave must have the RDB_MAX user defined, with privileges that allow reading of communication statistics. In addition, the poll period system variables must use the *default* names assigned in ControlWave Designer.
- If your network incorporates dial-up communication lines, the Network Troubleshooting Wizard will **not** work, since it is designed for networks where data polling is continuous.
- The Network Troubleshooting Wizard does **not** implement any changes automatically, it simply reports its findings, and makes recommendations which you can choose to implement yourself.

14.2 Starting the Network Troubleshooting Wizard

With OpenBSI communications active, click **Start>Programs>OpenBSI Tools>Debugging Tools> Network Tuning Wizard.**

The Network Troubleshooting Wizard starts, though the various windows will appear empty.



Node Information
Name: MAIN_STREET Load File: MAIN_STREET
Desc:
Local Addr: 1 Link Level - Turn Around Delay: 0 msec

Test Functions:
☑ Configuration Sanity Check
☑ Message Timeout Test
☑ Check Comm. Statistics
☑ Check Buffer Statistics
□ Generate Network Traffic

```
10:21:21  STARTING NETWORK TESTS.  MASTER NODE:  MAIN_STREET.

10:21:21  Retrieving Port Information.
          ERROR - Failed on Port Summary Fetch on Master Node: MAIN_STREET, Stopping Tests.

10:21:21  User Manually Stopped Tests.

10:21:21  NETWORK TESTS COMPLETE.
```

Figure 14-1. Network Troubleshooting Wizard

14.3 Testing a BSAP Network or BSAP Sub-Network

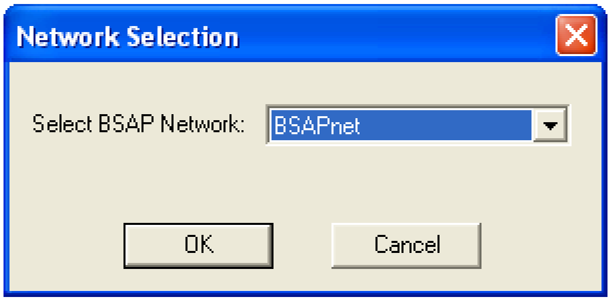
There are four basic steps to testing a BSAP network or sub-network using the wizard.

1. Select the BSAP network (or sub network).
2. Specify the branch of the network you want to test (by selecting a master node)
3. Choose which tests you want to perform
4. Run the tests.

Each of these steps will be discussed in the sections that follow.

14.3.1 Step 1. Select the BSAP Network (or BSAP Sub-network)

Click on the icon, shown at left, or click **File> Select Network**, and the Network Selection dialog box opens.



Network Selection

Select BSAP Network: BSAPnet

Figure 14-2. Network Selection dialog box

The **Select BSAP Network** list box displays the name of the BSAP network, and or BSAP sub-networks in your currently running NETDEF file.

Select the desired network or sub-network, and click **OK**.

The wizard displays a tree showing the selected BSAP network or sub-network.

14.3.2 Step 2. - Specify the Branch of the Network you want to test

At any one time, the Network Troubleshooting Wizard can only perform tests on a single Master node, and its associated slave nodes. You must run the wizard again to examine any additional nodes in a separate portion of the network.

Note: We recommend you start your tests with the NHP node (top-most node in the BSAP tree), and then proceed down to lower branches of the network.

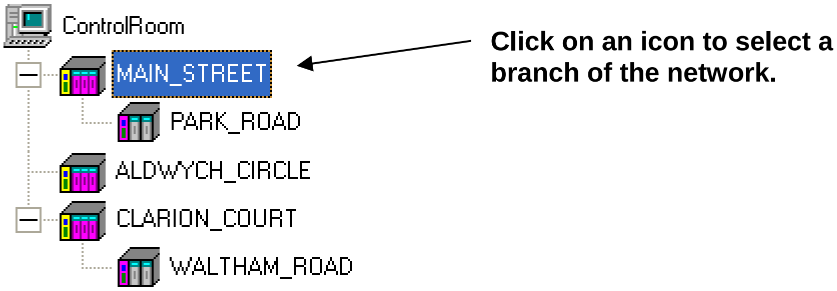


Figure 14-3. Selecting a Branch of the Network

To choose a portion of a network for testing by the Network Troubleshooting Wizard, click on the icon for a master node, in the BSAP network tree.

Once you click on a master node, the **Node Information** area of the Test window displays various parameters for the master node, extracted from the NETDEF file. (For information on what these parameters mean, see *Viewing Node Information*, below.)

In the BSAP network tree shown, above, we chose the “ControlRoom” node (Network Host PC). If we run a test now, it will examine communications between the "ControlRoom" node, and the three slave nodes immediately below it: "MAIN_STREET," "ALDWYCH_CIRCLE," and "CLARION_COURT."

After running this test, there are two additional branches of the tree which have not yet been examined. We need to click on "MAIN_STREET" and run the tests again to check communications between "MAIN_STREET" and "PARK_ROAD." In addition, we need to click on "CLARION_COURT" and run the tests again to check communications between "CLARION_COURT" and "WALTHAM_ROAD."

Once you complete tests on each branch of the network, and implement the recommended changes, you may want to re-run the tests to see if conditions have improved.

Viewing Node Information

When you click on the icon for a node (or the name next to the icon) the program displays information extracted from the NETDEF file. This information includes:

Field	Description
Name	The node name.
Load File	The path and filename of the control strategy file used for this node. (Does not apply if this node is a Network Host PC).
Desc	An optional textual description of the node.
Local Addr	The BSAP local address of the node. (Does not apply if this node is a Network Host PC.)

14.3.3 Step 3. - Choose Which Tests to Perform

There are several tests that can be performed. Each one is described, below.

If desired, you can specify in the Options dialog box, a threshold percentage at which warnings should be generated based on data collected during the tests. The same threshold percentage is applied to each test. Warnings are a step below errors; they indicate that a potential exists for a problem, but the problem has not occurred. See *Setting Test Options* later in this section for details.

Configuration Sanity Check

This test looks at the configuration of the ports in the Master and its Slave nodes. It verifies the following items:

- The test examines the Port baud rates on the Master node's Master Port and the Slave Port of each of the slave nodes to verify that they match.
- The test checks the master port poll period to see that it is in a

reasonable range.

- The test checks the slave port poll period to see that it is not too short. The Slave Port poll period determines how long a slave node waits for a poll from its master before declaring its master dead, and discarding any pending messages it had waiting for the master.
- The test checks the data link level timeout. This is the amount of time a Master waits for the start of a message (acknowledgement) to begin arriving from its slave. For Network 3000 masters, the acknowledgement must be a complete message. For ControlWave and OpenBSI (NHP) masters, the entire message may still be in transit, so long as the start of the message has been received.

Poll Per & Link Level Tests

These tests are only conducted from the NHP. Timing measurements are performed to see if the OpenBSI poll period and link level timeout are set to reasonable values.

Message Timeout Test

In this test, messages are sent out to the selected branch of the network, and measurements are performed to see how long it takes for them to return. This is used to determine whether message timeout periods are set properly. NOTE: You specify the number of messages used in this test within the Options dialog box. See *Setting Test Options* later in this section for details.

Check Comm. Statistics

Communication statistics at the Master and Slave are cleared, and then the wizard checks to see if new statistics indicating problems accumulate. It then makes recommendations based on these findings.

Check Buffer Statistics

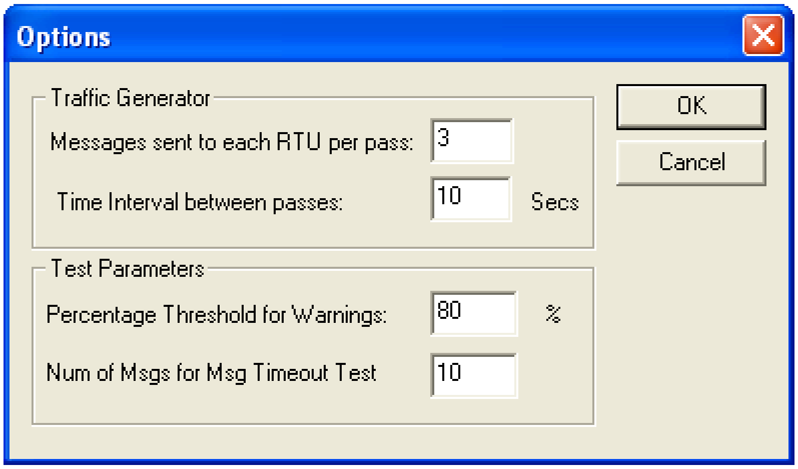
Communication buffer statistics at the Master and Slave are cleared, and then the wizard checks to see if new statistics indicating problems accumulate. Typical problems would be a shortage of buffers. It then makes recommendations based on these findings.

Generate Network Traffic

Normally, the network tests are based on the actual communications generated by the control strategy files in the nodes. Alternatively, the wizard can generate network traffic to the RTUs by itself. The number of messages sent to an RTU in one pass, and the time interval between passes is specified within the Options dialog box. See *Setting Test Options* later in this section for details.

14.3.4 Setting Test Options:

To access the Options dialog box click on the icon, shown above, or click **View>Options**.



Traffic Generator

Messages sent to each RTU per pass: 3

Time Interval between passes: 10 Secs

Test Parameters

Percentage Threshold for Warnings: 80 %

Num of Msgs for Msg Timeout Test 10

Figure 14-4. Options dialog box

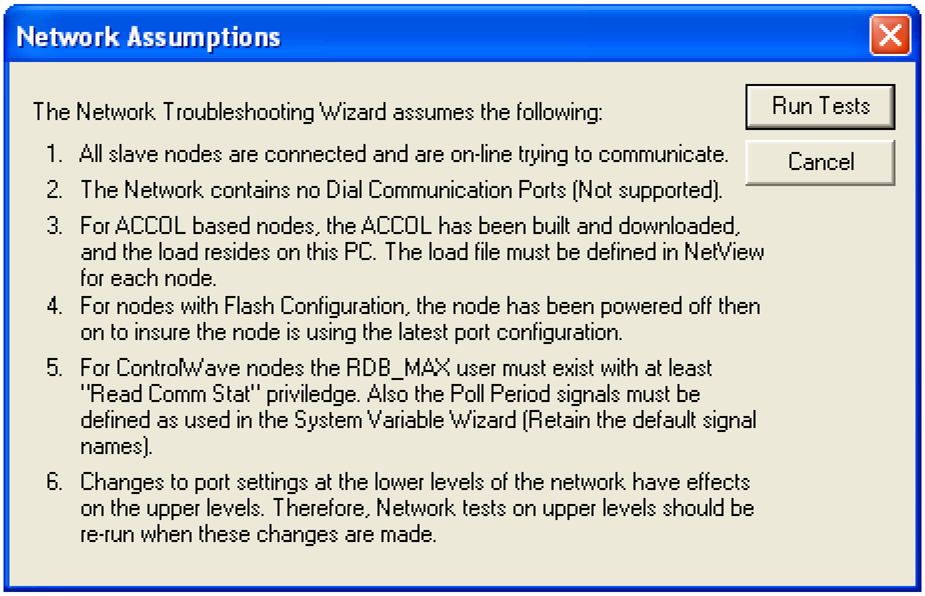
The various options are discussed, below. Click **OK** when you finish making your selections.

Field	Description
Traffic Generator	
Messages sent to each RTU per pass	For the Generate Network Test, this specifies how many messages to send to each RTU at one time, for example, if you enter 3 here, 3 messages are sent to each RTU, then when the time interval between passes expires, 3 more are sent, and so on.
Time Interval between passes	For the Generate Network Traffic Test, this specifies the time (in seconds) to wait before sending another batch of messages to each RTU.
Test Parameters	
Percentage Threshold for Warnings	This defines a threshold at which warnings are generated based on potential problems the wizard detects. For example, if you set your threshold at 80%, when the wizard performs a buffer check, if it determines that you've used 80 percent of your available buffers, a warning message is generated during the test, even though an error hasn't occurred, and might never occur. The lower the threshold you define, the more warnings you are likely to see as

	you run the tests.
Num of Msgs for Msg Timeout Test	This specifies the number of messages used when running the Message Timeout Test.

14.3.5 Step 4. – Run the Tests

To run the tests, click **Run Network Tests**. NOTE: The first time you run a test, in a particular session with the Network Troubleshooting Wizard, the Network Assumptions dialog box opens, reminding you of the various conditions which must have been satisfied before you can run a useful test. These conditions are discussed in the "Before You Begin" section at the beginning of this chapter. Click **Run Tests** and the testing begins.



The Network Troubleshooting Wizard assumes the following:

1. All slave nodes are connected and are on-line trying to communicate.
2. The Network contains no Dial Communication Ports (Not supported).
3. For ACCOL based nodes, the ACCOL has been built and downloaded, and the load resides on this PC. The load file must be defined in NetView for each node.
4. For nodes with Flash Configuration, the node has been powered off then on to insure the node is using the latest port configuration.
5. For ControlWave nodes the RDB_MAX user must exist with at least "Read Comm Stat" priviledge. Also the Poll Period signals must be defined as used in the System Variable Wizard (Retain the default signal names).
6. Changes to port settings at the lower levels of the network have effects on the upper levels. Therefore, Network tests on upper levels should be re-run when these changes are made.

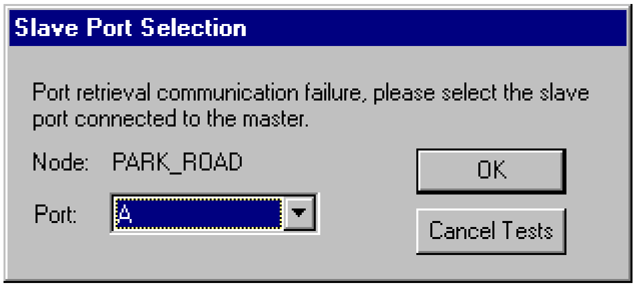
Figure 14-5. Network Assumptions

As the test proceeds, the portion of the test completed is displayed in the progress bar, and recommendations and error messages are displayed in the Results window.

A full description of what the recommendations and error messages mean is included in the *Interpreting the Messages appearing in the Results Window* section at the end of this chapter.

If, as the test proceeds, the wizard encounters multiple configured slave ports (for example, a slave port, and a pseudo slave port), the Slave Port Selection dialog box opens, and you must identify for it, which port on the Slave Node is used to communicate to the Master Node.

Use the **Port** list box to choose the correct port, then click **OK**, or alternatively, you can abort the tests by clicking **Cancel Tests**.


Slave Port Selection

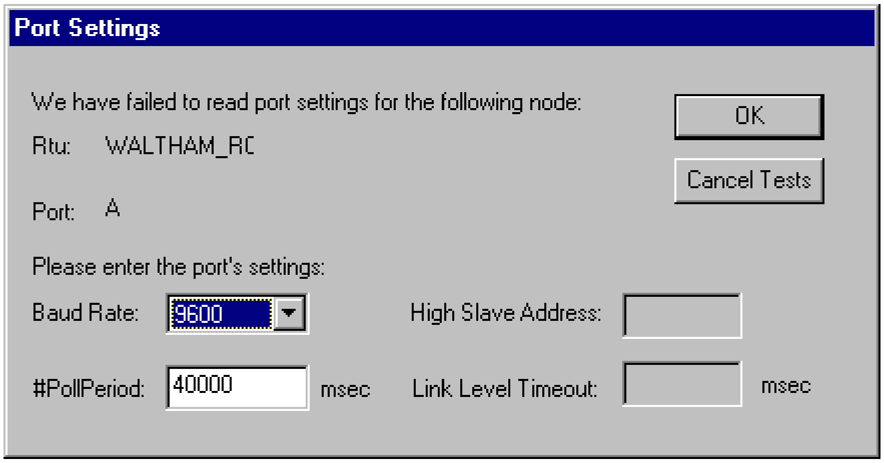
Port retrieval communication failure, please select the slave port connected to the master.

Node: PARK_ROAD

Port: A

Figure 14-6. Slave Port Selection dialog box

If communications between the Master and Slave nodes are still not possible, the Port Settings dialog box opens and prompts you to enter the current settings for the Master Port on the Master node.


Port Settings

We have failed to read port settings for the following node:

Rtu: WALTHAM_RC

Port: A

Please enter the port's settings:

Baud Rate: 9600

High Slave Address:

#PollPeriod: 40000 msec

Link Level Timeout: msec

Figure 14-7. Port Settings dialog box

The Master Port settings are:

Field	Description
Port	The name of the Master Port.
Baud Rate:	The current baud rate for the specified port.
High Slave Address	The highest BSAP local address of slave nodes connected to this Master Port.

#PollPeriod	The Master Port poll period, in milliseconds.
Link Level Timeout	This is the maximum amount of time (in milliseconds) that the Master Port waits to receive a response for any one data link transaction.

When you finish supplying these parameters, click **OK** and the wizard tries to complete the tests again. Alternatively, you can abort the tests at this point, by clicking **Cancel Tests**.

14.3.6 Saving the Results of the Network Tests

When the network tests are complete, you can save the results in a text file.

To do this, click **Save the Results**, then specify a path and filename for the text file in the Save As dialog box, and click **Save**.

14.4 Interpreting the Messages Appearing in the Results Window

There are three types of messages:

- Status Messages
- Error Messages
- Warning Messages

Each message is listed along with an explanation/recommendation for possible action. At the end of the chapter, instructions are included that should help you implement the various recommendations.

14.4.1 Status Messages

These messages are for information only. They report the progress of testing. All messages are preceded with a time stamp.

Message:	**Explanation:**
Baud Rate Checks Passed.	This is part of the sanity check. It indicates that the configured port baud rates on the Master node's Master Port and the Slave Port of each of the slave nodes have been examined, and they match.
Master Link Level Timeout Check Passed	This is part of the sanity check. It indicates that the Link Level Timeout configured for the Master node is in a reasonable range.
Master Poll Period Checks Passed	This is part of the sanity check. It indicates that the poll period for the Master node's Master port has been calculated to be within a reasonable range based on the number of nodes, baud rate, etc.

Message:	**Explanation:**
Message Timeout Tests Passed, Avg number *secs*, Node: *nodename*	A response has been successfully received from the slave node named *nodename*. The average turn-around time for the response to come back was number *secs*.
POLL TEST - Minimum Poll Period required (No Preferred Polling) is minimum msec, Best Poll Period (with Preferred Polling and current traffic) is optimum msec. Port: *portname*, Master Node: *nodename.*	This is a recommendation that the poll period of port *portname* on Master node *nodename* must be at least minimum. For improved communications, it is recommended that it be set to optimum milliseconds.
Slave Poll Period Checks Passed.	This is part of the sanity check. It indicates that the poll period for the Slave node's slave port is within a reasonable range.
STARTING NETWORK TESTS. MASTER NODE: *nodename*	This indicates that testing has begun for the Master node named *nodename*.
User Manually Stopped Tests.	The user has stopped the testing by clicking **Cancel Tests.**

14.4.2 Error Messages

These messages indicate errors in the communications configuration. Carefully review the error messages, and attempt to implement necessary changes to correct them.

All messages are preceded with a time stamp.

Message:	**Explanation:**
ERROR - Check Buffer Stats: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is "Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".
ERROR - Check Comm Stats: *reason* **Node:***nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is "Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".
ERROR - Clear Buffer Stats: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is 'Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".

Message:	Explanation:
ERROR - Clear Comm Stats: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is “Timeout waiting for response” i.e. the node didn’t answer within the expected period of time, or “Node currently off-line”.
ERROR - Failed on Port Summary Fetch on Master Node: *nodename*, **Stopping Tests."**	It was not possible to communicate with node *nodename*.
ERROR - Invalid Slave Baud Rate, Master: *master_baudrate*, **Slave** *slave_baudrate*, **Slave Node:** *nodename*.	The slave port baud rate on the Slave node *nodename* does NOT match the corresponding Master port baud rate on the Master node. Change the baud rate for the Slave Node’s slave port to match the baud rate on the Master Port of the Master Node. For Network 3000-series nodes, the baud rate is changed within the ACCOL source file. For ControlWave-series nodes, the baud rate is set as a Flash parameter.
ERROR - Link Level Timeout too short on Port:*portname*, **value must be at least** *num* **msecs, Master Node:** *nodename*	The Link Level Timeout is the amount of time after sending a request to one of its slave nodes, that a Master Node waits for the response to start arriving. If this is set too short, messages from the slave won’t have enough time to be transmitted to the master. Set the link level timeout on port *portname* of node *nodename* to a value of at least *num* milliseconds.
ERROR - Poll Test: *reason* **Node: %s.**	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is “Timeout waiting for response” i.e. the node didn’t answer within the expected period of time, or “Node currently off-line”.
ERROR - Port Fetch: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is “Timeout waiting for response” i.e. the node didn’t answer within the expected period of time, or “Node currently off-line”.
ERROR - Sanity Check: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is “Timeout waiting for response” i.e. the node

Message:	Explanation:
	didn't answer within the expected period of time, or "Node currently off-line".
ERROR - Slave Address not defined on Master Ports, Slave Node: *nodename*	The BSAP local address for node *nodename* is not in the valid range for slave node addresses on this Master Port.
ERROR – Slave Poll Period Signal Value too low, Port: *portname* **Minimum Value:** *num*, **Slave Node:** *nodename*	The Slave Port poll period specifies how long the slave node waits to hear a request from its Master node. If the Master doesn't send any requests for this period of time, the Slave node assumes that the Master node has failed, and discards any pending messages waiting for the Master. This error indicates that the poll period on Slave Port *portname* on node *nodename* is too low. Set it to a value of *num* or greater.
ERROR - Start Traffic: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is "Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".
ERROR – Stop Test: *reason* **Node:** *nodename*	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is "Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".
ERROR - Stop Traffic: *reason* **Node:** *nodename*.	It was not possible to communicate with node *nodename* because of *reason.* Typically, the reason is "Timeout waiting for response" i.e. the node didn't answer within the expected period of time, or "Node currently off-line".

14.4.3 Warning Messages

These messages indicate potential problems in the communications configuration. Carefully review the warning messages, and consider implementing the recommended changes.

All messages are preceded with a time stamp.

Message	Explanation
WARNING - Buffer Overrun on Master	This could indicate a buffer

Message	Explanation
port. Garbage on communications line, or "End of Message" and "Start of Message" was missed (characters dropped), Slave Node *nodename*	shortage. Try increasing the number of buffers in node *nodename*.
WARNING - CRCs received on Master port. Garbage on the communications line or characters being dropped, *portname* **Node:** *nodename*	This could indicate noise on the communication line. Check for bad cable or possible source of interference.
WARNING - Duplicate messages seen on Master port. Down ACKs being dropped, either bad communications line or Link Level Timeout on Master port too short, *portname* **Node** *nodename*	This could indicate noise on the communication line. Check for bad cable or possible source of interference. Another possible reason is that the Link Level Timeout on the Master Port may be too short. Try Increasing the value of the link level timeout.
WARNING - "End of Message" missed on Master port. Messages being chopped off, try increasing Link Level Timeout on Master port, Slave Node: *nodename***.**	The Link Level Timeout on the Master Port may be too short. Try Increasing the value of the link level timeout.
WARNING - Increase Buffer Allocation in this Node: *nodename*	There are not enough communication buffers defined in node *nodename.* Add more buffers.
WARNING - Increase Wait Packet Allocation in this Node:*nodename*	There are not enough wait packets defined in node *nodename.* Add more wait packets.
WARNING - Invalid ACK messages on Master port. Sequence numbers are off, ACKs received after being timed out, try increasing Link Level Timeout on Master port, Slave Node: *nodename*	The Link Level Timeout on the Master Port may be too short. Try Increasing the value of the link level timeout.
WARNING - Invalid DLE sequences detected on Master port. Messages received were not properly encoded or characters being dropped, Slave Node: *nodename***.**	This could indicate noise on the communication line. Check for bad cable or possible source of interference. Alternatively, there could be some other communication problem at the slave node.
WARNING – Link Level Timeout could be too long on Port: *portname***, maximum time required during tests:** *num* **msecs, Master Node:** *nodename*	The Link Level Timeout is the amount of time after sending a request to one of its slave nodes, that a

Message	Explanation
	Master Node waits for the response to start arriving. If this is set too short, messages from the slave won’t have enough time to be transmitted to the master. If it is too long, it will delay retry attempts thereby making communications slow. The Link Level Timeout on port *portname* of node *nodename* could be too long. Try shortening it to a value of *num*.
WARNING - Link Level Timeout could be too short on Port: *portname***, the maximum time required for some msgs during test:** *num* **msecs, Master Node:** *nodename*	The Link Level Timeout is the amount of time after sending a request to one of its slave nodes, that a Master Node waits for the response to start arriving. If this is set too short, messages from the slave won’t have enough time to be transmitted to the master. The Link Level Timeout on port *portname* of node *nodename* could be too short. Try increasing it to a value of *num*.
WARNING - Link Level Timeouts on Master port. Slave RTU not there or try increasing Link Level Timeout on Master port, Slave Node: *nodename*	The Link Level Timeout is the amount of time after sending a request to one of its slave nodes, that a Master Node waits for the response to start arriving. If this is set too short, messages from the slave won’t have enough time to be transmitted to the master. The Slave node *nodename* may be off-line, or possibly, the Link Level Timeout on its Master’s Master Port may be too short. Try increasing the Link Level Timeout.
WARNING - Link Level Timeout too short for immediate response nodes the value should be between *num1* **and** *num2* **msec, Port:** *portname* **Master Node:** *nodename*	The Link Level Timeout is the amount of time after sending a request to one of its slave nodes, that a Master Node waits for the response to start arriving. If this is set too short, messages from the slave won’t have enough time to be transmitted to the master. Set the link level

Message	Explanation
	timeout on port *portname* of node *nodename* to a value between *num1* and *num2* milliseconds.
WARNING – Master Poll Period could be set lower, Best guess *num* **msec, Port:** *portname*, **Rtu:** *nodename*	The Master Port poll period defines how frequently this Master node requests data from all of the Slave nodes on this port. Lowering this value for port *portname* on node *nodename* can improve network efficiency. It is estimated that *num* milliseconds should be the new poll period.
WARNING – Messages aborted on the Slave port. Increase the associated #pollper signal for this port, Slave Node %s."	This means the Slave node thinks its Master node has failed, and so it is discarding pending messages for the Master. If this is not the case, try increasing the Poll period signal associated with the slave port.
WARNING – Message Timeout too short, Longest: *num* **secs, Node:** *nodename*	The OpenBSI Message Timeout is set too short (application level timeout), Try setting it to the *num* value, which represents the longest period of time it took to get an answer from a node, in this case, that node was the node named *nodename.*
WARNING – Naks received on Master port. A slave on this port is running out of Buffers, *portname* **Node:** *nodename*	This indicates that one of the slave nodes of Master node *nodename*, trying to communicate on port *portname,* is out of buffers. Check the buffers on each of the slave nodes, and increase them, if necessary.
WARNING – Poll Period too low, Best guess *num* **msec, Port** *portname*, **Rtu:** *nodename*	This indicates you should increase the poll period on port *portname* in node *nodename*. Try increasing it to *num* milliseconds.
WARNING – Protocol Errors - Buffer Overruns or Invalid ACK messages on Master port. Garbage on communications line, or characters dropped, Master Node *nodename*.	This can indicate that either the Master node *nodename* is running out of buffers, or the communication line is bad. Try checking the cable; if it’s okay, increase the number of buffers in the Master node.
WARNING – Timeouts received on Master port. Messages are getting chopped off or being received in	The Link Level Timeout is the amount of time after sending a request to one of

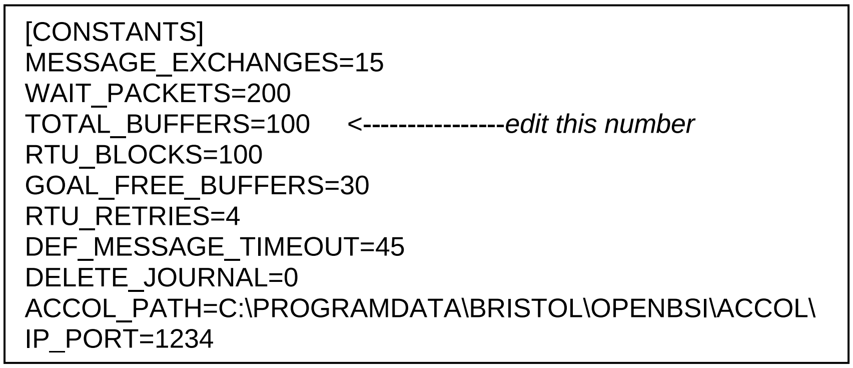
Message	Explanation
pieces, try increasing Link Level Timeout for the Master port, *portname* **Node:** *nodename.*	its slave nodes, that a Master Node waits for the response to start arriving. If this is set too short, messages from the slave won't have enough time to be transmitted to the master. Try increasing the link level timeout on port *portname* of node *nodename*.
WARNING – Timeouts sent on Master port. Master node did not see CTS going high (Modem Control), *portname* **Node:** *nodename*	The CTS (clear to send) signal in the Slave node is triggered by user defined logic to tell OpenBSI that the slave node's data is ready. Check to see that your logic in the slave node sets the CTS modem control signal properly.

14.5 Making Changes at the OpenBSI Workstation (NHP)

14.5.1 Changing the Number of Buffers allocated at the OpenBSI Workstation

During initial OpenBSI system configuration, you specify the number of buffers in the **Number of Communication Buffers** field in the Advanced Parameters dialog box (accessible from the **Advanced** button on the first page of the System Wizard).

Once your system has been created, if you need to change the number of buffers, you must change the TOTAL_BUFFERS entry in the *.NDF file, then save that file, and restart OpenBSI.



```
[CONSTANTS]
MESSAGE_EXCHANGES=15
WAIT_PACKETS=200
TOTAL_BUFFERS=100     <----------------edit this number
RTU_BLOCKS=100
GOAL_FREE_BUFFERS=30
RTU_RETRIES=4
DEF_MESSAGE_TIMEOUT=45
DELETE_JOURNAL=0
ACCOL_PATH=C:\PROGRAMDATA\BRISTOL\OPENBSI\ACCOL\
IP_PORT=1234
```

Figure 14-8. Changing the Number of Buffers at the OpenBSI Workstation

14.5.2 Changing the Number of Wait Packets allocated in the OpenBSI Workstation

During initial OpenBSI system configuration, you specify the number of wait packets in the **Number of Wait Packets** field in the Advanced Parameters dialog box (accessible from the **Advanced** button on the first page of the System Wizard).

Once your system has been created, if you need to change the number of buffers, you must change the WAIT_PACKETS entry in the *.NDF file, then save that file, and restart OpenBSI.

```
[CONSTANTS]
MESSAGE_EXCHANGES=15
WAIT_PACKETS=200      <----------------edit this number
TOTAL_BUFFERS=100
RTU_BLOCKS=100
GOAL_FREE_BUFFERS=30
RTU_RETRIES=4
DEF_MESSAGE_TIMEOUT=45
DELETE_JOURNAL=0
ACCOL_PATH= C:\PROGRAMDATA\BRISTOL\OPENBSI\ACCOL\
IP_PORT=1234
```

Figure 14-9. Changing the Number of Wait Packets at the OpenBSI Workstation

14.5.3 Changing the RTU Message Timeout Used by OpenBSI

During initial OpenBSI system configuration, you define the RTU message timeout on the first page of the System Wizard using the **Time out interval to wait before declaring that any message has been lost and will never return** field.

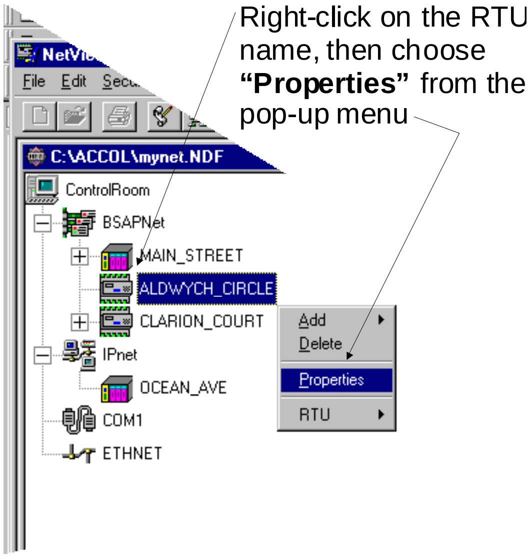
Note: Do not confuse the RTU Message Timeout with the Link Level Timeout. The RTU Message Timeout is the application level timeout. It is the amount of time that an application such as DataView, the Harvester, etc. waits before declaring that a message has been lost. This is completely separate from the Link Level Timeout.

Once your system has been created, if you need to change the RTU Message Timeout, you must change the DEF_MESSAGE_TIMEOUT entry in the *.NDF file, then save that file, and restart OpenBSI.

```
[CONSTANTS]
MESSAGE_EXCHANGES=15
WAIT_PACKETS=200
TOTAL_BUFFERS=100
RTU_BLOCKS=100
GOAL_FREE_BUFFERS=30
RTU_RETRIES=4
DEF_MESSAGE_TIMEOUT=45  <------------edit this number
DELETE_JOURNAL=0
ACCOL_PATH=C:\PROGRAMDATA\BRISTOL\OPENBSI\ACCOL\
```

Figure 14-10. Changing the Default Message Timeout

If necessary, you can also change the RTU Message Timeout that OpenBSI uses for a particular node (controller). You might want to do this if one particular controller, for whatever reason, takes a longer period to respond.

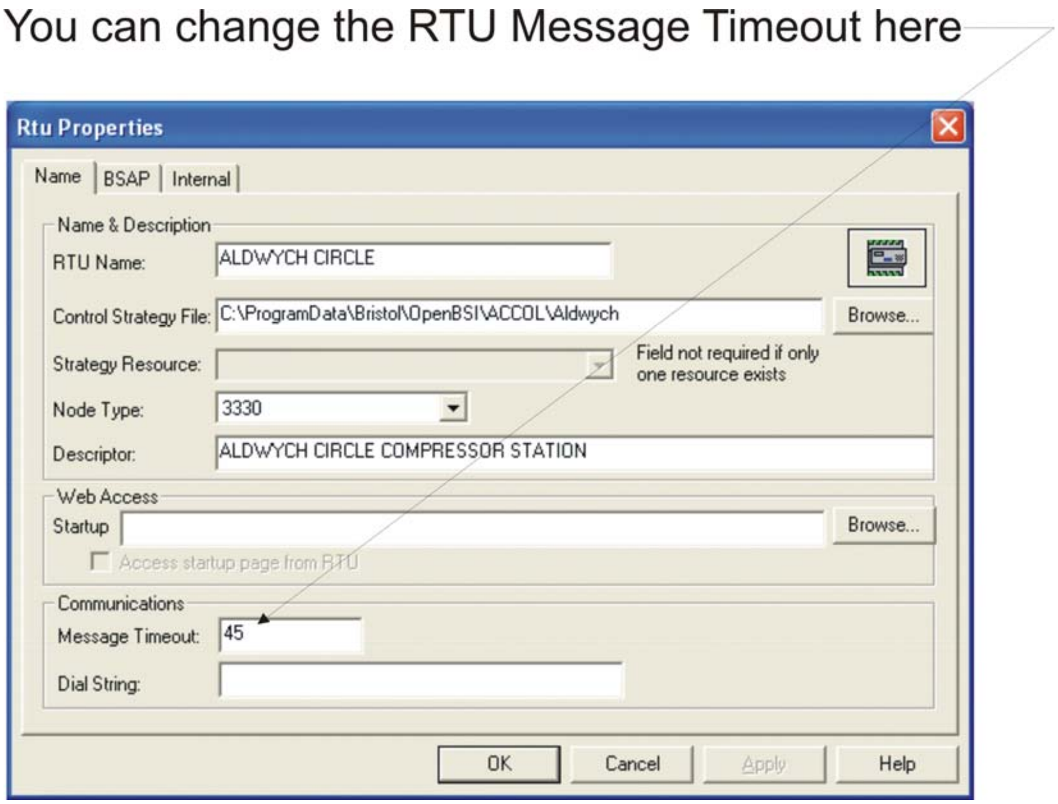


Right-click on the RTU name, then choose **"Properties"** from the pop-up menu

Figure 14-11. Changing the RTU Properties

To do this, right click on the RTU name in the NetView tree, then choose **Properties** from the pop-up menu.

On the RTU Properties page, enter the new **Message Timeout** value, then click **OK**.



You can change the RTU Message Timeout here

Rtu Properties

Name & Description

RTU Name: ALDWYCH CIRCLE

Control Strategy File: C:\ProgramData\Bristol\OpenBSI\ACCOL\Aldwych

Strategy Resource:

Field not required if only one resource exists

Node Type: 3330

Descriptor: ALDWYCH CIRCLE COMPRESSOR STATION

Web Access

Startup:

□ Access startup page from RTU

Communications

Message Timeout: 45

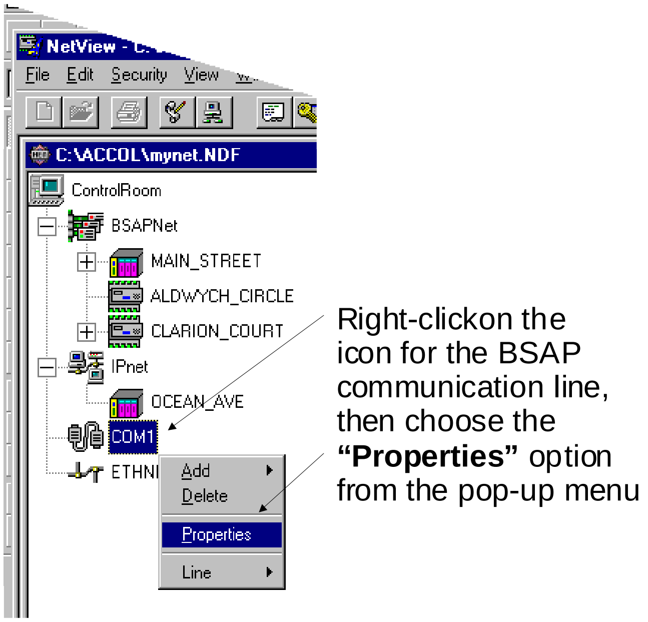
Dial String:

Figure 14-12. Changing the RTU Message Timeout

Note: If desired, you can change the message timeout for all RTUs in a network by right-clicking on the icon for a network in the NetView tree, and choosing **Properties** from the pop-up menu. This calls up the Network Properties dialog box, from which you can set the **Timeout**.

14.5.4 Changing OpenBSI's baud rate, poll period, slave address range, and link level timeout

To change any of these items in OpenBSI, right-click on the icon for the communication line in the NetView tree, then choose **Properties** from the pop-up menu. The Line Properties dialog box opens. Click the **BSAP** tab.

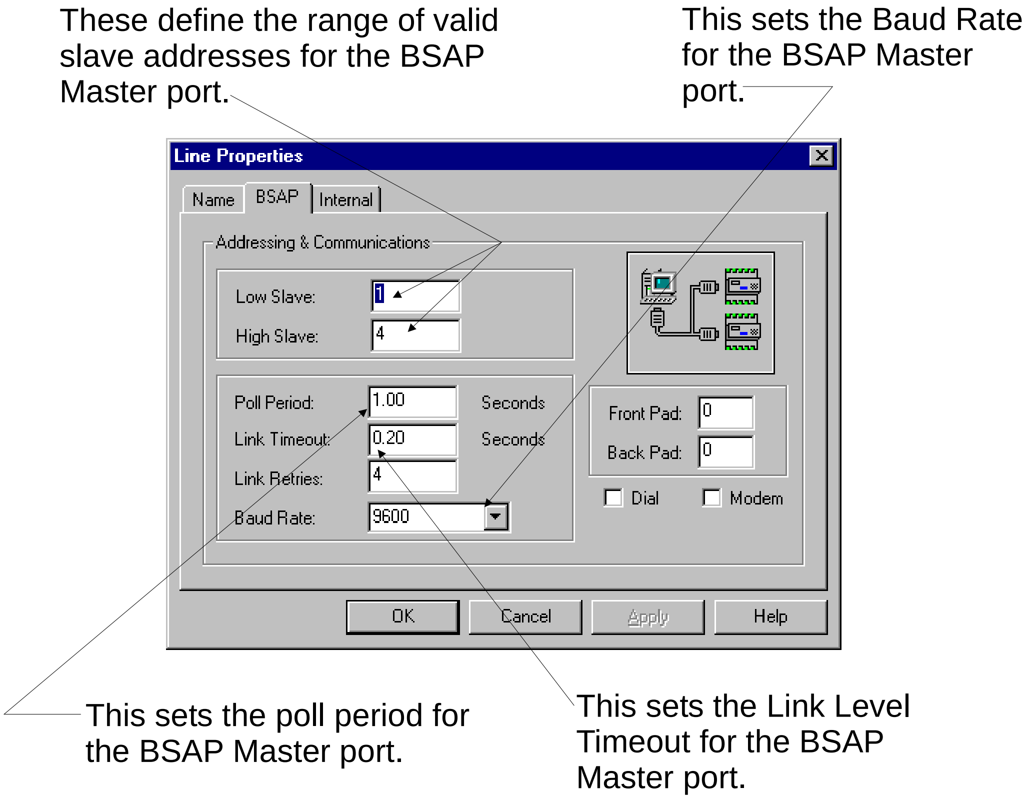


Right-clickon the icon for the BSAP communication line, then choose the **"Properties"** option from the pop-up menu

Figure 14-13. Changing OpenBSI Communication Properties

- To change the baud rate, choose the new rate using the **Baud Rate** selection box.
- To change the poll period, enter the new value in the **Poll Period** field.
- To specify the range of BSAP addresses for the Slave nodes off of this Master port, enter the correct addresses in the **Low Slave** and **High Slave** fields.
- To change the Link Level Timeout, specify the new value in the **Link Timeout** field.

Click **OK** and the changes take effect immediately.


These define the range of valid slave addresses for the BSAP Master port.
This sets the Baud Rate for the BSAP Master port.
Line Properties
Name
BSAP
Internal
Addressing & Communications
This sets the poll period for the BSAP Master port.
This sets the Link Level Timeout for the BSAP Master port.
OK
Cancel
Apply
Help

Low Slave: 1

High Slave: 4

Poll Period: 1.00 Seconds

Link Timeout: 0.20 Seconds

Link Retries: 4

Baud Rate: 9600

Front Pad: 0

Back Pad: 0

☐ Dial ☐ Modem

Figure 14-14. OpenBSI Communication Properties

14.6 Making Changes in the Network 3000 series node

14.6.1 Changing the Number of Buffers in a Network 3000 series node

In a Network 3000 node, you specify the number of buffers in the *COMMUNICATIONS section of the ACCOL source file (*.ACC).

In ACCOL Workbench, double-click on this section, then edit the number of communication buffers, and click **OK.**

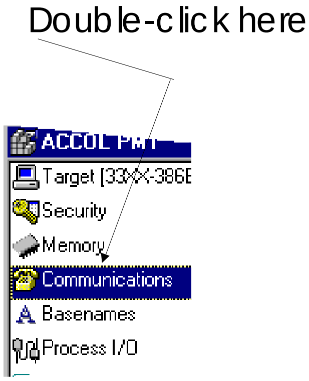
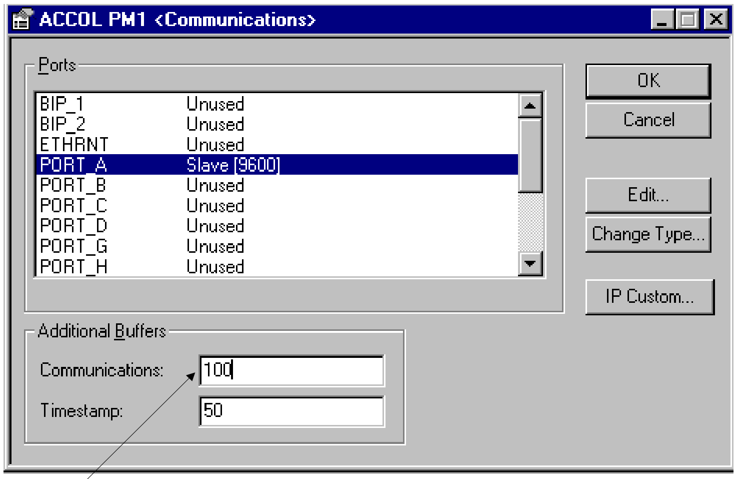


Figure 14-15. Accessing the Communications Section

When you finish all your edits in ACCOL Workbench, you must save the file, run the **Build** command, and then download the revised file into the Network 3000 controller.


ACCOL PM1 <Communications>

Ports

BIP_1	Unused
BIP_2	Unused
ETHRNT	Unused
PORT_A	Slave [9600]
PORT_B	Unused
PORT_C	Unused
PORT_D	Unused
PORT_G	Unused
PORT_H	Unused

Additional Buffers

Communications: 100

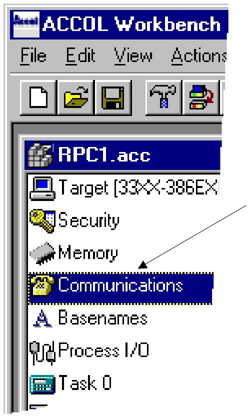
Timestamp: 50

Set the desired number of buffers here

Figure 14-16. Setting the Number of Buffers

14.6.2 Changing the Baud Rate of a Port in a Network 3000 Node

In a Network 3000 node, you specify port baud rates in the *COMMUNICATIONS section of the ACCOL source file (*.ACC).

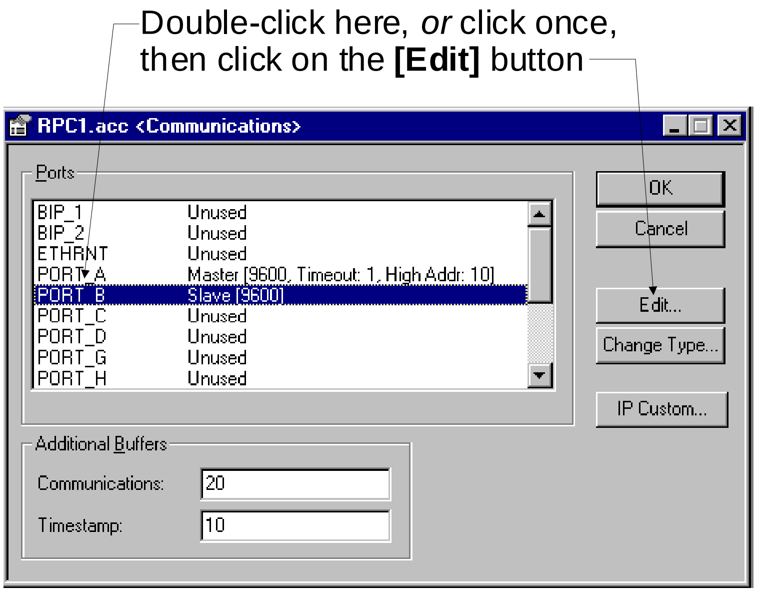


Double-click here to edit information for the port

Figure 14-17. Accessing the Communications Section

In ACCOL Workbench, double-click on the **Communications** section icon. The Communications dialog box opens.

In the Communications dialog box, double-click on the name of the port (*or* click on it once, then click **Edit**).



Double-click here, *or* click once, then click on the **[Edit]** button

RPC1.acc <Communications>

Ports

BIP_1	Unused
BIP_2	Unused
ETHRNT	Unused
PORT_A	Master [9600, Timeout: 1, High Addr: 10]
PORT_B	Slave [9600]
PORT_C	Unused
PORT_D	Unused
PORT_G	Unused
PORT_H	Unused

Additional Buffers

Communications: 20

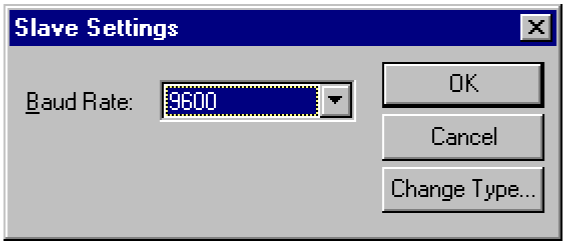
Timestamp: 10

Figure 14-18. Selecting a Port

A dialog box opens in which you can select the new baud rate for the port (the name of the dialog box, and the other fields present may vary, depending upon the type of port).

Choose the new baud rate using the **Baud Rate** selection box, then click **OK.**

When you finish all your edits in ACCOL Workbench, you must save the file, run the **Build** command, and then download the revised file into the Network 3000 controller.



Slave Settings

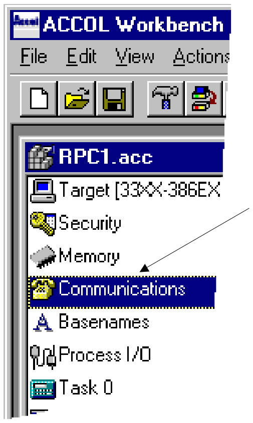
Baud Rate: 9600

Figure 14-19. Slave Settings dialog box

14.6.3 Changing the Link Level Timeout, and range of Slave addresses for a Master Port in a Network 3000 node

In a Network 3000 node, you specify the Link Level Timeout and range of Slave addresses for a Master Port in the *COMMUNICATIONS section of the ACCOL source file (*.ACC).

In ACCOL Workbench, double-click on the **Communications** section icon. The Communications dialog box opens.

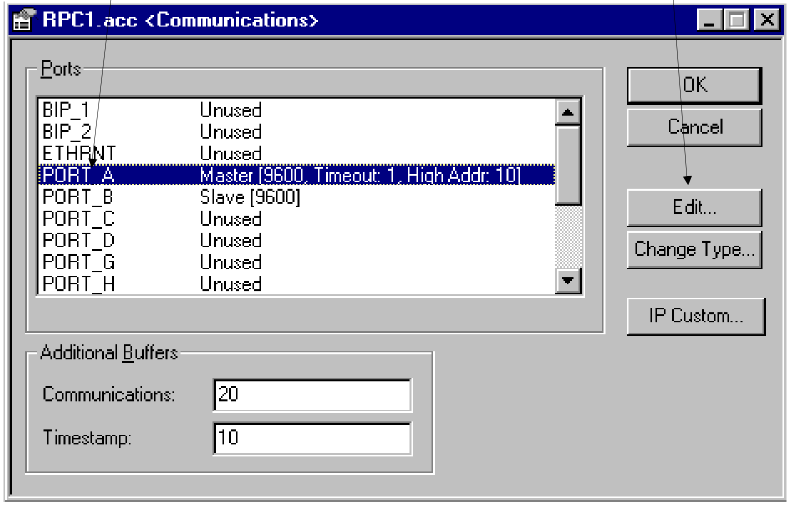


Double-click here to edit information for the port

Figure 14-20. Accessing the Communications section

In the Communications dialog box, double-click the name of the Master port (*or* click on it once, then click **Edit)**.

Double-click here, *or* click once, then click on the **[Edit]** button



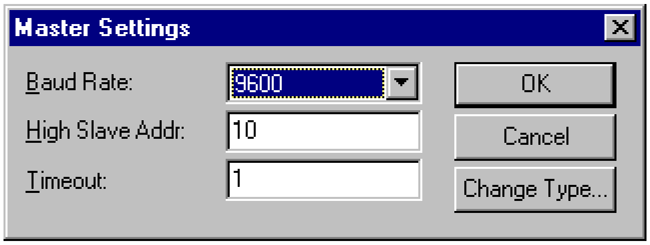
BIP_1 Unused
BIP_2 Unused
ETHRNT Unused
PORT_A Master [9600, Timeout: 1, High Addr: 10]
PORT_B Slave [9600]
PORT_C Unused
PORT_D Unused
PORT_G Unused
PORT_H Unused

Communications: 20
Timestamp: 10

Figure 14-21. Editing Port Characteristics

The Master Settings dialog box opens.

To change the Link Level Timeout, enter a new value in the **Timeout** field.



Master Settings

Baud Rate: 9600

High Slave Addr: 10

Timeout: 1

Figure 14-22. Master Settings dialog box

To change the range of BSAP addresses for this port, enter the highest BSAP local address of the Slave nodes on this port in the **High Slave Addr** field.

Note: If you have multiple Master Ports in this node, the range of addresses for each Master Port's slave nodes must be in ascending order based on the port (BIP1, BIP2, Port A, Port B… to Port J) and they must not overlap. If you need more information about this restriction, please see *Chapter 4* of the *Network 3000 Communications Configuration Guide* (document# D5080) for details.

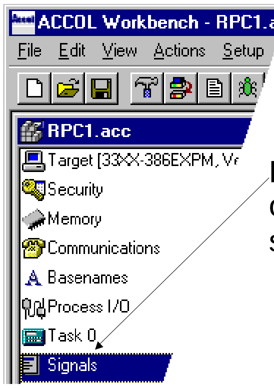
Click **OK** when you finish making changes.

When you finish all your edits in ACCOL Workbench, you must save the file, run the **Build** command, and then download the revised file into the Network 3000 controller.

14.6.4 Changing the Poll Period of a Port in a Network 3000 Node

Note: This section discusses changing the #POLLPER signals in the ACCOL source file. It is also possible to call them up in DataView, and change them on-line, without re-downloading the controller, however, these changes would be lost, the next time you download the controller, unless you preserve the changes elsewhere, for example, using recipe files.

Both Master Ports and Slave Ports use poll periods. In a Network 3000 node, you specify poll periods using the #POLLPER signals, which are located in the ***Signals** section of the ACCOL source file (*.ACC).



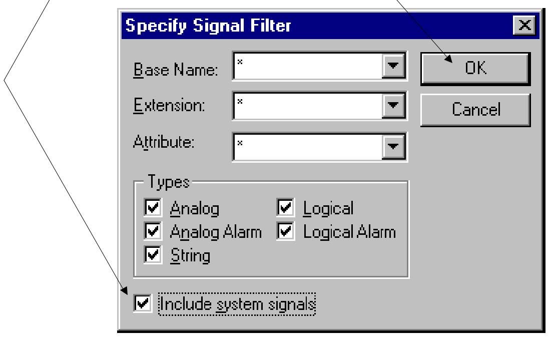
Double-click on the *SIGNALS section

Figure 14-23. Accessing the Signals section

Double-click on the **Signals** icon in ACCOL Workbench, to bring up the *SIGNALS section.

The Specify Signal filter dialog box opens. Check the **Include system signals** box, then click **OK.**

Check **"Include system signals"** then click on **[OK]**



Base Name: *

Extension: *

Attribute: *

Types

☑ Analog ☑ Logical

☑ Analog Alarm ☑ Logical Alarm

☑ String

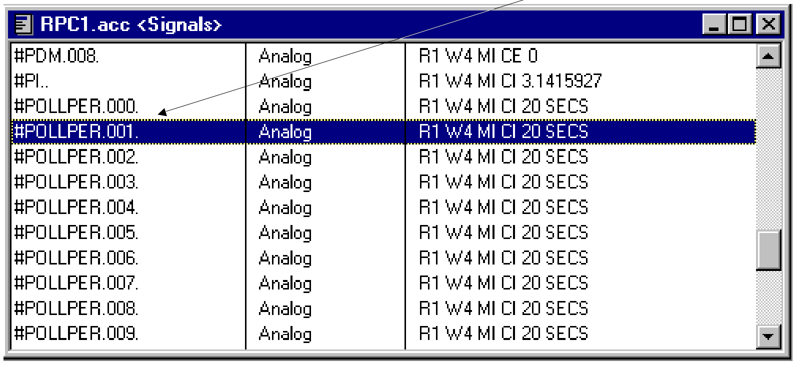
☑ Include system signals

Figure 14-24. Specify Signal Filter dialog box

Table 14-1. Configuring the Poll Period

If you are configuring the poll period for this port…	You must use this poll period signal:
Port A	#POLLPER.000.
Port B	#POLLPER.001.
Port C	#POLLPER.002.
Port D	#POLLPER.003.
BIP 1	#POLLPER.004.
BIP 2	#POLLPER.005.
Port G	#POLLPER.006.
Port H	#POLLPER.007.
Port I	#POLLPER.008.
Port J	#POLLPER.009.

Double-click on the #POLLPER signal for the particular port



#PDM.008.	Analog	R1 W4 MI CE 0
#PI..	Analog	R1 W4 MI CI 3.1415927
#POLLPER.000.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.001.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.002.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.003.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.004.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.005.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.006.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.007.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.008.	Analog	R1 W4 MI CI 20 SECS
#POLLPER.009.	Analog	R1 W4 MI CI 20 SECS

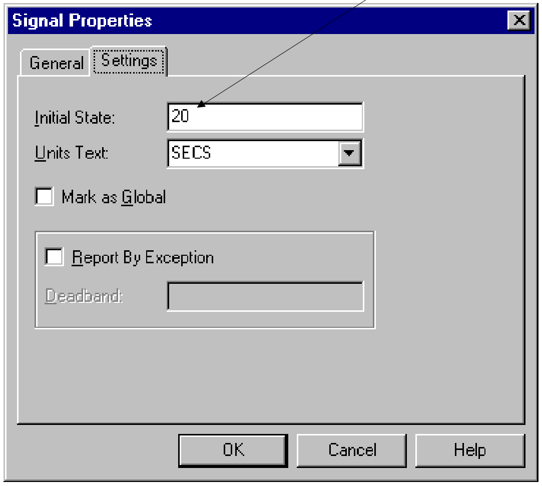
Figure 14-25. Editing the Poll Period

When the Signals window opens, *double*-click on the #POLLPER signal which corresponds to the port you want to configure. (See the table, above, for help on choosing the right signal).

In the Signal Properties dialog box, click the **Settings** tab.

Change the poll period value shown in the **Initial State** field to the desired new value, then click **OK**.

Enter the new value for the poll period in the **"Initial State"** field.



Initial State: 20

Units Text: SECS

□ Mark as Global

□ Report By Exception

Deadband:

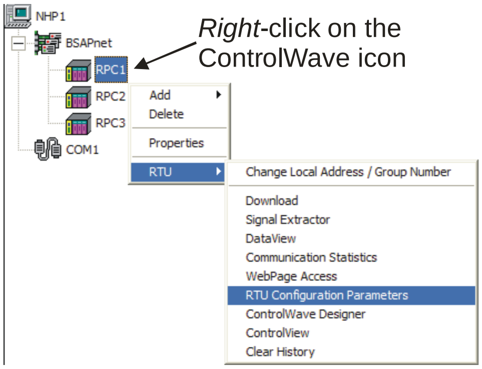
Figure 14-26. Signal Properties dialog box

When you finish all your edits in ACCOL Workbench, you must save the file, run the **Build** command, and then download the revised file into the Network 3000 controller.

14.7 Making Changes in the ControlWave series node

14.7.1 Specifying the Baud rate and (for Master Ports only) the range of Slave node Addresses

Note: This section assumes that you established a connection with the ControlWave node via LocalView, NetView, or TechView.

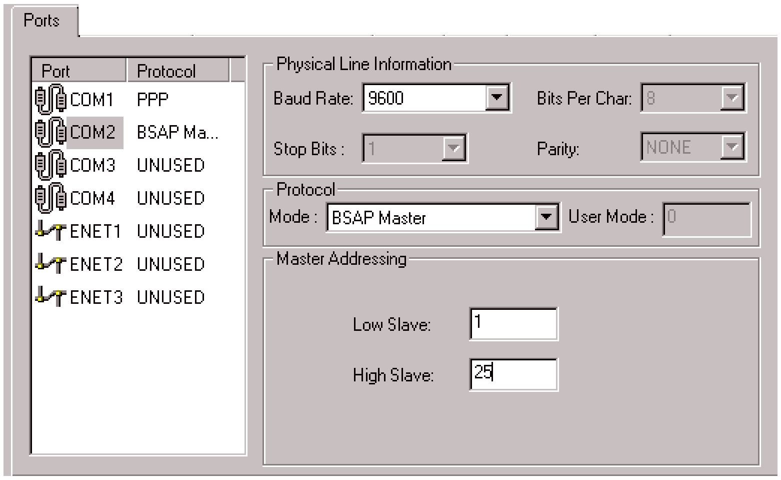


Right-click on the ControlWave icon

Figure 14-27. Accessing RTU Configuration Parameters

With communications active in LocalView , NetView, or TechView *right*-click on the ControlWave icon, and choose **RTU>RTU Configuration Parameters** from the pop-up menus.

The Flash Configuration Utility opens. First, click the **Load From RTU** button, and respond to any sign-on prompt. The current settings at the ControlWave are read into the utility.



Port	Protocol
COM1	PPP
COM2	BSAP Ma...
COM3	UNUSED
COM4	UNUSED
ENET1	UNUSED
ENET2	UNUSED
ENET3	UNUSED

Physical Line Information
Baud Rate: 9600
Bits Per Char: 8
Stop Bits : 1
Parity: NONE

Protocol
Mode : BSAP Master
User Mode : 0

Master Addressing
Low Slave: 1
High Slave: 25

Figure 14-28. Ports page in Flash Configuration Utility

Now, click on **Ports** tab, and choose the ControlWave port you want to configure (COM1, COM2, etc.)

Specify the baud rate for the port in the **Baud Rate** selection field.

To define the range of BSAP local addresses used by slave nodes of a BSAP master port, enter the lower and upper ends of this range in the **Low Slave** and **High Slave** fields. These numbers must be integers in the range 1 to 127.

Click **Save to Rtu** and respond to any sign-on prompts.

At this point, you can optionally make additional changes on other pages of the Flash Configuration Utility. When you finish, turn off the ControlWave, then turn it back on, for the new port definition to come into effect.

14.7.2 Changing Poll Periods and the Link Level Timeout in a ControlWave Node

Note: This section discusses changing the _P*x*_POLLPER and _P*x*_TIMEOUT system variables in the ControlWave project, within ControlWave Designer. It is also possible to call them up in DataView, and change them on-line, without re-downloading the controller, however, these changes would be lost, the next time you download the controller, unless you preserve the changes elsewhere, for example, using recipe files

Within ControlWave Designer, start the System Variable Wizard by clicking **View > System Variable Wizard**.

When the wizard has successfully established communications with ControlWave Designer, and your project is open, do the following:

Choose the **Port Detail** tab.

First, check the box of the port you want to

Next, click on the **[Configuration]** button for that port

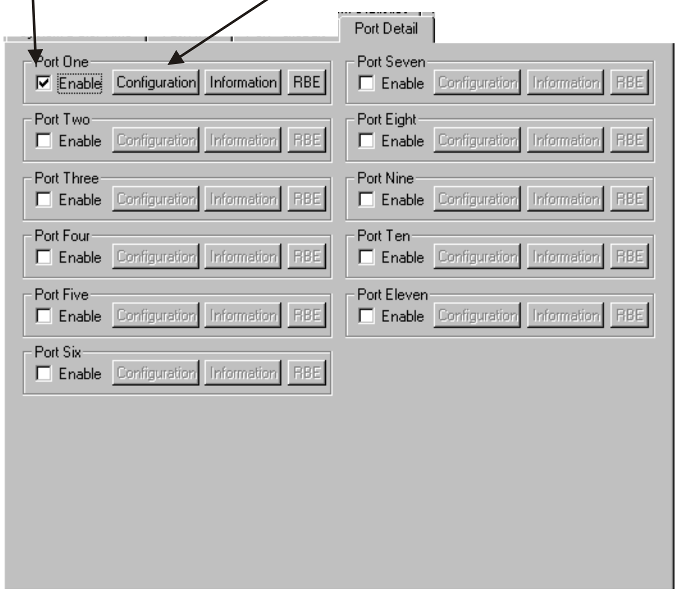
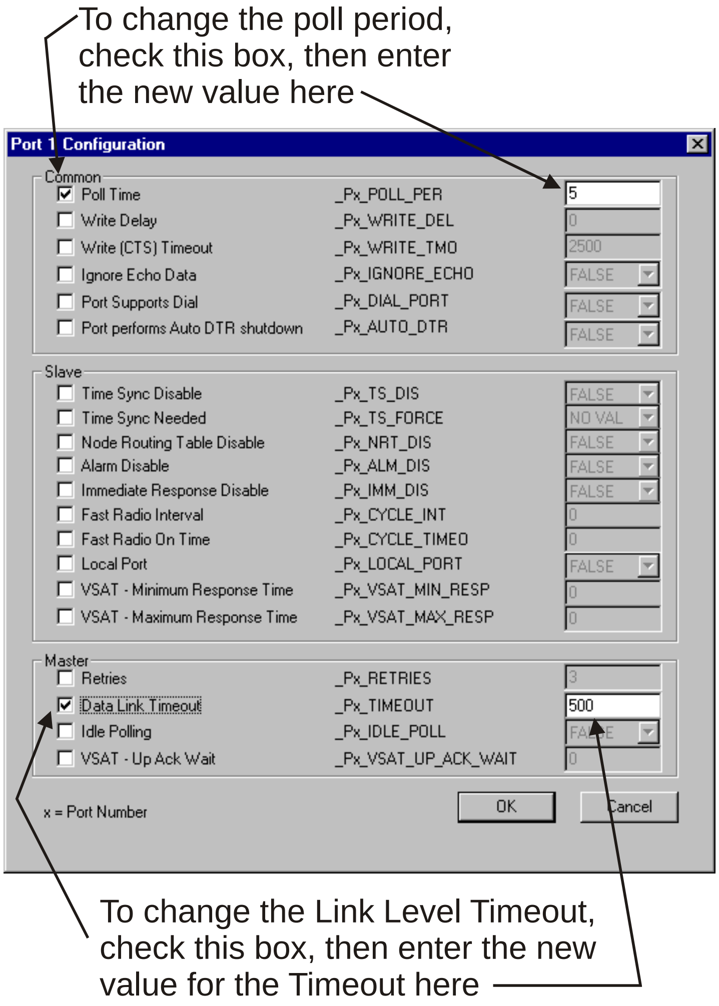

Port Detail
Port One
☑ Enable Configuration Information RBE
Port Two
☐ Enable Configuration Information RBE
Port Three
☐ Enable Configuration Information RBE
Port Four
☐ Enable Configuration Information RBE
Port Five
☐ Enable Configuration Information RBE
Port Six
☐ Enable Configuration Information RBE
Port Seven
☐ Enable Configuration Information RBE
Port Eight
☐ Enable Configuration Information RBE
Port Nine
☐ Enable Configuration Information RBE
Port Ten
☐ Enable Configuration Information RBE
Port Eleven
☐ Enable Configuration Information RBE

Figure 14-29. Port Detail tab

Select the **Enable** box for the port you want to configure.

Click the **Configuration** button.

To change the poll period, select the **Poll Time** check box, then enter the new value.



To change the poll period, check this box, then enter the new value here

Port 1 Configuration

Common

☑ Poll Time	_Px_POLL_PER	5
☐ Write Delay	_Px_WRITE_DEL	0
☐ Write (CTS) Timeout	_Px_WRITE_TMO	2500
☐ Ignore Echo Data	_Px_IGNORE_ECHO	FALSE
☐ Port Supports Dial	_Px_DIAL_PORT	FALSE
☐ Port performs Auto DTR shutdown	_Px_AUTO_DTR	FALSE

Slave

☐ Time Sync Disable	_Px_TS_DIS	FALSE
☐ Time Sync Needed	_Px_TS_FORCE	NO VAL
☐ Node Routing Table Disable	_Px_NRT_DIS	FALSE
☐ Alarm Disable	_Px_ALM_DIS	FALSE
☐ Immediate Response Disable	_Px_IMM_DIS	FALSE
☐ Fast Radio Interval	_Px_CYCLE_INT	0
☐ Fast Radio On Time	_Px_CYCLE_TIMEO	0
☐ Local Port	_Px_LOCAL_PORT	FALSE
☐ VSAT - Minimum Response Time	_Px_VSAT_MIN_RESP	0
☐ VSAT - Maximum Response Time	_Px_VSAT_MAX_RESP	0

Master

☐ Retries	_Px_RETRIES	3
☑ Data Link Timeout	_Px_TIMEOUT	500
☐ Idle Polling	_Px_IDLE_POLL	FALSE
☐ VSAT - Up Ack Wait	_Px_VSAT_UP_ACK_WAIT	0

x = Port Number

To change the Link Level Timeout, check this box, then enter the new value for the Timeout here

Figure 14-30. Port Configuration

To change the Link Level Timeout, check the **Data Link Timeout** then enter the new value for the timeout.

When you finish making changes, click **OK.**

Finally, you must re-compile the ControlWave project, using the **Build**>**Make** command, and then download it into the ControlWave.

14.8 Some Notes about Setting Immediate Response Delays

The immediate response delay is a setting which you can enable for a BSAP slave port. It specifies a period of time, in seconds, that a slave node will *wait* before responding to a request for data from its master. The advantage to delaying the response is that it may actually speed up communications. This is because it allows time for requested data to be processed, and readied for transmission to the master, before sending out the response; otherwise, the response would be an empty acknowledgement message, which would have to be followed later with another message containing the actual requested data. (For more information on how these message transactions work, please see the *Network 3000 Communications Configuration Guide* (document# D5080).

Table 14-2. Setting Immediate Response Delays

If the BSAP Slave Port is to be configured for Immediate Response, and your RTU is a….	**We recommend you do the following:**
ControlWave series node	You must enable immediate response (_Pn_IMM_DIS system variable must be FALSE.) The delay is calculated automatically, to be 50 milliseconds (or less) and is not user-configurable.
Network 3000-series node which supports immediate response	Configure the #POLLPER signal for that port for immediate response according to the instructions in the *System Signals* section of the *ACCOL II Reference Manual* (document# D4044). Although you may set it up to 2.55 seconds, generally you should set the immediate response delay to 0.01 to 0.02 seconds (10 to 20 milliseconds).

A good range for immediate response in Network 3000 controllers is 0.01 to 0.02 seconds (10 to 20 milliseconds). Most users should not exceed this range. Setting the immediate response delay too high can hurt system communications, because it can tie up the Slave Port, waiting for its message to be completed, and nothing else can be sent out that port. If, for some reason, you do want to set the immediate response delay to a higher value, you can do so, however, be sure that the link level timeout at the master is at least 0.25 to 0.5 seconds *longer than* the immediate response delay. The default link level timeout is 0.5 seconds.

For ControlWave users, Immediate Response can be enabled by setting the _P*n*_IMM_DIS variable to FALSE (the default). The actual delay time is calculated within the software to be 50 milliseconds or less. The value is not user-configurable.

For ControlWave process automation controllers, the Signal Extractor reads an MWT file (*.MWT), and generates an ASCII file from it, containing information about all variables marked as “OPC” in the variable declaration page(s), and optionally, all global variables if they have automatically been marked for “OPC”. This ASCII file may be used to construct a database for a user-specific application.

Notes:

- In order for this to work, you must select the OPC option(s) in the RTU_Resource Settings which are accessible from the project tree of ControlWave Designer.
- In versions of ControlWave Designer prior to 3.3, signals were marked as **“CSV”** instead of **“OPC.”**

For Network 3000-series controllers, the Signal Extractor reads an ACCOL Object (*.ACO) file, and generates an ASCII text file from it. This ASCII file contains information about all global, alarm, and report by exception (RBE) signals defined in the ACO file, and may be used to construct a database, for a user-specific application.

Appendix A – Error and Status Messages

OpenBSI uses several different error and status messages:

Note: Codes are not always shown.

Code	Error / Status Message	Cause:
	A critical MEX is running, the shutdown is aborted.	OpenBSI cannot be shutdown because another program is using the OpenBSI driver. For example, ACCOL Workbench or ControlWave Designer is being used to perform on-line edits, or an HMI package is running (OpenEnterprise, Intellution® FIX®, Iconics Genesis, etc.) In order to shut down OpenBSI, the other program(s) must be shut down *first*.
	Failed to launch OpenBSI Program. The program is not in the proper directory, or was not installed. Command Line: *shows command line which failed*	An attempt was made to start one of the OpenBSI utility programs, etc., but the program could not be found. Check directory paths.
1	Successful status return	An operation was completed successfully.
-100	MEX not initialized for process	A program attempted to use the OpenBSI driver before a message exchange had been established.
-101	Service already allocated by other proc	The message exchange requested is already in use.
-102	No unused service found	All message exchanges are allocated, and no more can be requested. This can occur when the number of simultaneous OpenBSI programs running exceeds the available message exchanges defined. The number of message exchanges is initially defined in the Advanced System Parameters dialog box in the System Wizard of NetView. Once a system is up-and-running, you can only change this parameter by editing the NDF file with a text editor.
-103	Invalid structure passed	This occurs when a third party program (typically HMI) requests structures which are not

Code	Error / Status Message	Cause:
		supported by the current version of OpenBSI. You may need to upgrade the driver used by the third-party program to communicate with OpenBSI.
-104	Msg was not allocated on input or output	Internal memory error.
-105	Unable to reserve wait packet for response. MEX or system buffer quota exceeded.	The OpenBSI workstation has run out of communication buffers. This should not happen. The number of buffers is initially defined in the Advanced System Parameters dialog box in the System Wizard of NetView. Once a system is up-and-running, you can only change this parameter by editing the NDF file with a text editor.
-106	Message response has been timed out	An RTU has not responded to the OpenBSI workstation within the configured timeout period. The RTU may be off-line, or the defined timeout period may be too short.
-107	Invalid constants specified	One or more of the system constants defined in NetView is invalid or out of range. Check the NDF file for errors.
-108	Overflow of user supplied buffer	Internal memory problem.
-109	Could not find destination MEX	A message references a non-existent message exchange.
-110	Communications error sending message	An RTU is deemed to be off-line by OpenBSI.
-111	Invalid timer number requested	Internal error.
-112	Timer control structs already alloc	Internal error.
-113	No memory avail to alloc structs	Internal memory problem.
-114	Could not startup line processor	Could not find the OpenBSI communication driver executables (BSBSAP3S.EXE or BSIPDRV.EXE). Check that paths are defined correctly. This could indicate an installation problem.
-115	System not Initialized	The user attempted to start one of the OpenBSI utilities without *first* starting NetView, thereby

Code	Error / Status Message	Cause:
		preventing communications. Start NetView *first*.
-116	Initialization already performed	An attempt was made to start NetView, but OpenBSI communications are already running (either via another copy of NetView, or BSAUTO).
-117		This error means that Access to the NDF file failed in either NetView or TechView. The cause is the application cannot physically get to the NDF file and is caused by the user not having permissions to access the file where it is stored.
-118	First level slave not accepting msgs	The controller (RTU) has been marked “off-line”.
-119	Message to send has invalid length	Internal error.
-120	Unused	[redacted]
-121	Invalid MEX number specified	A message referenced an illegal message exchange number.
-122	Invalid first level slave # specified	A request was made to a first level controller that is NOT defined for the communication line.
-123	Invalid statistic type specified	When initializing statistics for the OpenBSI Monitor, one of the statistics (RTU, Message Exchanges, or Buffers) did not initialize correctly.
-124	Failed to alter database schema	When upgrading from a previous version of OpenBSI, the columns in the NETDEF database file(s) must be changed. This message occurs if, for some unknown reason, this change could not be performed. This can also occur due to an installation problem related to ODBC.
-125	Unused	[redacted]
-126	RTU Not located in NETTOP file	An RTU name has been entered which has not been defined for the current network. Check your NETTOP or NETDEF files to verify that an RTU exists with that name.
-127	Communication line already started w *name*	The user tried to start a communication line which is already running, or multiple

Code	Error / Status Message	Cause:
		communication lines with the same name were accidentally defined in the NETDEF database.
-128	Cannot download RTU from this machine	The current OpenBSI Workstation only has proxy access to this RTU (it is not the NHP for this RTU) so it will not be allowed to perform a download.
-129	Dial-up line in use for other node	This can occur when multiple RTUs share the same dial-up communication line, and an attempt is made to dial an RTU, while another RTU is already using the dial-up line.
-130	Cannot open network def file	The NETDEF database cannot be opened. Typically, this occurs when attempting to use a network from an older version of OpenBSI. See *Chapter 1* for information on upgrading older networks for use in the current version of OpenBSI. This can also occur as the result of a problem in the Windows™ registry.
-131	Cannot start the resource monitor	The resource monitor executable OBSIRESMON.EXE is missing. The installation of OpenBSI could have been performed improperly, or paths could be defined incorrectly.
-132	Invalid network or line type parsed	An invalid network or line type was defined in the NETDEF database.
-133	RTU / Net Type mismatch	An attempt was made to define a BSAP RTU in an IP network, or an IP RTU in a BSAP network.
-134	NRT could not be created	A Node Routing Table (NRT) could not be created. Typically, this would occur when attempting to define a BSAP network with too many slave RTUs on a given level, such that the network cannot be represented with 15 bits or less. See the *NETTOP and NETBC Manual* (document# D4057) for rules about defining network levels.
-135	Illegal Network Type	An invalid network or line type

Code	Error / Status Message	Cause:
		was defined in the NETDEF database.
-136	Illegal Local Address	An entered local address is outside the range defined for this communication line.
-137	Master / Net NRT mismatch	There is a mismatch between the Node Routing Table (NRT) defined at the OpenBSI workstation, and at one or more of the RTUs in the network.
-138	Illegal second BSAP net	For older systems: Only one BSAP network is allowed in a system; multiple sub-networks, however, are supported.
-139	Duplicate Ip address in use	The same IP address is being used for more than one device (RTUs, workstations) in the network. Every RTU or workstation must have a unique IP address.
-140	No NHP in definition	The NETDEF database does NOT have a Network Host PC (NHP) defined.
-141	Illegal IP address	An IP address entered is inaccessible based on the defined IP mask for the communication line.
-142	Name already in use	An attempt was made to define an RTU, network, NHP, or communication line, with a name that is already in use. Choose another name.
-143	Failed object allocation from *comm on*	Internal memory error.
-144	Could not open the proxy file	The proxy file (*.pxy) was missing or could not be opened. Check the path and name for the proxy file defined in the database, and verify that a valid proxy file with that name exists at the specified location.
-145	Illegal line type	An invalid network or line type was defined in the NETDEF database.
-146	Illegal Hi / Low slaves	The range of high / low addresses for slave nodes is incorrect for the given communication line. This may occur if the range defined is not between 1 and 127, or if the high slave address entered is less

Code	Error / Status Message	Cause:
		than the low slave, or the low slave is higher than the high slave, etc.
-147	DLL Could not hook message stream	Internal error.
-148	Router errors moved to journal errors	Internal error.
-149 to -155	Unused	[redacted]
-156	Error loading parser dll	The system could not find the file Parserii.DLL.
-157	Communications already stopped on the line	The user attempted to shutdown communications on a communication line that is already stopped.

Appendix B – NETDEF File Format

Note: Normally you modify NETDEF files on-line, within NetView. Most users do not need to edit the NETDEF files off-line (as described in this appendix). This appendix is intended primarily for system engineers or other individuals who need to alter the default configuration of OpenBSI, but who prefer NOT to perform the changes within NetView, or who need to change certain parameters which can only be modified off-line.

The NetView program stores information on the characteristics of the controller network in Network Definition (NETDEF) Files.

When opening an all new NDF file, NetView automatically creates three additional files which are transparent to the NetView user (with extensions of *.MDB, *.LDB, and *.DSN). The MDB, LDB, and DSN files constitute a database. Together, the NDF file and the three database files are collectively referred to as the **Network Definition (NETDEF) Files**.

*filename***.NDF**
*filename***.MDB**
*filename***.LDB**
*filename***.DSN**

All four files share the same file basename, for example, CURRENT.NDF, CURRENT.MDB, CURRENT.LDB, and CURRENT.DSN. CURRENT is the default name used for *filename*, however, you can replace it with the name of your choice.

All of the NETDEF files are normally stored in the OPENBSI subdirectory of the Network Host PC (NHP). If you ever copy them to another location, you must *manually* edit the DBQ path in the DSN file to reflect the new location, otherwise you could use the wrong NETDEF files.

Proxy workstations may not contain all four files, depending upon their configuration. Only one set of NETDEF files can be active at any time at the NHP.

The NDF file holds information on system-wide constants, and application parameters. This ASCII file can be edited with any text editor.

Information on specific system components (Network Host PCs (NHPs), communication lines, networks, and RTUs) is stored in the three database file (*.MDB, *.LDB, and *.DSN). You can modify certain information in these files off-line using the Database Config Utility, described later in this appendix.

B.1 Editing the NDF File

The NDF file defines system-wide communication constants, and application parameters used by various OpenBSI utilities. You can edit it using any ASCII text editor.

The various sections of the NDF file are described, below:

[Constants] section

This section of the NDF file defines certain system-wide parameters used by OpenBSI. This section must exist in the NDF file on the NHP, and in the NDF file on any remote workstation.

Keyword	Description
MESSAGE_EXCHANGES=*nummex*	The number of message exchanges *nummex* allocated for use at the current workstation. Message exchanges are similar to post-office boxes for programs; they hold data being passed between programs. The *nummex* value must be larger than 10, but less than 128. Example: MESSAGE_EXCHANGES=15
WAIT_PACKETS=*numpackets*	This defines the number of responses OpenBSI allows to be outstanding at any one time. If *numpackets* number of responses are outstanding, the application program (e.g. DataView, HMI packages, etc.) is forced to wait until some of the responses are received or time-out. Example: WAIT_PACKETS=200
TOTAL_BUFFERS=*totalbuffers*	This is the number of temporary communication buffers OpenBSI uses. A buffer is used when a message is waiting to be sent to the proper first level node (BSAP sub-nets only), and when a response has not yet been processed by the application program (e.g. DataView, HMI packages, etc.) The default value for *totalbuffers* is 100. Example: TOTAL_BUFFERS=100
RTU_BLOCKS=*totalrtus*	This defines the maximum number of remote process controllers (RTUs) in the system. The minimum value for *totalrtus* is 100. Example: RTU_BLOCKS=100
GOAL_FREE_BUFFERS=*buffers*	OpenBSI attempts to keep a ready

	supply of buffers available for general use. If the number of buffers available is less than this value, OpenBSI copies some data into local buffers of the currently running process. The *buffers* value should be 1/2 of the total buffers or around 20, whichever is smaller. Example: GOAL_FREE_BUFFERS=30
DEF_MESSAGE_TIMEOUT=*timeout*	The time-out interval OpenBSI waits before declaring that any message, including those routed to another workstation, is lost and will never return. You must specify the *timeout* value in seconds. Example: DEF_MESSAGE_TIMEOUT=60
RTU_RETRIES=*retries*	The number of attempts OpenBSI makes to send a message to a first level RTU (BSAP sub-nets only) before it declares that RTU as “dead” or non-functional. The default value for *retries* is 4. Example: RTU_RETRIES=4
PATH_ERRORS=*errorpath*	The *errorpath* string indicates the location of OpenBSI's language-specific error text files. Users who purchase the OpenBSI Development Kit can edit the message text within these files to conform to their own language requirements, e.g. to create error messages in Spanish, French, etc. The file names of “BSSTATUS.TXT” or “BSJOURN.TXT” are appended to this string to find the files. Example: PATH_ERRORS=C:\ProgramData\Bristol\OPENBSI
JOURNAL_FILE =*journalpath*	This *journalpath* string is the path and file name for the currently active OpenBSI journal file. Example: JOURNAL_FILE=C:\ProgramData\Bristol\ACCOL\JOURNAL.DAT
DELETE_JOURNAL=*select*	If *select* is non-zero, indicates that the journal file is deleted on OpenBSI

	start-up. This helps prevent the journal file from eventually growing to a large size, and consuming excess disk space. Example: DELETE_JOURNAL=0
ACCOL_PATH=aco*path*	The *acopath* string indicates the directory/folder where the system stores ACCOL files. Example: ACCOL_PATH= C:\ProgramData\Bristol\OPENBSI\ACCOL
IP_PORT=*portnumber*	The UDP *portnumber* (sometimes known as a socket number) used for communication with RTUs. The system uses it to split message traffic along different “streams”. All PC's or RTU's which are to communicate with each other must have the same *portnumber* value for IP_PORT. In this sense, it is like a common password which must be known by each node in the network (or sub-network). If no value is entered, NetView assigns a default value for use throughout the network. (Although the term “UDP port” is used, it has no actual relationship with the physical communication ports.) Example: IP_PORT=100
TIMESYNC_PORT=*timeportnum*	The UDP port number used for time synchronization of the RTUs. Any connected PC or RTU which does not have this *timeportnum* value will be unable to receive time synchronization messages. In a sense, therefore, this value is like a common password which must be known throughout the network. If no value is entered, NetView assigns a default value for use throughout the network. (Although the term “UDP port” is used, it has no actual relationship with the physical communication ports.) Example: TIMESYNC_PORT=101
TIMESYNC_FREQUENCY=*frequency*	Frequency of time synchronization messages to RTUs. You must specify the *frequency* in seconds. Example: TIMESYNC_FREQUENCY=3600

ROUTER_PORT=*router*	The TCP port number used for communication between message routers. (Although the term "TCP port" is used, it has no actual relationship with the physical communication ports.) The value of *router* must be the same on all nodes which use the message router. In a sense, therefore, this value is like a common password which must be known throughout the network. Example: ROUTER_PORT=102
CONNECTION_TIMEOUT=*contime*	How long to wait before timing out an IP Proxy access connection. You must specify the value of *contime* in seconds. (For a description of what proxy access is, please see *Defining the Proxy File* later in this appendix.) Example: CONNECTION_TIMEOUT=60
PROXY_DIRECT=*proxyselect*	When you set *proxyselect* to TRUE, the remote workstation is specifying it would like direct access to proxy RTUs. Do not confuse this with the NHP allowance of direct access to its RTUs. (For a description of what proxy access is, please see *Defining the Proxy File* later in this appendix.) Example: PROXY_DIRECT=TRUE
PROXY_FAIL_COUNT=*count*	When using Proxy Direct Access, and attempts to send data to an RTU are failing, *count* is the maximum number of failures which OpenBSI allows to occur before this PC must contact the RTU's NHP to see if communication parameters have changed. Example: PROXY_FAIL_COUNT=3

[Application] section

This section defines application level parameters which are shared among all of the OpenBSI Utilities:

Keyword	Description
SIGNAL_INHIBIT_CHANGE=*level*	This is the minimum security level an operator must have in order to change the manual, control, or alarm inhibit/enable status of a signal. The

Keyword	Description
	default security level for this is 4.
LIST_RECIPE_CHANGE=*level*	This is the minimum security level an operator must have in order to change a signal list or recipe in DataView. The default security level for this is 3.
SECURITY_SCHEME=*choice*	When *choice*=0, the password only security scheme is used. When *choice*=1, the username/password scheme is used. The default is password only.
SIGNAL_DATA_RATE=*rate*	This is the refresh *rate* (in seconds) at which signal data should be updated on the screen. The default *rate* is 5.
ARRAY_DATA_RATE=*rate*	This is the refresh *rate* (in seconds) at which array data should be updated on the screen. The default *rate* is 30.
COMM_STATS_RATE=*rate*	This is the refresh *rate* (in seconds) at which communication statistics in the Remote Communication Statistics Tool should be updated on the screen. The default *rate* is 15.
COMM_RETRIES=*retries*	*retries* is the number of unsuccessful attempts the Data Collector makes to collect data from an RTU, before declaring an error. If a modem is used, this same number defines the number of modem retries which will be made. The default number of retries is 3.
MODEM_RETRY_INTERVAL=*interval*	In some applications, a pair of ACCOL signals is used to notify that a modem should be turned ON/OFF to allow for data collection. The *interval* defines the rate (in seconds) at which the Data Collector examines the Modem Confirm signal, to see if it has been turned ON. The default value for this parameter is 1 second.
DATAVIEW_LISTS_PATH=*path*	This is the directory path DataView uses to store signal searches (.SCH), recipes (.RCP) and DataView Lists (.DVL). The default path is \OPENBSI.
COLLECTOR_CFG_PATH=*path*	This is the directory path used by the

Keyword	Description
	Data Collector and the Data File Conversion utility for storing configuration files such as STATION.CFG and DACONFIG.TXT.
COLLECTOR_DATA_PATH=*path*	This is the directory path where the Data Collector stores its data. This data includes information collected from: signal lists, the archive files, data arrays, and audit trail alarm and event buffers.
WEB_BROWSER_PATH=*path*	This is the directory path where OpenBSI looks for Microsoft® Internet Explorer. This is necessary when configuring ControlWave series controllers.
MASTER_PASSWORD=*string*	DO NOT ATTEMPT TO EDIT THIS STRING. DOING SO WILL MAKE THIS FILE UNREADABLE BY NETVIEW.

B.2 Defining a Proxy File:

Proxy RTU's are controllers (RTU's) which the *current OpenBSI workstation* may have access to, but *only if* access has been granted by the Network Host PC (NHP). The workstation does NOT initially know the IP address (or BSAP address) necessary to connect to these RTU's, it only knows the name and address of an NHP, and the RTU node names associated with that NHP.

The proxy file is a file on the OpenBSI workstation which contains the name of an NHP, and its RTU node names. If the workstation requires communication with one of those RTU's it must first contact the NHP and request access. The NHP can grant limited access, by intercepting messages and delivering them indirectly, or it may grant direct access by notifying the workstation to contact the RTU directly via the RTU's IP address (not possible for BSAP RTU's).

The contents of the proxy file are described below:

Keyword	Description
NETWORK_TYPE = *nettype*	This is the type of sub-network the NHP is on. This should always be **IP**.
NAME =*nhpname*	This field defines the host name for this NHP. A maximum of 16 characters are allowed.
IP_PRIMARY =*a.b.c.d*	This field defines the 4 byte Primary IP address of the NHP

Keyword	Description
IP_SECONDARY =*e.f.g.h*	This field defines the 4 byte Secondary IP address of the NHP
RTU_*x=rtuname*	These entries define the names of RTU's accessible via this NHP.

Figure B-1 shows a sample proxy file.

```
NETWORK_TYPE=IP
NAME=OFFICE_HQ
IP_PRIMARY=123.10.0.1
IP_SECONDARY=
RTU_1=ELMSTREET
RTU_2=PARKROAD
RTU_3=FRONTSTREET
RTU_4=SEASIDEDRIVE
RTU_5=MAINSTREET
RTU_6=CEDARLANE
RTU_7=BOULEVARD
```

Figure B-1. Sample Proxy File

B.3 Using the Off-Line Database Configuration Utility (DBConfig)

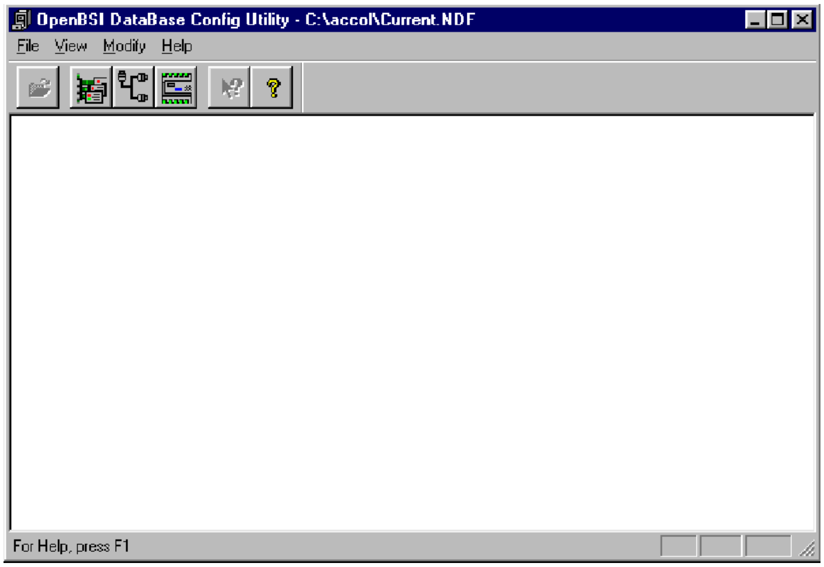
The off-line Database Config Utility allows you to perform off-line modifications to existing system structures (NHPs, communication lines, RTUs, networks) in the NETDEF Database Files (*.MDB, *.DSN, *.LDB). The Database Config Utility CANNOT add new structures, or delete existing structures; it only performs modifications.

The off-line Database Config Utility is the recommended method for performing off-line modifications to the NETDEF Database Files. If, instead, you would like to edit the database files directly using a third-party package (such as Microsoft® Access) see *Database Tables and Fields* later in this appendix.

B.3.1 Starting the Database Config Utility

Database Config Utility

To start the Database Config Utility, click on **Start>Programs>OpenBSI Tools> Common Tools > Off-Line Database Config**.



OpenBSI DataBase Config Utility - C:\accol\Current.NDF

For Help, press F1

Figure B-2. Off-Line Database Configuration utility

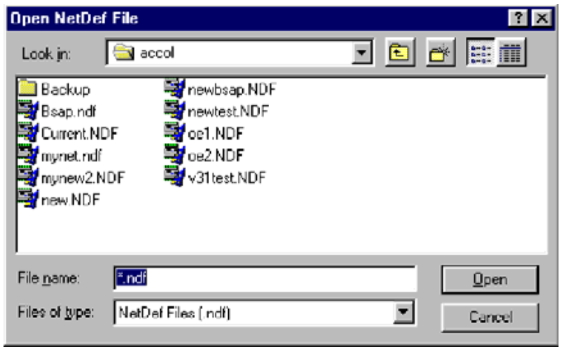
B.3.2 Opening a Set of NETDEF Files for Modification

Once you start the Database Config Utility, you can choose the set of NETDEF files you would like to modify. (The NETDEF files must have been created with OpenBSI Version 3.1 (or newer), older NETDEF files cannot be opened.)

To open the file, click on the icon, shown above, or click **File>Open**. The Open NetDef File dialog box opens, from which you can select the desired NDF filename.

⚠ **Caution** **If NetView is currently running, do not attempt to modify the currently running NETDEF files.**

Once you select a file, and click **Open**, the utility prompts you to provide a username and/or password for access to the NETDEF file. Editing of NETDEF files requires user privileges of either an Engineer or an Administrator.



Open NetDef File

Look in: accol

Backup
Bsap.ndf
Current.NDF
mynet.ndf
mynew2.NDF
new.NDF
newbsap.NDF
newtest.NDF
oe1.NDF
oe2.NDF
v31test.NDF

File name: *.ndf

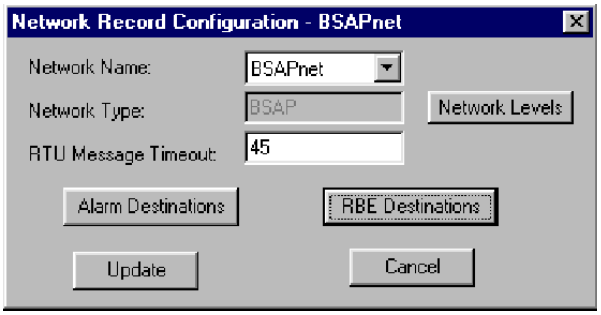
Files of type: NetDef Files (*.ndf)

Figure B-3. Selecting a NETDEF File for Modification

B.3.3 Modifying Your BSAP or IP Network

Once you start the Database Config Utility, you can choose the set of NETDEF files you would like to modify. (The NETDEF files must have been created with OpenBSI Version 3.1 (or newer), older NETDEF files cannot be opened.)

To modify the details of an existing BSAP network or IP network, click on the icon, shown above, or click **Modify>Network Record**. The Network Record Configuration dialog box opens:



Network Record Configuration - BSAPnet

Network Name: BSAPnet

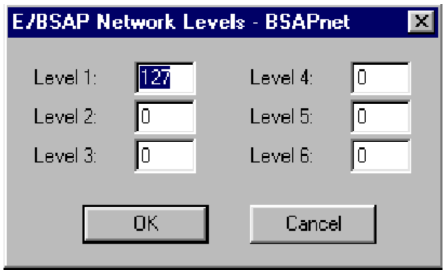
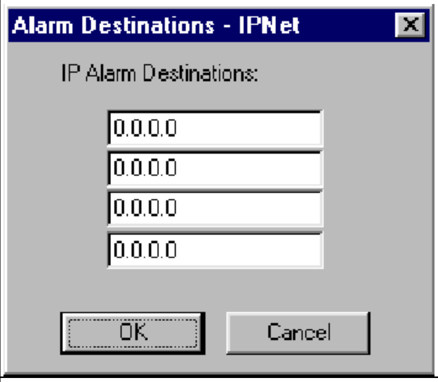
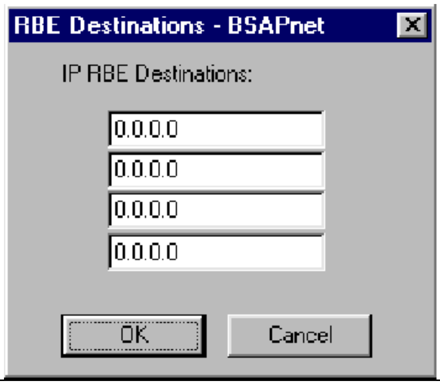
Network Type: BSAP

RTU Message Timeout: 45

Figure B-4. Network Record Configuration dialog box

Depending upon the type of network (BSAP or IP) not all options are available. For descriptions of the various fields, see below. After you specify all desired changes, click **Update** to make the actual modifications to the database.

Field	Description
Network Name	Use this list box to select which of your configured networks you want to modify.
Network Type	This field displays the type of network (BSAP or IP) which you selected. This field cannot be edited.
RTU Message	An RTU must respond to a program (such as DataView,

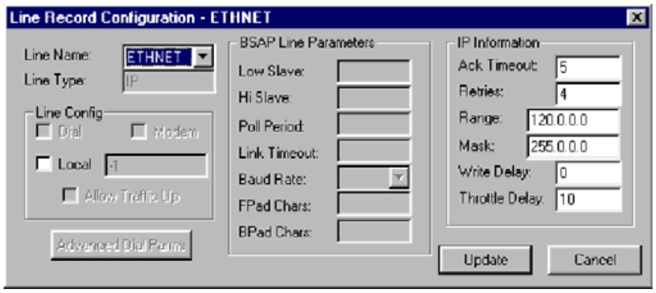
Field	Description
Timeout	Netview, etc.) within this number of seconds. If no response is received, the node is said to have "timed out." For more information on this parameter, see *Network Wizard: Step 2 of 2* in *Chapter 6*.
[Network Levels]	This push button is used for BSAP/EBSAP networks only, and activates the Network Levels dialog box. This dialog box allows you to specify the maximum number of RTUs which are slaves to a given master node. When finished, click OK to return to the Network Record Configuration dialog box.  E/BSAP Network Levels - BSAPnet Level 1: 127 Level 2: 0 Level 3: 0 Level 4: 0 Level 5: 0 Level 6: 0
Alarm Destinations	This push button activates the Alarm Destinations dialog box. This dialog box lets you specify the IP addresses of up to four OpenBSI workstations you want to receive alarm reports from the RTUs in this network. Click on OK when finished to return to the Network Record Configuration dialog box.  Alarm Destinations - IPNet IP Alarm Destinations: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
RBE Destinations	This push button activates the RBE Destinations dialog box. This dialog box lets you specify the IP addresses of up to four OpenBSI workstations which you want to receive report by exception (RBE) data from the RTUs in this network. Click OK when finished to return to the Network Record Configuration dialog box.  RBE Destinations - BSAPnet IP RBE Destinations: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

Field	Description
Update	Click on this push button to save all of the changes to this network.

B.3.4 Modifying Your BSAP/EBSAP/Local BSAP or IP Communication Line

To modify the details of an existing communication line, click on the icon, shown at left, or click **Modify> Line Record**. The Line Record Configuration dialog box opens:

Depending upon the type of communication line, not all options are available. For descriptions of the various fields, see below. After you specify all desired changes, click **Update** to make the actual modifications to the database.



Line Record Configuration - ETHNET

Line Name: ETHNET
Line Type: IP

Line Config
□ Dial □ Modem
□ Local -1
□ Allow Traffic Up

BSAP Line Parameters
Low Slave:
Hi Slave:
Poll Period:
Link Timeout:
Baud Rate:
FPad Chars:
BPad Chars:

IP Information
Ack Timeout: 5
Retries: 4
Range: 120.0.0.0
Mask: 255.0.0.0
Write Delay: 0
Throttle Delay: 10

Figure B-5. Line Record Configuration dialog box

The following parameters apply to all types of communication lines:

Field	Description
Line Name	Use this list box to select which of your configured communication lines you want to modify.
Line Type	This field displays the type of communication line which you selected. You cannot edit this field.

The following parameters are for BSAP, EBSAP, and Local BSAP lines only:

Field	Description
Poll Period	For BSAP/EBSAP lines, this is the rate (in seconds) at which OpenBSI requests data from the top-level RTUs in the network. For Local BSAP lines, this is the rate (in seconds) at which OpenBSI requests data from the currently selected RTU.
Baud Rate	Use this list box to specify the rate at which communications occur on this line.
Link Timeout	This is the maximum amount of time (in seconds) that OpenBSI waits to receive a response to any one data link transaction. If **0** is entered as the link timeout, the system

Field	Description
	uses a default timeout calculated based on the baud rate of the line.
FPad Chars, BPad Chars	These fields specify the number of null characters to insert at the front end (FPad), or back end (BPad) of a message. Null characters are useful in situations where there may be a momentary delay which could cause the start of a message to be missed, for example, while a radio link is being activated. Null characters are also necessary if you are communicating using a 2-wire RS-485 link, to ensure that DTR is not dropped prematurely. To determine the delay caused by null packing, perform the following calculation:

$$\text{seconds of delay} = \frac{\text{number of null characters * 10}}{\text{baud rate}}$$

Field	Description
Dial	Checking this box indicates that this is a dial-up line. (Not supported for IP lines.) Click **Advanced Dial Parms** to modify dialing parameters. For information on these, see *Specifying Dial Parameters* in *Chapter 6*.
Modem	Check this box if the RTUs on this line require RTS/CTS hand-shaking in order for messages to be sent. The NHP turns on the Request to Send (RTS) control line for the RTU, which must respond to the NHP by turning on the Clear to Send (CTS) control line, at which point, the data can be sent.

The following parameters are for BSAP, EBSAP Lines only:

Field	Description
Low Slave	This value is the lowest local address among all of the Level 1 RTUs on this communication line. (The local address is determined based on switches, soft switches, or jumpers at the RTU.)
High Slave	This value is the highest local address among all of the Level 1 RTUs on this communication line. It CANNOT be less than the value of **Low Slave**.

The following parameters are for Local BSAP Lines only:

Field	Description
Local	Check this box if this is a Local BSAP Line. (Local BSAP lines are typically used for one of two things: 1) As a backup line for use when a regular communication line fails; 2) To plug an OpenBSI Workstation in at a lower level of a BSAP network.
Allow Traffic Up	By default, a Local BSAP Line communicates only with the RTU to which it is currently connected, and any slave nodes of that RTU. Checking this box allows the Local BSAP Line

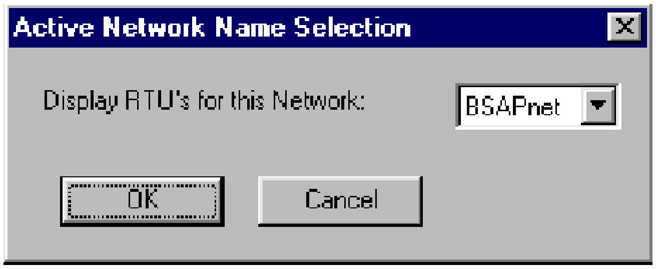
Field	Description
	to reach RTUs at *higher* levels of the network, i.e. the master of the RTU to which you are currently connected.

The following parameters are for IP lines only:

Field	Description
Ack Timeout	This should be set to the maximum amount of time it takes for a sending node to receive the acknowledgment of a data request (i.e. after sending a message, how long should a node wait to hear that the request reached its destination.) This should be based on the maximum turn-around time between the NHP and any RTU in the address range for this communication line.
Retries	This is the number of link level retries. It represents the total number of attempts OpenBSI makes to send a message to an RTU on this line. An attempt is said to have failed if an Ack Timeout occurs.
Range	This field specifies (in dotted decimal format) the valid range of IP addresses for this communication line. For more information on this subject, see *Chapter 6*.
Mask	This field specifies (in dotted decimal format) which bits in the binary representation of the corresponding **Range** field are common to any valid IP address on this communication line.
Write Delay	This is the amount of time (in seconds) the system should wait before sending a packet, if the packet has empty space to hold more data. This could occur, for example, if a data request for information about a single signal comes in, but there is additional room in the data packet to hold data for additional signals. If the **Write Delay** has not expired, the system waits for additional data requests for signal data to come in, and fill up the free space in the packet with responses to those requests. If additional requests do not come in before expiration of the delay, the packet is sent “as is.”
Throttle Delay	This delay (specified in seconds) is triggered if the system runs out of buffers. If this occurs, other nodes must wait for the time specified by the delay before sending more messages. This delay allows buffers to be freed up.

B.4 Modifying Your RTU Configuration

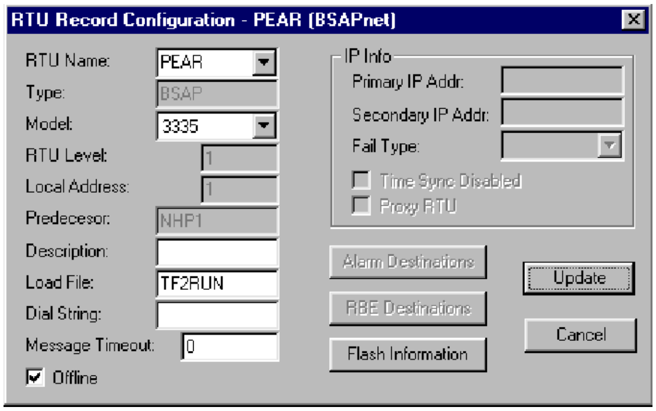
To modify the details of an existing RTU, click the icon, shown above, or click on **Modify>RTU Record**. The Active Network Name Selection dialog box opens.



Active Network Name Selection

Display RTU's for this Network: BSAPnet

Figure B-6. Active Network Name Selection dialog box



RTU Record Configuration - PEAR (BSAPnet)

RTU Name: PEAR
Type: BSAP
Model: 3335
RTU Level: 1
Local Address: 1
Predecesor: NHP1
Description:
Load File: TF2RUN
Dial String:
Message Timeout: 0
☑ Offline

IP Info
Primary IP Addr:
Secondary IP Addr:
Fail Type:
□ Time Sync Disabled
□ Proxy RTU

Figure B-7. RTU Record Configuration dialog box

Use the **Display RTU's for this Network** list box to choose which of your networks contains the RTUs you want to modify. Click **OK** and the RTU Record Configuration dialog box opens.

Depending upon the type of RTU (BSAP or IP) not all options are available. For descriptions of the various fields, see below. When you specify all desired changes, click on **Update** to make the actual modifications to the database.

The following parameters apply to all types of RTUs:

Field	Description
RTU Name	The name of this RTU. Although up to 16 characters may be specified for the name, be aware that various older programs require that RTU names be four (4) characters or less.
Type	The type of RTU, either **BSAP**, or **IP**. This is a read-only field.
Model	The RTU model, e.g. **3330**, **3335**.

Field	Description
Local Address	This is the BSAP local address of this RTU, which must range from 1 to 127. This is a read-only field.
Description	A textual description of this RTU, up to 64 characters in length.
Load File	The ACCOL load file name which runs in this RTU.
Dial String	The dial string consists of the phone number the OpenBSI workstation sends to an attached modem in order to dial this RTU. The dial string may also include modem. OpenBSI immediately precedes the dial string with the "AT" modem command. **Note:** Dialing is not yet supported for IP RTUs.
Message Timeout	This value specifies (in seconds) how long to wait before declaring that a message, routed to this RTU, is lost and will never return. If you don't specify a value, the system uses the default message time-out period for the network.
Offline	When checked, turns off communications with this RTU.
Flash Information	This push button activates the RTU Flash Record Configuration dialog box. See *Using the RTU Flash Record Configuration Dialog Box* later in this appendix.

The following parameters apply to BSAP RTUs ONLY:

Field	Description
RTU Level	This is the network level, which ranges from 1 to 6. This is a read-only field.
Predecessor	Predecessor is the master of this BSAP RTU. This is a read-only field.

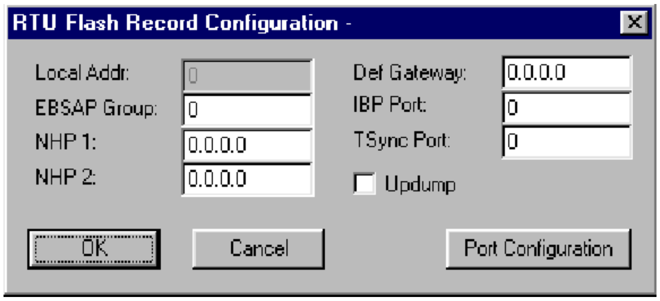
The following parameters apply to IP RTUs only:

Field	Description
Primary IP Addr	The IP address of this RTU, in dotted decimal format. If this RTU has two IP ports, this is the address of the primary port. If this RTU is part of a redundant pair of RTUs, this is the address for the "A" unit of the redundant pair.
Secondary IP	If this RTU has two IP ports, this is the address of the second port. If this RTU is part of a redundant pair of RTUs, this is the address for the "B" unit of the redundant pair.
Fail Type	Use this list box to choose either "Primary" or "Symmetric" as the fail type. If you choose "Primary," OpenBSI always attempts to communicate with this RTU using the Primary IP Address, unless that link fails, in which case, it tries to communicate using the Secondary IP Address. If you choose "Symmetric," OpenBSI always attempts to use the

Field	Description
	current working communication link (either primary or secondary) and then if that link fails, it fails over to the alternate link. Choose this method if the RTU belongs to a redundant pair.
Time Sync Disabled	If you select this option, time synchronization messages will NOT be sent to this RTU.
Proxy RTU	If you select this option, any OpenBSI 3.*x* workstation granted proxy direct access would be allowed to send messages directly to this RTU.
Alarm Destinations	This push button activates the Alarm Destinations dialog box, discussed earlier in this appendix.

B.4.1 Using the RTU Flash Record Configuration Dialog Box

The RTU Flash Record Configuration dialog box is accessible from the **Flash Information** push button in the RTU Record Configuration dialog box.


RTU Flash Record Configuration -

Local Addr: 0
EBSAP Group: 0
NHP 1: 0.0.0.0
NHP 2: 0.0.0.0
Def Gateway: 0.0.0.0
IBP Port: 0
TSync Port: 0
□ Updump

Figure B-8. RTU Flash Record Configuration dialog box

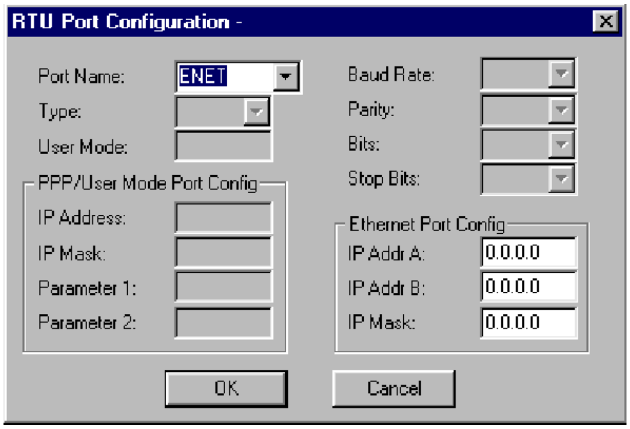
The following entries apply to any RTU supporting FLASH memory:

Field	Description
Local Addr	This is the BSAP local address, which must be an integer from 1 to 127. The default is 1. NOTE: Even if this RTU will be part of a purely IP network, the local address entered here must match that defined in the RTU to allow for proper routing of alarm and RBE messages.
Def Gateway	This is an IP address of a default gateway. The default gateway is an address to which any messages with destinations which are not directly reachable will be sent (i.e. not in the address range specified via the IP mask for this node.) This address must be entered in dotted decimal format.
EBSAP Group	This is the EBSAP group number. If this network does NOT use expanded node addressing, the EBSAP group number should be 0.
IBP Port	This is the UDP port number (socket number) used by the Bristol IP driver. It is used to split message traffic along

Field	Description
	different “streams"'. All PC's or RTU's which are to communicate with each other must have the same IBP port number.
NHP 1	This is the primary IP address for this RTU's Network Host PC (NHP). It must be entered in dotted decimal format.
NHP 2	This is a secondary IP address for the same NHP referenced by NHP1 (or the IP address of a redundant backup NHP). It must be entered in dotted decimal format.
Tsync Port	This is the UDP port number (socket number) used for time synchronization of the RTU's. All PC's or RTU's must have this value defined, or else they will be unable to receive time sync messages.
Updump	Updump should be enabled only if Bristol Application Support or Development personnel are attempting to debug a problem, and need a copy of the unit's internal system memory (memory dump). When this option is selected, and the RTU resets, it will wait for a few seconds for the user to press the reset button again. Rather than enter self-test mode following a crash, updump enable causes a menu to be activated on the attached PC or laptop which allows system RAM to be saved in a disk file.
Port Configuration	This push button calls up the RTU Port Configuration dialog box.

B.4.2 Using the RTU Port Configuration Dialog Box

The RTU Port Configuration dialog box is accessible from the **Port Configuration** push button of the RTU Flash Record Configuration dialog box.



Port Name: ENET

IP Addr A: 0.0.0.0

IP Addr B: 0.0.0.0

IP Mask: 0.0.0.0

Figure B-9. RTU Port Configuration dialog box

Field	Description
Port Name	Choose the name of the RTU port from this list box.

Field	Description
Type	The type of communication protocol which will use this port. Choices are “BSAP”, “EBSAP”, “PPP”, “USER_MODE”, or “UNUSED”.
User Mode	This field is only used if “USER_MODE” is chosen for the "Type". It indicates a protocol number which is used to reference internal and custom tables at the RTU, in order to select the proper driver software for this custom data link.
Baud Rate	This is the baud rate used by this serial port for BSAP cold downloads. (If IP communication is performed through this port, this is also the baud rate used.) The default baud rate is 9600.
Parity	Specifies either ODD, EVEN, or NONE for the parity. The default is NONE. This field is ignored for BSAP or EBSAP communication.
Bits	This is the number of bits used in a character. The default is 8. This field is ignored for BSAP or EBSAP communication.
Stop Bits	This is the number of stop bits per character. The default is 1. This field is ignored for BSAP or EBSAP communication.
PPP/User Mode Port Config:	
IP Address	This is the IP address of this serial IP port. This address must be in dotted decimal format, and must be unique.
IP Mask	This specifies the range of valid IP address which this RTU can send messages to through this port. It must be entered in dotted decimal format.
Parameter 1	This is a protocol-specific value which may be utilized by a non-standard protocol at RTU initialization. Its value is 4 bytes unsigned, and defaults to 0. (This field is only used for non-standard, customized data links.)
Parameter 2	This is a second protocol-specific value which may be utilized by a non-standard protocol at RTU initialization. Its value is 4 bytes unsigned, and defaults to 0. (This field is only used for non-standard, customized data links.)
Ethernet Port Config:	
IP Addr A	This is the IP address of the Ethernet Port on the “A” unit of a redundant pair of RTU's, or of the current RTU if it is NOT part of a redundant pair. This address must be in dotted decimal format, and must be unique.
IP Addr B	This is the IP address of the Ethernet Port on the “B” unit of a redundant pair of RTU's. This address must be in dotted decimal format, and must be unique. If this RTU is NOT part of a redundant pair, the “B” address may be specified as 0.0.0.0.

Field	Description
IP Mask	This specifies the range of valid IP addresses which this RTU can send messages to through this port. It must be entered in dotted decimal format.

B.5 Database Tables and Fields

Notes:

- We recommend you perform all of your off-line database edits using the Database Config Utility, described earlier, in this appendix. Advanced users or developers may, however, choose to access or edit tables/fields directly using a third-party package such as Microsoft® Access. Exercise care, however, because improper edits to the database could potentially corrupt your NETDEF files, thereby resulting in a loss of system communications.
- In the database tables, all IP addresses are stored as large hexadecimal numbers.

B.5.1 "net" table fields

Field	Description
nid	Table id of network.
name	The sub-network name.
type	Type of sub-network defined by this section. Either BSAP(1) or IP(2).
master	Network Master Node for a BSAP sub-network, either an IP defined RTU, or this NHP. The value is an index into the "rtu" table.
levels	Maximum number of RTUs per level used in global addressing for each level of the BSAP sub-network. This field is for BSAP sub-networks ONLY. Example Value: 3,5,10
nrt_ver	Integer representing the version of the Node Routing Table for this BSAP sub-network.
rtu_tmo	The time-out interval to wait before declaring that a message, routed to any RTU on this subnet, has been lost and will never return. If this field is not specified or is 0, the default time-out period is used. The value is specified in seconds.
alrm1 – alrm4	These fields define IP address destinations for alarm messages from this network. Up to four IP addresses can be specified. This field is for IP networks ONLY.

Field	Description
rbe1 – rbe 4	These fields define IP address destinations for rbe messages from this network. Up to four IP addresses can be specified. This field is for IP networks ONLY.

B.5.2 “rtu” table fields

Field	Description
rid	Table id of RTU.
nid	Table id of network this RTU belongs to.
name	The RTU name.
type	Type of sub-network this RTU belongs to. Either BSAP(1) or IP(2).
model	This field defines the RTU type. {NONE=0, 3305=1, 3308=2, 3310=3, 3330=4, 3335=5, 3508=6, 3530=7, VIRTUAL=8, 9=ControlWave, 10=CWave_LP, 11=CWave_RIO, 12=CWave_Micro, 13=CWave_EFM, 14=CWave_GFC, 15=CWave_XFC, 16=CW_10, 17=CW_30, 18=3808 and 4088B, 19=CWave_Exp }
descr	A textual description of the RTU. A maximum of 64 alpha-numeric characters are allowed.
load	This field defines the ACCOL load file base name for the RTU. This field can be up to 16 alpha-numeric characters.
lvl	Level of the BSAP sub-network this RTU in on. “Lvl” can range from 1 to 6. This field is for BSAP RTU's ONLY.
local	Local Address of the RTU. “local” can range from 1 to 127. This field is for BSAP RTU's ONLY.
pred	Predecessor node (or Master) this RTU is attached to. This field is for BSAP RTU's ONLY. “rid” of RTU.
dial_str	Phone number to use if this RTU is on a dial-up line. Currently available for BSAP RTU's ONLY.
offline	If non-zero, this RTU is considered off-line and no communication is attempted.
rtu_tmo	The time-out interval to wait before declaring that a message, routed to this RTU, has been lost and will never return. If this field is not specified, the default time-out period is used. The value of rtu_tm is specified in seconds.
ip_prim	This field defines the 4 byte Primary IP address of this RTU.
ip_sec	This field defines the 4 byte Secondary IP address of this RTU.
fail_type	Fallback handling method. Primary(1) or Symmetric(2).

Field	Description
	Primary will always try the primary link first and in the failure case will fallback to the secondary. Symmetric will continue to use the current working link (primary or secondary) until a failure occurs, in which case it will fall back to the alternate. This field is for IP RTU's ONLY.
time_sync	Disables time synchronization messages for this RTU. When set to TRUE, messages are disabled; when set to FALSE, they are enabled. This field is for IP RTU's ONLY.
proxy	When set to TRUE, direct access is allowed to this RTU; when set to FALSE, direct access to this RTU is denied. This field is for IP RTU's ONLY.
alrm1 – alrm4	These fields define IP address destinations for alarm messages from this RTU. Up to four IP addresses can be specified. This field is for IP RTUs ONLY.
rbe1 – rbe4	These fields define IP address destinations for rbe messages from this RTU. Up to four IP addresses can be specified. This field is for IP RTUs ONLY.
proxy_tmo	Message timeout for RTUs that are remote proxy RTUs.
web_page	Name of startup web page for this RTU.

B.5.3 “flash” table fields

The next several entries are constants which are programmed into FLASH memory of the RTU:

Field	Description
rid	Table id of RTU in “rtu” table.
updump	If set non-zero, RTU is in diagnostic mode, and can UPDUMP its memory (equivalent to Switch 8 on address switch bank).
laddr	RTU Local address used for BSAP communications. The default for this field is pulled from the LOCAL_ADDRESS parameter. “laddr” can range from 1 to 127.
group	Group number for EBSAP (expanded node addressing) communications. Default of zero indicates standard BSAP.
nhp_a	IP address for the primary PC which is the “master” for this RTU. Being “master” indicates that that PC is responsible for sending time synchs and alarm destination information to this RTU.
nhp_b	Secondary IP address for “master” PC. (Can also be a second PC).
def_gw	IP address for the default gateway. The default gateway is a computer to which packets are sent when the address and

Field	Description
	sub-net masks for the ports do not indicate where a packet is to be sent. This computer then forwards the packet to its destination.
ibp_port	UDP port to be used for IBP (standard OpenBSI) communications to this RTU. This value must be the same as the OpenBSI IBP port on any PC or RTU which is communicating to this RTU via IP.
ts_port	UDP port to be used for time synchs to this RTU. This value must be the same as the Time Synch Port on any NHP for this RTU. Default value is pulled from NDF file.
enet_ipaddra	IP address for the Ethernet port on redundant unit “A” (or if the unit is not redundant, the current RTU). The IP addresses for all nodes must be unique (this includes redundant backup nodes). If this value is zero, the Ethernet port is not used for IP communications.
enet_ipaddb	If the unit is redundant, the IP address for the “B” unit. This address must be different than unit “A” and be unique in the network.
ipmask	Subnet mask to indicate which network sub-section is reachable out the Ethernet port.

B.5.4 “port” table fields

For the next series of parameters, there are a series of groups, one for each port in the RTU. Within each port, the parameters are prefixed by the port name: (A, B, C, D, BIP1, BIP2, G, H, I, J). These parameters are set (in FLASH memory) to define the cold download rates and protocol for each port. In addition, if the communication protocol used is IP, these parameters are also used by the running system. If particular parameters are omitted, defaults will be used. If the entire section is omitted, the default is for a BSAP port at 9600 baud.

Field	Description
rid	Table id of RTU in “rtu” table.
port	RTU port name.
baud	Serial communications rate for port. {300=2, 600=3, 1200=4, 2400=5, 4800=6, 9600=7, 19200=8, 38400=9, 187500=10, 1MEG=11, RASCL=12}
parity	Parity bit used. {none=0, odd=1, even=3}
bits	Number of data bits. {6bits=128, 7bits=64, 8bits=192}
stop_bits	Number of stop bits for serial communications. {1bit=4, 1and ½bits=8, 2bits=12}
type	Indicates the usage for the port. {Unused=0, BSAP=1, EBSAP=2, User_mode=3, PPP=4}
user_mode	For IP communications, the protocol number used (if the protocol number is not in the _TYPE list). This allows custom MAC / Data-link layers to be defined.
ip_addr	For IP communications, the IP address assigned to the port.
ip_mask	For IP communications, the sub-net mask of addresses which indicates those addresses reachable out this port.
param1	Protocol specific optional parameter.
param2	Protocol specific optional parameter.

B.5.5 “line” table fields

Field	Description
lid	Table id of comm line.
name	Communication line name.
type	Type of communication line defined by this section. “Type” must be either BSAP(1), IP(2), EBSAP(3) or Local Connect(4).
slaves	Defines the high and low slave addresses that are serviced by this communications port. This field does NOT apply to IP communication lines. (Low slave in low order word, High slave in high order word)
local	Unused.
dial	If non-zero, indicates this communications port uses a modem and dials the RTU to make a connection. This field does NOT apply to IP communication lines.
modem	If non-zero, RTS/CTS keying will be used. (modem control). This field does NOT apply to IP communication lines.
poll_per	This field defines how often top level nodes are polled for data. “poll_per” must be specified in milliseconds. NOTE: This field only applies for BSAP or EBSAP line types.
link_tmo	This field defines the amount of time to wait before receiving a response to any one data link transaction. “Link_tmo” must be specified in milliseconds. This field does NOT apply to IP communication lines. If 0 is entered for “Link_tmo”, the line will use a default based on the selected baud rate.
baud	Rate at which communications is to proceed through this serial port. This field does NOT apply to Ethernet IP communication lines. {300=1, 1200=2, 2400=3, 4800= 4, 9600=5, 19200=6, 38400=7}
padding	The number of pad characters at the start & end of a message. Used to help debug with RTS/CTS control of modems & radios or if you are using 2-wire RS-485. This field does NOT apply to IP communication lines. (Front pad in low order word and back pad in high order word)
ip_range	The common portion of all IP addresses on this communication line, with uncommon portions entered as 0. This field applies to IP communication lines ONLY.
ip_mask	The sub-net mask associated with the IP_RANGE. This field applies to IP communication lines ONLY.
ack_tmo	This should be set to the maximum amount of time it takes for the acknowledgment of a data request to be received by

Field	Description
	the sending node (i.e. after sending a message, how long should a node wait to hear that the request reached its destination) This should be set based on the maximum turn-around time between any two points within this communication line. This field applies to IP communication lines ONLY.
Retries	This is the total number of attempts made to send a message. An attempt is said to have failed if an ACK_TIMEOUT occurs.
write_delay	The WRITE_DELAY is the amount of time the system should wait before sending a packet, if the packet has empty space to hold more data. This could occur, for example, if a data request for information about a single signal came in, but there was additional room in the data packet to hold data for additional signals. If the WRITE_DELAY has not expired, the system will wait for additional data requests for signal data to come in, and fill up the free space in the packet with responses to those requests. If additional requests don't come in before expiration of the write_delay, then the packet is sent, “as is”. This field applies to IP communication lines ONLY. write_delay must be entered in milliseconds.
throt_delay	The throttle delay field is triggered by the system running out of buffers. If this occurs, other nodes must wait for the time specified by the throt_delay before sending more messages. This delay allows buffers to be freed up. This field applies to IP communication lines ONLY. throt_delay must be entered in milliseconds.
init_str	This field defines the string the driver will send to initialize the modem. This field does NOT apply to IP communication lines.
dial_retries	Defines the number of times the driver will attempt to connect to the RTU. This field does NOT apply to IP communication lines.
dial_tmo	Defines the amount of time to wait for the connection to the RT U, before declaring this dial attempt a failure. This field does NOT apply to IP communication lines.
hangup_str1	Defines the first string to send to start the hang-up procedure. This field does NOT apply to IP communication lines.
hangup_str2	Defines the second string to send in the hang-up procedure. This field does NOT apply to IP communication lines.
hangup_retries	Defines the number of times the driver will attempt to hang-up the modem. This field does NOT apply to IP communication lines.
hangup_tmo	This field defines the amount of time to wait for the modem to properly hang-up, before declaring this hang-up attempt a failure. This field does NOT apply to IP communication lines.

Field	Description
hangup_delay	The field defines the amount of time to wait between sending the hang-up strings. This field does NOT apply to IP communication lines.
nodata_tmo	This field defines the amount of time with no communication traffic, the driver will wait before hanging up a connected dial line. This field does NOT apply to IP communication lines.
dtr	If non-zero, the field tells the driver to use DTR in the operation of the modem. This field does NOT apply to IP communication lines.
local_node	RTU table index of RTU line is locally connected to.
local_line	If non-zero indicates this line is connected locally to an RTU.

B.5.6 “proxy” table fields

Field	Description
pxid	Table index of proxy file.
name	Filename of the proxy info.

B.5.7 “seq” table fields

This table contains the next available index for each table, along with a database version.

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Appendix C – Keyboard Shortcuts

OpenBSI allows you to access system functions by pointing and clicking with the mouse on menu bar and pull down menu items, or by clicking on icons. You can also access several OpenBSI features using keyboard shortcuts which mimic the point and click operations. These are described in the tables which follow.

In addition to the sequences shown, you can also activate most menu selections by a single character keystroke (shown underlined in the menu bar or pull down menu).

C.1 NetView

Menu Bar / Pull Down Menu Sequence	Equivalent Keyboard Sequence	Function
File >New...	**Ctrl-N**	Create new set of NETDEF files
File >Open...	**Ctrl-O**	Open an existing set of NETDEF files
File>Save	**Ctrl-S**	Save the current NETDEF files
File>Print	**Ctrl-P**	Print
Edit>Undo	**Ctrl-Z**	Undo last action (limited to certain types of actions)
	F1	Call up on-line help

C.2 DataView

Menu Bar/Pull Down Menu Sequence	Equivalent Keyboard Sequence	Function
File>Save	**Ctrl-S**	Save the current file
File>New	**Ctrl-N**	Open a new file
File>Open	**Ctrl-O**	Open an existing file
Format>Properties	**Alt-Enter**	Re-call the DataView dialog box to change properties of window.
Edit>Insert	**Ins**	Insert a line into the current list
Edit>Delete	**Del**	Delete the currently selected item
File>Copy to Clipboard	**Ctrl-C**	Copy the textual contents of the window to the Clipboard
File>Print	**Ctrl-P**	Print the text of this window on the printer
Recipe>Write to RTU	**Ctrl-W**	Write contents of recipe to Network 3000 controller
Recipe>Read From RTU	**Ctrl-R**	Read current values from Network 3000 controller into recipe window
	F1	Call up on-line help

C.3 Downloader

Menu Bar / Pull Down Menu Sequence	**Equivalent Keyboard Sequence**	**Function**
File>Single Node	**Ctrl-N**	Download a single Network 3000 node
File>Open List	**Ctrl-O**	Download a group of Network 3000 nodes based on RDL file
	F1	Call up on-line help

C.4 Remote Communication Statistics Tool

Menu Bar / Pull Down Menu Sequence	**Equivalent Keyboard Sequence**	**Function**
Statistics>Copy to Clipboard	**Ctrl-C**	Copy textual contents of window to Clipboard
Statistics>Print	**Ctrl-P**	Print textual contents of window on printer
	F1	Call up on-line help

C.5 LocalView

Menu Bar / Pull Down Menu Sequence	**Equivalent Keyboard Sequence**	**Function**
File>New	**Ctrl-N**	Open a new View Mode File (*.LVG)
File>Open	**Ctrl-O**	Open an existing View Mode File (*.LVG)
File>Save	**Ctrl-S**	Save the current LVG File.
	F1	Call up on-line help

Appendix D – Modem and Radio Configuration Tips

D.1 Configuring the Workstation to Dial-up BSAP-capable Controllers

You can configure OpenBSI to allow communication with ControlWave or Network 3000 controllers via an attached modem. When the OpenBSI Workstation needs to communicate with a controller, it notifies the modem to dial-up the controller; once the connection is successfully made, it sends data between the workstation and the controller.

Note: Instructions for setting up the modem connected to the workstation, as well as the modems used by the ControlWave or Network 3000-series controllers are beyond the scope of this manual. See the documentation accompanying your modem for details.

D.2 Guidelines for Configuring Modems to Work with the Controllers

OpenBSI can send an initialization string to the modem. (See “*Specifying Dialing Parameters*” in Chapter 6.)

OpenBSI’s RTU Wizard also allows you to specify a dial string. (This is also discussed in *Chapter 6,* as part of BSAP RTU configuration.) You should include a “DT” (tone dialing) or “DP” (pulse dialing) modem command in the dial string.

You must perform any other configuration of the modem(s) using whatever modem configuration software is provided with the modem, or if applicable, via switch settings on the modem.

Table D-1 shows how modem characteristics should be set when connected to an OpenBSI workstation.

The first column describes what modem settings are required.

The second column shows corresponding initialization codes which would be included in the initialization string for a US Robotics modem. If you are starting with a modem which is at its factory default settings, the E1, &C1 and &D2 codes shown in the table are unnecessary.

If you have a different type of modem, *use the equivalent initialization code from the manual accompanying that particular modem*; not the code shown here. If you still cannot successfully set up your modem, refer to the troubleshooting tips later in this section.

Table D-1. Setting up a Modem to Work with OpenBSI

A modem connected to an OpenBSI Workstation must have the following settings:	**Corresponding US Robotics Code:**
Turn ON local echo of codes.	E1 **Note:** E1 is a factory default
Disable ARQ result codes.	&A0
Set modem's serial port rate to variable; to follow the connection rate.	&B0
Set Carrier Detect (CD) to normal operation.	&C1 **Note**: &C1 is a factory default
Set Data Terminal Ready (DTR) to normal.	&D2 **Note**: &D2 is a factory default
Disable transmit data (TD) Flow Control.	&H0
Disable data compression.	&K0
Disable error control. **Note**: This setting is NOT required if you have an identically configured modem at the RTU end.	&M0
Ignore RTS for receive data (RD).	&R1

D.3 Troubleshooting Tips for Modem Problems

Table D-2 shows a list of possible modem configuration problems and suggested remedies.

Table D-2. Modem Troubleshooting

Problem:	**Suggested Remedy:**
For an internal modem, there is no communication at all.	▪ If DTR is ON, check to see that the dial string is a correct, valid, phone number.
For an external modem, there is no RD (receive data), and no dialing occurs.	▪ Check to see that the dial string is a correct, valid, phone number. ▪ Check to see that the carrier detect setting is consistent with the carrier detect line, and that the carrier detect line is properly configured.
The modem dials, but does not connect.	▪ Check to see that the dial string is a correct, valid, phone number. ▪ Check to see that the carrier detect setting is consistent with the carrier detect line, and that the carrier detect line is properly configured. ▪ Check the baud rate and connection settings on both modems. ▪ For an external modem, check the wiring of the carrier detect line to the PC.
The modem connects, but does not communicate.	▪ Check the baud rate and connection settings on both modems. ▪ Check the baud rate in OpenBSI, and on the controller's port. ▪ Verify that flow control is disabled.

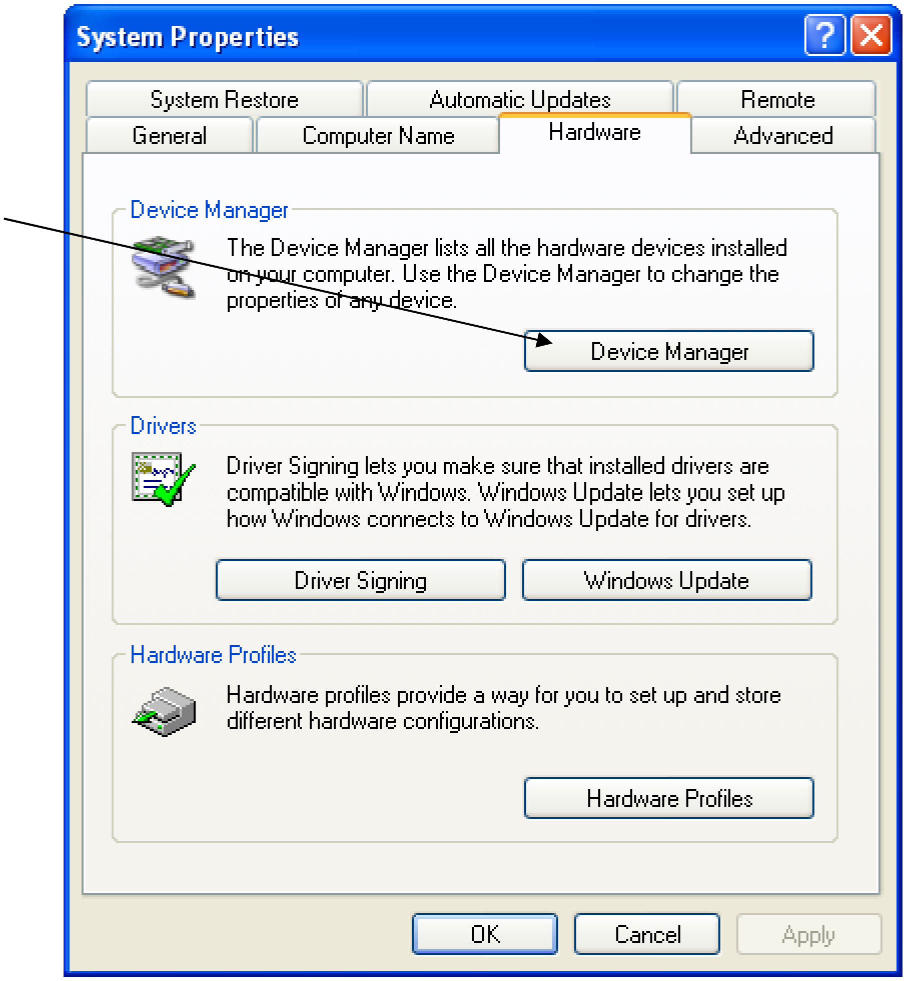
Problem:	Suggested Remedy:
	▪ Verify that the controller's address is correctly specified in OpenBSI.

D.3.1 OpenBSI Trouble-shooting Tip for Using RTS/CTS with Radios

If you use RTS/CTS with radios, and encounter a problem where the OpenBSI workstation can transmit, but RTUs are unable to respond, it could be related to PC port configuration in Windows which results in messages being truncated.

If this problem occurs follow these steps:

1. Click **Start> Settings>Control Panel** to call up the Windows control panel.
2. Double-click the **System** icon. The System Properties dialog box opens.
3. From the **Hardware** tab, click the **Device Manager** button:



Click here

System Properties

Device Manager

The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.

Drivers

Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.

Hardware Profiles

Hardware profiles provide a way for you to set up and store different hardware configurations.

Figure D-1. Windows System Properties dialog box

4. Click on the plus sign “+” next to the “Ports (COM & LPT)” selection. This displays a list of ports.

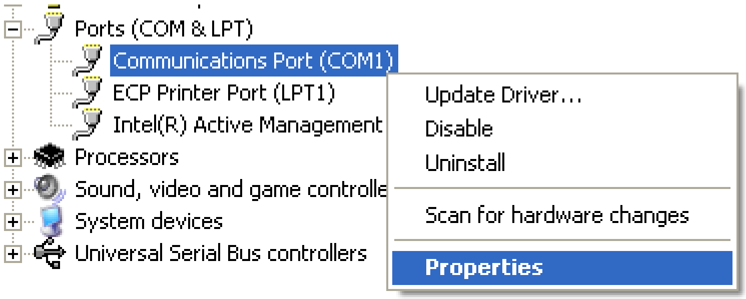
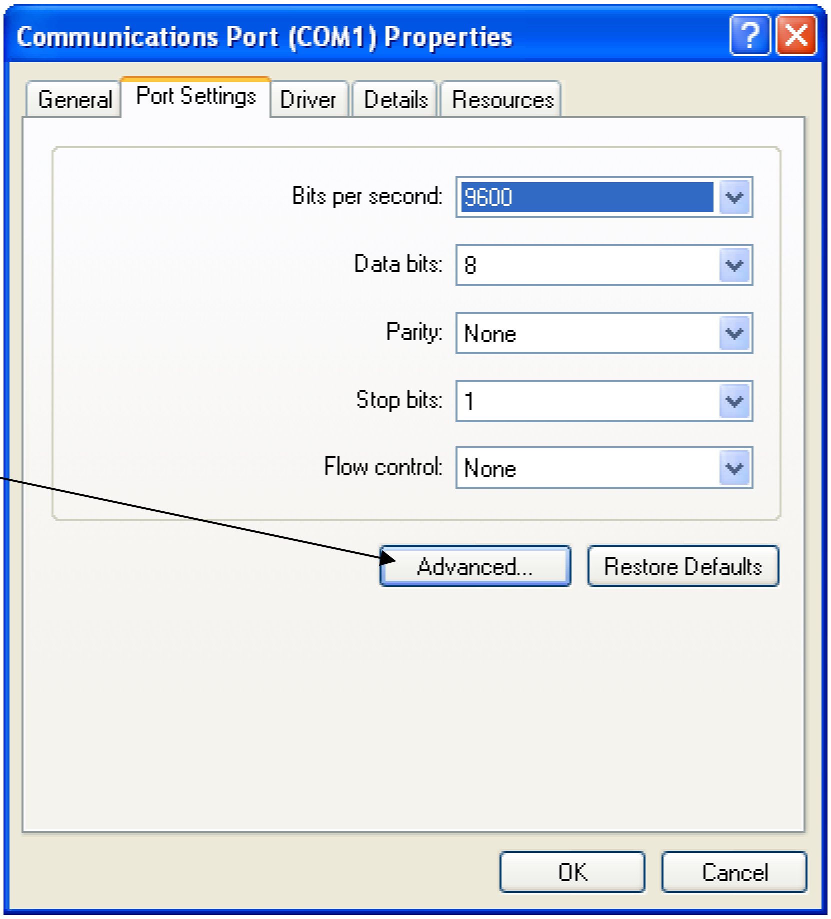

Ports (COM & LPT)
Communications Port (COM1)
ECP Printer Port (LPT1)
Intel(R) Active Management
Processors
Sound, video and game controlle
System devices
Universal Serial Bus controllers
Update Driver...
Disable
Uninstall
Scan for hardware changes
Properties

Figure D-2. List of Ports in Device Manager

5. Right-click once on the port used for OpenBSI communications (typically COM1 or COM2), and choose **Properties** from the pop-up menu.

6. The Communication Port Properties dialog box opens; click the **Port Setting**s tab, then click the **Advanced** push button to call up the Advanced Port Settings dialog box.



Bits per second: 9600

Data bits: 8

Parity: None

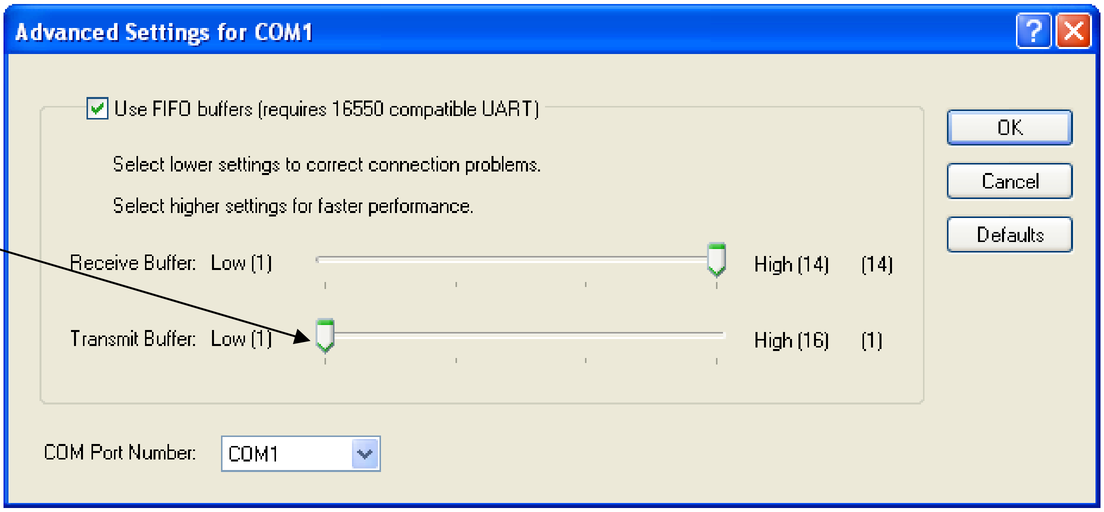
Stop bits: 1

Flow control: None

Click here

Figure D-3. Communication Port Properties dialog box

7. In the Advanced Port Settings dialog box, drag the **Transmit Buffer** slide bar to the low end of its range, and click **OK.**



☑ Use FIFO buffers (requires 16550 compatible UART)

Select lower settings to correct connection problems.

Select higher settings for faster performance.

Receive Buffer: Low (1) High (14) (14)

Transmit Buffer: Low (1) High (16) (1)

COM Port Number: COM1

Drag the Transmit Buffer slide bar to the low end of the range.

Figure D-4. Editing the Advanced Settings for the Port

8. Then choose **OK** in the Communication Port Properties dialog box, and exit the device manager and control panel to save the settings.

9. Reboot your PC for the new settings to take effect.

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Appendix E – Initialization Files

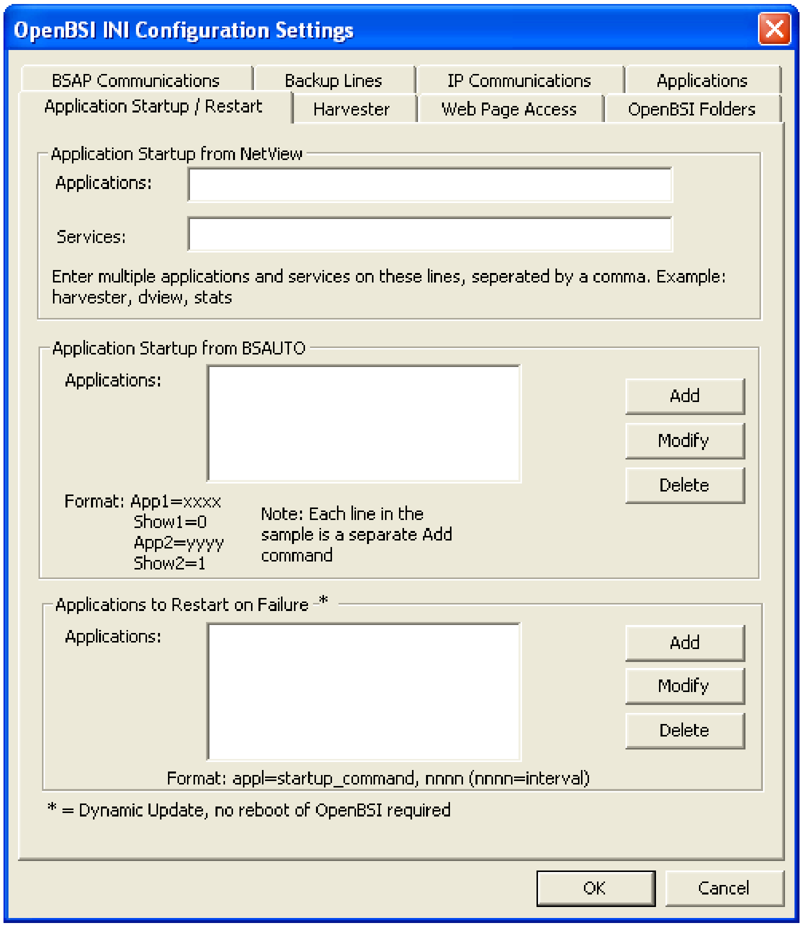
Beginning with OpenBSI 5.7, OpenBSI includes a configuration tool for editing many of the initialization files.

To access this tool, click on: **Start > Programs > OpenBSI Tools > Common Tools > Advanced Configuration.**

Note: If there is no asterisk "*" next to the parameter on screen, you must re-start OpenBSI in order for the change to take effect.

E.1 Application Startup/Restart Page

OpenBSI can start applications and services automatically. This is configured on the Application Startup/Restart tab.



Enter multiple applications and services on these lines, seperated by a comma. Example: harvester, dview, stats

Format: App1=xxxx
Show1=0
App2=yyyy
Show2=1

Note: Each line in the sample is a separate Add command

Format: appl=startup_command, nnnn (nnnn=interval)

* = Dynamic Update, no reboot of OpenBSI required

Figure E-1. Advanced Configuration – Application Startup / Restart

E.1.1 Application Startup from NetView

It is possible to have NetView start various applications and Windows services. These parameters are stored in the NETVIEW.INI file.

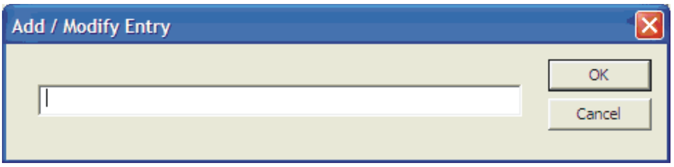
Field	Description
Applications	A comma delimited list of applications to be started from NetView. Example: dview, stats
Services	A comma delimited list of Windows services to be started from NetView. Example: bservice

E.1.2 Application Startup from BSAUTO / OBSIService

If you configure the BSAUTO or OBSIService feature to automatically start OpenBSI communications you can also configure other programs to start automatically. In addition, you can re-start particular programs that are registered with an OpenBSI message exchange. These parameters are stored in the USERAPPS.INI file.

Note: The choice of BSAUTO or OBSIService depends on your operating system. See *Chapter 2* for more information.

Field	Description
Applications	A list of applications to be started. The syntax for specifying the application requires two separate lines: App*n*=*path_and_filename* Show*n*=*show* where *n* is a number identifying the entry. These must be consecutive ascending numbers. The first number must be 1. *path_and_filename* identifies the location and executable name of the application to be started *show* is either “1” if the application is to be visible in a window or “0” if the window holding the application is to be minimized. Click **Add** then type in the text for the App*n* line via the Add/Modify dialog box, and click **OK**. Then click on **Add** again to add the **Show***n* line via the same method. To change an existing entry, select it and click **Modify**. To remove an entry, click on it, and then click **Delete**.



`

Some sample application entries would be:

```
App1=C:\"Program Files"\Bristol\OPENBSI\dataview.exe
Show1=1
App2=C:\"Program Files"\Bristol\OPENBSI\stats.exe
Show2=0
```

E.1.3 Applications to Restart on Failure

OpenBSI can optionally restart applications that have failed. The application to be restarted must be associated with a particular OpenBSI message exchange. These parameters are stored in the USERAPPS.INI file. Changes to these parameters occur immediately, and do *not* require a re-start of OpenBSI.

Field	Description
Applications	These entries must be entered in the following format: *mex_name=command_line_startup, interval* where: *mex_name* is the name of a message exchange. The name of particular message exchanges may be obtained via the "Mex Summary" tab of the Monitor Window in NetView. Standard message exchanges include the following: *mex_name* Program HARVEST OpenBSI Harvester BSICNVR Data File Conversion Utility MSGRTR OpenBSI Message Router BSIBSAP BSAP communications driver IPDRIVE Bristol IP com. driver *command_line_startup* is a command line argument for restarting the program associated with the specified message exchange. **Note**: The \openbsi portion of the path need not be entered. The "DRIVER" command line startup entry is special for these communication drivers, and must be entered exactly as shown. You can include restart command line arguments for any program associated with a message exchange.

command_line_startup	OpenBSI program
harvester.exe	OpenBSI Harvester
bsicnvrt.exe	Data File Converter
rtrservc.exe	BSI Message Router
DRIVER	BSAP com driver
DRIVER	Bristol IP com driver

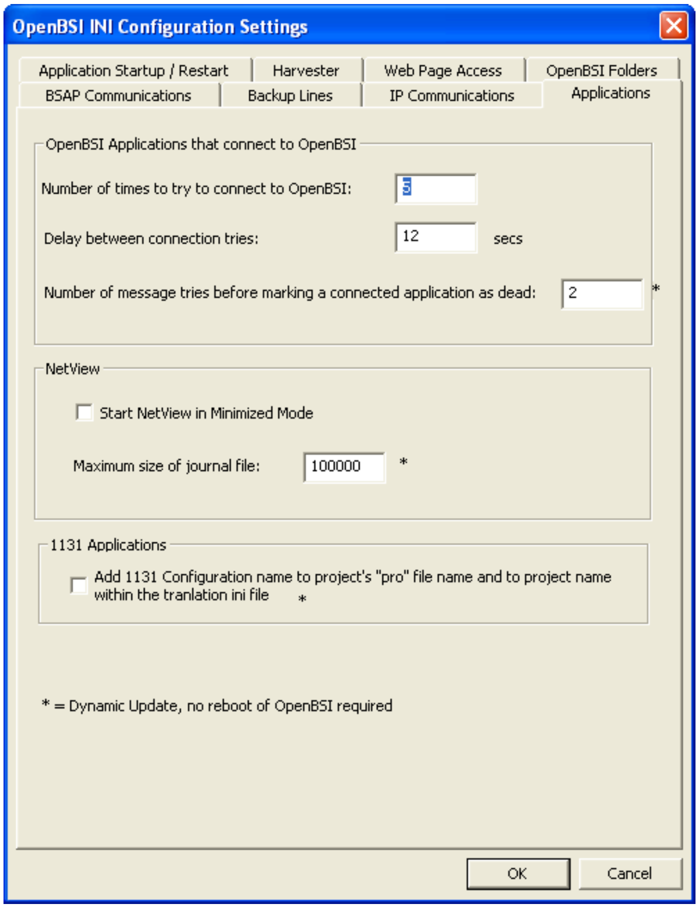
interval is a period of time, in milliseconds, that OpenBSI will wait for the application named by *mex_name* to re-start itself before forcing a command line startup,

Some sample entries appear, below:

```
HARVEST=harvester.exe, 1000
BSICNVR=bsicnvrt.exe, 1000
MSGRTR=rtrservc.exe, 1000
BSIBSAP=DRIVER, 1000
IPDRIVE=DRIVER, 1000
```

E.2 Applications Page

The Applications tab sets parameters for certain OpenBSI programs.



OpenBSI Applications that connect to OpenBSI

Number of times to try to connect to OpenBSI: 5

Delay between connection tries: 12 secs

Number of message tries before marking a connected application as dead: 2 *

NetView

□ Start NetView in Minimized Mode

Maximum size of journal file: 100000 *

1131 Applications

□ Add 1131 Configuration name to project's "pro" file name and to project name within the tranlation ini file *

* = Dynamic Update, no reboot of OpenBSI required

Figure E-2 Advanced Configuration – Applications

E.2.1 OpenBSI Applications that connect to OpenBSI

OpenBSI Utilities such as DataView, the Alarm Router, the Downloader, etc. require the OpenBSI communications driver to be running in order for them to work. These parameters govern how these applications will try to connect to the OpenBSI driver. Most of these entries are stored in the BSBSAP.INI file.

Field	Description
Number of times to try to connect to OpenBSI	Shows the number of times the utility will try to connect to the OpenBSI driver.
Delay between connection tries	Specifies the period of time (in seconds) between each attempt to connect to OpenBSI. This period of time between attempts causes DataView and other such utilities to wait before declaring an error and shutting down if the OpenBSI communications driver is NOT running due to NetView or LocalView not having been started.
Number of message tries before marking a connected application as dead	Specifies how many times OpenBSI should check to see that a process connected to it is still active. Each count takes one minute. The default is 2 (2 minutes.)

E.2.2 NetView

These parameters define aspects of NetView operation.

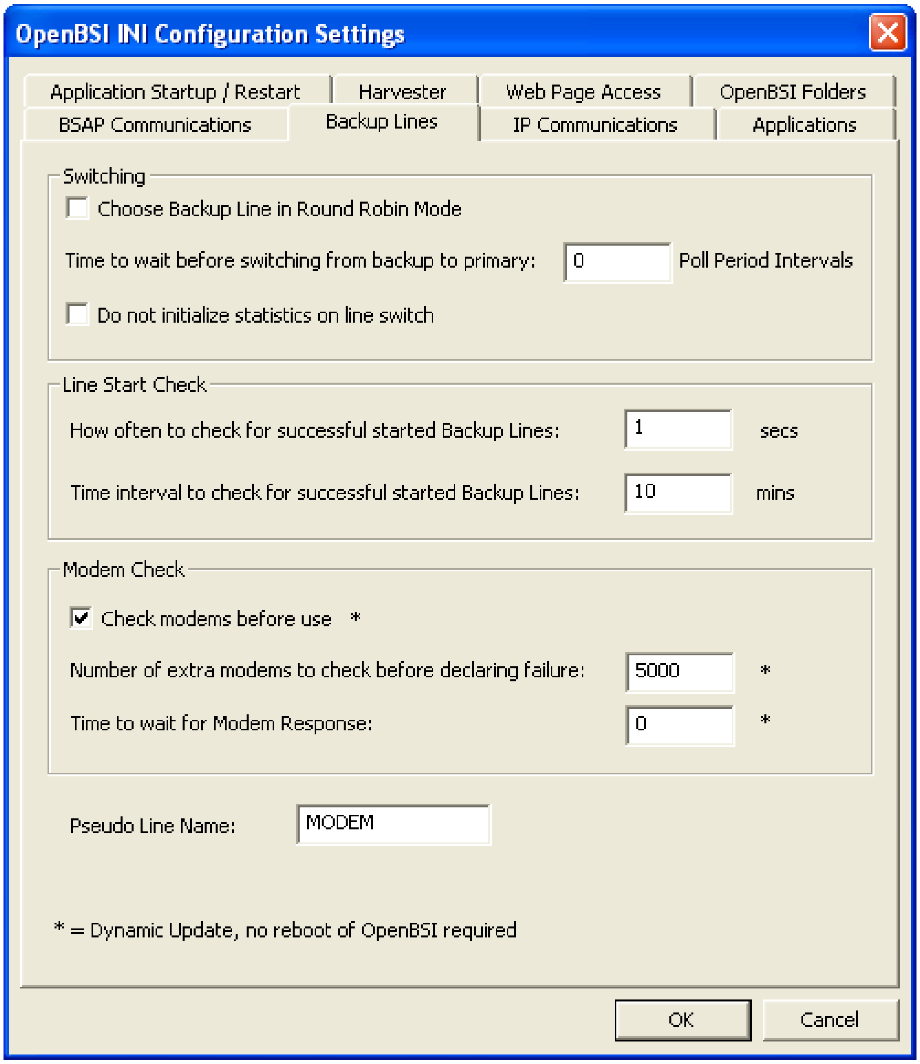
Field	Description
Start NetView in Minimized Mode	Check this box if you want NetView to start minimized. This entry is stored in the NETVIEW.INI file.
Maximum size of journal file	This defines the maximum number of entries which can be stored in the currently active journal file. When this number is exceeded, this file is renamed with a *.BAK file extension, and a new empty journal file will be created. NOTE: When this renaming occurs, any previous *.BAK journal file in that directory will be overwritten, therefore, it is the user’s responsibility to remove these files to a different location, if they are to be saved for future reference. This limitation is intended to prevent journal files from consuming too much disk space. This entry is stored in the BSBSAP.INI file.

E.2.3 1131 Applications

Field	Description
Add 1131 Configuration name to project's "pro" file name and to project name within the translation ini file	If your ControlWave project includes more than one configuration / resource, for example one for ControlWave and one for ControlWave Micro, and you want to distinguish between the two configurations/resources, check this box to add the configuration and resource name to the PRO files and to project file name references in the translation INI file. (Requires OpenBSI 5.8 Service Pack 1 or newer.) **Note:** The 1131 Downloader, ControlWave Designer's Transfer Download Files utility, TechView's TRANSLATION.INI file, the Signal Extractor, and the @GV._CW_LOAD_STR system variable all use only the first eleven characters to distinguish between project file names. If you choose this option to include the configuration and resource name in the *.PRO filename, make sure they are short enough to fit within the eleven character restriction or else there will be conflicts within filenames.

E.3 Backup Lines

These parameters are associated with backup communication lines. These parameters are stored in the BSBSAP.INI file.



OpenBSI INI Configuration Settings

Switching

☐ Choose Backup Line in Round Robin Mode

Time to wait before switching from backup to primary: 0 Poll Period Intervals

☐ Do not initialize statistics on line switch

Line Start Check

How often to check for successful started Backup Lines: 1 secs

Time interval to check for successful started Backup Lines: 10 mins

Modem Check

☑ Check modems before use *

Number of extra modems to check before declaring failure: 5000 *

Time to wait for Modem Response: 0 *

Pseudo Line Name: MODEM

* = Dynamic Update, no reboot of OpenBSI required

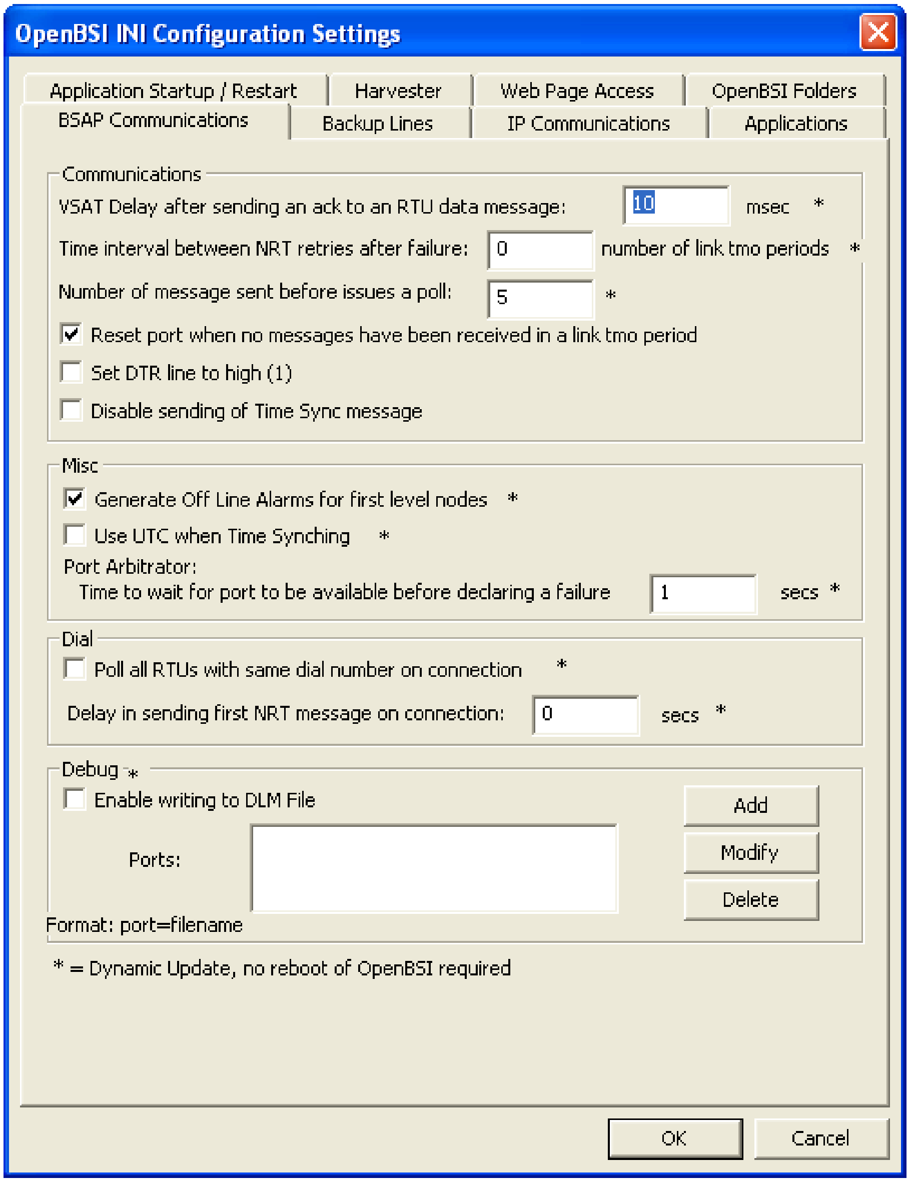
Figure E-3. Advanced Configuration – Backup Lines

Field	Description
<u>Switching</u> **Choose Backup Line in Round Robin Mode**	This specifies how backup lines are chosen. If *unchecked*, the first free backup line will always be used. If *checked*, a round-robin method will be used in which OpenBSI chooses the backup line based on a sequential process.
Time to wait before switching from backup to primary	This helps define a period of time to wait before actually switching from the backup line, back to the primary line, to ensure that the primary line is truly stable. The number entered here is multiplied by the poll period to define the waiting time.
Do not initialize statistics on line switch	When checked, prevents communication line statistics from being reset when switching backup lines. When not checked, statistics are reset when lines are switched.

Line Start Check	
How often to check for successful started Backup Lines	When OpenBSI starts up, it spends some pre-defined number of minutes checking to see if backup lines have started successfully. If a particular line hasn't started, attempts will be made to start it This entry defines how frequently, within that period of time, this check for backup lines should occur. The default is 10 seconds. If no value is entered, no checking will occur.
Time interval to check for successful started Backup Lines	This entry defines a period of time (in minutes) at OpenBSI startup, during which checks will be made to see if backup lines have started successfully. If not specified a default value of 1 minute is used.
Modem Check	
Check modems before use	If checked, OpenBSI checks the status of a modem before it uses that modem for a backup line. If the check fails, OpenBSI reports an error in the OpenBSI journal file. (OpenBSI 5.8 or newer.)
Number of extra modems to check before declaring failure	This specifies that if a backup line is to be chosen, then check to see that its modem is functioning; if the modem isn't functioning, proceed to the next backup line/modem, and check it, etc., until this number of modems has been checked. If no value is entered here, OpenBSI will continue to check modems until it finds a working one.
Time to wait for Modem Response	specifies how long (in milliseconds) the OpenBSI communications driver will wait for a response during the modem check, before declaring that a modem is not functioning. This time should be specified in *msec* and generally should be kept low to avoid delays in proceeding to the next modem, if a modem has truly failed. If this item is not in the file, the driver will select a timeout value based on the configured baud rate, for example, at 9600 baud, the timeout would be 3000 milliseconds (3 seconds).
Pseudo Line Name	specifies the name of a BSAP Primary Pseudo Communication Line. The pseudo line is NOT actually used for communications, but is used as a place holder for RTUs which will communicate only through dial lines.

E.4 BSAP Communications Page

These entries define how BSAP ports communicate. These parameters are stored in the BSBSAP.INI file.



OpenBSI INI Configuration Settings

Communications

VSAT Delay after sending an ack to an RTU data message: 10 msec *

Time interval between NRT retries after failure: 0 number of link tmo periods *

Number of message sent before issues a poll: 5 *

☑ Reset port when no messages have been received in a link tmo period

☐ Set DTR line to high (1)

☐ Disable sending of Time Sync message

Misc

☑ Generate Off Line Alarms for first level nodes *

☐ Use UTC when Time Synching *

Port Arbitrator:
Time to wait for port to be available before declaring a failure 1 secs *

Dial

☐ Poll all RTUs with same dial number on connection *

Delay in sending first NRT message on connection: 0 secs *

Debug *

☐ Enable writing to DLM File

Ports:

Format: port=filename

* = Dynamic Update, no reboot of OpenBSI required

Figure E-4. Advanced Configuration –BSAP Communications

Field	Description
Communications	
VSAT Delay after sending an ack to an RTU data message (msec)	This is the amount of time (in milliseconds) OpenBSI waits after sending an ACK to a message from an RTU.
Time interval between NRT retries after failure: (number of link tmo periods)	If no acknowledgement to the first Node Routing Table (NRT)/Time Sync message is received, addition NRT/TS messages are sent at a default interval of 3 seconds. To extend this interval, enter a multiplier in this field. If 1 is the multiplier, the interval is 3 seconds, if 2, the interval is 6

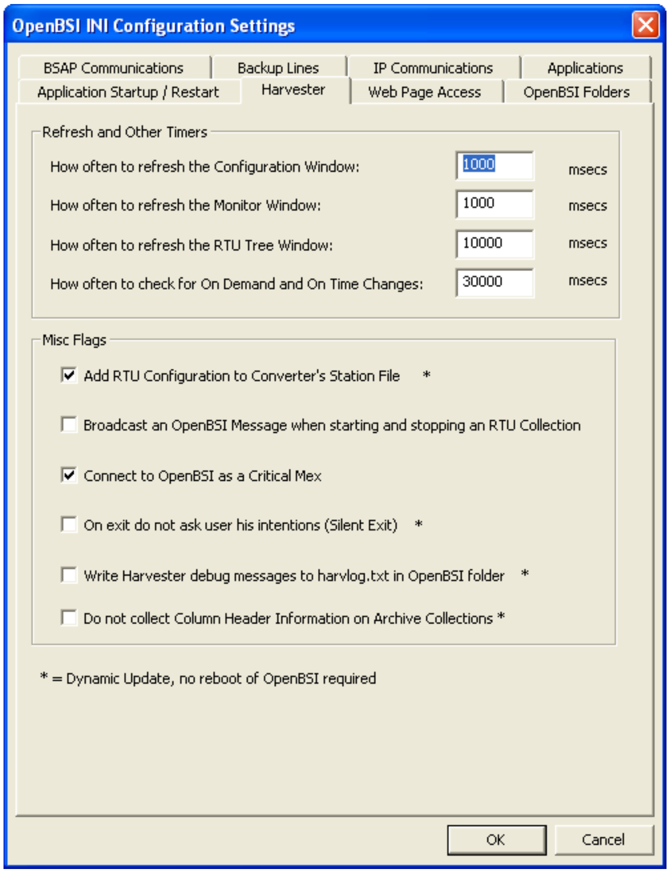
Field	Description
	seconds, etc.
Number of message sent before issues a poll	This is the number of messages allowed to be sent through this port before issuing a poll message to the RTU.
Reset port when no messages have been received in a link tmo period	When checked, if no response messages have been received and the link timeout has expired, the port will be reset. The only time this should be left unchecked is in certain very specific situations, such as problems with backup lines.
Set DTR line to high (1)	When checked, DTR is raised for this port (turned ON). When unchecked, DTR for this port is set low (turned OFF).
Disable sending of Time Sync message	When checked, the OpenBSI Workstation will not send a time synchronization message through its BSAP ports out to the RTUs. (Requires OpenBSI 5.8 Service Pack 1 or newer.)
Misc	
Generate Off Line Alarms for first level nodes	By default, if communication is lost with a first-level BSAP node, an alarm message called COMM.STATUS will appear in Alarm Router to report the loss of communications. In certain systems which use periodic dial-up or radios, these alarms could be bothersome, since the loss of communications would be considered normal. In those cases, you can disable these alarms by un-checking this entry.
Use UTC when Time Synching	If you want time synching to be with Universal Time (UTC), check this box.
Port Arbitrator: Time to wait for port to be available before declaring a failure (secs)	If using the Port Arbitrator, this is the number of seconds the BSAP driver will wait for a port to be released, before declaring a failure.
Dial	
Poll all RTUs with same dial number on connection	If checked, and an RTU is connected after a dial, the driver checks for other RTUs that have the same dial-up number and starts polling them as well.
Delay in sending first NRT message on connections (secs)	When a dial attempt succeeds, and carrier detect (CD) is seen, a Node Routing Table (NRT) / Time Sync message is sent. This parameter defines a delay (in seconds) between when carrier detect is seen, and the actual NRT/Time Sync is transmitted.
Debug	
Enable writing to DLM File	When checked, enables the Data Line Monitor feature. This feature causes a log of communication messages for a BSAP port at the PC to be saved in a file. **Note**: This can be changed without re-starting OpenBSI.
Ports	This field defines the name of the output file of the Data Line Monitor for a given port. Entries must be in the format *portname = filename* Click **Add** to add a new entry to the list via the Add/Modify dialog box. To change an existing entry, select it and click **Modify**. To remove an entry, click on it, and then click **Delete**. Some sample entries would be:

Field	Description

	Com1=c:\ProgramData\Bristol\OpenBSI\accol\com1msgs.log
	Com2=c:\msgs2.log

E.5 Harvester

These parameters govern the operation of the OpenBSI Harvester utility, and are stored in the Harvester.INI file. Full information on the Harvester is included in the *OpenBSI Harvester Manual* (document# D5120).



Refresh and Other Timers

How often to refresh the Configuration Window: 1000 msecs

How often to refresh the Monitor Window: 1000 msecs

How often to refresh the RTU Tree Window: 10000 msecs

How often to check for On Demand and On Time Changes: 30000 msecs

Misc Flags

☑ Add RTU Configuration to Converter's Station File *

☐ Broadcast an OpenBSI Message when starting and stopping an RTU Collection

☑ Connect to OpenBSI as a Critical Mex

☐ On exit do not ask user his intentions (Silent Exit) *

☐ Write Harvester debug messages to harvlog.txt in OpenBSI folder *

☐ Do not collect Column Header Information on Archive Collections *

* = Dynamic Update, no reboot of OpenBSI required

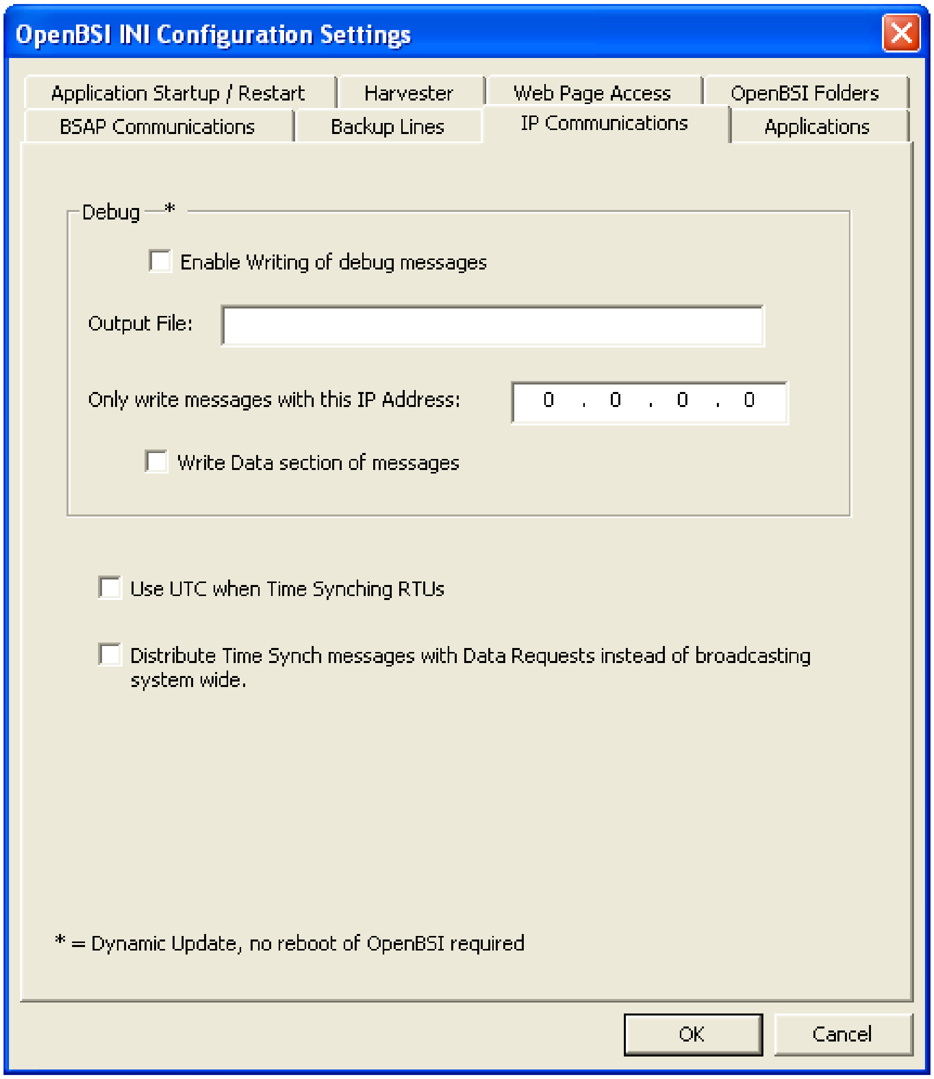
Figure E-5. Advanced Configuration – Harvester

Field	Description
Refresh and Other Timers	
How often to refresh the Configuration Window	This specifies the rate (in milliseconds) at which the configuration pane on the right hand top of the window is updated.
How often to refresh the Monitor Window	This specifies the default rate (in milliseconds) at which the monitor pane of the window is updated.
How often to refresh the RTU Tree Window	This specifies the default rate (in milliseconds). at which the tree of

	RTUs pane of the window is updated.
How often to check for On Demand and On Time Changes	This specifies the default rate (in milliseconds) at which the Harvester will check for an on-demand request for data.
Misc Flags	
Add RTU Configuration to Converter's Station File	When checked, this will write RTU configuration data to the station file.
Broadcast an OpenBSI Message when starting and stopping an RTU Collection	When checked, the Harvester broadcasts a message at the start and end of a collection.
Connect to OpenBSI as a Critical Mex	The Harvester is normally considered to be a critical message exchange (mex), thereby preventing OpenBSI from being shut down. When un-checked, however, Harvester is not considered critical, and so OpenBSI can be shut down.
On exit do not ask user his intentions (Silent Exit)	When checked, this allows the Harvester to be closed without a confirmation prompt to the operator. This same setting also enables silent startup.
Write Harvester debug messages to harvlog.txt in OpenBSI folder	When checked, puts the Harvester into debug mode. In Debug mode, the contents of the monitor window is written to the file harv_log.txt in the \ProgramData\Bristol\OPENBSI\ directory.
Do not collect Column Header Information on Archive Collections	By default, Harvester collects column header information each collection pass. To prevent this re-collection of column header data and thereby reduce the number of communication messages per collection, check this box. This option can reduce communication costs if your communication link is expensive, for example a satellite link. Requires OpenBSI 5.8 SP2 or newer.

E.6 IP Communications

These parameters affect the operation of OpenBSI IP ports. These parameters are stored in the BSIPDRV.INI file.


OpenBSI INI Configuration Settings

Debug *

□ Enable Writing of debug messages

Output File:

Only write messages with this IP Address: 0 . 0 . 0 . 0

□ Write Data section of messages

□ Use UTC when Time Synching RTUs

□ Distribute Time Synch messages with Data Requests instead of broadcasting system wide.

* = Dynamic Update, no reboot of OpenBSI required

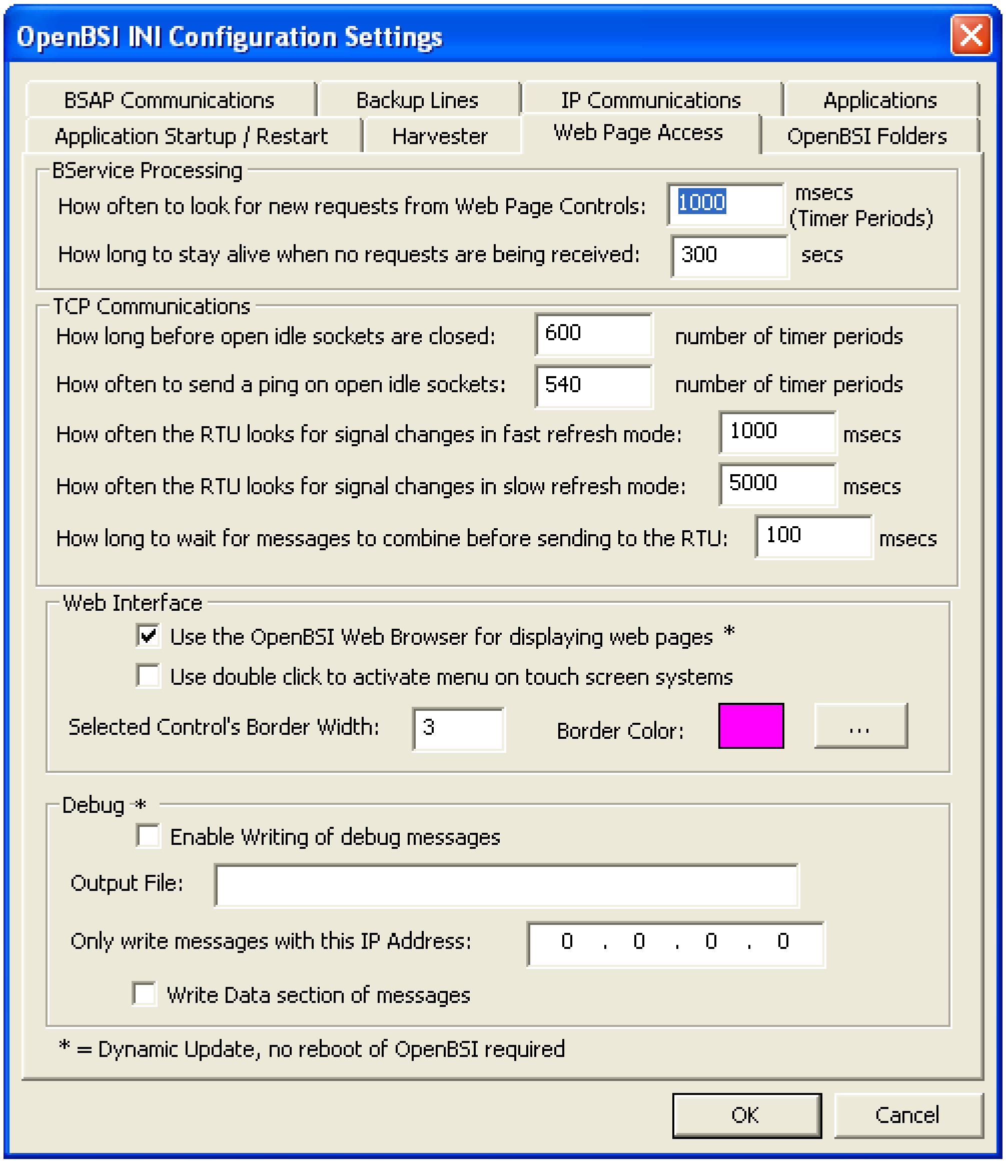
Figure E-6. Advanced Configuration –IP Communications

Field	Description
Debug	
Enable Writing of debug messages	When checked, enables the Data Line Monitor feature. This causes a log of communication messages for an IP port at the PC to be saved in a file. This setting can be updated immediately; it does not require a re-start of OpenBSI to take effect.
Output File	This should specify the path and filename of the log file for the Data Line Monitor. This setting can be updated immediately; it does not require a re-start of OpenBSI to take

	effect.
Only write messages with this IP Address	If an IP address is entered here, the Data Line Monitor will only log messages between this IP port and the RTU with this IP address. This setting can be updated immediately; it does not require a re-start of OpenBSI to take effect.
Write Data section of messages	When checked, causes raw UDP messages to be included in the Log File. This setting can be updated immediately; it does not require a re-start of OpenBSI to take effect.
Use UTC when Time Synching RTUs	If you want time synching to be with Universal Time (UTC), check this box.
Distribute Time Synch messages with Data Requests instead of broadcasting system wide	When you check this, OpenBSI sends time synchronization/node routing table (TS/NRT) messages when it sends a data request to a particular RTU, instead of broadcasting to all RTUs in the network. (OpenBSI 5.8 or newer.) **Note**: This setting cannot prevent a forced sending of time synch messages from NetView or a third party driver.

E.7 Web Page Access

These settings determine how Web_BSI web pages function. These settings are stored in the DATASERV.INI file.



BService Processing

How often to look for new requests from Web Page Controls: 1000 msecs (Timer Periods)

How long to stay alive when no requests are being received: 300 secs

TCP Communications

How long before open idle sockets are closed: 600 number of timer periods

How often to send a ping on open idle sockets: 540 number of timer periods

How often the RTU looks for signal changes in fast refresh mode: 1000 msecs

How often the RTU looks for signal changes in slow refresh mode: 5000 msecs

How long to wait for messages to combine before sending to the RTU: 100 msecs

Web Interface

☑ Use the OpenBSI Web Browser for displaying web pages *

□ Use double click to activate menu on touch screen systems

Selected Control's Border Width: 3 Border Color: 🟪

Debug *

□ Enable Writing of debug messages

Output File:

Only write messages with this IP Address: 0 . 0 . 0 . 0

□ Write Data section of messages

* = Dynamic Update, no reboot of OpenBSI required

Figure E-7. WebPage Access

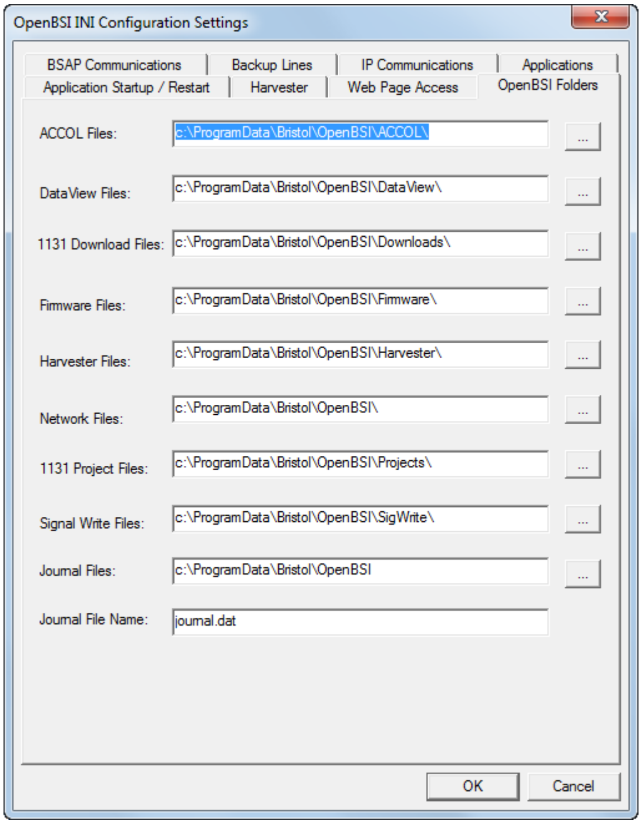
Field	Description
BService Processing	
How often to look for new requests from Web Page Controls (msecs – Timer Periods)	This specifies the rate at which OpenBSI checks for pending requests (in milliseconds) from web page controls. The default is 1000.
How long to stay alive when no requests are being received (secs)	This is the number of seconds BSERVICE will be allowed to run if no data requests have been issued. Once this period of time has expired, BSERVICE will shut down. Default is 180 seconds.

TCP Communications	
How long before open idle sockets are closed (number of timer periods)	This indicates how many timer periods to wait before deleting an idle socket (IP connection to an RTU). (Timer=1000 or 1 second, default life is 120 seconds or 2 minutes)
How often to send a ping on open idle sockets (number of timer periods)	This indicates how many timer periods to wait before sending an idle socket (connection to an RTU) a ping message. The default is 60.
How often the RTU looks for signal changes in fast refresh mode (msecs)	This defines how fast the RTU should check for signal changes for the fast Publish / Subscribe method (in milliseconds). The default is 500.
How often the RTU looks for signal changes in slow refresh mode (msecs)	This defines how fast the RTU should check for signal changes for the slow Publish / Subscribe method (in milliseconds). The default is 5000.
How long to wait for messages to combine before sending to the RTU (msecs)	This defines how long to wait while messages bound to the same RTU are combined.
Web Interface	
Use the OpenBSI Web Browser for displaying web pages	If checked (default), the BBI web browser will be used; otherwise Internet Explorer will be used.
Use double click to activate menu on touch screen systems	If checked (default), double-clicking on a signal value in a web page will bring up a pop-up menu (equivalent to right-clicking) for changing the value. This was added in OpenBSI 5.7 Service Pack 1 to support HMIs which do NOT support the right click operation for touch screens.
Selected Control's Border Width	Specifies the width (in pixels) of the control's border.
Border Color	Click the **"…"** button to specify the border color.
Debug	
Enable Writing of debug messages	When checked, enables the Data Line Monitor feature. This feature causes a log of communication messages for the Data Server to be saved in a

	file. Changes to this entry do not require a restart of OpenBSI to take effect.
Output File	This should be set to the log file name where Data Line Monitor data will be stored.
Only write messages with this IP Address	Optionally, the data stored in the log file may be limited to the messages between a single RTU, and the Data Server. To do this, enter the IP address of the target RTU here.
Write Data section of messages	When checked, causes raw UDP messages to be included in the Data Line Monitoring log file.

E.8 OpenBSI Folders

OpenBSI stores user files in several different folders on the workstation. To change the default location click on the **[…]** button.



ACCOL Files: c:\ProgramData\Bristol\OpenBSI\ACCOL\

DataView Files: c:\ProgramData\Bristol\OpenBSI\DataView\

1131 Download Files: c:\ProgramData\Bristol\OpenBSI\Downloads\

Firmware Files: c:\ProgramData\Bristol\OpenBSI\Firmware\

Harvester Files: c:\ProgramData\Bristol\OpenBSI\Harvester\

Network Files: c:\ProgramData\Bristol\OpenBSI\

1131 Project Files: c:\ProgramData\Bristol\OpenBSI\Projects\

Signal Write Files: c:\ProgramData\Bristol\OpenBSI\SigWrite\

Journal Files: c:\ProgramData\Bristol\OpenBSI

Journal File Name: journal.dat

Figure E-8. OpenBSI Folders

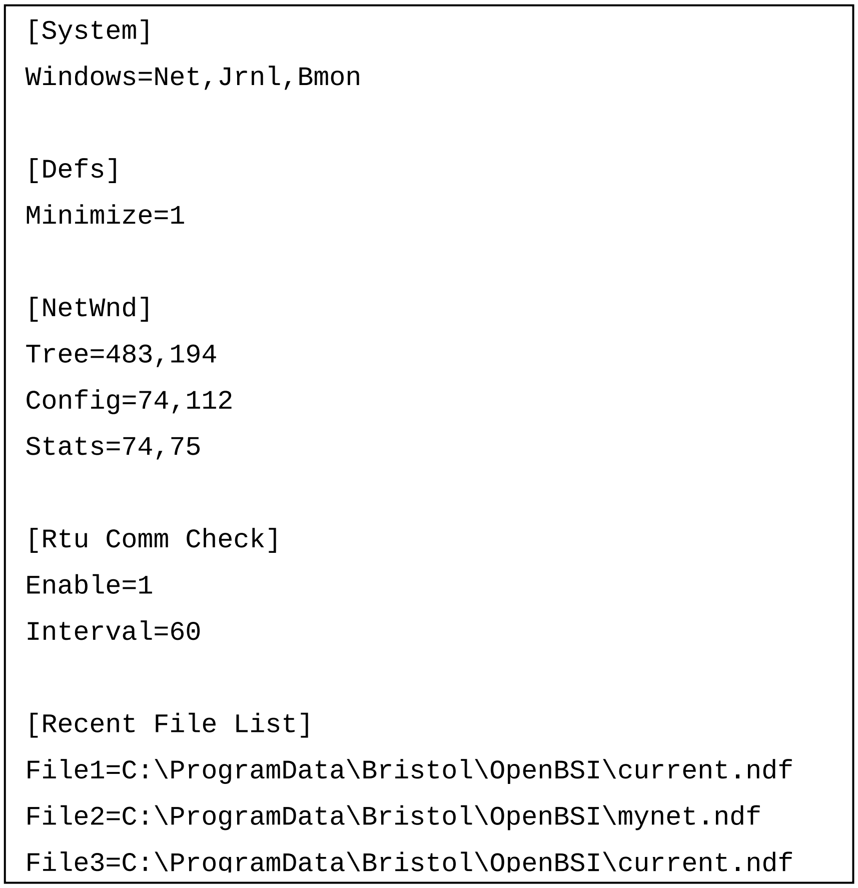
Field	Description
ACCOL Files	This folder stores files created by ACCOL Workbench for Network 3000 controllers including *.ACO, *.ACL, *.ACC, *.LIS as well as *.RDL batch download files and *.SIG files for Network 3000 controllers.
DataView Files	This folder stores files created by DataView including signal search (*.SCH), DataView list (*.DVL), and recipe (*.RCP) files.
1131 Download Files	This folder stores zipped projects created by ControlWave Designer (*.ZWT) and the *.PRO boot file.
Firmware Files	This folder stores binary files (*.BIN) for upgrading controller firmware.
Harvester Files	This folder stores array, audit, and list files created by the OpenBSI Harvester.
Network Files	This folder holds the NETDEF database files including *.NDF, *.MDB, *.DSN, and *.LDB. Also, if you create a *.DOC file for your network, it resides here.
1131 Project Files	This folder stores ControlWave Designer *MWT files and associated project sub-folders. Also, by default, *.SIG files created for ControlWave controllers reside here.
Signal Write Files	This folder stores Signal Writer *.WLS and *.WSG files.
Journal Files	This folder stores the OpenBSI journal file. The journal file maintains a record of certain system events, such as when OpenBSI starts or stops.
Journal File Name	This is the name of the OpenBSI journal file. By default, this is JOURNL.DAT.

E.9 NETVIEW.INI

An initialization file called NETVIEW.INI governs operation of NetView. This file resides in the cfgfiles sub-folder of your OpenBSI user files directory (C:\ProgramData\Bristol\Openbsi is the default user files directory). Information on this file is provided for third-party developers using OpenBSI. It is NOT intended to be edited by typical users. The syntax of the NETVIEW.INI file is shown below. *Figure E-9* shows a sample NETVIEW.INI file.

Keyword	Description
[SYSTEM]	SYSTEM section marker
Windows=*Window_1, Window_2,…Window_n*	Windows to load. Default if none entered is NET for NETWND.DLL. To load the journal window, use JRNL, to load the Monitor window, use BMON.
RUN=*App_1, App_2, App_3,…App_n*	Applications (*.EXE) to launch
SYSTEM=*Serv_1, Serv_2, Serv_3,…Serv_n*	Windows services to start. Default service if none entered is Message Router Service

Keyword	Description
[DEFS]	DEFS section marker
Minimize=*choice*	Enter 1 to minimize NetView window on startup, otherwise 0.
[NETWND]	NETWND section marker.
TREE=*a,b*	Size of Window pane in pixels for BSI tree
CONFIG=*c,d*	Size of Window pane in pixels for Configuration Window.
STATS=*e,f*	Size of Window pane in pixels for Statistics Window
[ROUTER]	ROUTER section marker
NOROUTER=*status*	When 1, Message Router is NOT launched, when 0 or nothing, Message Router is launched
[RTU COMM CHECK]	RTU COMM CHECK section marker.
ENABLE=*status*	When 1, enables RTU comm checking; when 0, disables it. Should only be enabled on relatively high speed networks.
INTERVAL=*seconds*	Specifies the rate at which checking occurs. Only one RTU is checked per rate cycle, i.e. if INTERVAL=60, only one RTU is checked every 60 seconds.
[NETDEF]	NETDEF section marker.
Drivername	ODBC (*.DBF) Driver Name; default if nothing entered is the Microsoft Access Database driver.



```
[System]
Windows=Net,Jrnl,Bmon

[Defs]
Minimize=1

[NetWnd]
Tree=483,194
Config=74,112
Stats=74,75

[Rtu Comm Check]
Enable=1
Interval=60

[Recent File List]
File1=C:\ProgramData\Bristol\OpenBSI\current.ndf
File2=C:\ProgramData\Bristol\OpenBSI\mynet.ndf
File3=C:\ProgramData\Bristol\OpenBSI\current.ndf
```

Figure E-9. Example NETVIEW.INI File

E.10 BSBSAP.INI

This file is used by advanced users performing trouble-shooting, and by users with special application requirements. It allows many options to be specified for the BSAP communications driver. This file resides in the cfgfiles sub-folder of your OpenBSI user files directory (C:\ProgramData\Bristol\Openbsi is the default user files directory). The syntax of the BSBSAP.INI file is shown below. *Figure E-10* shows a sample BSBSAP.INI file.

Keyword	**Description**
[DLM]	DLM section marker.
Enabled=*toggle*	When *toggle* is set to “1”, enables the Data Line Monitor feature. This feature causes a log of communication messages for a BSAP port at the PC to be saved in a file. This feature is disabled if *toggle* is set to “0”.
Com*x*=*filename*	*x* should be set to the port number (“1” for COM1, “2” for COM2, etc.) *filename* should be set to the log file name where Data Line Monitor data is stored.
[QUOTA]	QUOTA section marker.

Keyword	**Description**
SendQuota=*n*	*n* should be set to the number of messages allowed to be sent through this port before issuing a poll message to the RTU.
[TIME]	TIME section marker.
utc=*toggle*	*toggle* can be set to “1” to force the BSAP driver to time sync RTU’s with UTC Universal Time. Setting *toggle* to “0” disables this feature. NOTE: Only set to 1 if you want to change the RTU’s time to UTC/GMT time.
UpAckDelay=*n*	Used for VSAT ports ONLY. *n* should be set to the interval of time (in milliseconds) the driver will wait after sending an ACK to a message sent by the RTU.
[COMMDLL]	COMMDLL section marker.
com*x*=*user_dll_name*	*x* should be set to the port number (“1” for COM1, “2” for COM2, etc.) *user_dll_name* should be set to the name of a user-created DLL which will be used instead of the default communication handler DLL for this port. If any of your ports use the Port Arbitrator feature, you must have an entry for each of those ports in the format: com*x*=bsaparbtrcomm.dll
[DIAL]	DIAL section marker.
SpecialDial=*toggle*	If *toggle* is set to “1”, and an RTU is connected after a dial, the driver checks for other RTUs that have the same dial-up number and starts polling them as well. If *toggle* is set to “*0”* this feature is disabled.
FirstNRTDelay=*secs*	When a dial attempt succeeds, and carrier detect (CD) is seen, a Node Routing Table (NRT) / Time Sync message is sent. *secs* defines a delay (in seconds) between when carrier detect is seen, and the actual NRT/Time Sync is transmitted. (Requires OpenBSI 5.4 Service Pack 2 or newer.)
[COMM]	COMM section marker.
DTR=*toggle*	When *toggle* is set to “1”, DTR is turned ON (high) for this port. When set to “0” DTR is OFF (low). **Note:** When communicating with a 3508/**3808/4088B** device **at 1200 baud** using TechView with OpenBSI 5.8 Service Pack 1 or newer, this is automatically set to 1 as part of the TechView session, since 3508s require this.
NoStatsInit=*no_clear*	When *no_clear* is set to “1”, prevents

Keyword	Description
	communication line statistics from being reset when switching backup lines. When omitted, or *no_clear* is set to "0", statistics are reset when lines are switched.
Reset=*key*	When not present, or when *key* is set to "1", the default, the communication port will be reset if no response messages are received, and a pre-configured timeout has expired. When *key* is set to "0" the port will never be reset. "0" should only be used in certain very specific situations, such as problems with backup lines. This parameter requires OpenBSI 5.0 and newer.
PseudoLine=*name_of_line*	specifies the name of a BSAP Primary Pseudo Communication Line. The pseudo line is NOT actually used for communications, but is used as a place holder for RTUs which will communicate only through dial lines. *"name_of_line"* can be replaced with any valid name of your choice. See *Appendix H - Backup Communication Lines* for more information.
Switchcount=*count*	This is a period of time (calculated by *count* * poll period) to wait before actually switching from the backup line, back to the primary line, to ensure that the primary line is truly stable.
[ALARMS]	ALARMS section marker.
DriverAlarms=*toggle*	When *toggle* is set to "1", or if the [ALARMS] section is omitted from the file, an alarm called COMM.STATUS will appear in Alarm Router from any RTU when communications have been lost. If *toggle* is set to "0" these alarms will NOT be generated. Because radio systems, or dial-up modem systems, typically only communicate with an RTU for short periods of time, the COMM.STATUS alarms generated when the modem hangs up, or the radio shuts off, could be bothersome. Since in these cases, the loss of communications is legitimate, since the modem or radio is expected to be off, you may wish to set *toggle* to "0" to prevent these alarms from being generated.
[STARTUP_WAIT]	STARTUP_WAIT section marker.

Retries=*num_retries*
DELAY=*between_retries*
	OpenBSI Utilities such as DataView, the Alarm Router, the Downloader, etc. require the OpenBSI communications driver to be running in order for them to work. Starting NetView or LocalView starts this driver. *num_retries* and *between_retries* together define a period of time during which DataView and other such utilities will wait before declaring an error and shutting down if the OpenBSI communications driver is

Keyword	Description
	NOT running because NetView or LocalView have not started. *num_retries* is the number of times the utility will try to attach to the driver, and *between_retries* is the period of time (in seconds) between each such attempt. This delay time is useful, if you start DataView,Downloader, etc. but then realize you don't have LocalView or NetView running; you now have a short period of time to start them before the error occurs. NOTE: These parameters are available in OpenBSI 5.0 and newer.
[JOURNAL]	JOURNAL section marker.
Size=*max_entries*	*max_entries* defines the maximum number of entries which can be stored in the currently active journal file. When this number is exceeded, this file is renamed with a *.BAK file extension, and a new empty journal file will be created. NOTE: When this renaming occurs, any previous *.BAK journal file in that directory will be overwritten, therefore, it is the user's responsibility to remove these files to a different location, if they are to be saved for future reference. This limitation is intended to prevent journal files from consuming too much disk space. NOTE: This parameter is available in OpenBSI 5.0 and newer
[BACKUP]	BACKUP section marker.
CheckInterval=*interval*	*interval* is how often (in seconds) OpenBSI will check, at startup, to see if backup lines have not started successfully, and so it will attempt to start them. If 0, no attempts will be made. If omitted from the file, a default value of 10 seconds is used. The checking triggered by CheckInterval only occurs while the CheckPeriod is active.
CheckPeriod=*period*	*period* is the duration of time at OpenBSI startup (in minutes) during which OpenBSI will periodically attempt to start backup lines which have not started successfully. If 0, no attempts will be made. If omitted from the file, a default value of 1 minute is used. The frequency at which checking occurs during this period is determined by the CheckInterval.
CheckModems=*choice*	specifies whether OpenBSI should check whether a modem is good before using it for a backup line. If *choice* = 1 (default) OpenBSI checks for a good modem; if choice=0, OpenBSI does not check for a good modem. (OpenBSI 5.8 or newer.) If the check fails, OpenBSI sends an error message to the OpenBSI journal file.

Keyword	Description
RoundRobin=*choice*	specifies how backup lines will be chosen, when needed. If *choice*=0, the first free backup line will always be used. If *choice*=1, a round-robin method will be used, in which OpenBSI chooses the backup line based on a sequential process.
ExtraModemsCheck=*num*	specifies that if a backup line is to be chosen, then check whether its modem is functioning; if not, proceed to the next available backup line, and check its modem, etc. The value of *num* specifies how many different backup line modems will be checked before declaring a failure. If ExtraModemCheck is omitted, all backup line modems will be checked until a good one is found. Requires OpenBSI 5.6 or newer.
ModemsCheckTimeout=*msec*	specifies how long (in milliseconds) the OpenBSI communications driver will wait for a response during the modem check, before declaring that a modem is not functioning. This time should be specified in *msec* and generally should be kept low to avoid delays in proceeding to the next modem, if a modem has truly failed. If this item is not in the file, the driver will select a timeout value based on the configured baud rate, for example, at 9600 baud, the timeout would be 3000 milliseconds (3 seconds).
[TIME]	TIME section marker.
IdleProcMultiplier=n	If no acknowledgement to the first Node Routing Table (NRT) / Time Sync message is received, additional NRT/TS messages are sent by default, every 3 seconds. *n* is a multiplier that controls the time between transmission of NRT/TS messages, if the messages have not been acknowledged. For example if n=1 the time between unacked NRT/TS messages is 3 seconds, for n=2 the time is 6 seconds, for n=3 the time is 9 seconds and so on. If n=0 or the IdleProcMultiplier key is not in the BSBSAP.INI file, the BSAP driver calculates the time between NRT/TS messages based on the user's link level timeout. (Requires OpenBSI 5.4 Service Pack 2 or newer.)
WaitForPort=*secs*	If using the Port Arbitrator, this specifies the number of seconds the BSAP driver will wait for the port to be released, before declaring a failure. See *Appendix I* for more information on the Port Arbitrator.
[LOG]	LOG section marker.The [LOG] items control logging for the Redirector Utility. If you have many RTUs using redirection, you may achieve

Keyword	Description
	slightly faster performance for the Redirector by setting these items to 0.
LOG_PORT=*readwrite*	If desired, information on the status of the redirector connection can be logged to a file on your hard disk. If *readwrite* is set to "1" an entry will be made in the log file indicating each time read and/or write operations occurred through the redirector connection. If *readwrite* is set to "0" the read/write time will not be logged. NOTE: This setting is initially made through a dialog box when configuring the Redirector. See *Appendix G* for details on the Redirector.
LOG_SOCK=*socketstatus*	If *socketstatus* is set to "1" an entry will be made in the log file for the redirector connection indicating the status of the IP socket. Any error messages generated for the IP socket will also be logged. If *socketstatus* is set to "0" this information will not be written to the log file. NOTE: This setting is initially made through a dialog box when configuring the Redirector. See *Appendix G* for details on the Redirector.
LOG_DATA=*data*	If *data* is set to "1", all messages sent via the Redirector will also be copied to the log file. This should never be done except under debugging purposes and only for one RTU and port at any one time; otherwise, the log file will quickly become very large. Under normal circumstances, *data* should always be set to "0".
LOG_DYNAMIC=*checkfile*	If *checkfile* is set to "1" (the default), each time a redirector message is to be sent, the redirector will check to see if there are changes in the BSBSAP.INI [LOG] settings. If *checkfile* is set to "0", the redirector will NOT check for changes to [LOG] settings in BSBSAP.INI again during this session, so whatever other [LOG] settings are current, will be kept for the remaining portion of the session. See *Appendix G* for details on the Redirector.
[Exchange]	EXCHANGE section marker.
Retry=*count*	*count* specifies how many times OpenBSI should check to see that a process connected to it is still active. Each count takes one minute. The default is 2 (2 minutes.) Added in OpenBSI 5.5 Service Pack 1

```
[DLM]
Enabled=1
Com1=c:\ProgramData\Bristol\OpenBSI\accol\com1msgs.log

[QUOTA]
SendQuota=5

[TIME]
utc=0
UpAckDelay=10
FirstNRTDelay=5

[COMMDLL]
Com1=BSAPArbtrComm.dll
Com2=c:\Program Files\mydll.dll

[DIAL]
SpecialDial=1
[COMM]
DTR=0
Reset=1
NoStatsInit=1
Pseudoline=DUMMY
switchcount=2

[ALARM]
DriverAlarms=1
[STARTUP_WAIT]
RETRIES=5
DELAY=12

[JOURNAL]
SIZE=100000

[BACKUP]
CheckInterval=15
CheckPeriod=2
CheckModems=1
RoundRobin=0
ExtraModemsCheck=4
ModemsCheckTimeout=1500

[TIME]
IdleProcMultiplier=2
WaitForPort=6

[LOG]
LOG_PORT=1
LOG_SOCK=1
LOG_DATA=0
LOG_DYNAMIC=1
```

Figure E-10. Sample BSBSAP.INI File

E.11 BSIPDRV.INI

This file is used by advanced users performing trouble-shooting, and by users with special application requirements. This file resides in the cfgfiles sub-folder of your OpenBSI user files directory (C:\ProgramData\Bristol\Openbsi is the default user files directory). It allows the following options to be specified for the IP communications driver:

- Data line monitoring of a specified IP port. Messages are copied to the specified log file.
- Limitation of the monitoring to messages between this port and a single RTU.
- Inclusion/exclusion of raw UDP messages in the data line monitoring log file.
- Synchronization of RTU time with Universal Time (UTC).

The syntax of the BSIPDRV.INI file is shown below; *Figure* E-11 shows a sample BSIPDRV file.

Keyword	**Description**
[DLM]	DLM section marker.
Enabled=*toggle*	When *toggle* is set to “1”, enables the Data Line Monitor feature. This feature causes a log of communication messages for an IP port at the PC to be saved in a file. This feature is disabled if *toggle* is set to “0”.
File=*filename*	*filename* should be set to the log file name where Data Line Monitor data will be stored.
Filter=*ip_address*	*ip_address* may optionally be set to the IP address of an RTU on this line. When set, this limits the logging to messages between this IP port and the RTU with this IP address.
Data_Dump=*toggle*	When *toggle* is set to “1” causes raw UDP messages to be included in the Data Line Monitoring log file. Setting *toggle* to “0” excludes these messages.
[TIME]	TIME section marker.
utc=*toggle*	*toggle* can be set to “1” to force the IP driver to time sync RTU’s with UTC Universal Time. Setting *toggle* to “0” disables this feature. NOTE: Only set to 1 if you want to change the RTU’s time to UTC Universal Time.
[TIMESYNCH]	TIMESYNCH section marker.
Distribute_TSNRI=*choice*	When *choice=1*, OpenBSI sends time synchronization/node routing table (TS/NRT) messages when it sends a data request to a particular RTU, instead of broadcasting to all RTUs in the network. (OpenBSI 5.8 or newer.) When *choice=0* (default) OpenBSI broadcasts TS/NRT messages to

Keyword	Description
	all RTUs in the network. **Note**: This setting cannot prevent a forced sending of time synch messages from NetView or a third party driver.

```
[DLM]
Enabled=1
File=c:\ProgramData\Bristol\OpenBSI\accol\ipmsgs.log
Filter=10.1.1.2
Data_Dump=1

[TIME]
utc=0
[TIMESYNCH]
Distribute_tsnri=1
```

Figure E-11. Sample BSIPDRV.INI file

E.12 DATASERV.INI

The OpenBSI Data Server initialization file (DATASERV.INI) may be modified by advanced users. This file resides in the cfgfiles sub-folder of your OpenBSI user files directory (C:\ProgramData\Bristol\Openbsi is the default user files directory). It includes the following options.

Keyword	Description
[Sequencer]	Sequencer section marker.
MsgTimer=*rate*	*rate* is how often to check queue for pending requests (in milliseconds. The default is 1000. (Formerly referred to as "Timer.")
IdleLife=*time*	*time* is the number of seconds BSERVICE will be allowed to run if no data requests have been issued. Once this period of time has expired, BSERVICE will shut down. Default is 180 seconds.
[Socket]	Socket section marker.
Life=*duration*	*duration* indicates how many sequence periods ("Timer") to wait before deleting an idle socket. (Timer=1000 or 1 second, default life is 120 seconds or 2 minutes)
Ping=*numseq*	*numseq* indicates how many sequence periods to wait before sending an idle socket a ping message. The default is 60.
FastPub=*fcheck*	*fcheck* defines how fast the RTU should check for signal changes for the fast Publish/Subscribe method. (in milliseconds). The default is 500.
SlowPub=*scheck*	*scheck* defines how fast the RTU should check for signal changes for the slow Publish/Subscribe

Keyword	Description
	method. (in milliseconds). The default is 5000.
WriteDelay=*time*	*time* defines how long (in milliseconds) to wait while messages bound for the same RTU are combined.
[UI]	UI section marker.
BBIWebBrowser=*toggle*	If *toggle* is 1 or if the BBIWebBrowser item is not included in the DATASERV.INI file, the BBI web browser will be used; otherwise Internet Explorer will be used. (This option was introduced in OpenBSI 5.5 Service Pack 2.)
[DLM]	DLM section marker.
Enabled=*toggle*	When *toggle* is set to “1”, enables the Data Line Monitor feature. This feature causes a log of communication messages for the Data Server to be saved in a file. This feature is disabled if *toggle* is set to “0.”
File=*filename*	*filename* should be set to the log file name where Data Line Monitor data will be stored.
Address=*ip_address*	*ip_address* may optionally be set to the IP address of an RTU using the Data Server. When set, this limits the logging to messages between this address and the Data Server.
Data_Dump=*toggle*	when *toggle* is set to “1” causes raw UDP messages to be included in the Data Line Monitoring log file. Setting *toggle* to “0” excludes these messages.
[MACHINE]	MACHINE section marker.
Touchscreen=*supported*	when *supported* is set to “1” allows both double-clicks and right clicks to bring up a pop-up menu. This is necessary when using an HMI that does NOT support right-clicks; the double-click performs the same operation as a right click. When *supported* is “0”, only a right-click can bring up a pop-up menu. This feature added in OpenBSI 5.7 Service Pack 1.

```
[Sequencer]
MsgTimer=1000
Idlelife=180

[Socket]
Life=120
Ping=60
FastPub=500
SlowPub=5000
WriteDelay=4000

[UI]
BBIWebBrowser=1

[DLM]
Enabled=1
File=c:\ProgramData\Bristol\OpenBSI\accol\dsmsgs.log
Address=10.1.1.2
Data_Dump=1

[MACHINE]
Touchscreen=1
```

Figure E-12. Sample DATASERV.INI File

E.13USERAPPS.INI - Automatic Start of Application Programs

Users who have configured the BSAUTO or OBSIService feature to automatically start OpenBSI communications (described in *Chapter 6*) can also configure other programs to start automatically. In addition, beginning with OpenBSI 5.6, it is possible to re-start particular programs that are registered with an OpenBSI message exchange. To do these start/restart operations, you must create a text file in the cfgfiles sub-folder of your OpenBSI user files directory (C:\ProgramData\Bristol\Openbsi is the default user files directory) called USERAPPS.INI. The syntax for this file is shown, below, and a sample file is included on the next page.

Keyword	**Description**
[USERAPPS]	USERAPPS section marker.
App*1* = *path_and_filename* Show*1* = *window_config* : App*n* = *path_and_filename* Show*n* = *window_config*	*path_and_filename* is the path and filename of the application you want to start. *window_config* specifies whether the application should start with its window visible or minimized. The choices are: “1” (window visible - the default) or “0” (window minimized.) *n* is an integer which refers to each individual entry in the file. The entries must be consecutively numbered.
[*mex_name*] Interval=*interval*	*mex_name* is the name of a message exchange. The name of particular message exchanges may be obtained via the “Mex Summary” tab of the Monitor Window in NetView. Standard message exchanges include the following: *mex_name* Program HARVEST OpenBSI Harvester BSICNVR OpenBSI Data File Conversion Utility MSGRTR OpenBSI Message Router BSIBSAP BSAP communications driver IPDRIVE Bristol IP communications driver *interval* is a period of time, in

<table>
<tr><th>Keyword</th><th>Description</th></tr>
<tr><td></td><td>milliseconds, that OpenBSI will wait for the application named by <i>mex_name</i> to re-start itself before forcing a command line startup, as specified in the [RESTART] section.</td></tr>
<tr><td>[RESTART]</td><td>RESTART section marker.</td></tr>
<tr><td><i>mex_name=command_line_startup</i></td><td><i>command_line_startup</i> is a command line argument for restarting the program associated with the specified message exchange. <b>Note</b>: The \openbsi portion of the path need not be entered. The “DRIVER” command line startup entry is special for these communication drivers, and must be entered exactly as shown. You can include restart command line arguments for any program associated with a message exchange.
<table>
<tr><th><i>command_line_startup</i></th><th>Program</th></tr>
<tr><td>harvester.exe</td><td>OpenBSI Harvester</td></tr>
<tr><td>bsicnvrt.exe</td><td>OpenBSI Data File Conversion Utility</td></tr>
<tr><td>rtrservc.exe</td><td>OpenBSI Message Router</td></tr>
<tr><td>DRIVER</td><td>BSAP communications driver</td></tr>
<tr><td>DRIVER</td><td>Bristol IP communications driver</td></tr>
</table>
</td></tr>
</table>

The sample USERAPPS.INI file, below starts two applications (Communication Statistics Tool, and DataView.) DataView opens in a window, while the Communication Statistics Tool will be minimized on startup. In addition, it restarts the Harvester, Data File Conversion Utility, Message Router, BSAP driver, and Bristol IP driver in the event those programs should stop and not restart themselves within 1000 milliseconds (1 second).

```
[USERAPPS]
App1=D:\”Program Files”\Bristol\OPENBSI\dataview.exe
Show1=1

App2=D:\”Program Files”\Bristol\OPENBSI\stats.exe
Show2=0


HARVEST=1000
BSICNVR=1000
MSGRTR=1000
BSIBSAP=1000
IPDRIVE=1000

[RESTART]
HARVEST=harvester.exe
BSICNVR=bsicnvrt.exe
MSGRTR=rtrservc.exe
BSIBSAP=DRIVER
IPDRIVE=DRIVER
```

Figure E-13. Sample USERAPPS.INI File

E.14 Other Initialization Settings

To set the date format used in various OpenBSI tools, use the **“Regional Settings”** item in the Windows™ control panel.

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Appendix F – Signal View ActiveX Controls

What if I am a third-party developer, and I want to include “live” ACCOL signal data in my own application? Suppose I am a plant manager, how can I maintain a spreadsheet with up-to-date flow data in it? With industry-standard ActiveX technology, it is possible to include “live” data within another Windows™ software application.

OpenBSI provides two ActiveX controls for collecting and displaying ACCOL signal data: The Signal Summary Control and the Signal Detail Control.

In order to use these ActiveX controls you must:

- Include them in an application which supports ActiveX controls.

Note: See the documentation accompanying your application for instructions on how to include ActiveX controls

- Communications must be operating, and NetView must be running with an appropriate set of NETDEF files before you attempt to start the ActiveX control in the other application.

F.1 Signal View Summary Window (Signal Summary Control)

Within the other application, the Signal View Summary window will initially appear empty. To activate a pop-up menu, *right* click on gray areas outside the grid, as shown in the figure below.

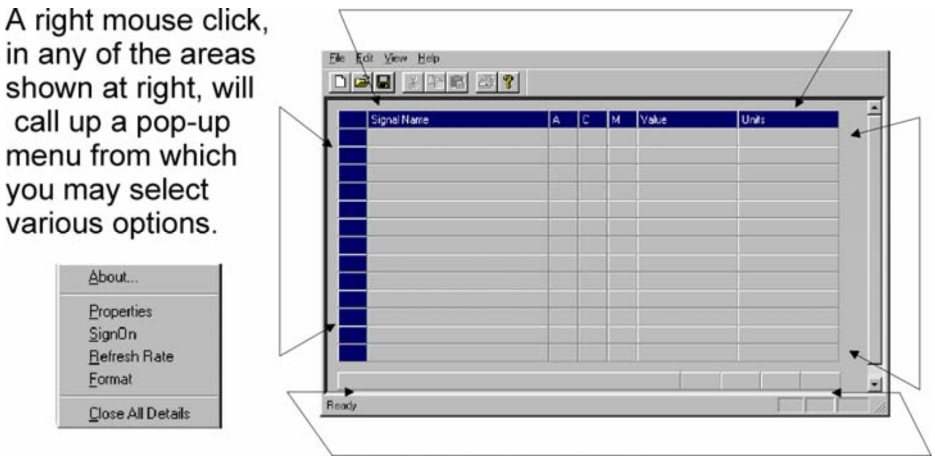
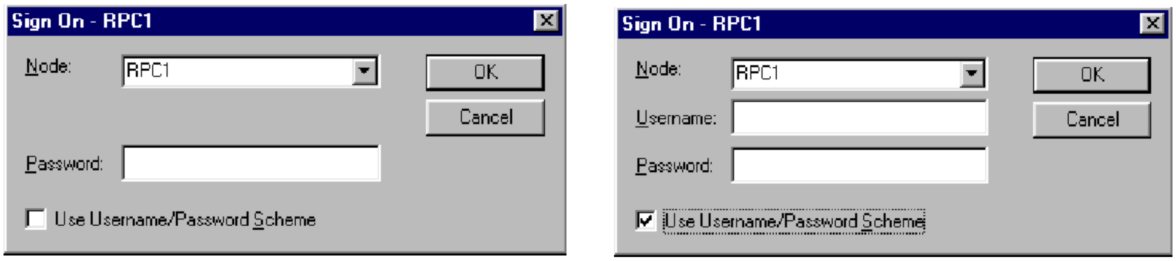

A right mouse click, in any of the areas shown at right, will call up a pop-up menu from which you may select various options.
About...
Properties
SignOn
Refresh Rate
Format
Close All Details
File
Edit
View
Help
Signal Name
A
C
M
Value
Units
Ready

Figure F-1. Signal View Summary Window

The first option you should choose is **"SignOn"** to sign on to an RTU.

F.1.1 Signing On To a Controller (RTU)

To bring up the Sign On dialog box, click on the **"SignOn"** option in the pop-up menu.



Sign On - RPC1

Node: RPC1

Password:

☐ Use Username/Password Scheme

Sign On - RPC1

Node: RPC1

Username:

Password:

☑ Use Username/Password Scheme

Figure F-2. Sign On dialog box

First, select the RTU name from the **"Node"** list box, then, enter the RTU's **"Password"** or (if this particular RTU requires both a username, and a password), check the **"Use Username/Password Scheme"** and enter *both* a **"Username"** and a **"Password"**.

F.1.2 Using the Signal Search Properties Dialog Box

Once you have successfully signed on to an RTU, choose **"Properties"** from the pop-up menu, to call up the Signal Search dialog box. A signal search allows you to search your ACCOL load for all ACCOL signals which share one or more common characteristics. For example, you can define the search criteria to be all signals which share the same signal extension and are control-inhibited. Or you could search for all signals which are currently in the high-high alarm state. The following is a list of valid signal search criteria:

- Signal base name
- Signal extension
- Signal attribute
- Current alarm state (logical alarm, high, high-high, low, low-low)
- Inhibit/enable bit status (alarm inhibit/enable, control inhibit/enable, manual inhibit/enable)
- Questionable data bit status

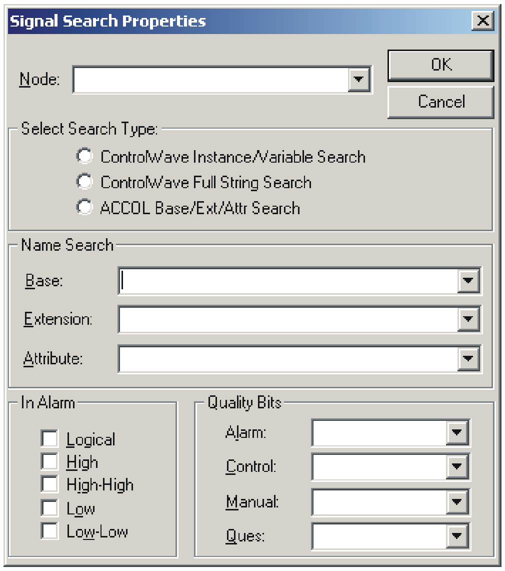
To start a Signal Search, press the *right* mouse button, with the mouse cursor located in the gray areas to the left or right of the grid, and a pop-up menu will appear. Choose **"Properties"** from the pop-up menu, and the Signal Search Properties dialog box will appear.

Three search modes are possible.

- ControlWave Instance/Variable Search
- ControlWave Full String Search
- ACCOL Base/Ext/Attr Search

In ControlWave Instance/Variable Search Mode, you can search based on the POU **“Instance”** name(s)**,** and/or the **“Variable”** name. Wildcards may be used in either of these fields.

In ControlWave Full String Search Mode, you can enter a string that is in *either* the instance name or variable name. The search string you enter can include wildcards to establish a pattern to be matched.



Signal Search Properties

Node:

OK

Cancel

Select Search Type:

○ ControlWave Instance/Variable Search
○ ControlWave Full String Search
○ ACCOL Base/Ext/Attr Search

Name Search

Base:

Extension:

Attribute:

In Alarm

□ Logical
□ High
□ High-High
□ Low
□ Low-Low

Quality Bits

Alarm:

Control:

Manual:

Ques:

Figure F-3. Signal Search Properties

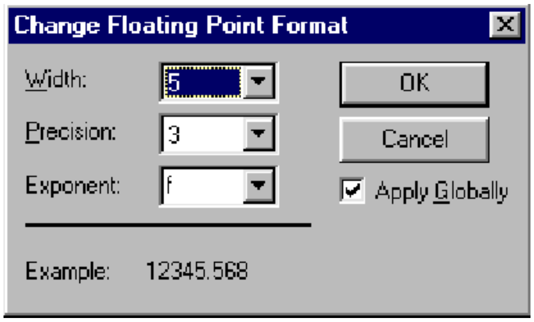
In ACCOL Base/Exte/Attr Search Mode, the **“Node”**, "**Base**", "**Extension**" and "**Attribute**" fields include list boxes which allow easy selection from the available base names, extensions, and attributes in a given ACCOL load.

Check boxes are provided to select signals which share the same alarm status. The Quality Bits area list boxes allow selection of either inhibit or enable for each alarm, control, or manual inhibit/enable bit. Questionable data status is also selected in this area.

Select the desired search criteria, and click **OK** to execute the search. All signals which share the selected characteristics will appear in the Signal View Summary window.

F.1.3 Changing the Floating Point Format of Data in the Signal View Summary Window

Within the Signal View Summary Window analog values are displayed according to a default floating point format. To alter this default format, choose **"Format"** from the pop-up menu. The Change Floating Point Format dialog box opens.



Change Floating Point Format

Width: 5

Precision: 3

Exponent: f

☑ Apply Globally

Example: 12345.568

Figure F-4. Change Floating Point Format

Use the **"Width"** list box to specify the total number of characters in the field (including the decimal point) when displaying a floating point number.

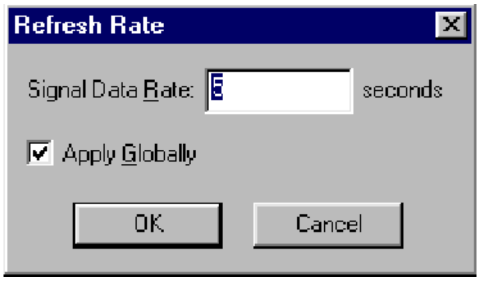
Use the **"Precision"** list box to choose the number of places to the right of the decimal point which should be displayed.

Use the **"Exponent"** list box to choose floating point format “f”, exponential notation “e” or choose “g” to have Signal View choose the “best fit” format.

If the floating point format defined here should be used throughout Signal View windows, click on the **"Apply Globally"** check box.

F.1.4 Changing the Refresh Rate of Data in the Signal View Summary Window

Within the Signal View Summary Window analog values are normally updated with new data every 5 seconds (assuming NetView is configured to collect data from the RTU at that rate or *faster*). To alter this default rate, choose **"Refresh Rate"** from the pop-up menu. The Refresh Rate dialog box opens.



Refresh Rate

Signal Data Rate: 5 seconds

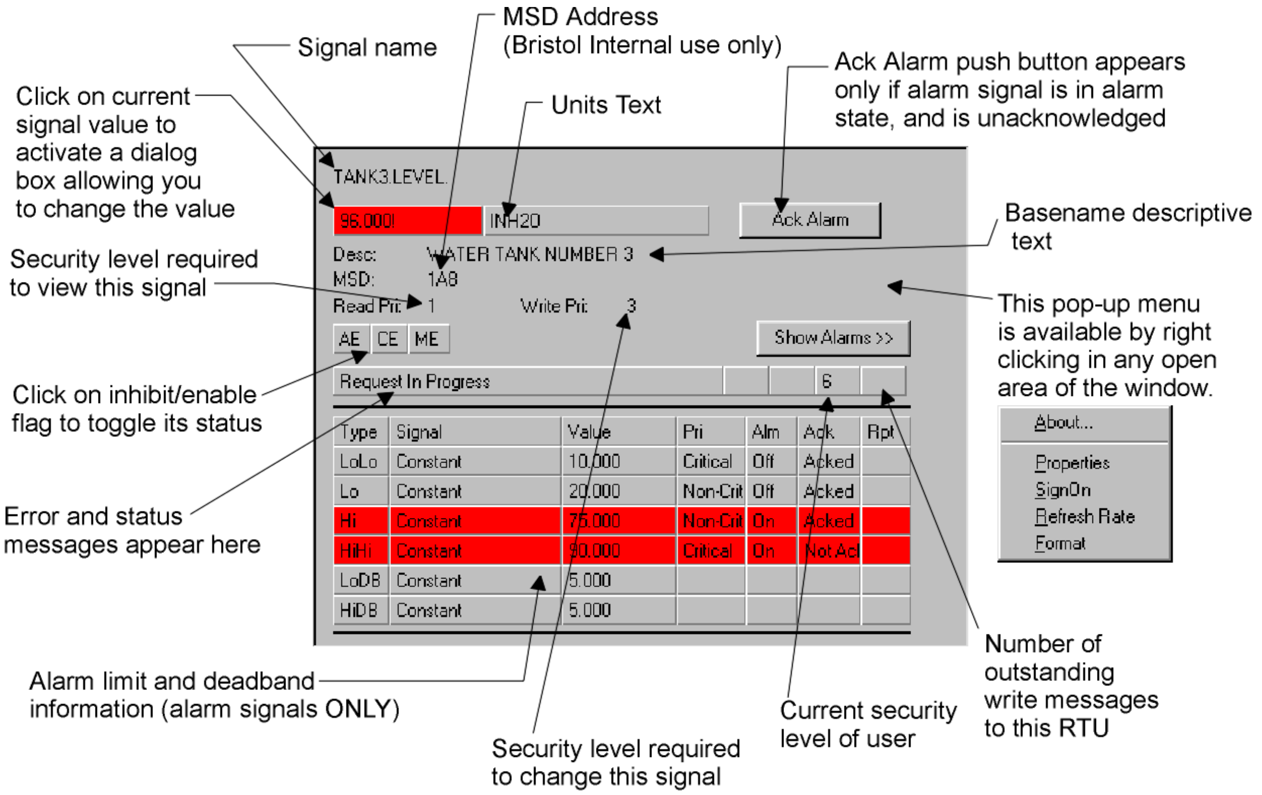
☑ Apply Globally

Figure F-5. Refresh Rate dialog box

Enter the new rate (in seconds) in the "Signal Data Rate" field. If you want this new rate to apply to all Signal View windows, choose **"Apply Globally"**. Click **OK**.

F.2 Using the Signal View Detail Window (Signal Detail Control)

The Signal View Detail Window, for a particular signal, is accessible by clicking on that signal's name in the Signal View Summary Window. The appearance of the window varies, somewhat, depending upon the type of signal being displayed. A typical window is shown below:



TANK3.LEVEL

96.000! INH20

Desc: WATER TANK NUMBER 3

MSD: 1A8

Read Pri: 1 Write Pri: 3

Request In Progress 6

Type	Signal	Value	Pri	Alm	Ack	Rpt
LoLo	Constant	10.000	Critical	Off	Acked	
Lo	Constant	20.000	Non-Crit	Off	Acked	
Hi	Constant	75.000	Non-Crit	On	Acked	
HiHi	Constant	90.000	Critical	On	Not Ac	
LoDB	Constant	5.000				
HiDB	Constant	5.000				

Signal name

MSD Address (Bristol Internal use only)

Units Text

Ack Alarm push button appears only if alarm signal is in alarm state, and is unacknowledged

Click on current signal value to activate a dialog box allowing you to change the value

Basename descriptive text

Security level required to view this signal

This pop-up menu is available by right clicking in any open area of the window.

Click on inhibit/enable flag to toggle its status

Error and status messages appear here

Number of outstanding write messages to this RTU

Alarm limit and deadband information (alarm signals ONLY)

Current security level of user

Security level required to change this signal

Figure F-6. Signal View Detail Window

A pop-up menu (with options similar to those in the Signal View Summary window) is available by right-clicking on an open space in the Signal Detail window.

If desired, you can close multiple Signal Detail windows at the same time, by choosing **"Close All Details"** from the pop-up menu in the Signal View Summary window.

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Appendix G – Redirecting BSAP Messages through TCP/IP to a Distant BSAP Network

G.1 What is the Redirect Utility?

The Redirect Utility takes standard BSAP messages intended for a BSAP or EBSAP network, and directs them out a TCP/IP communication line. This allows a BSAP or EBSAP network of RTUs located at a remote location to be accessed through an OpenBSI Workstation via TCP/IP. The OpenBSI Workstation treats the messages it sends to the network as normal BSAP messages, however, in reality, they are transparently intercepted by the Redirect utility, encapsulated in a "TCP/IP wrapper", and sent out a TCP/IP port.

When the messages reach the distant location, they must first pass through a CDPD modem, CDMA modem, or terminal server, to remove the "TCP/IP wrapper" and then send the messages on to their destination BSAP/EBSAP RTUs.

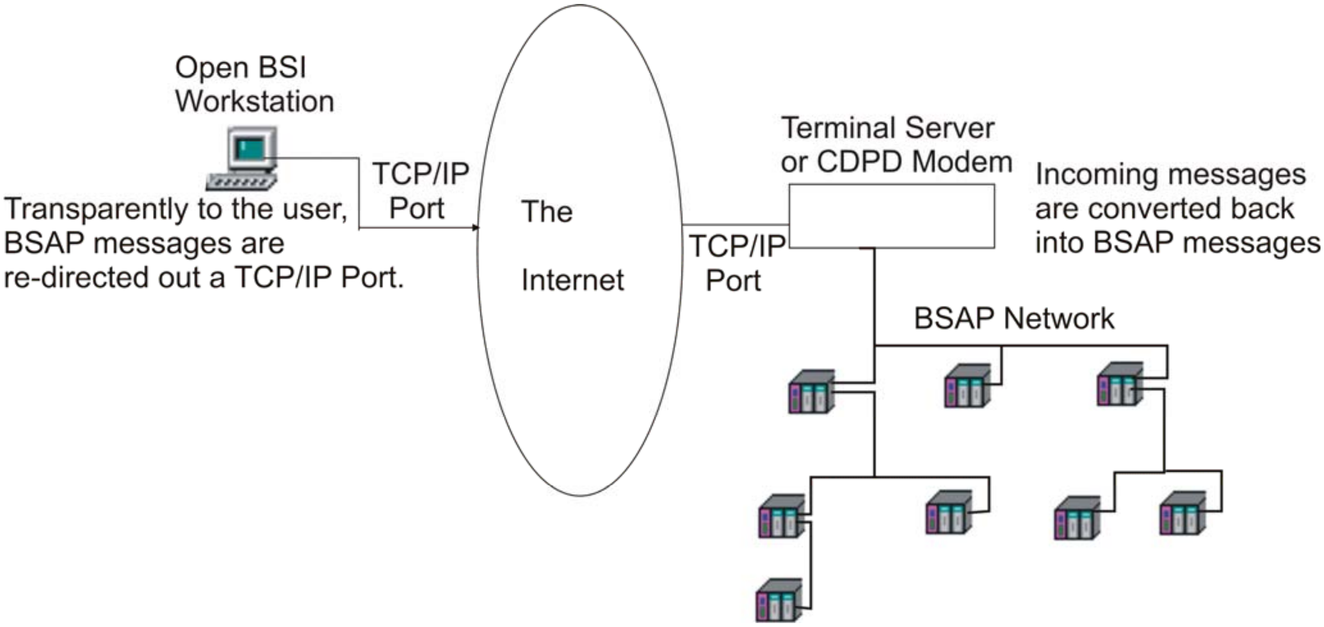

Open BSI Workstation
Transparently to the user, BSAP messages are re-directed out a TCP/IP Port.
TCP/IP Port
The Internet
TCP/IP Port
Terminal Server or CDPD Modem
Incoming messages are converted back into BSAP messages
BSAP Network

Figure G-1. Concept of Redirection

BSAP messages sent in the reverse direction (from the RTUs back to the OpenBSI Workstation) go first to the terminal server, CDPD modem, or CDMA modem, where they are encapsulated in a "TCP/IP wrapper" and then sent out as TCP/IP messages. When the TCP/IP messages reach the OpenBSI Workstation, they are first intercepted by the Redirect utility, which removes the "TCP/IP wrapper" and sends them on to OpenBSI which treats them as normal incoming messages from BSAP/EBSAP RTUs.

Configuration entries made by the Redirect utility are stored in the BSBSAP.INI file in the WINDOWS or WINNT directory.

Note: Only one BSAP/EBSAP network can exist in a system.

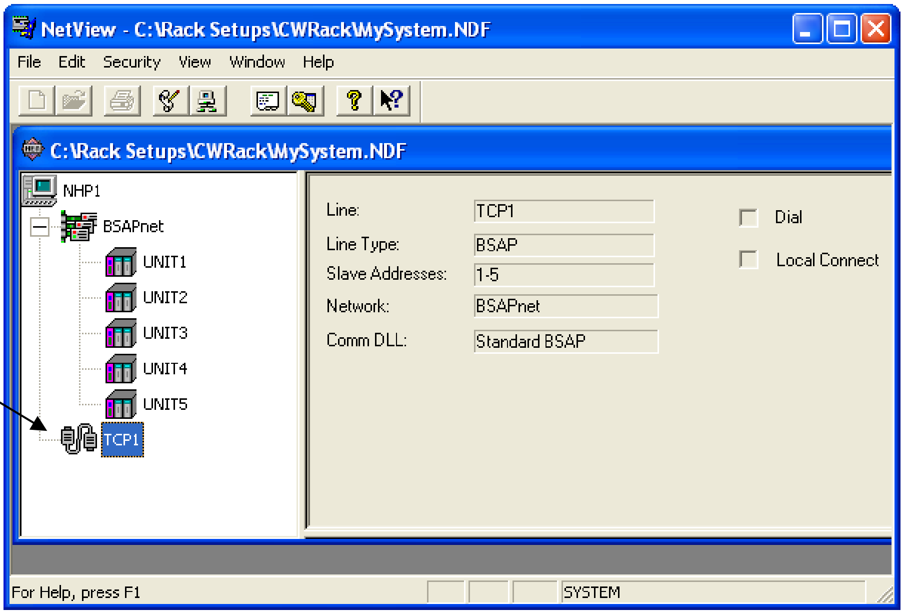
G.1.1 Defining the BSAP / EBSAP Network, RTUs, and Comm Line in NetView

The network of BSAP/EBSAP RTUs are defined in NetView as if they were directly connected to the OpenBSI Workstation. Beginning with OpenBSI 5.7, up to 5000 communication lines can be defined in your network.

1. Define a BSAP/EBSAP network as described in *"Defining A BSAP Network"* in *Chapter 6 - Using NetView*.
2. Add RTUs to the network as defined in *"Defining RTUs (BSAP)"* in *Chapter 6 - Using NetView*.
3. Define a BSAP or EBSAP communication line as defined in *"Defining A Communication Line For A BSAP Network"* in *Chapter 6 - Using NetView"*.

Note: When defining the communication line, you MUST NOT name it COM1, COM2, etc. Use some other name that does NOT begin with COM, e.g. TCP1, BSAP1, etc.

Define everything as you normally would, except you must name the Comm Line something other than COM1, COM2, etc.


NetView - C:\Rack Setups\CWRack\MySystem.NDF
File Edit Security View Window Help
C:\Rack Setups\CWRack\MySystem.NDF
NHP1
BSAPnet
UNIT1
UNIT2
UNIT3
UNIT4
UNIT5
TCP1
For Help, press F1
SYSTEM

Line: TCP1
Line Type: BSAP
Slave Addresses: 1-5
Network: BSAPnet
Comm DLL: Standard BSAP
□ Dial
□ Local Connect

Figure G-2. Specifying the Redirect Line in NetView

G.1.2 Setting Up the RTUs at the Remote Location

The RTUs should be configured as normal. The only difference is that they must be connected to a terminal server, CDPD modem, or CDMA modem, which can handle the incoming/outgoing messages.

For instructions on setting up the terminal server or modem, see the documentation accompanying the terminal server or modem. When you perform the configuration, make note of the IP address and port number you configure for the CDPD modem or terminal server.

Notes:

- Sample port configuration settings for the Xyplex MAXSERVER 1620 terminal server is included at the end of this appendix.
- CDMA modems obtain their IP addresses from a cellular phone service provider. These addresses are then stored at a Domain Name Server (DNS).

G.1.3 Using the Redirect Utility

1. Start the Redirect Utility by clicking as follows: **Start** > **Programs** > **OpenBSI Tools** > **Common Tools** > **BSAP to IP Setup**
2. Click the **New Port** button. A port icon (named "NEW001") will be added to the tree on the left hand side.

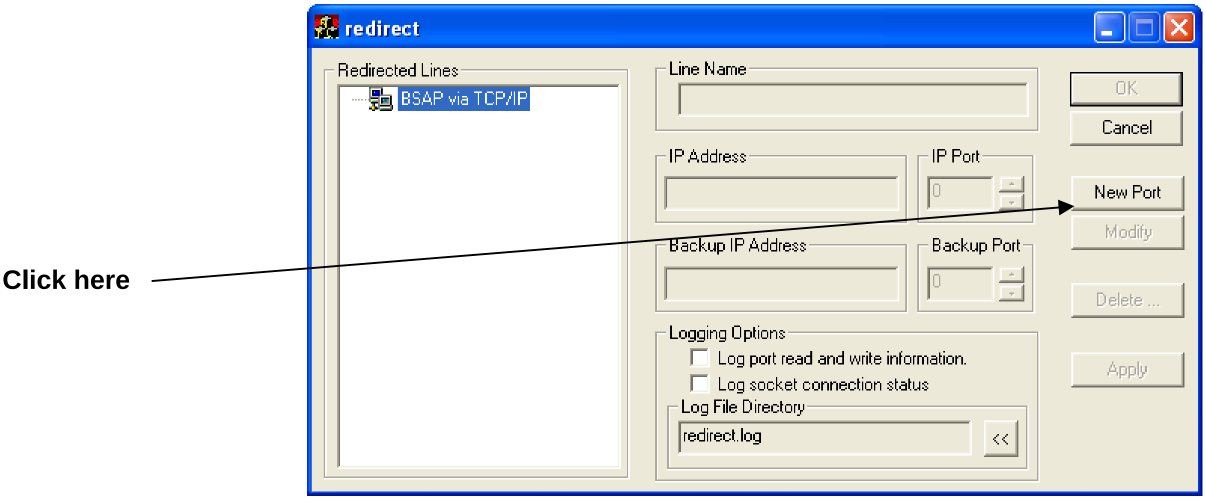


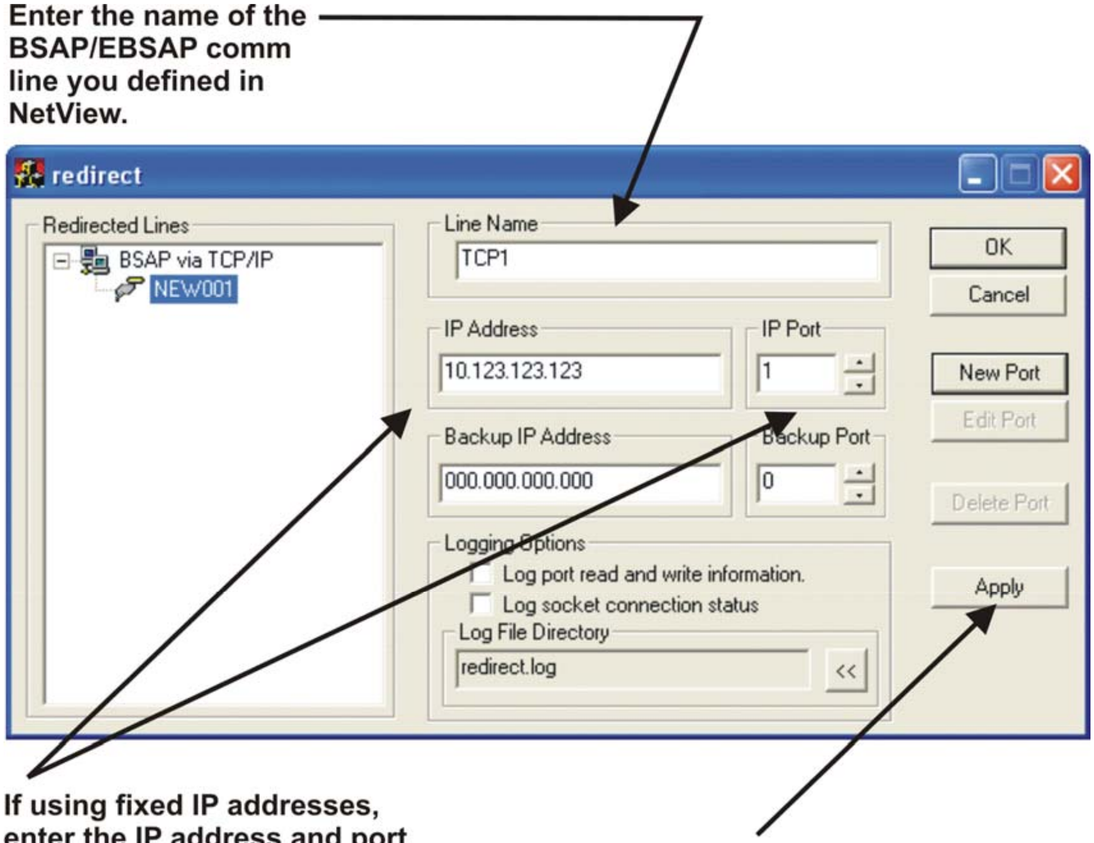
Figure G-3. Redirect Utility

3. Enter the name and number of the BSAP /EBSAP communication line for the remote RTUs, that you created earlier, in NetView. If, for example, you created a line named "TCP1", enter "TCP1" in the **"Line Name"** field.

CDPD modem or Terminal Server

Specify the IP address of the CDPD modem or terminal server which is connected to the RTU in the **"IP Address"** field. (This must match whatever you configured for the IP address when setting up the CDPD modem or terminal server. See the documentation accompanying these devices for more information.)

Enter the name of the BSAP/EBSAP comm line you defined in NetView.



redirect

Redirected Lines

- BSAP via TCP/IP
  - NEW001

Line Name: TCP1

IP Address: 10.123.123.123

IP Port: 1

Backup IP Address: 000.000.000.000

Backup Port: 0

Logging Options

□ Log port read and write information.

□ Log socket connection status

Log File Directory: redirect.log

If using fixed IP addresses, enter the IP address and port number of the modem (or terminal server) to which the network is connected. If using a CDMA modem with a DNS, enter *modem_name.dns_name* for the IP address, where *modem_name* is the name of the modem as defined at the DNS, and *dns_name* is the name of the DNS. Then enter the port number.

Click here when you are finished.

Figure G-4. Specifying the Modem or Terminal Server

CDMA modem If NOT using DNS, specify the fixed **"IP Address"**. If using DNS, specify the name of the modem as defined in the DNS in the **"IP Address"** field. (This is required for lookup of the correct address.) The name should follow the format:

modem_name.dns_name

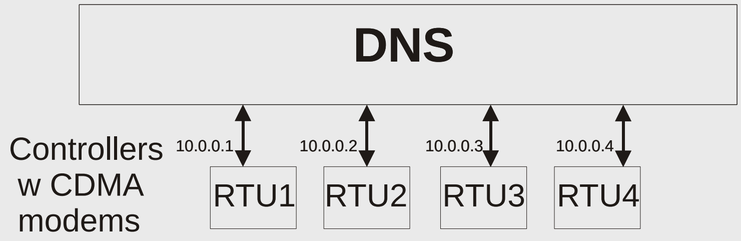
where:

modem_name	is the name stored in the lookup table for the modem.
dns_name	is the name of the Domain Name Server (DNS).
Example:	fdr.yourcompany.com

IMPORTANT

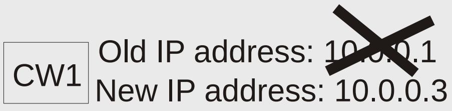
If your system uses multiple CDMA modems to communicate with RTUs, those RTUs MUST NOT share the same Username and Password or else you could run into a conflict in which you are collecting data from the wrong RTU, but you wouldn't know that was the case. In a situation like this, if you can't have unique username / password combinations, we strongly recommend using fixed IP addresses. The example, below, illustrates, why:

Domain Name Server (DNS)
(Maintains a list of IP addresses which have been assigned to CDMA modems. This list is called a lookup table.)



The CDMA modem(s) obtain their IP addresses from the cellular service provider. The cellular service provider dynamically *changes* the modems' IP addresses at least once a day. Because of this change, the DNS must periodically be notified by the CDMA modem of what the modem's current address is. Once such an address change occurs, the DNS lookup table will be out of date until it receives the updated address information from the CDMA modem.

Because IP addresses will get re-assigned by the cellular service provider, you could have a serious problem:

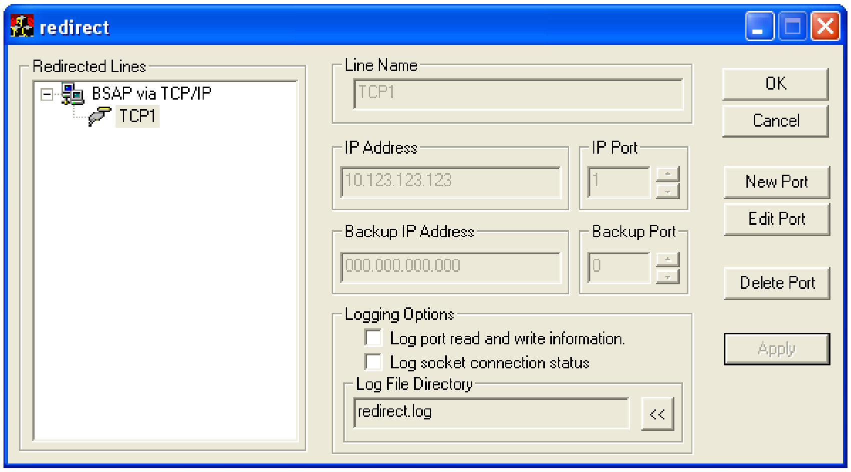


If, for example, the CDMA modem for RTU1 has changed from 10.0.0.1 to 10.0.0.3 but its old IP address of 10.0.0.1 has been re-assigned to the CDMA modem for RTU4, then there's potentially a serious problem. Until the DNS has been updated, it will continue to tell any program (such as Open BSI's Redirector) that the CDMA modem for RTU1 is at 10.0.0.1, even though that address is now used by the CDMA modem for RTU4. This could result in the Redirector accidentally sending data intended for RTU1 to RTU4, instead. If RTU1 and RTU4 have identical loads running, and have the same Username/ Password combinations, this could be disastrous, since there would be no way to detect that data was going to the wrong RTU. For this reason, each controller MUST be accessed by a different username/password combination to avoid this problem.

4. If you want to specify a different IP address, which should be tried in case the primary IP address fails, enter that in the **“Backup Address”** field.

5. Specify the IP port number used on the terminal server or modem in the **"IP Port"** field. (This must match whatever you configured for the IP port number when setting up the modem or terminal server, and does NOT change.) See the documentation accompanying these devices for more information. If you entered a **“Backup IP Address”** in step 4, you must also enter the IP port number for that address in the **“Backup Port”** field.

6. Click on **Apply**. The new line name and number will appear in the tree on the left hand side of the dialog box.



Redirected Lines
- BSAP via TCP/IP
  - TCP1

Line Name: TCP1

IP Address: 10.123.123.123

IP Port: 1

Backup IP Address: 000.000.000.000

Backup Port: 0

Logging Options

☐ Log port read and write information.

☐ Log socket connection status

Log File Directory: redirect.log

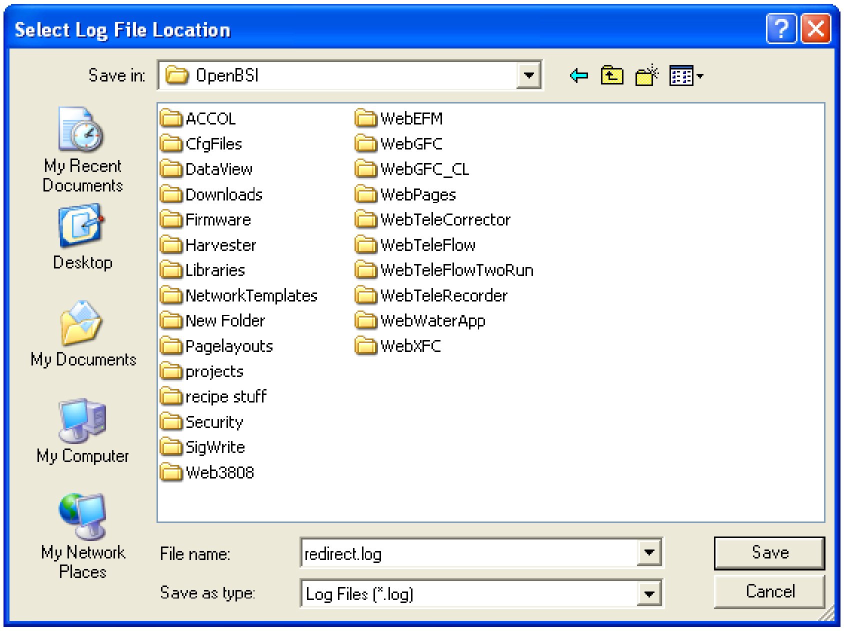
Figure G-5. Redirect Utility - Tree

7. Specify logging options (OPTIONAL):

   If desired, information on the status of the redirector connection can be logged to a file on your hard disk. If you check **"Log port read and write information"**, an entry will be made in the log file indicating each time read and/or write operations, occurred through the redirector connection.

   If you check **"Log socket connection status"**, an entry will be made in the log file indicating the status of the IP socket. Any error messages generated for the IP socket will also be logged.

   Click on the **[<<]** button to specify the path and file name of your log file. When you have specified the path and file name, click **Save**.



File name: redirect.log

Save as type: Log Files (*.log)

Figure G-6. Select Log File Location

Note: Certain logging settings are saved in the BSBSAP.INI file. See *Appendix E* for details.

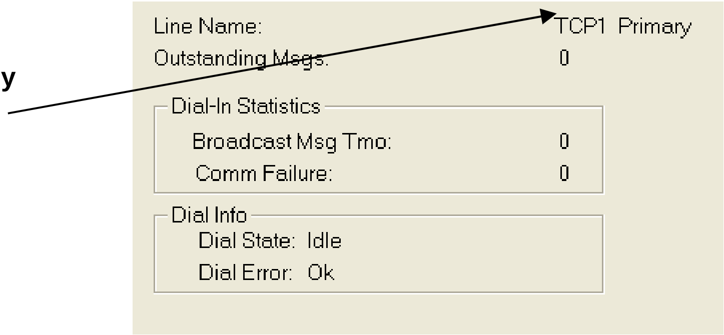
8. When you are finished, click **OK** and exit the utility.

G.1.4 Modifying Information in the Redirect Utility

If you need to modify the information for a line, click on the icon for it, then click on the **Edit Port** button and make changes, then click on **Apply**. If you want to delete a port, click on the icon for it, then click on **Delete Port.**

G.1.5 Communication Line Status Checking

The Communication Line status pane in NetView has been modified to identify, for Redirector users, whether the RTU's IP address used by the Redirector line is the primary address, or the secondary address.


Line used by Redirector

Line Name: TCP1 Primary

Outstanding Msgs: 0

Dial-In Statistics

Broadcast Msg Tmo: 0

Comm Failure: 0

Dial Info

Dial State: Idle

Dial Error: Ok

Figure G-7. Line Status pane in NetView

G.1.6 Sample Port Configuration Settings For the Xyplex MAXSERVER 1620 Terminal Server:

The following are sample port configuration settings for using the Redirect Utility with a Xyplex MAXSERVER 1620 terminal server. If you are using a different type of terminal server, or CDPD modem, you will need to consult that manufacturer's documentation for help on port configuration.

```
Xyplex>> show port 5

Port 5:  (Remote)             01   Jan 1986  02:10:49
Character Size:                  8       Input Speed:         9600
Flow Control:                 None       Output Speed:        9600
Parity:                       None       Modem Control:   Disabled
Access:                     Remote       Local Switch:        None
Backwards Switch:             None       Name:              PORT_5
Break:                    Disabled       Session Limit:          4
Break Length:                250ms       Type:                Soft
Forwards Switch:              None
CCL Modem Speaker:       Inaudible       CCL Name:            None
Dialout Action:             Logout
APD Authentication:
Interactive Only:         Disabled

Preferred Service:      None

Authorized Groups:      0
(Current) Groups:       0

Enabled Characteristics:
Internet Connections
```

```
Xyplex>> show port 5 alt char

Port 5:  (Remote)                               01   Jan 1986  02:11:01

Resolve Service:           Any_Lat       DTR wait:                  Disabled
Idle Timeout:                    0       Typeahead Size:                 128
Idle Time Receive Mode:   Disabled       Idle Time Transmit Mode:   Disabled
SLIP Address:              0.0.0.0       SLIP Mask:          255.255.255.255
Remote SLIP Addr:          0.0.0.0       Default Session Mode :  Transparent
TCP Window Size:               256       Prompt:                      Xyplex
DCD Timeout:                  2000       Dialback Timeout:                20
Stop Bits:                       1       Script Login:              Disabled
TCP Keepalive Timer:             0       Username Filtering:            None
Nested Menu:              Disabled       Nested Menu Top Level:            0
Command Size:                   80       Clear Security Entries:    Disabled
Rlogin Transparent Mode:  Disabled       Login Duration:                   0
Xon Send Timer:                  0       TCP Outbound Address:       0.0.0.0
Slip Autosend:            Disabled       Radius Accounting:         Disabled

Username Prompt:                   Enter username>
Password Prompt:        Enter user Password>
```

```
Xyplex>> show port 5 telnet char

Port 5:  (Remote)                               01   Jan 1986  02:11:17

Abort Output Character:       None       Newline:                    CR/NULL
Attention Character:          None       Newline Filtering:             None
Default Port:                   23       Query Character:               None
Echo Mode:                  Remote       Remote Port:                   2500
Erase Keystroke Character:    None       Synchronize Character:         None
Erase Line Character:         None       Transmit:              BuffTime  80
Interrupt Character:          None       Binary Session Mode:        PASSALL
TerminalType:                 None       Tn3270 Device:                 None
Tn3270 TranslationTable:      None       Tn3270 Printer Port:            Any
Local Port:                   4500       Tn3270 Default Port:             23


Enabled Characteristics:


Xyplex>>
```

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Appendix H – Defining Backup Communication Lines

H.1 Introduction - What are Backup Communication Lines?

Beginning with OpenBSI 4.2, you can configure backup communication lines at the Network Host PC (NHP) which can automatically take over if communications with a particular controller (RTU) fail on a primary BSAP or EBSAP communication line.

Backup lines use a modem to dial-up the particular RTU.

A backup communication line can only communicate with a *single* RTU at any particular time, therefore, if you have more than one RTU which you want to reach *simultaneously* via backup lines, you must define a separate backup line for each such RTU.

The first figure, below, shows a Network Host PC with four communication lines (COM1, COM2, COM3, and COM4). COM1 and COM2 are primary communication lines; COM3 and COM4 are backup communication lines.

COM1 provides a direct connection to the Slave Port of the RTU named TF1, and COM2 provides a direct connection to the Slave Port of the RTU named TF2. Backup communication lines COM3 and COM4 are reserved for communications with either RTU if either COM1 or COM2 should fail.

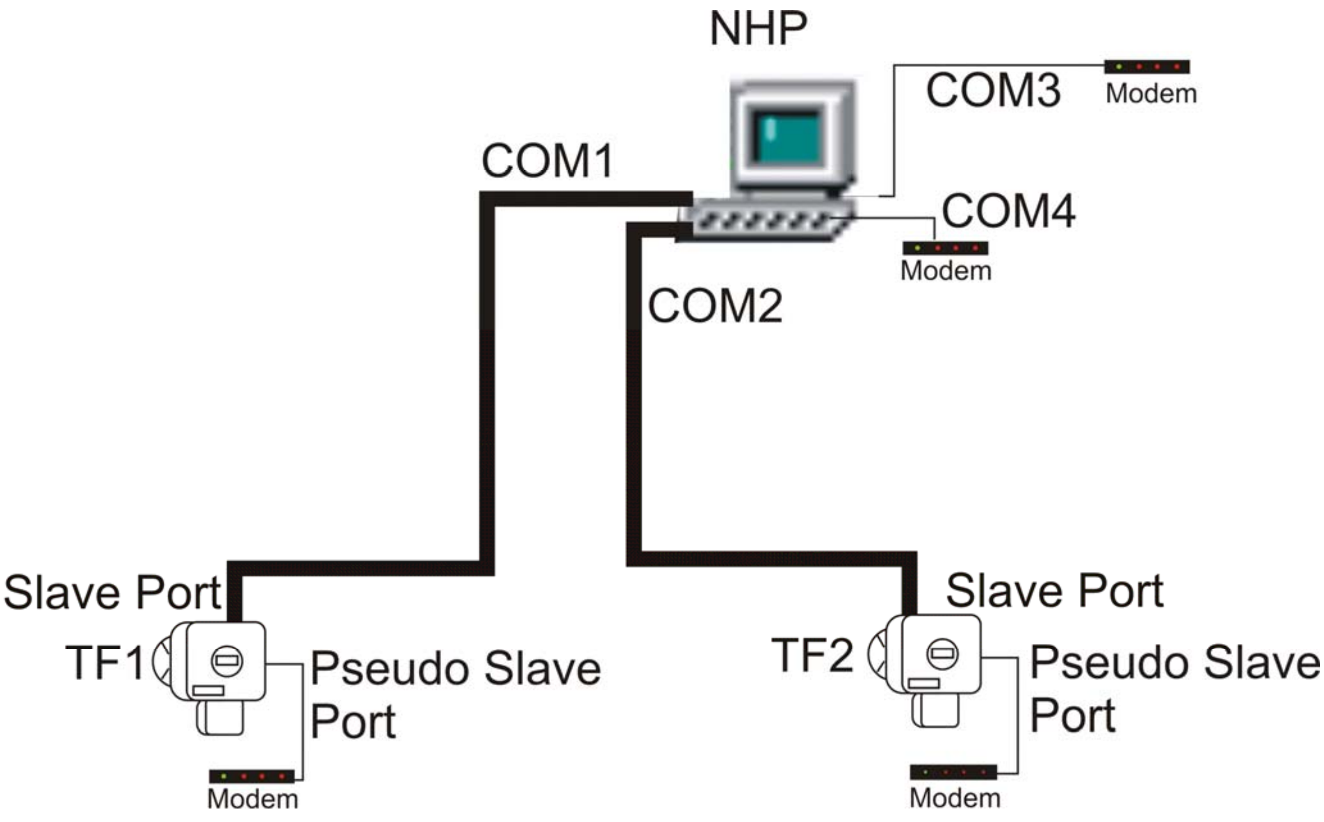


Figure H-1. Backup Lines for COM3 and COM4

In the next figure, primary communication line COM2 has been cut. Once this failure has been detected, COM4 will dial out, and attempt to connect to the modem plugged into the Pseudo Slave Port of TF2, to re-establish communications, until COM2 can be repaired.

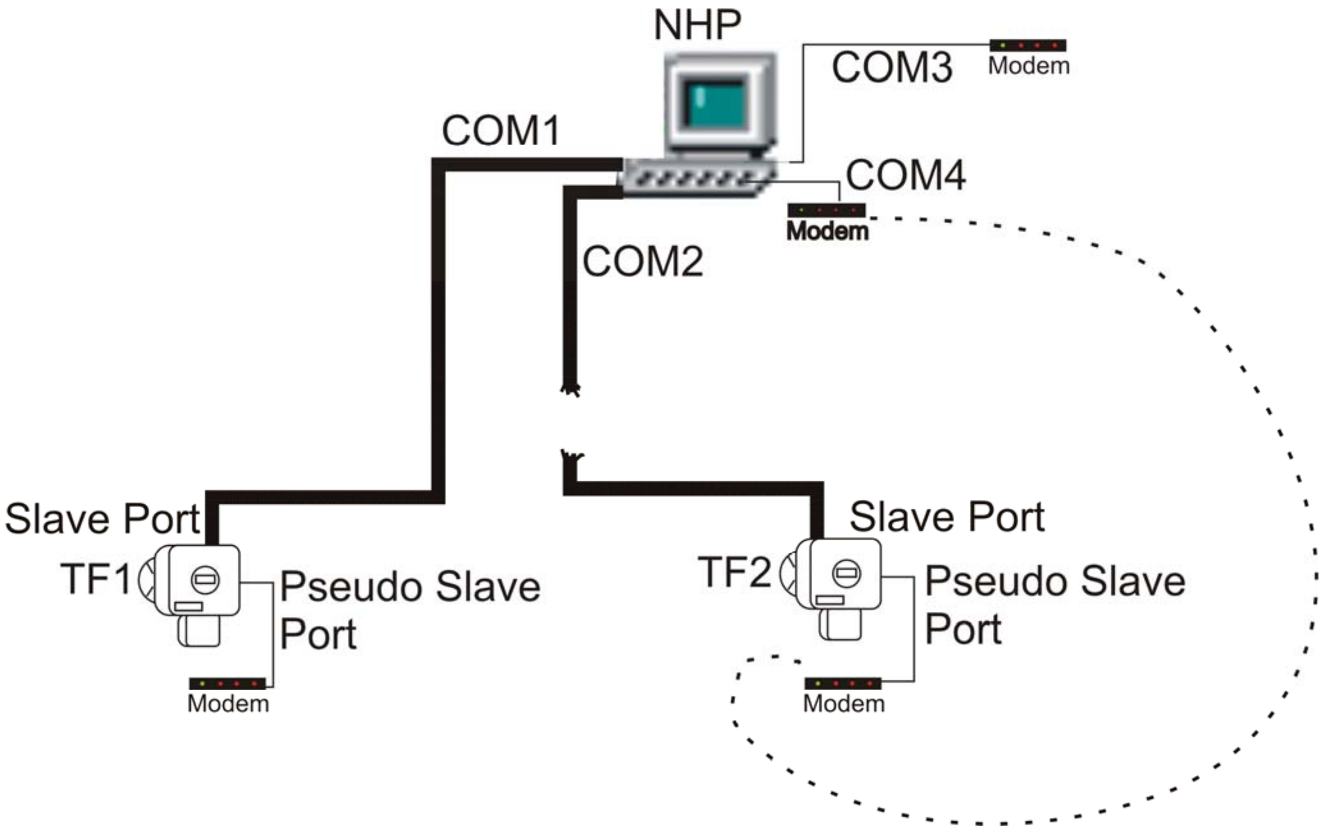


Figure H-2.Backup Lines – COM4 takes over for COM2

H.2 What triggers a switchover from a primary communication line to a backup line?

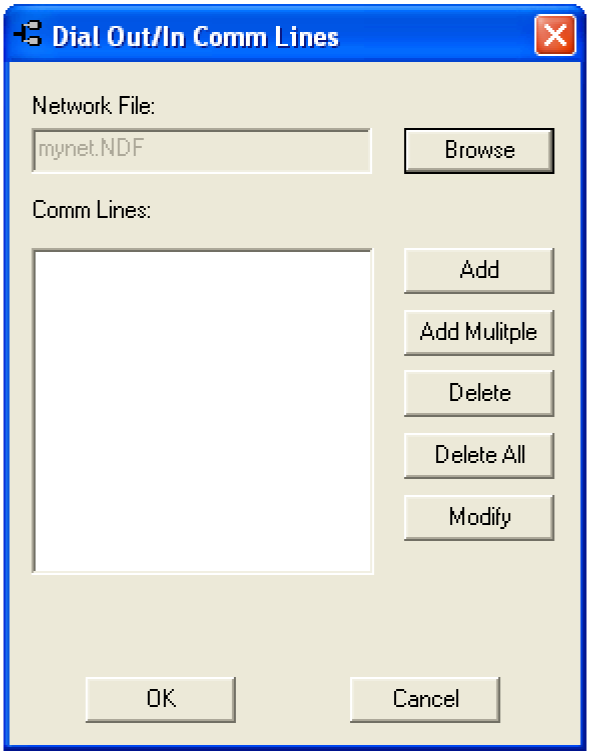
If the Network Host PC (NHP) cannot communicate with a particular RTU via the primary communication line (and a download to that RTU is NOT in progress), a switchover to the backup communication line occurs (if a backup line is available).

H.3 Configuring a single backup communication line

Notes:

- You must have an OpenBSI network already defined in NetView to configure a backup communication line.
- You must stop OpenBSI communications, because the backup communication line cannot be defined while communications are active.

1. Start the Backup Lines Utility by clicking on **Start**> **Programs** > **OpenBSI Tools** > **Common Tools** > **Backup Comm Lines.**



Network File: mynet.NDF

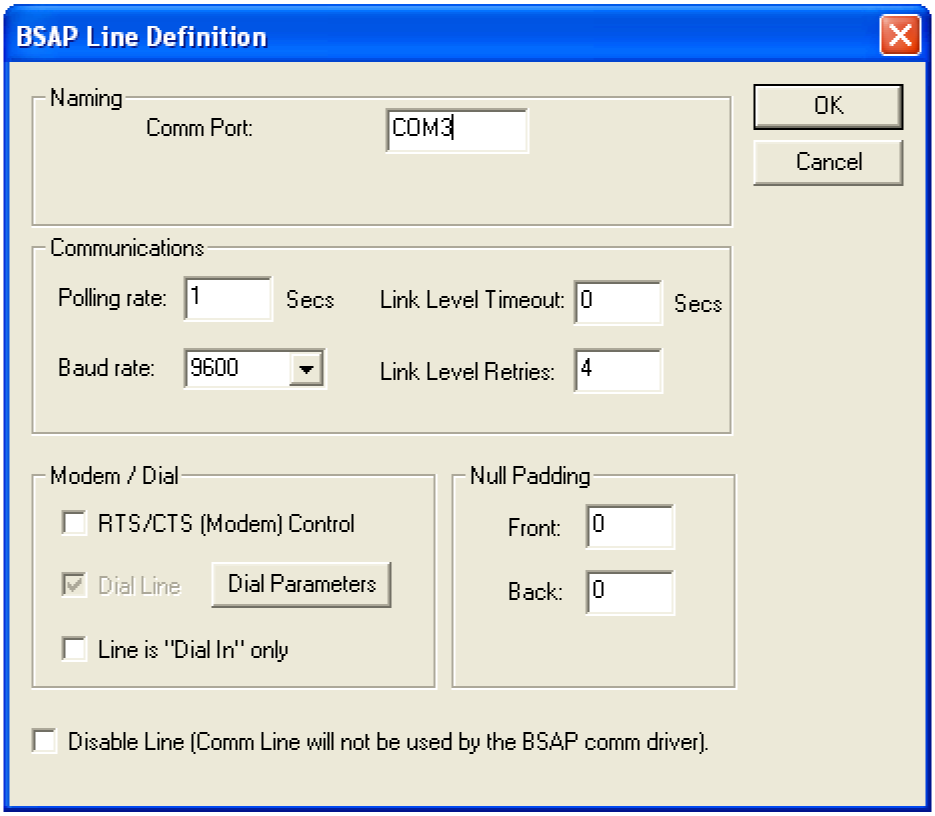
Figure H-3. Backup Lines Utility

2. Click the **Browse** button and locate the NETDEF database file (*.MDB) which contains the details of your network. Once you select a file, the utility prompts you to provide a username and/or password for access to the NETDEF file. Editing of NETDEF files requires user privileges of either an Engineer or an Administrator.

3. Click **Add**. The BSAP Line Definition dialog box opens. Complete the fields as described in the *"BSAP Backup Line Definition"* sub-section.

4. After you exit the BSAP Backup Line Definition dialog box, and return to the Comm Backup Lines dialog box, click **OK** and the backup line definition is complete.

H.3.1 BSAP Backup Line Definition



BSAP Line Definition

Naming
Comm Port: COM3

OK
Cancel

Communications
Polling rate: 1 Secs
Link Level Timeout: 0 Secs
Baud rate: 9600
Link Level Retries: 4

Modem / Dial
□ RTS/CTS (Modem) Control
☑ Dial Line
Dial Parameters
□ Line is "Dial In" only

Null Padding
Front: 0
Back: 0

□ Disable Line (Comm Line will not be used by the BSAP comm driver).

Figure H-4. BSAP Line Definition dialog box

Field	**Description**
Naming **Comm Port**	This is the name of the communication port, e.g. COM3. **Note**: It MUST NOT be the name of a port already defined as a primary communication port.
Communications: **Polling rate**	This is the rate (in seconds) at which OpenBSI polls the RTU on this line for data.
Baud rate	This is the character-by-character rate at which communications occur on this line. The rate must match the baud rate configured in the RTU at the other end of the line.
Link Level Timeout	This defines the maximum amount of time (in seconds) that OpenBSI waits to receive a response to any one data link transaction. If you enter “0“ as the link timeout period, the system uses a default timeout calculated based on the baud rate

	of the line.
Link Level Retries	If the number of Link Level Timeouts associated with this RTU reaches this number, OpenBSI declares the RTU "dead."
Modem / Dial **RTS/CTS (Modem) Control**	Check this box if the RTU on this line requires RTS/CTS hand-shaking in order for messages to be sent. The NHP turns on the Request to Send (RTS) control line for the RTU, which must respond to the NHP by turning on the Clear to Send (CTS) control line, at which point, the data can be sent.
Dial Line	When you check this, the **Dial Parameters** button activates, and you can configure dialing information by clicking on it. See *Section 6.18.7* in *Chapter 6* for an explanation of the various dialing parameters.
Line is "Dial In" only	Check this if RTUs dial into the OpenBSI Workstation using this line. Lines defined as "dial-in" CANNOT be used to dial out. In addition, all RTUs which make use of "dial in" lines must have a pseudo line defined as their primary communication line in NetView.
Null Padding **Front, Back**	These fields specify the number of null characters to insert at the beginning (front) or ending (back) of a message. Null characters are useful in situations where there is a momentary delay which could cause the start of a message to be missed, for example, while a radio link is being activated. Null characters are also necessary if you are communicating using a 2-wire RS-485 link, to ensure that DTR is not dropped prematurely. To determine the delay caused by null packing, perform the following calculation:

$$\text{seconds of delay} = \frac{\text{number of null chars * 10}}{\text{baud rate}}$$

Disable Line	When selected, this line will be removed from the pool of available backup lines, and will not be used for BSAP communications. This is useful to temporarily disable a particular line.

Click on **[OK]** to exit the BSAP Backup Line Definition dialog box.

H.4 Configuring Multiple Backup Communication Lines

If you want to configure more than one backup communication line, and the lines share most of the same characteristics, you can optionally use the **Add Multiple** button in the Comm Backup Lines dialog box.

This calls up a slightly different version of the BSAP Backup Line Definition dialog box.

In this version of the dialog box, you must first specify a basename for the lines you are going to define, e.g. COM, in the **Comm Port Name Base** field.

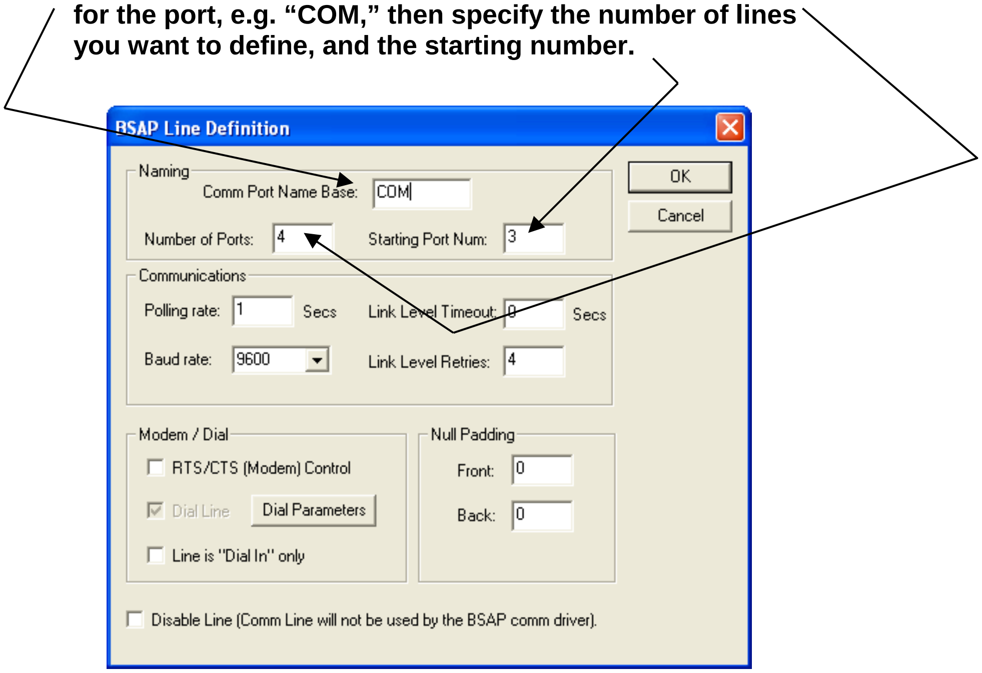
Next, specify the number of backup lines you are defining in the **Number of Ports** field.

Finally, in the **Starting Port Num** field, specify the number to be appended to the **Comm Port Name Base**, for the first backup communication line. The remaining communication lines are numbered consecutively based on that number.

For example, if you want to define four backup communication lines called "COM3, COM4, COM5, and COM6", then enter "COM" as the **Comm Port Name Base**, enter "4" in the **Number of Ports** field, and enter "3" as the **Starting Port Num**.

All other fields of the dialog box match those discussed previously. When finished, each of the backup communication lines will be identical, except for their names. If necessary, you can modify the characteristics of individual backup lines.

When defining multiple backup lines, enter the base name for the port, e.g. "COM," then specify the number of lines you want to define, and the starting number.



BSAP Line Definition

Naming

Comm Port Name Base: COM

Number of Ports: 4

Starting Port Num: 3

Communications

Polling rate: 1 Secs

Link Level Timeout: 0 Secs

Baud rate: 9600

Link Level Retries: 4

Modem / Dial

☐ RTS/CTS (Modem) Control

☑ Dial Line

☐ Line is "Dial In" only

Null Padding

Front: 0

Back: 0

☐ Disable Line (Comm Line will not be used by the BSAP comm driver).

Figure H-5. Defining Multiple Backup Lines

H.5 Establishing a Pseudo Line to Handle Dial-only RTUs

Note: Requires OpenBSI 5.3 or newer.

If, you have a system with hundreds of RTUs, and intend to dial them only when their data is requested, or if the RTU only dials in to the PC, it may be impractical to have dedicated dial-up communication lines for each RTU. This is especially true because the lines would only be used for short periods when data is requested, or when the RTU is dialing in with data.

As an alternative, you could assign these RTUs to a **pseudo line**. A pseudo line is a serial communication line that is not used for actual communications, but provides a “holding place” for these RTUs when they are not communicating with the OpenBSI workstation. Available backup lines handle all actual communication between the OpenBSI workstation and these RTUs.

Whenever OpenBSI requests data from one of these RTUs, or the RTU dials in with data, communications are automatically switched from the pseudo line, to one of the backup lines. When dial-up communication is complete, the backup line is freed, and the RTU is switched back to the pseudo line.

To set up the Pseudo Line, you must:

- include the PseudoLine=*name_of_line* statement in the [COMM] section of the BSBSAP.INI initialization file. (See *Appendix E* for more information on this file.)
- In NetView, assign one or more RTUs to the address range of the pseudo line.
- define one or more backup lines, as described in this appendix. If using Slave dial-in, make sure there is at least one backup line defined for dial-in.

H.6 Modifying a Backup Line

To modify a backup communication line, click on its name in the **Comm Lines** list, in the Dial In/Out Comm Lines dialog box, then click **Modify**. The BSAP Line Definition dialog box opens, to allow you to modify the characteristics of the backup communication line.

H.7 Deleting a Backup Line

To delete a backup communication line, click on its name in the **Comm Lines** list, in the Dial In/Out Comm Lines dialog box, then click **Delete**.

To delete all of the backup communication lines, click **Delete All**.

H.8 Disabling a Backup Line

To temporarily take a backup line out of service, you can disable it. To do this, call up the BSAP Line Definition dialog box for the line and select **Disable Line** then click **OK**.

H.9 Manually Forcing a Switchover

You can manually force a switchover of communications with an RTU from its primary communication line to a backup communication line, (or from the backup line to the primary line). To do this, click on the RTU in the NetView tree, so its Monitor window is visible, then click the **Manual Switch** button in the Monitor window.

If the **Manual Switch** button is not visible, this is an indication that the backup communication line was not detected. Verify that the line has been configured. You should also check the OpenBSI journal file to look for configuration errors related to the backup line.

H.10 Backup Line Initialization Parameters

You can set certain parameters that govern how OpenBSI uses backup lines. See *Section E-3* in *Appendix E – Initialization Files* for more information.

Appendix I – Port Arbitrator

Note: Requires OpenBSI 5.5 or newer.

I.1 Introduction - What is the Port Arbitrator?

Normally, when a serial communication port on your PC is configured in OpenBSI for BSAP communications, it will be used solely for BSAP messages.

Sometimes, however, you may have other communication protocols that you want to use on the same communication line. This presents a problem since messages for one protocol (BSAP) would typically be incompatible with messages from a foreign protocol, and vice versa. In this sort of situation, communications would be disrupted on this port.

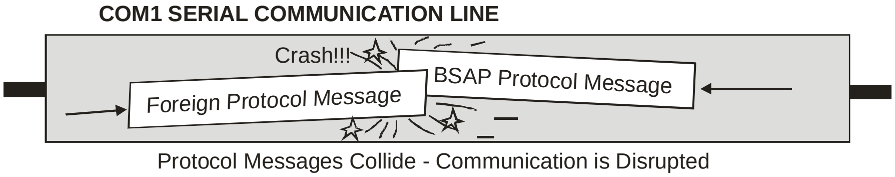

COM1 SERIAL COMMUNICATION LINE
Crash!!!
BSAP Protocol Message
Foreign Protocol Message
Protocol Messages Collide - Communication is Disrupted

Figure I-1. Protocol Message Collisions

To avoid this, you can use the **Port Arbitrator** to allow multiple protocols to share the same communication line.

The Port Arbitrator functions similar to a traffic cop who lets traffic move on only one lane of a road at a time. When BSAP is polling or sending other messages, the Arbitrator allocates the communication line to the BSAP driver. When BSAP is finished, the communication line is released to any foreign protocol that is waiting to use it.

Similarly, if the foreign protocol is using the communication line, the Arbitrator makes the BSAP driver wait for a specified period of time to allow the foreign protocol to finish up, and make the line available.

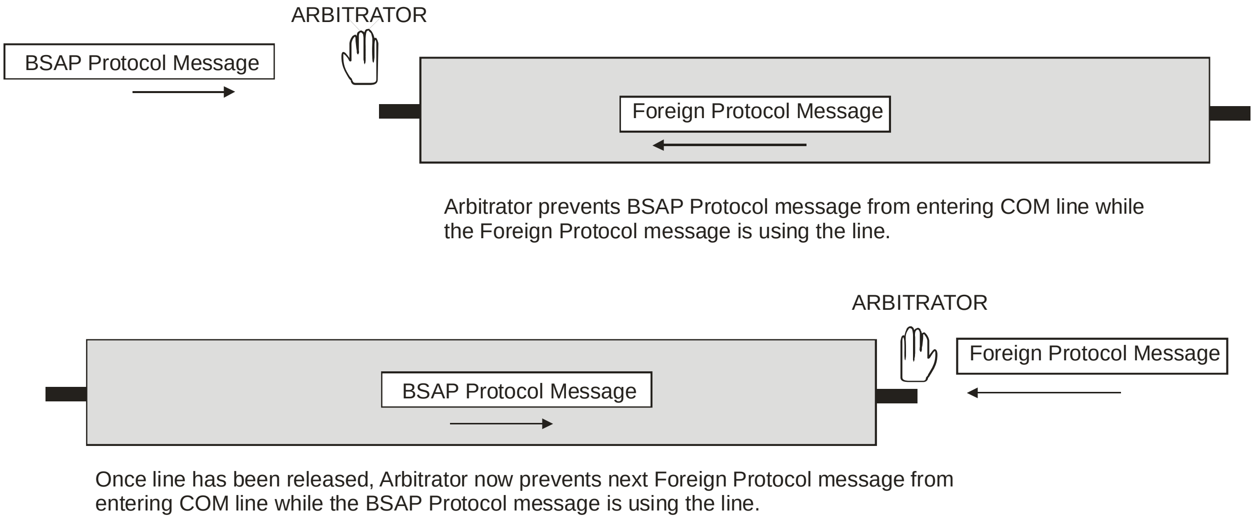
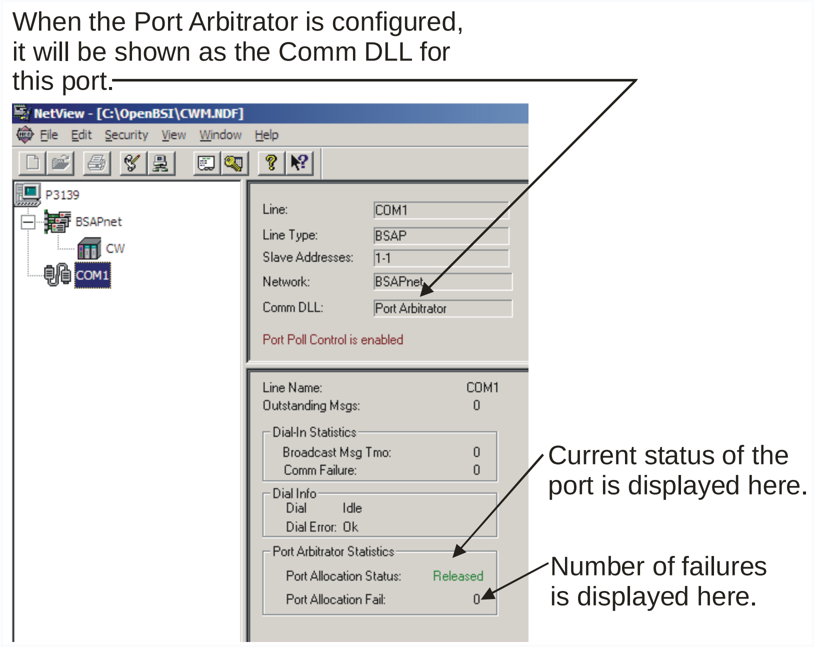

ARBITRATOR
BSAP Protocol Message
Foreign Protocol Message
Arbitrator prevents BSAP Protocol message from entering COM line while the Foreign Protocol message is using the line.
ARBITRATOR
Foreign Protocol Message
BSAP Protocol Message
Once line has been released, Arbitrator now prevents next Foreign Protocol message from entering COM line while the BSAP Protocol message is using the line.

Figure I-2. Port Arbitrator Manages Protocol Message Traffic

There are several things you need to be aware of before trying to use the Port Arbitrator:

- Dial-up lines cannot be configured to use the Port Arbitrator; the two features are mutually exclusive. Attempting to configure both features for the same line will generate a configuration error in the OpenBSI Journal File. RTUs that are on lines configured with this error are marked with the status values “OFFLINE”, “CONFIG_ERR” and “DEAD” in the Monitor pane of NetView.
- Backup lines, since they are dial-up lines, also cannot use the Port Arbitrator. Attempting to configure both features for the same line will generate a configuration error in the OpenBSI Journal File.
- If you have a primary communication line configured to use the Port Arbitrator, and you also have configured backup lines in your system, a failure of the primary line will NOT trigger a switchover to backup lines for RTUs on the primary line. Those RTUs will continue to be associated with the failed primary line.
- It is recommended, though not required, that the Port Poll Control be enabled for any port controlled via the Port Arbitrator. This ensures that the BSAP protocol only uses the port when it actually needs it, rather than continually polling for data, even when it’s not required.
- It is recommended, though not required, that the RTUs on the line be configured for **immediate response**. This reduces the amount of time the BSAP Protocol needs to wait for data, and thereby allows it to release the line quicker to the foreign protocol.
- The Port Arbitrator knows *nothing* about how the foreign protocol operates. It simply handles the allocation and release of the port on behalf of the BSAP Protocol.
- A port controlled by the Port Arbitrator can be in one of four possible states:

State	Description
"ALLOCATED"	The Port is currently being use by the BSAP communication protocol.
"WAITING"	Some foreign protocol is currently using the port, and the BSAP protocol is waiting to use it. The maximum amount of time the BSAP protocol will wait is specified by the WaitForPort entry in the [TIME] section of the BSBSAP.INI file. If this time is exceeded, the port will enter a "FAILED" state. For information on editing the BSBSAP.INI file, please see *Appendix E.*
"RELEASED"	The BSAP Protocol has released the Port, making it available for use by a foreign protocol.
"FAILED"	The foreign protocol failed to release the port in time for the BSAP Protocol to use it.



When the Port Arbitrator is configured, it will be shown as the Comm DLL for this port.

Line: COM1
Line Type: BSAP
Slave Addresses: 1-1
Network: BSAPnet
Comm DLL: Port Arbitrator

Port Poll Control is enabled

Line Name: COM1
Outstanding Msgs: 0

Dial-In Statistics
Broadcast Msg Tmo: 0
Comm Failure: 0

Dial Info
Dial Idle
Dial Error: Ok

Port Arbitrator Statistics
Port Allocation Status: Released
Port Allocation Fail: 0

Current status of the port is displayed here.

Number of failures is displayed here.

Figure I-3. Port Arbitrator in Monitor Pane

I.2 Configuring the Port Arbitrator

The basic configuration for the Port Arbitrator is simple. In the WINDOWS directory of your OpenBSI Workstation, edit the BSBSAP.INI file to include the following items:

- In the [TIME] section, include a value for the **WaitForPort** parameter to specify how many seconds the BSAP driver will wait for the port, before declaring a failure. If the WaitForPort item is omitted, the default will be 1 second. For example:

```
[TIME]
     WaitForPort=5
```

- In the [COMMDLL] section, include an entry for the Port Arbitrator **BSAPARBTRCOMM.DLL** for each port that is using it. In the example, below, the Port Arbitrator is used on both COM1 and COM2:

```
[COMMDLL]
    COM1=bsaparbtrcomm.dll
    COM2=bsaparbtrcomm.dll
```

For more information on the BSBSAP.INI file, please refer to *Appendix E*.

Although we've covered the basic configuration, a larger issue you need to consider is how the sharing of the protocols will be coordinated. As we've said before, the Port Arbitrator controls the BSAP Protocol's use of the port. If the BSAP driver isn't using the port, and the foreign protocol takes control of the port, you must have configured your foreign protocol to release the port in time for the BSAP driver to use it.

If, for example, the foreign protocol holds the port for ten seconds, and during that time a BSAP message comes in has to wait for longer than the WaitForPort entry, a failure will be declared.

Another possible problem relates to RTU Message Timeouts. If your RTU Message Timeout is not configured to take into account your waiting times you could have problems. This is because even if the port becomes available prior to expiration of the WaitForPort period, if the RTU's response doesn't arrive back at the OpenBSI Workstation prior to expiration of the RTU Message Timeout, it will be discarded.

Appendix J – Using the System Firmware Downloader

Note: The System Firmware Downloader is only for downloading system firmware; it is NOT for downloading your ControlWave project. For information on downloading your ControlWave project, see *Chapter 7*.

J.1 What is System Firmware?

System firmware is basically the electronic code that is the “brain” of the ControlWave. It allows the application programs that you create to run.

System firmware is responsible for:

- interpreting the functions, function blocks and programs and other logic in your ControlWave project,
- communicating with the hardware including I/O boards and other devices, and
- controlling basic functions such as what happens when power is applied to the unit, and what happens if power is interrupted, etc.

Each ControlWave controller ships from the factory with system firmware pre-installed. We periodically release new versions of the system firmware to introduce new features to the product, or to correct problems with existing firmware. In order to take advantage of these new features and corrections, you need the ability to install the new system firmware. You can accomplish this via various methods, including the System Firmware Downloader.

Note: System firmware may also be installed via Flash Mode in LocalView, or using HyperTerminal. See your hardware documentation for more information

⚠ **Warning** **Immediately after new system firmware is downloaded into flash memory, the System Firmware Downloader will automatically STOP any project running in the ControlWave unit, after which the ControlWave unit will be re-started and a boot-up sequence will begin, as the new system firmware is programmed. This process may take from 1 to 2 minutes to complete; after which the ControlWave project will be warm started from where it left off. During this period, the ControlWave will NOT be able to control your process; therefore, your process MUST be in a safe state before initiating the download, and you must be ready with manual backups/overrides, etc. to control the process on your own during this period. Failure to take such precautions could result in injury to persons or damage to property.**

J.2 Requirements for Using the System Firmware Downloader

- OpenBSI 5.6 (or newer) must be running.
- The controller must be a ControlWave-series controller.

- Boot prom firmware in the ControlWave Micro-based controller must be 4.70 or newer.
- Boot prom firmware in a ControlWave (non-ARM-based) controller must be 6.0 or newer.
- System firmware to be downloaded must be 4.60 or newer.
- You must log in with the following security privileges: “Add/Del/Change User Security Info”, “Full Application Access”, and “Change/Delete Files via FTP”. These privileges are defined in the Flash Configuration Utility.
- Switches on the unit must be set to enable Remote Firmware Download, and to unlock flash memory for writing. (See *Table J-1*, below, for appropriate switch settings on your particular ControlWave platform.)

Table J-1 RTU Switch Settings When Using the System Firmware Downloader

Platform	**Flash Memory must be Unlocked for Writing. Set this switch as follows:**	**Remote Firmware Downloading must be enabled. Set this switch as follows:**
• ControlWave • ControlWave Redundant Controller (see note) • ControlWave I/O Expansion Rack	Set SW1-2 to ON	Set SW3-2 to OFF
• ControlWave LP	Set SW4-2 to ON	Set SW4-6 to ON
• ControlWave MICRO • ControlWave EFM • ControlWave GFC • ControlWave GFC-CL • ControlWave Express • ControlWave Express PAC • CW_10 • CW_30 • CW_35	Set SW2-2 to ON	Set SW2-6 to ON
• ControlWave XFC	Set SW1-2 to ON	Set SW1-6 to ON

Note: For the ControlWave Redundant controller, each CPU should be loaded with new firmware separately; do NOT load a single CPU and wait for a redundant transfer.

J.3 Starting the System Firmware Downloader

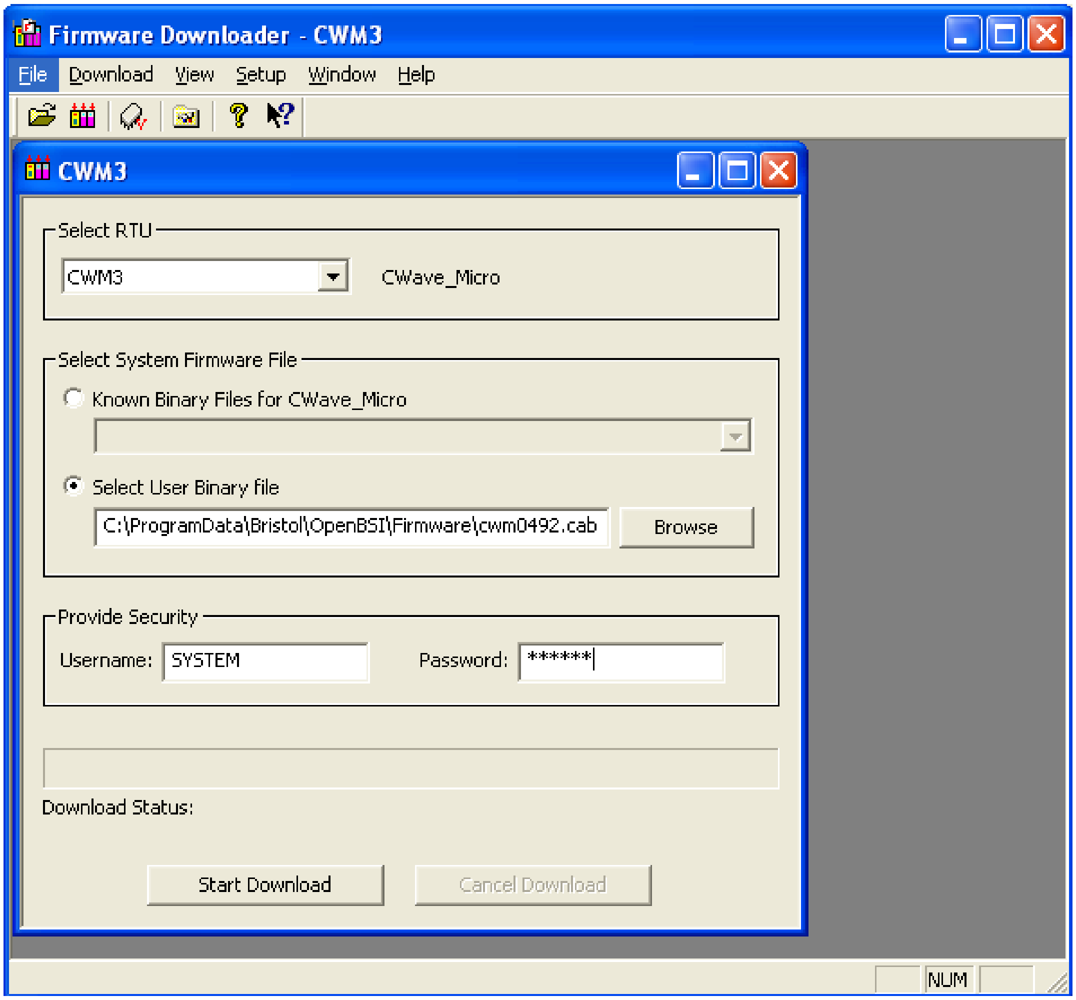
With OpenBSI communications running, click as follows:

Start > **Programs** > **OpenBSI Tools** > **ControlWave Tools** > **Remote Firmware Download**

J.3.1 Downloading System Firmware to a Single Controller

To download new system firmware to a single controller, do the following:

1. Click **Download** > **Single Node**, or click on the icon shown, above.
2. Use the **Select RTU** list box to select the RTU from those RTUs available in the network.



Select RTU: CWM3 CWave_Micro

Select System Firmware File

○ Known Binary Files for CWave_Micro

● Select User Binary file

C:\ProgramData\Bristol\OpenBSI\Firmware\cwm0492.cab

Provide Security

Username: SYSTEM Password: ******

Download Status:

Figure J-1. System Firmware Downloader

3. Specify the system firmware file to be downloaded. System firmware files have the file extension *.CAB. If you choose **Known Binary files**, the utility displays a list of CAB files in the default folder for firmware flash files; double-click on the file you want to download. If you choose **Select User Binary file**, use the **Browse** button to locate another folder containing the system firmware file you want to download, and double-click on it.
4. Enter the **Username** and **Password** for access to the controller.
5. Click **Start Download**.

Warning **You will be prompted to confirm that you want to proceed with the download. Do NOT click on "Yes" unless your process is in a safe-state, and you are ready with backup or manual override control mechanisms to control the process. This is because, although your ControlWave application project continues to run while the system firmware is being transferred from the PC; and you can cancel the download during the transfer by clicking on "Cancel Download" without any affect on the running process, immediately after the transfer is complete, *your ControlWave project will be STOPPED, and the ControlWave will be re-started to load the newly installed firmware, and a boot-up sequence will begin,* after which the ControlWave project will be warm-started from the point where it was when it stopped. During this reset period, usually lasting 1-2 minutes, control of your process is suspended. *Because of this, users must ensure that a backup or manual method of monitoring/ controlling the process is in place during system firmware upgrades.* Failure to take such precautions could result in injury to persons or damage to property.**

J.4 Downloading System Firmware to a Group of Controllers (Script File)

To download system firmware to more than one controller:

1. In a text editor, create a script file on your PC. *Figure J-2* shows the format of the script file. Save the script file. The file must have a file extension of *.FDB (Firmware Downloader Batch file). *Figure J-3* shows an example of a completed FDB script file.

```
[Downloads]
CMD1= -rnodename_1  -fpath_and_filename_1  -uusername_1 -ppassword_1
WAIT2=wait_time_2
CMD2= -rnodename_2  -fpath_and_filename_2  -uusername_2 -ppassword_2
WAIT3=wait_time_3
   :
   :
CMDn= -rnodename_n  -fpath_and_filename_n  -uusername_n -ppassword_n
WAITn=wait_time_n
```

where:

`nodename` is the name of the RTU, as it appears in NetView.

`path_and_filename` is the path and filename of the CAB file to be downloaded.

`username,password` is a valid sername/password combination for a user defined at the RTU with sufficient privileges to perform a firmware download. (See *Requirements for Using the System Firmware Downloader*.)

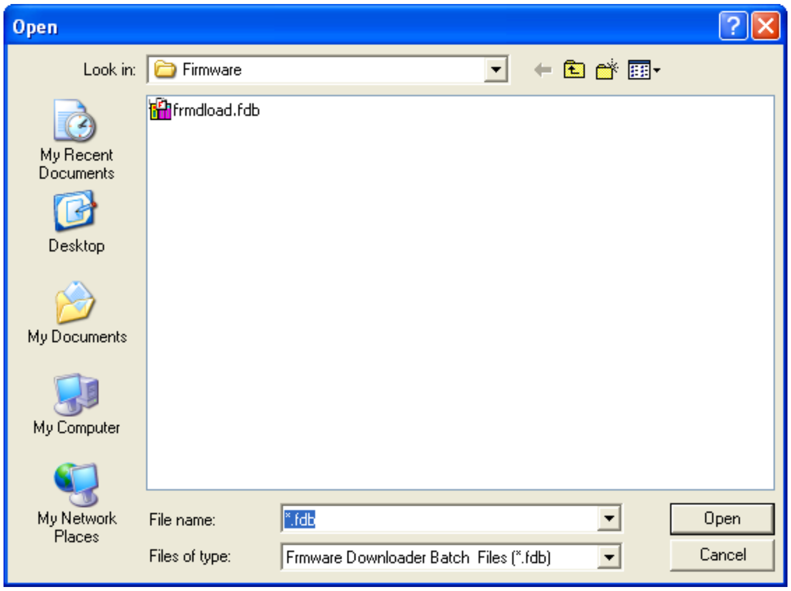
`wait_time` is the time, in seconds, to wait before proceeding to download the next RTU in the list.

Figure J-2. System Firmware Downloader Script File Format

```
[Downloads]
CMD1=-rELM_ST -fc:\ProgramData\Bristol\openbsi\firmware\cwmicro.cab -uSYSTEM -p666666
WAIT2=30
CMD2=-rOAK_ST -fc:\ProgramData\Bristol\openbsi\firmware\cwcust.cab -uOPERAT1 -pmypassw
WAIT3=15
CMD3=-rMAIN_ST -fc:\ProgramData\Bristol\openbsi\mystuff\cwgfc.cab -uOPERAT2 -p555555
```

Figure J-3 Example FDB Script File

2. Click **File** > **Open Script** and the Open dialog box will appear. Navigate to the file you created in step 1, and double-click on it.



Look in: Firmware

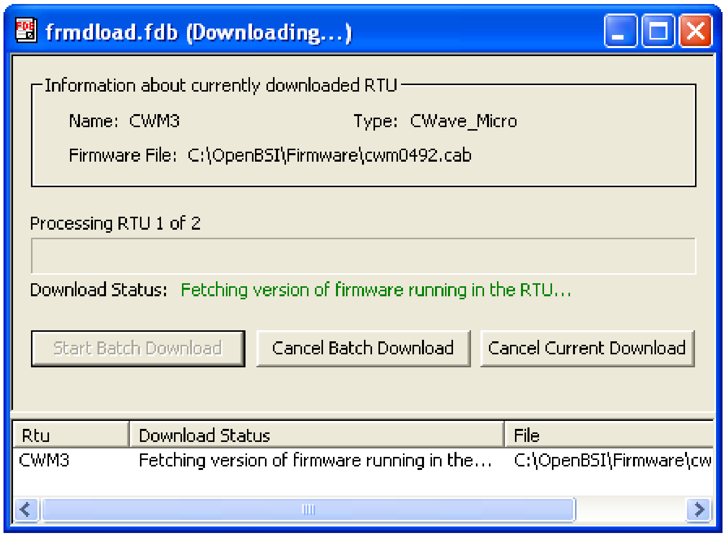
frmdload.fdb

File name: *.fdb

Files of type: Frmware Downloader Batch Files (*.fdb)

Figure J-4. Selecting a Script File

3. A batch download dialog box opens. Click **Start Download**.



frmdload.fdb (Downloading...)

Information about currently downloaded RTU

Name: CWM3 Type: CWave_Micro

Firmware File: C:\OpenBSI\Firmware\cwm0492.cab

Processing RTU 1 of 2

Download Status: Fetching version of firmware running in the RTU...

Rtu	Download Status	File
CWM3	Fetching version of firmware running in the...	C:\OpenBSI\Firmware\cw

Figure J-5. Starting the Batch Download

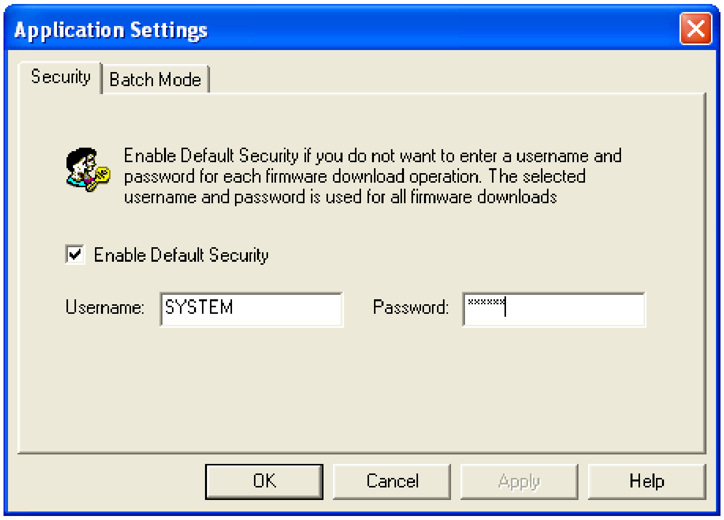
The System Firmware Downloader queries the first RTU to see what version of firmware it is currently running, then the System Firmware Downloader downloads the first CAB file into the flash memory of the first controller. If your FDB file includes a WAIT statement, it then waits for the specified period and then proceeds to download the second CAB file to the second RTU, etc.

J.5 Setting Application Parameters for the System Firmware Downloader

You can adjust certain characteristics of how the System Firmware Downloader using the Application Parameters dialog box.

Click on the “Settings” icon, shown above, or click on **Setup > Application Settings** to call up the Application Parameters dialog box.

J.5.1 Security Tab



Enable Default Security if you do not want to enter a username and password for each firmware download operation. The selected username and password is used for all firmware downloads

☑ Enable Default Security

Username: SYSTEM

Password: ******

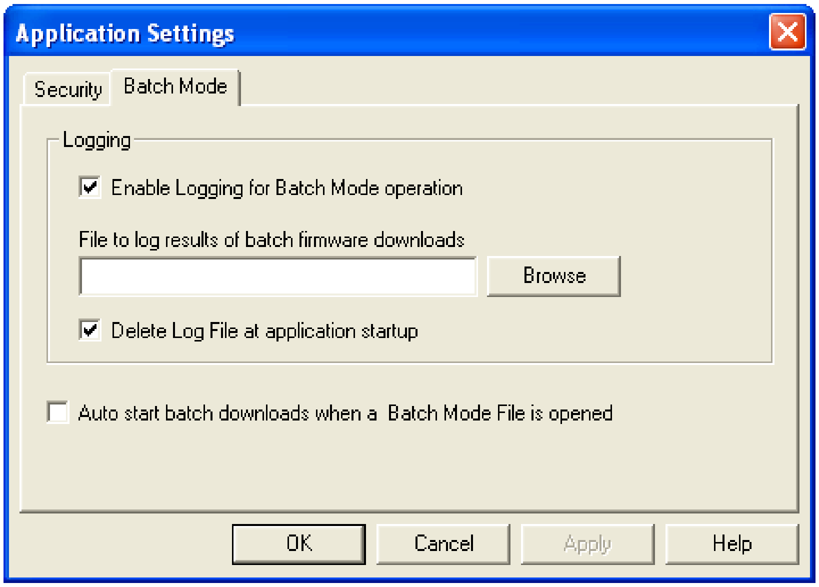
Figure J-6. Application Settings – Security tab

If you don’t want to enter a username / password each time you use the System Firmware Downloader to download system firmware to a particular RTU, you can specify a default username / password, which the System Firmware Downloader will ALWAYS use when downloading system firmware. For this to work, every RTU in your system for which you want to perform remote downloads MUST have this same user defined.

To do this, click **Enable Default Security** then enter the **Username** and **Password** you want to use for all the RTUs you want to download remotely.

Note: Beginning with OpenBSI 5.8 Service Pack 1, default passwords can be up to 16 characters; prior to that, they were limited to six characters.

J.5.2 Batch Mode Tab



☑ Enable Logging for Batch Mode operation

File to log results of batch firmware downloads

☑ Delete Log File at application startup

□ Auto start batch downloads when a Batch Mode File is opened

Figure J-7. Batch Mode tab.

Optionally, the System Firmware Downloader can save details on the success of batch firmware downloads into a log file.

To save this information, select the **Enable Logging for Batch Mode operation** then use the **Browse** button to specify the path, and enter the name of a file to store the information in the **File to log results of batch firmware downloads** field.

If you want the previous log file to be deleted when you restart the System Firmware Downloader, select the **Delete Log File at application startup** option.

If you want the batch download process to begin as soon as you open an FDB file, select the **Auto start batch downloads when a Batch Mode File is opened** option.

Click **OK** to save your changes and exit the dialog box.

J.6 Running the System Firmware Downloader from the Command Line

You can optionally start the System Firmware Downloader from the command line. *Table J-2* shows the command line switches:

Table J-2 System Firmware Downloader Command Line Switches

Switch	Argument Description
-r	RTU name.
-f	Absolute path of CAB file to download. If this switch is not in the command line, the newest default binary file that corresponds to this RTU type will be downloaded. If you include spaces in the path or filename, you must place quotation marks “ “ around them.
-u	Username
-p	Password

Switch	Argument Description
-b	Absolute path of a script file for batch mode operation. NOTE: If this switch is specified, the -r, -f, -u and -p switches are ignored because they would be handled in an FDB file. If you include spaces in the path or filename, you must place quotation marks " " around them.
-l	Absolute path of a log file to log batch mode operations. This switch has priority over the Logging Application settings. If you include spaces in the path or filename, you must place quotation marks " " around them.
-q	This switch does not have any argument. When is present, the user will not be prompted to confirm certain critical actions to be performed during the download process (like overriding the existing system firmware, or stopping the application running in the RTU). In other words the download process will proceed quietly until it is completed.

Example1:

```
FrmwrDload -rRTU_1 -fc:\ProgramData\Bristol\openbsi\firmware\3340.cab -uSystem -p666666
```

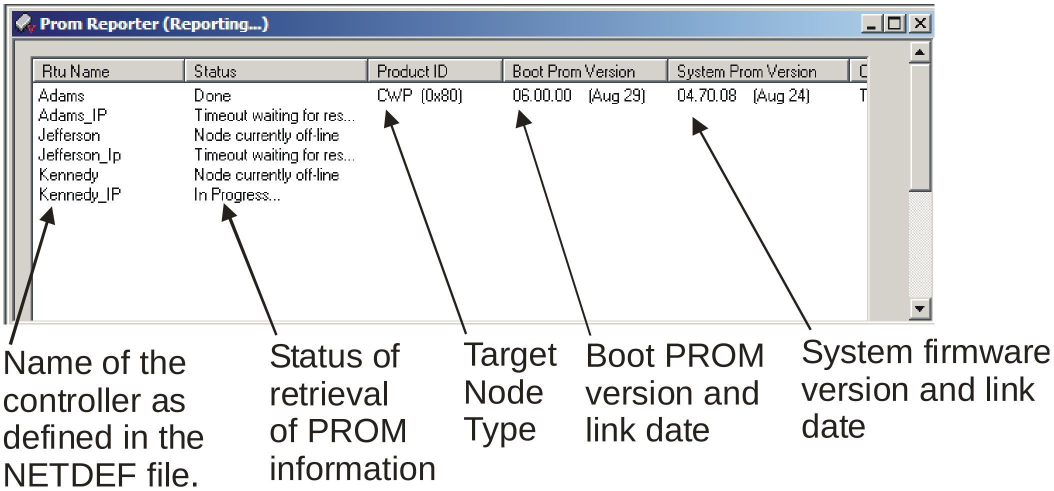
Example2:

```
FrmwrDload -bc:\ProgramData\Bristol\openbsi\firmware\myscript.fdb -lc:\myresults.log –q
```

J.7 Using PROM Reporter to see which Firmware is Loaded in an RTU

The PROM Reporter feature displays information about what system firmware is currently loaded in each controller.

To see this information, click on the icon, shown above, or click on **View > Prom Reporter.**



Prom Reporter (Reporting...)

Rtu Name	Status	Product ID	Boot Prom Version	System Prom Version	C
Adams	Done	CWP (0x80)	06.00.00 (Aug 29)	04.70.08 (Aug 24)	T
Adams_IP	Timeout waiting for res...				
Jefferson	Node currently off-line				
Jefferson_Ip	Timeout waiting for res...				
Kennedy	Node currently off-line				
Kennedy_IP	In Progress...				

Name of the controller as defined in the NETDEF file.
Status of retrieval of PROM information
Target Node Type
Boot PROM version and link date
System firmware version and link date

Figure J-8. PROM Reporter

Appendix K – Interpreting AUDIT Messages

If you configure it to do so, the AUDIT function block in your ControlWave project maintains a record of significant events and alarms that occur at the ControlWave controller.

The AUDIT function block stores a record of:

- Any alarm message
- Any event for variables you include in the AUDIT function block's Event List
- Other important system events

K.1 General Format for AUDIT Messages

AUDIT messages follow this general format:

Time/Date Stamp	Message Content	Local Seq Number	Global Seq Number
hh:mm:ss.t dd-mom-yy	*message_content*	*llllll*	*gggggg*

where:

hh is the two digit hour (0 to 23) portion of the time stamp.

mm is the two digit minute (0 to 59) portion of the time stamp

ss is the two digit second (0 to 59) portion of the timestamp

t is the tenths of second (0 to 9) portion of the timestamp

dd is the two digit day (0 to 31) portion of the date stamp

mon is the three character abbreviation for the month portion of the date stamp

yy is the two digit year (00 to 99) portion of the date stamp

llllll is the six digit local sequence number used internally by the ControlWave for proper ordering of audit messages

gggggg is the six digit global sequence number used internally by the ControlWave for proper ordering of audit and archive messages

message_content the content of the message varies depending upon what type of alarm or event occurs. Each of the different types of message content is described in its own section:

- BOOL variable value change
- Analog variable value change
- BOOL alarm
- Analog alarm
- Calibration Operations
- System Events

- Security Events
- User Notes

BOOL Variable Value Change

When a BOOL variable included in the AUDIT event list changes from FALSE to TRUE, or TRUE to FALSE, it registers a BOOL variable value change event:

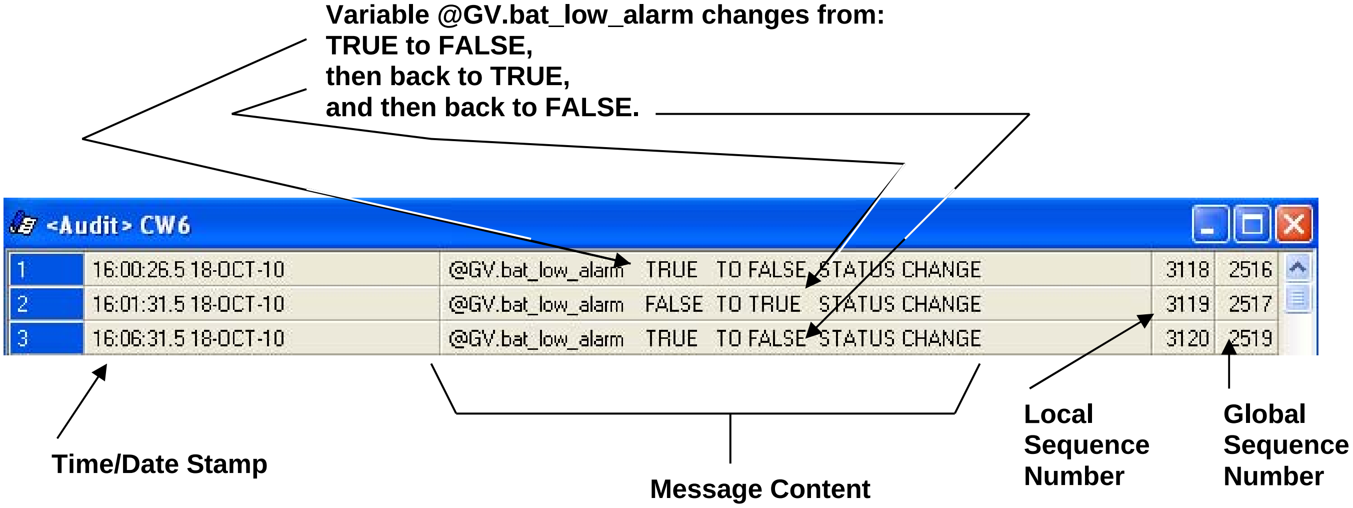
The message content for a BOOL variable value change is:

Variable Name (20 chars max)	**Old Value (6 chars)**		**New Value (6 chars)**	**Report**
variable_name	*oooooo*	**TO**	*nnnnnn*	**STATUS CHANGE**

where:

variable_name	is the name of the BOOL variable (up to 20 characters displayed)
oooooo	is the previous (old) value of the BOOL variable
nnnnnn	is the new value of the BOOL variable

Here is an example of a BOOL variable value change. The variable @GV.bat_low_alarm changes from TRUE to FALSE, then back to TRUE, and then back to FALSE.



```
1  16:00:26.5 18-OCT-10  @GV.bat_low_alarm  TRUE   TO FALSE  STATUS CHANGE  3118  2516
2  16:01:31.5 18-OCT-10  @GV.bat_low_alarm  FALSE  TO TRUE   STATUS CHANGE  3119  2517
3  16:06:31.5 18-OCT-10  @GV.bat_low_alarm  TRUE   TO FALSE  STATUS CHANGE  3120  2519
```

Analog Variable Value Change

When an analog variable (REAL, INT, etc.) included in the AUDIT event list changes value by more than a specified deadband it registers an analog value change event:

The message content for an analog variable value change (VC) is:

Variable Name (20 chars max)	Old Value (11 chars)		New Value (11 chars)	Units (6 chars)	Report
variable_name	*ooooooooooo*	**TO**	*nnnnnnnnnnn*	*uuuuuu*	**VC**

where:

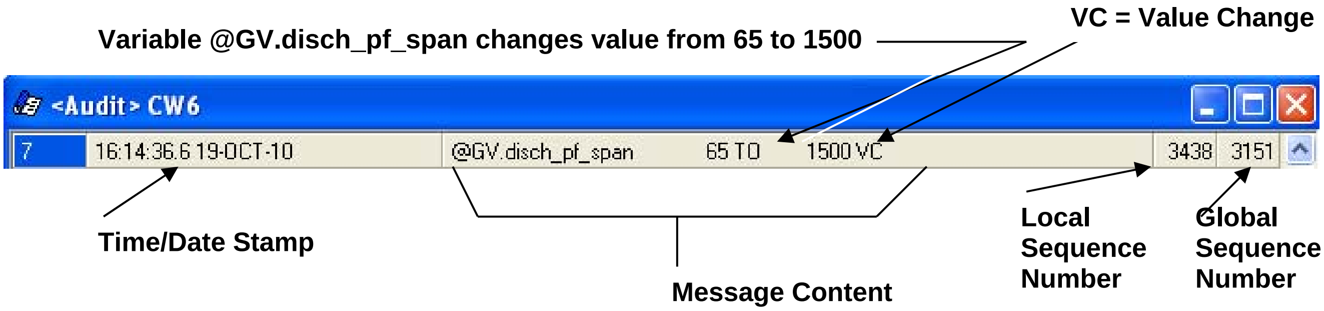
variable_name is the name of the analog (REAL, INT, etc.) variable - up to 20 characters displayed

ooooooooooo is the previous (old) value of the analog variable in the floating point format 11.7g

nnnnnnnnnnn is the new value of the analog variable in the floating point format 11.7g

uuuuuu is the engineering units associated with this variable

Here is an example of an analog variable value change.



```
<Audit> CW6
7    16:14:36.6 19-OCT-10    @GV.disch_pf_span       65 TO     1500 VC        3438   3151
```

BOOL Alarm

When a BOOL variable configured as an alarm either goes from an alarm state to a normal state, or from a normal state to an alarm state, it generates a BOOL alarm.

The message content for a BOOL alarm change is:

Variable Name (20 chars max)	New Value (6 chars)	Alarm Priority	Alarm State
variable_name	*nnnnnn*	*p-*	*alarm_state*

where:

variable_name is the name of the BOOL variable (up to 20 characters displayed)

nnnnnn is the new value of the BOOL variable

p is one of the following:

C	Critical (Most important priority)
N	Non-Critical
O	Operator Guide
E	Event (Least important priority)

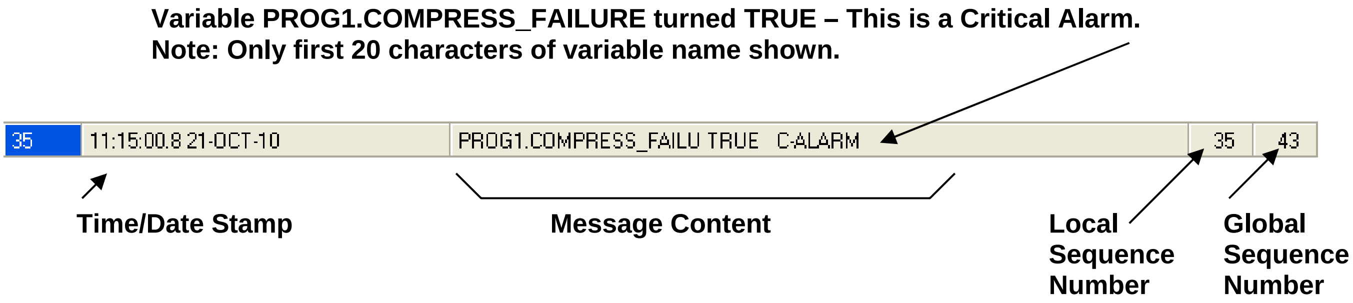
alarm_state is the current alarm state of the variable:

ALARM indicates the variable change is from the normal state into the ALARM state

RETURN TO NORMAL

indicates the variable change is from the alarm state into the NORMAL (non-alarm) state.

Here is an example of a BOOL alarm:



Variable PROG1.COMPRESS_FAILURE turned TRUE – This is a Critical Alarm.
Note: Only first 20 characters of variable name shown.

```
35  11:15:00.8 21-OCT-10  PROG1.COMPRESS_FAILU TRUE   C-ALARM  35  43
```

Analog Alarm

When an analog variable (REAL, INT, etc.) configured as an alarm passes a pre-defined alarm limit, this generates an alarm message. This occurs both when it enters an alarm state, and when it returns to normal.

The message content for an analog alarm is:

Variable Name (20 chars max)	New Value (11 chars)	Alarm Type	Alarm Priority	Alarm Limit Violated (11 chars)
variable_name	*nnnnnnnnnnn*	*type*	*p*-**ALM**	*alarm_limit*

where:

variable_name is the name of the analog (REAL, INT, etc.) variable - up to 20 characters displayed *nnnnnnnnnnn* is the new value of the analog variable in the floating point format 11.7g

type is the alarm type, which is one of the following:

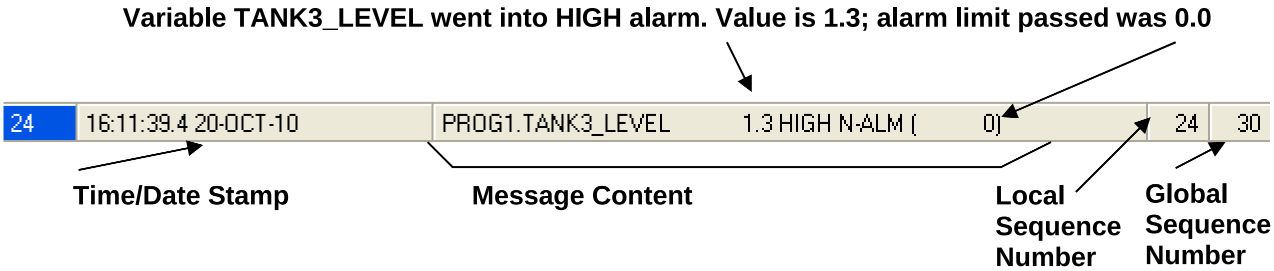
LOW	Low alarm
HIGH	High alarm
LOLO	Low low alarm
HIHI	High high alarm

p is one of the following:

C	Critical (Most important priority)
N	Non-Critical
O	Operator Guide
E	Event (Least important priority)

alarm_limit is the most recent alarm limit violated in the floating point format 11.7g

Here is an example of an analog alarm:



Variable TANK3_LEVEL went into HIGH alarm. Value is 1.3; alarm limit passed was 0.0

```
24 | 16:11:39.4 20-OCT-10 | PROG1.TANK3_LEVEL          1.3 HIGH N-ALM (          0) | 24 | 30
```

Calibration Operations

Calibration operations involve calibrating or verifying the zero and span for pressure or temperature readings from a multivariable transmitter.

The message content for a calibration operation is:

Calibration Operation (20 chars max)	Actual Value (11 chars)		Target Value (11 chars)	Units (6 chars)
calib_operation	*aaaaaaaaaaa*	**AT**	*ttttttttttt*	*uuuuuu*

where:

calib_operation is the type of calibration activity. This can be:

DP VERIFICATION

SP VERIFICATION

T VERIFICATION

ZERO ADJUSTMENT

DP ZERO CALIBRATION

DP SPAN CALIBRATION

SP ZERO CALIBRATION

SP SPAN CALIBRATION

T ZERO CALIBRATION

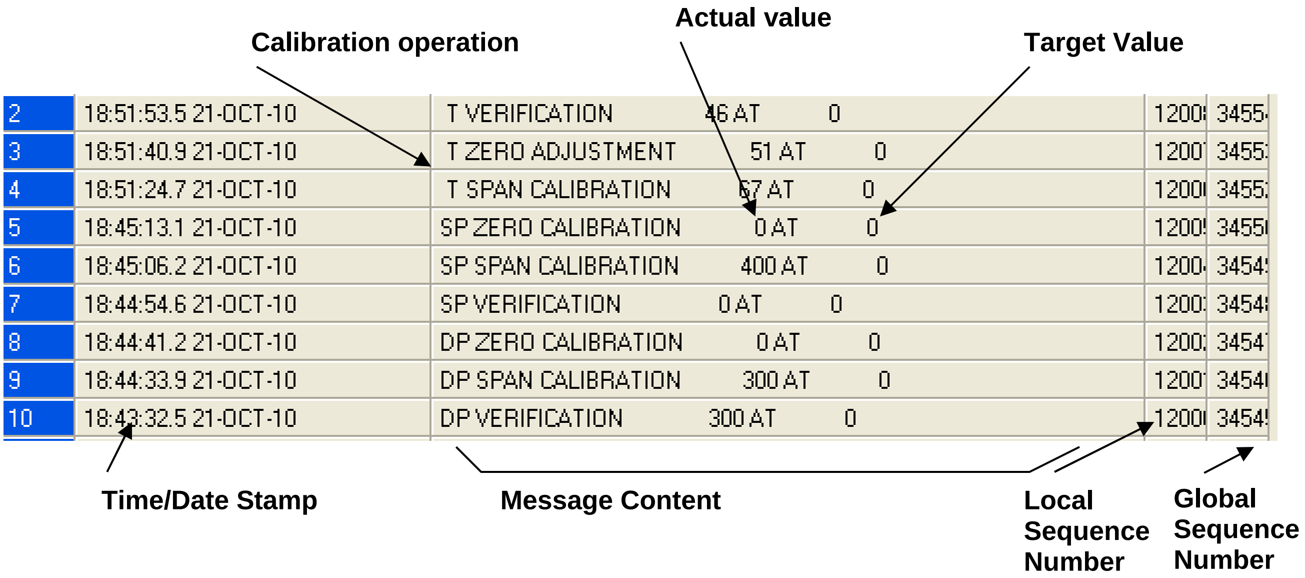
T SPAN CALIBRATION

aaaaaaaaaaa is the actual value of the calibration variable in the floating point format 11.7g

tttttttttt is the target value of the calibration variable in the floating point format 11.7g

uuuuuu is the engineering units associated with this calibration variable

Here are some examples of calibration operations:



2	18:51:53.5 21-OCT-10	T VERIFICATION 46 AT 0	1200	3455
3	18:51:40.9 21-OCT-10	T ZERO ADJUSTMENT 51 AT 0	1200	3455
4	18:51:24.7 21-OCT-10	T SPAN CALIBRATION 67 AT 0	1200	3455
5	18:45:13.1 21-OCT-10	SP ZERO CALIBRATION 0 AT 0	1200	3455
6	18:45:06.2 21-OCT-10	SP SPAN CALIBRATION 400 AT 0	1200	3454
7	18:44:54.6 21-OCT-10	SP VERIFICATION 0 AT 0	1200	3454
8	18:44:41.2 21-OCT-10	DP ZERO CALIBRATION 0 AT 0	1200	3454
9	18:44:33.9 21-OCT-10	DP SPAN CALIBRATION 300 AT 0	1200	3454
10	18:43:32.5 21-OCT-10	DP VERIFICATION 300 AT 0	1200	3454

System Events

The message content for a system event varies depending upon the type of system event:

SYSTEM TIME Event

System time events indicate an external time synchronization message was received that differs from the ControlWave’s real time clock by more than 4 seconds. This resets the real time clock to the new time. These events follow this format:

SYSTEM TIME *dd-mon-yy hh:mm:ss.t*

where:

dd is the two digit day (0 to 31) portion of the received date/time stamp

mon is the three character abbreviation for the month portion of the received date/time stamp

yy is the two digit year (00 to 99) portion of the received date/time stamp

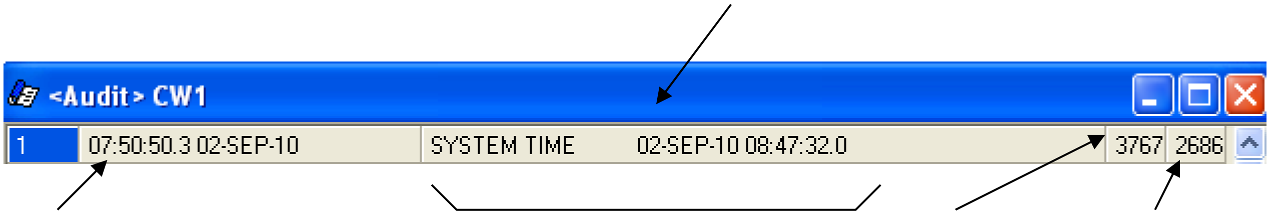
hh is the two digit hour (0 to 23) portion of the received date/time stamp.

mm is the two digit minute (0 to 59) portion of the received date/time stamp

ss is the two digit second (0 to 59) portion of the received date/time stamp

t is the tenths of second (0 to 9) portion of the received date/time stamp

Received a time synch message saying to reset the clock to 02-NOV-10 08:47:32.0



```
1   07:50:50.3 02-SEP-10   SYSTEM TIME    02-SEP-10 08:47:32.0   3767  2686
```

Time/Date Stamp

Message Content

Local Sequence Number

Global Sequence Number

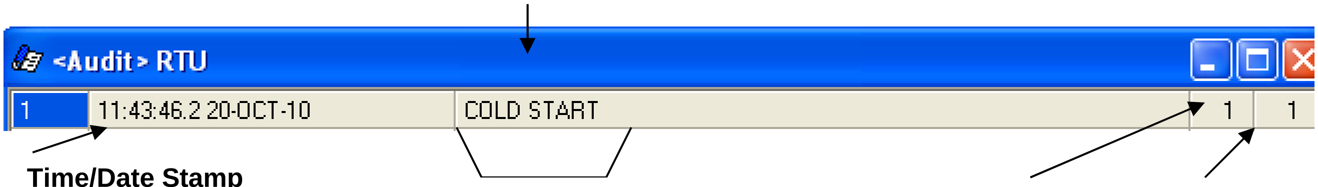
COLD START Event

A cold start event starts the ControlWave project and sets all variables to their initial values. It follows the format:

COLD START

The example, below, shows a cold start event.

Project re-started; all variables initialized.



```
1   11:43:46.2 20-OCT-10   COLD START   1   1
```

Time/Date Stamp

Message Content

Local Sequence Number

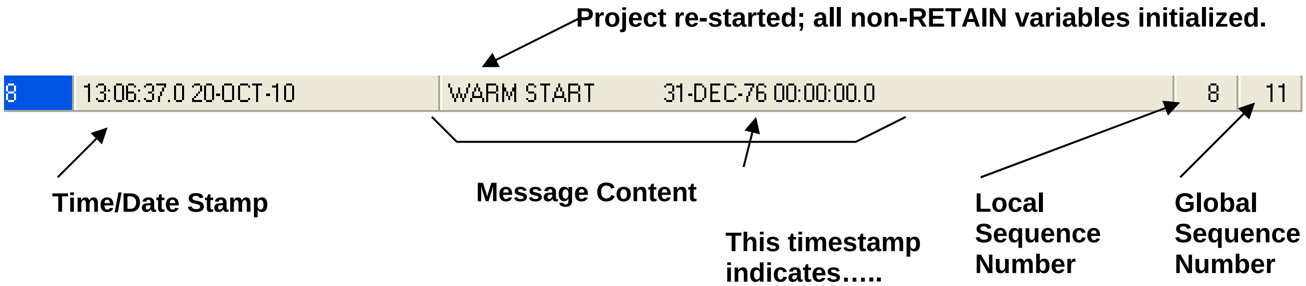
Global Sequence Number

WARM START Event

A warm start event starts the ControlWave project and sets all variables to their initial values except for those variables marked RETAIN. It follows the format:

WARM START *dd-mon-yy hh:mm:ss.t*

The example, below, shows a warm start event:



```
8    13:06:37.0 20-OCT-10    WARM START      31-DEC-76 00:00:00.0      8    11
```

Project re-started; all non-RETAIN variables initialized.

Time/Date Stamp

Message Content

This timestamp indicates…..

Local Sequence Number

Global Sequence Number

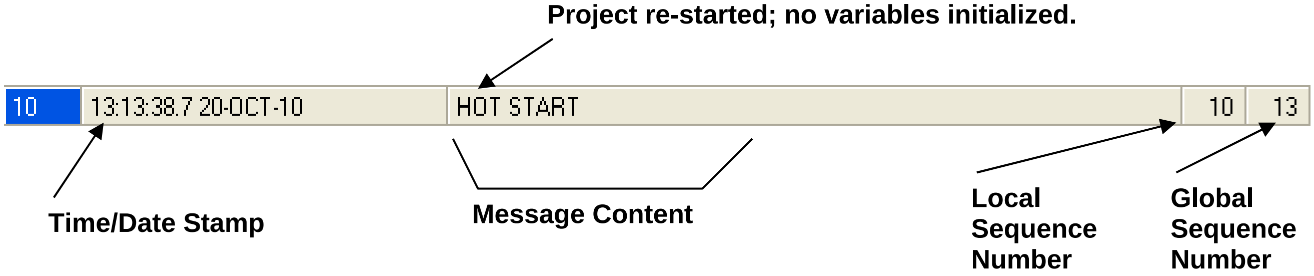
where: *dd-mon-yy hh:mm:ss.t* reflects the date/time stamp at which????

HOT START Event

A hot start event starts the ControlWave project without initializing any variables. It follows the format:

HOT START

The example, below, shows a hot start event.



```
10    13:13:38.7 20-OCT-10    HOT START                                10    13
```

Project re-started; no variables initialized.

Time/Date Stamp

Message Content

Local Sequence Number

Global Sequence Number

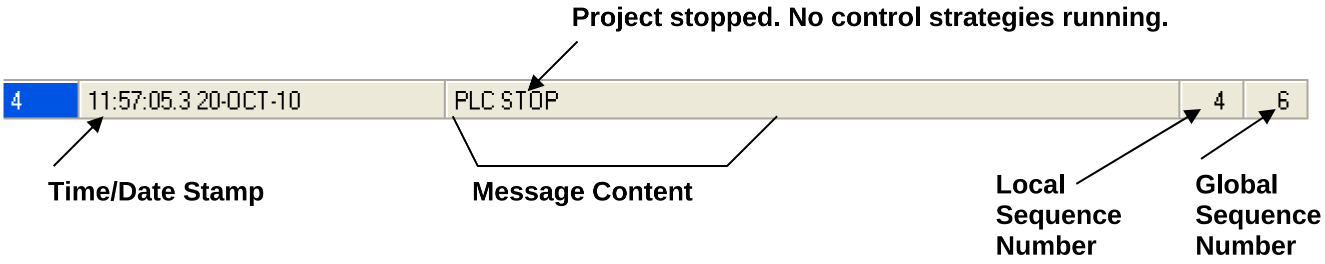
PLC STOP Event

A PLC STOP event means the ControlWave project is stopped. No control strategies are executing.

It follows the format:

PLC STOP

The example, below, shows a PLC STOP event.



```
4    11:57:05.3 20-OCT-10    PLC STOP    4    6
```

Security Events

Security events refer to login or logout activity at ports or from a keypad. The various security events follow these formats; items in brackets “[ ]”only apply when *type* is RDB.

LOGIN Event

When a user logs into the ControlWave, it generates a login event. Login events follow the format:

username **LOGIN** *type* **Port**:*port_num* [**Mex:** *mex_num*] [**Glad:** *adr*]

where:

username is the name of the user logging in. In the example, below, the user is “SYSTEM.”

type is the type of connection used to log in. This could be:

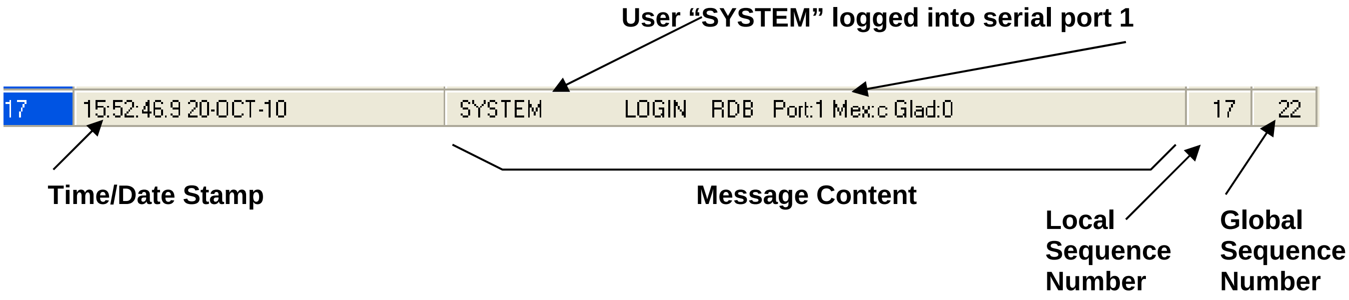
RDB	Remote Database Access (OpenBSI)
FTP	File Transfer Protocol
BTCP	Bristol TCP Protocol (IP)
DISPLAY KEYBOARD	The display/keypad
CWD	ControlWave Designer

port_num is the serial port number of the ControlWave port used to log in, or the IP address of the ControlWave IP port.

mex_num is the message exchange number in hexadecimal format. This only applies for RDB type connections.

adr is the global address in hexadecimal format. This only applies for RDB type connections.

An example of a LOGIN event is:



```
17   15:52:46.9 20-OCT-10   SYSTEM     LOGIN   RDB   Port:1 Mex:c Glad:0   17   22
```

LOGOUT Event

When a user logs off from the ControlWave, it generates a logout event. Logout events follow the format:

username **LOGOUT** *type* **Port**:*port_num*

where:

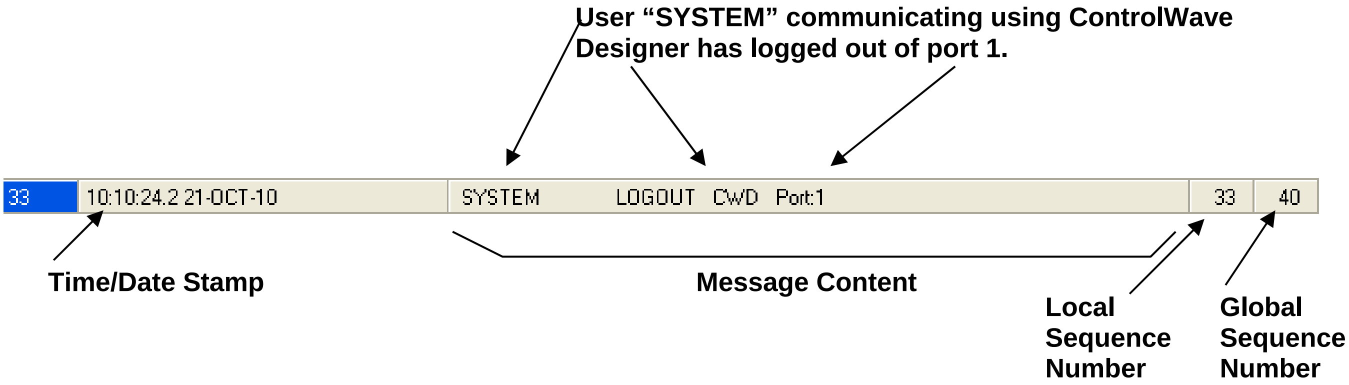
username is the name of the user logging out. In the example, below, the user is "SYSTEM."

type is the type of connection originally used to log in. This could be:

RDB	Remote Database Access (OpenBSI)
FTP	File Transfer Protocol
BTCP	Bristol TCP Protocol (IP)
DISPLAY KEYBOARD	The display/keypad
CWD	ControlWave Designer

port_num is the number of the ControlWave serial port originally used to log in, or the IP address of the ControlWave IP port used to log in.

An example of a LOGOUT event is:



```
33   10:10:24.2 21-OCT-10   SYSTEM      LOGOUT  CWD  Port:1   33   40
```

User "SYSTEM" communicating using ControlWave Designer has logged out of port 1.
Time/Date Stamp
Message Content
Local Sequence Number
Global Sequence Number

TIMEOUT Event

After a pre-determined period of inactivity the ControlWave logs out a user and generates a timeout event.

Note: Inactivity timeout events only occur if you specify an activity timeout using the system variable _SEC_SIGNOFF_TMO in your ControlWave project.

Timeout events follow this format:

username **TIMEOUT** *type* **Port**:*port_num* [**Mex:** *mex_num*] [**Glad:** *adr*]

where:

username is the name of the user whose access timed out. In the example, below, the user is "SYSTEM."

type is the type of connection used to log in. This could be:

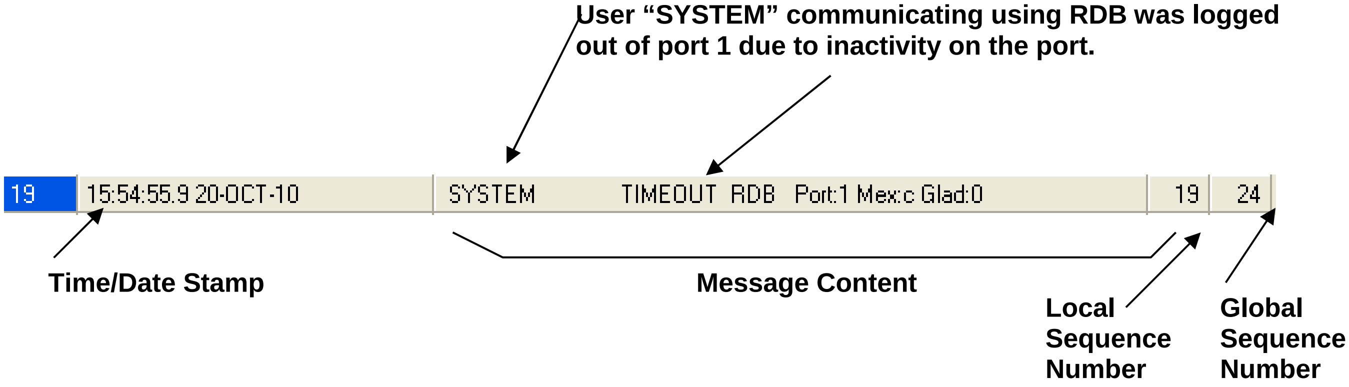
RDB	Remote Database Access (OpenBSI)
FTP	File Transfer Protocol
BTCP	Bristol TCP Protocol (IP)
DISPLAY KEYBOARD	The display/keypad
CWD	ControlWave Designer

port_num is the number of the ControlWave serial port the user originally logged into or the IP address of the ControlWave IP port used to log in.

mex_num is the message exchange number in hexadecimal format. This only applies for RDB type connections.

adr is the global address in hexadecimal format. This only applies for RDB type connections.

An example of a timeout event is shown below:



User "SYSTEM" communicating using RDB was logged out of port 1 due to inactivity on the port.

```
19  15:54:55.9 20-OCT-10  SYSTEM      TIMEOUT  RDB   Port:1 Mex:c Glad:0   19   24
```

FORCEOUT Event

When a user logs onto the ControlWave, and then **another** user logs on, it forces a log out of the first user, generating a forceout event.

Note: Forceout events are only logged if you set the system variable _SEC_SIGNIN_AUD_FTP_ENA to TRUE in your ControlWave project.

FORCEOUT events follow the format:

username **FORCEOUT** *type* **Port**:*port_num* [**Mex:** *mex_num*] [**Glad:** *adr*]

where:

username is the name of the user logging out.

type is the type of connection originally used to log in. This could be:

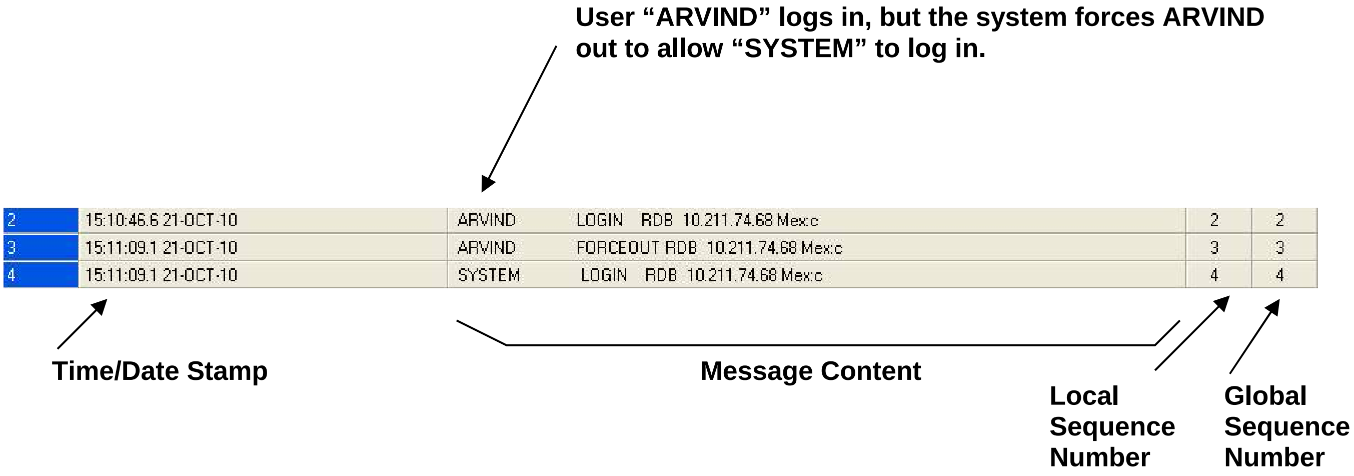
RDB	Remote Database Access (OpenBSI)
FTP	File Transfer Protocol
BTCP	Bristol TCP Protocol (IP)
DISPLAY KEYBOARD	The display/keypad
CWD	ControlWave Designer

port_num is the number of the ControlWave serial port originally used to log in, or the IP address of the ControlWave IP port used to log in.

mex_num is the message exchange number in hexadecimal format. This only applies for RDB type connections.

adr is the global address in hexadecimal format. This only applies for RDB type connections.

An example of a FORCEOUT event is shown below. The user ARVIND is forced out to allow the user SYSTEM to log in.

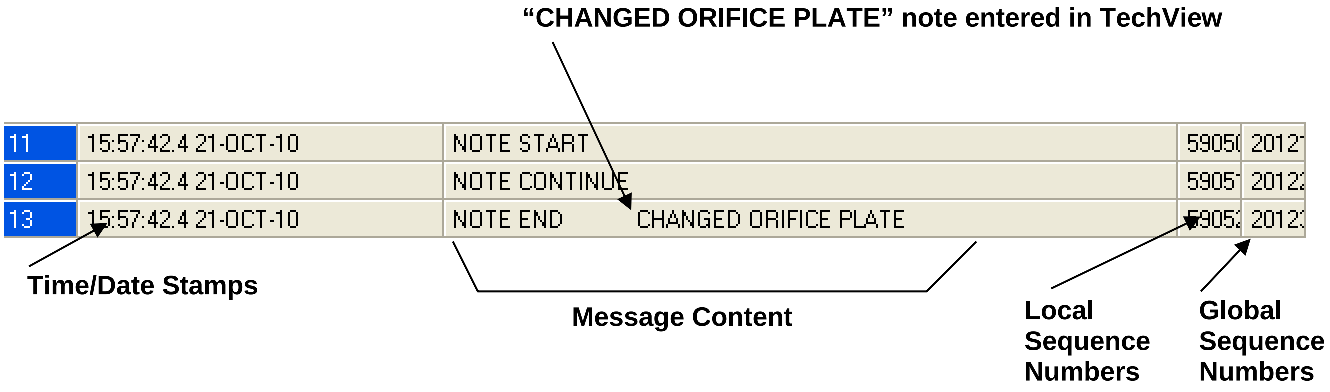


User "ARVIND" logs in, but the system forces ARVIND out to allow "SYSTEM" to log in.

```
2   15:10:46.6 21-OCT-10   ARVIND    LOGIN    RDB  10.211.74.68 Mex:c   2   2
3   15:11:09.1 21-OCT-10   ARVIND    FORCEOUT RDB  10.211.74.68 Mex:c   3   3
4   15:11:09.1 21-OCT-10   SYSTEM    LOGIN    RDB  10.211.74.68 Mex:c   4   4
```

User Notes

You can enter a note in TechView to log some particular action you take **(**click **Operations** > **Write Audit Notes).** Entering the note "CHANGED ORIFICE PLATE" results in the following audit message content:



"CHANGED ORIFICE PLATE" note entered in TechView

```
11   15:57:42.4 21-OCT-10   NOTE START                             59050  20121
12   15:57:42.4 21-OCT-10   NOTE CONTINUE                          59051  20122
13   15:57:42.4 21-OCT-10   NOTE END      CHANGED ORIFICE PLATE    59052  20123
```

.

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Addendum to D5081, D5087: Starting Web Pages or Programs using LocalView (*.LVG) Files

This addendum applies to the following manuals:

D5081 – *OpenBSI Utilities Manual*
D5087 – *Web_BSI Manual*

If desired, you can associate programs (or web pages) with particular controllers, and then start them automatically when establishing communications via LocalView.

Alternatively you can generate icons on the Windows™ desktop to activate the web page or program for a particular controller.

These capabilities are useful, for example, if an operator frequently needs to call up a particular web page or program, for a particular controller, they can do it simply by starting a particular LocalView (*.LVG) file, *or* by clicking on a pre-configured icon on the Windows™ desktop which activates the LVG file.

Associating a Web Page with a Particular Controller:

Note: If this is the first time you are communicating with a particular controller using web pages from this PC, you must use the Locator web page *first* to identify the controller (see *"Locating Nodes"*, below). Otherwise, you can skip to *"Specifying the Web Page Path and Filename"*.

Locating Nodes

You use the Locator page to identify which controller(s) you would like to communicate with, from this PC. The controllers can be identified either by loading proxy files, or by loading OpenBSI information. In either case, they will be displayed as icons in a tree on the left side of the page.

Note: You will need to run the Node Locator page the *first time* you use web pages with a particular controller, from this PC. After that, you should not need to use it again, unless you are communicating with a different node, using a different PC, or if your network configuration has changed.

You can start WebBSI by clicking as follows:

Start > Programs > OpenBSI Tools > Web Page Access > Standard Pages

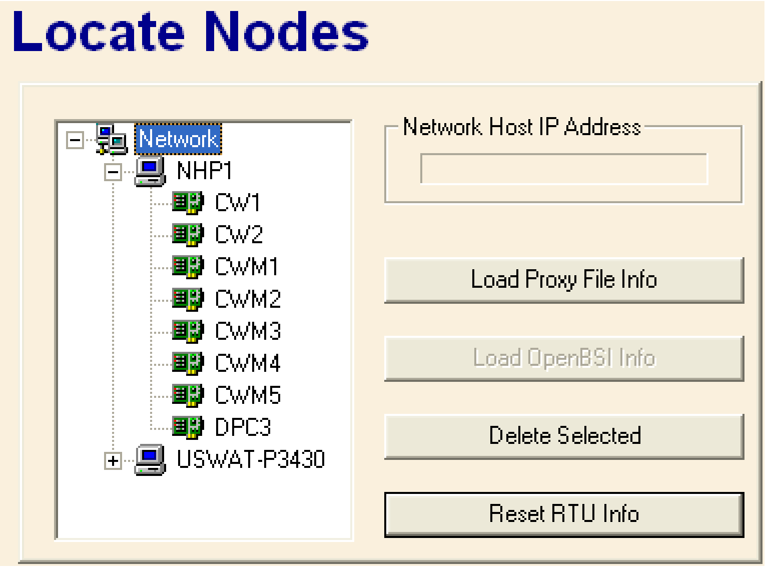


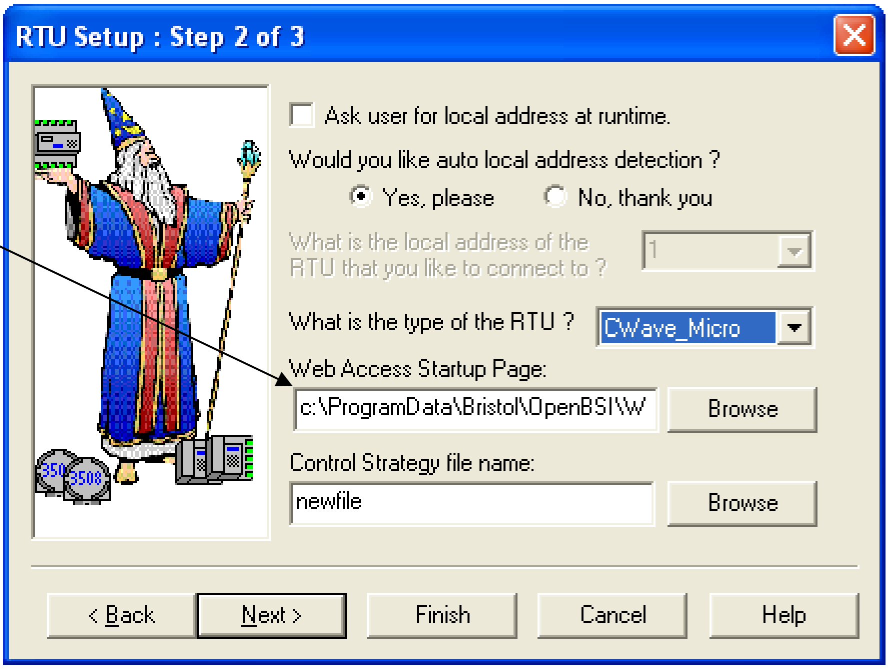
Figure 1. – Locate Nodes

The Node Locator Page is accessible by clicking on the "Security" category button (along the left-hand side of the first WebBSI page), and choosing the "Locate Nodes" drop-down menu selection.

Field	Description
Network Host Address	Displays the primary IP address of the Network Host PC (NHP). Click on the icon for the Network Host PC in the tree at left, if the address is not visible.
Load Proxy File Info	Loads proxy import files (.PXY). These files identify those controllers (RTUs) to which this PC should have access. **Note**: Proxy files are created through the "Proxy Export" feature in NetView. See *"Creating and Exporting A Proxy File"* in *Chapter 6* of the *OpenBSI Utilities Manual* (document# D5081).
Load OpenBSI Info	Loads information about accessible controllers from the OpenBSI NETDEF database. **Note**: This button is inaccessible if a proxy file has already been loaded.
Delete Selected	Deletes the currently selected RTU from the tree, thereby eliminating access to that RTU from this PC.
Reset RTU Info	Deletes the entire tree. This allows you to re-define the accessible RTUs, either by loading a proxy file, or loading OpenBSI information.

Specifying the Web Page Path and Filename

Specify the web page you want to associate with this controller.



RTU Setup : Step 2 of 3

□ Ask user for local address at runtime.

Would you like auto local address detection ?

● Yes, please ○ No, thank you

What is the local address of the RTU that you like to connect to ? 1

What is the type of the RTU ? CWave_Micro

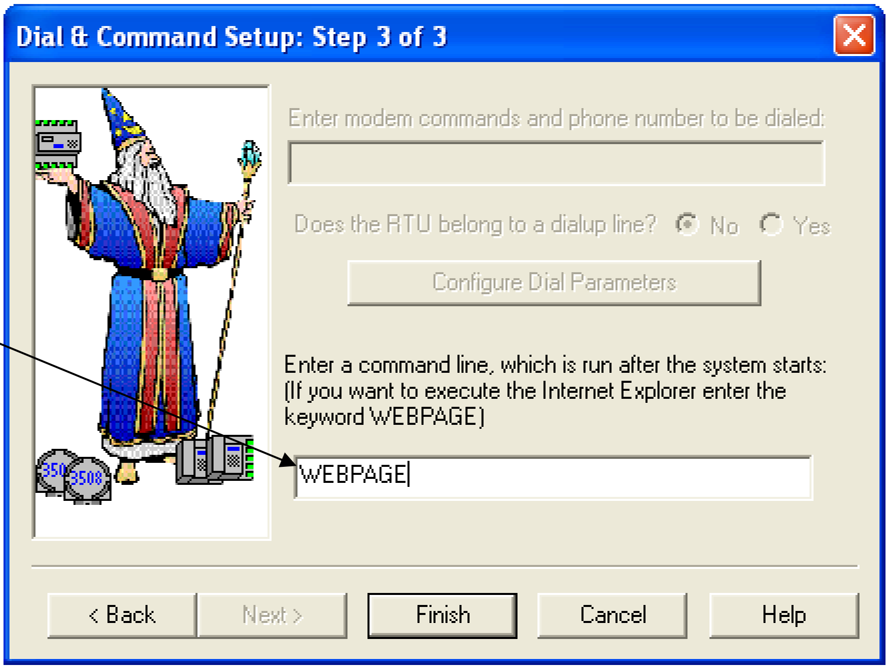
Web Access Startup Page: c:\ProgramData\Bristol\OpenBSI\W

Control Strategy file name: newfile

Figure 2. – Associating a Web Page with the Controller

To associate a web page with a particular controller start LocalView, open a new LVG file, and configure communications, as usual, but specify the path and filename of the web page in the **"Web Access Startup Page"** field of LocalView's RTU Setup page. Then click **Next**.

On the next page in LocalView, specify “WebPage” for the command line entry, then click **Finish** to initiate communications.



Dial & Command Setup: Step 3 of 3

Enter modem commands and phone number to be dialed:

Does the RTU belong to a dialup line? ● No ○ Yes

Enter a command line, which is run after the system starts:
(If you want to execute the Internet Explorer enter the keyword WEBPAGE)

WEBPAGE

Keyword for starting Internet Explorer.

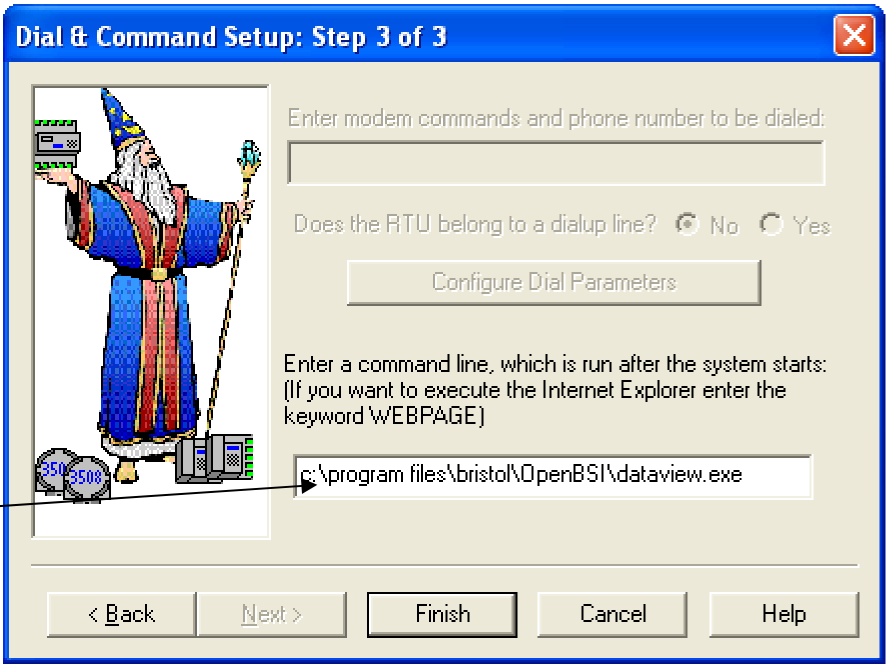
Figure 3. Web Page Command Line Keyword

Once communications are established, LocalView calls up Microsoft® Internet Explorer® and displays the specified web page.

If desired, you can generate a shortcut icon for calling up this web page with this controller in the future. See *Creating a Shortcut Icon for an LVG File* later in this addendum.

Associating a Program with a Particular Controller:

To associate a program with a particular controller start LocalView, open a new LVG file, and configure communications, as usual, but on the Dial and Command Setup page, specify the path and filename of the program (executable) you want to associate with this controller.



Specify the path and file name of the program you want to associate with this controller. This causes LocalView to start that program once it establishes communications with the controller.

Dial & Command Setup: Step 3 of 3
Enter modem commands and phone number to be dialed:
Does the RTU belong to a dialup line?
No
Yes
Configure Dial Parameters
< Back
Next >
Finish
Cancel
Help

Enter a command line, which is run after the system starts:
(If you want to execute the Internet Explorer enter the keyword WEBPAGE)

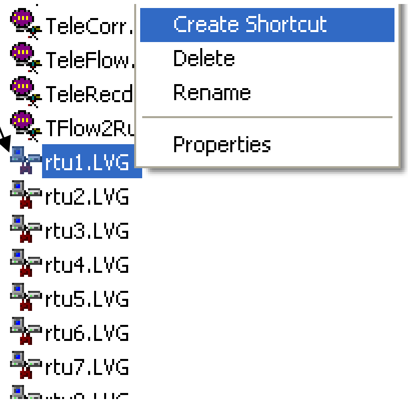
c:\program files\bristol\OpenBSI\dataview.exe

Figure 4. Associating a Program with the Controller

Once communications are established, LocalView starts the specified program.

If desired, you can generate a shortcut icon for calling up this program with this controller in the future. See *"Creating a Shortcut Icon for an LVG File"* later in this addendum.

Creating a Shortcut Icon for an LVG File



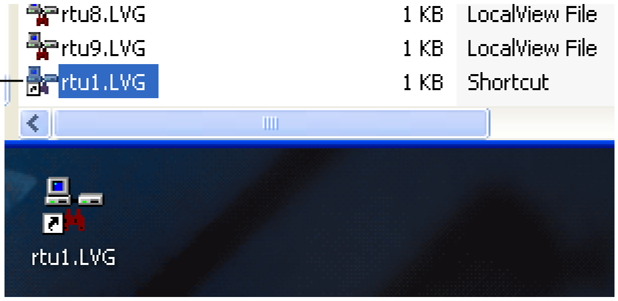
Right click on the LVG file you want to create a shortcut for, and choose "Create Shortcut" from the pop-up menu.

Figure 5. Creating a Shortcut

Once you have created an LVG file in LocalView that contains an association between a particular controller, and a particular web page, or program, locate that file (usually they will be in your ACCOL directory). The name of the LVG file will be whatever name you assigned to it when you started up LocalView.

Now, right click on the LVG filename, and choose **"Create Shortcut"** from the drop-down menu.

Finally, drag the shortcut onto your desktop. You can rename it, if desired.



rtu8.LVG	1 KB	LocalView File
rtu9.LVG	1 KB	LocalView File
rtu1.LVG	1 KB	Shortcut

Drag the icon onto your desktop

Figure 6. Dragging the Shortcut onto Your Desktop

Now, simply double-clicking on this icon will start LocalView communications with the specified controller, *and* start the specified program or web page.

Index

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