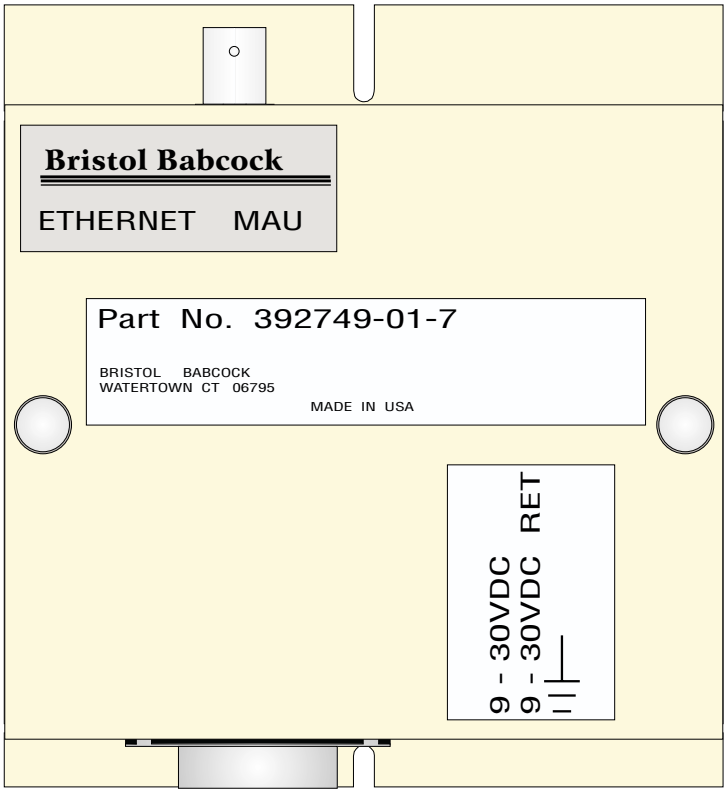
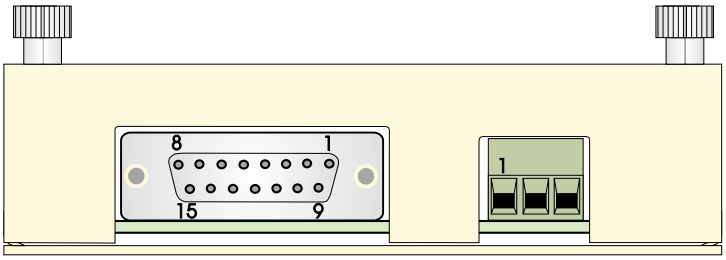
Product Information Package

No. PIP-ENET-MAU

Issue: 07/00

BRISTOL BABCOCK
ETHERNET MEDIA ACCESS UNIT
(MAU)





Bristol Babcock

NOTICE

Copyright Notice

The information in this document is subject to change without notice. Every effort has been made to supply complete and accurate information. However, Bristol Babcock assumes no responsibility for any errors that may appear in this document.

Request for Additional Instructions

Additional copies of instruction manuals may be ordered from the address below per attention of the Sales Order Processing Department. List the instruction book numbers or give complete model number, serial or software version number. Furnish a return address that includes the name of the person who will receive the material. Billing for extra copies will be according to current pricing schedules.

Trademarks or copyrighted products mentioned in this document are for information only, and belong to their respective companies, or trademark holders.

IMPORTANT! READ INSTRUCTIONS BEFORE STARTING!

Be sure that these instructions are carefully read and understood before any operation is attempted. Improper use of this device in some applications may result in damage or injury. The user is urged to keep this book filed in a convenient location for future reference.

These instructions may not cover all details or variations in equipment or cover every possible situation to be met in connection with installation, operation or maintenance. Should problems arise that are not covered sufficiently in the text, the purchaser is advised to contact Bristol Babcock for further information.

EQUIPMENT APPLICATION WARNING

The customer should note that a failure of this instrument or system, for whatever reason, may leave an operating process without protection. Depending upon the application, this could result in possible damage to property or injury to persons. It is suggested that the purchaser 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. If additional information is required, the purchaser is advised to contact Bristol Babcock.

RETURNED EQUIPMENT WARNING

When returning any equipment to Bristol Babcock for repairs or evaluation, please note the following: The party sending such materials is responsible to ensure that the materials returned to Bristol Babcock are clean to safe levels, as such levels are defined and/or determined by applicable federal, state and/or local law regulations or codes. Such party agrees to indemnify Bristol Babcock and save Bristol Babcock harmless from any liability or damage which Bristol Babcock may incur or suffer due to such party's failure to so act.

ELECTRICAL GROUNDING

Metal enclosures and exposed metal parts of electrical instruments must be grounded in accordance with OSHA rules and regulations pertaining to "Design Safety Standards for Electrical Systems," 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code).

The grounding requirement is also applicable to mechanical or pneumatic instruments that include electrically-operated devices such as lights, switches, relays, alarms, or chart drives.

EQUIPMENT DAMAGE FROM ELECTROSTATIC DISCHARGE VOLTAGE

This product contains sensitive electronic components that can be damaged by exposure to an electrostatic discharge (ESD) voltage. Depending on the magnitude and duration of the ESD, this can result in erratic operation or complete failure of the equipment. Read supplemental document S14006 at the back of this manual for proper care and handling of ESD-sensitive components.

Bristol Babcock 1100 Buckingham Street, Watertown, CT 06795
Telephone (860) 945-2200

WARRANTY

A. Bristol warrants that goods described herein and manufactured by Bristol are free from defects in material and workmanship for one year from the date of shipment unless otherwise agreed to by Bristol in writing.

B. Bristol warrants that goods repaired by it pursuant to the warranty are free from defects in material and workmanship for a period to the end of the original warranty or ninety (90) days from the date of delivery of repaired goods, whichever is longer.

C. Warranties on goods sold by, but not manufactured by Bristol are expressly limited to the terms of the warranties given by the manufacturer of such goods.

D. All warranties are terminated in the event that the goods or systems or any part thereof are (i) misused, abused or otherwise damaged, (ii) repaired, altered or modified without Bristol's consent, (iii) not installed, maintained and operated in strict compliance with instructions furnished by Bristol, or (iv) worn, injured or damaged from abnormal or abusive use in service time.

E. THESE WARRANTIES ARE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED (INCLUDING WITHOUT LIMITATION WARRANTIES AS TO MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), AND NO WARRANTIES, EXPRESS OR IMPLIED, NOR ANY REPRESENTATIONS, PROMISES, OR STATEMENTS HAVE BEEN MADE BY BRISTOL UNLESS ENDORSED HEREIN IN WRITING. FURTHER, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF.

F. No agent of Bristol is authorized to assume any liability for it or to make any written or oral warranties beyond those set forth herein.

REMEDIES

A. Buyer's sole remedy for breach of any warranty is limited exclusively to repair or replacement without cost to Buyer of any goods or parts found by Seller to be defective if Buyer notifies Bristol in writing of the alleged defect within ten (10) days of discovery of the alleged defect and within the warranty period stated above, and if the Buyer returns such goods to Bristol's Watertown office, unless Bristol's Watertown office designates a different location, transportation prepaid, within thirty (30) days of the sending of such notification and which upon examination by Bristol proves to be defective in material and workmanship. Bristol is not responsible for any costs of removal, dismantling or reinstallation of allegedly defective or defective goods. If a Buyer does not wish to ship the product back to Bristol, the Buyer can arrange to have a Bristol service person come to the site. The Service person's transportation time and expenses will be for the account of the Buyer. However, labor for warranty work during normal working hours is not chargeable.

B. Under no circumstances will Bristol be liable for incidental or consequential damages resulting from breach of any agreement relating to items included in this quotation from use of the information herein or from the purchase or use by Buyer, its employees or other parties of goods sold under said agreement.

How to return material for Repair or Exchange

Before a product can be returned to Bristol Babcock for repair, upgrade, exchange, or to verify proper operation, form (GBU 13.01) must be completed in order to obtain a RA (Return Authorization) number and thus ensure an optimal lead time. Completing the form is very important since the information permits the Bristol Babcock Repair Dept. to effectively and efficiently process the repair order.

You can easily obtain a RA number by:

A. FAX

Completing the form (GBU 13.01) and faxing it to (860) 945-3875. A BBI Repair Dept. representative will return call (or other requested method) with a RA number.

B. E-MAIL

Accessing the form (GBU 13.01) via the Bristol Babcock Web site (www.bristolbabcock.com) and sending it via E-Mail to brepair@bristolbabcock.com. A BBI Repair Dept. representative will return E-Mail (or other requested method) with a RA number.

C. Mail

Mail the form (GBU 13.01) to

Bristol Babcock Inc.
Repair Dept.
1100 Buckingham Street
Watertown, CT 06795

A BBI Repair Dept. representative will return call (or other requested method) with a RA number.

D. Phone

Calling the BBI Repair Department at (860) 945-2442. A BBI Repair Department representative will record a RA number on the form and complete Part I, then send the form to the Customer via fax (or other requested method) for Customer completion of Parts II & III.

A copy of the completed Repair Authorization Form with issued RA number should be included with the product being returned. This will allow us to quickly track, repair, and return your product to you.

Bristol Babcock Inc. Repair Authorization Form

(Providing this information will permit BBI to effectively and efficiently process your return. Completion is required to receive optimal lead time. Lack of information may result in increased lead times.)

Date_____ **RA #**_____**SH**_ **Line No.**_____

Standard Repair Practice is as follows: Variations to this is practice may be requested in the "Special Requests" section.

- Evaluate / Test / Verify Discrepancy
- Repair / Replace / etc. in accordance with this form
- Return to Customer

Please be aware of the Non warranty standard charge:

- There is a $100 minimum evaluation charge, which is applied to the repair if applicable (√ in "returned" B,C, or D of part III below)

Part I Please complete the following information for single unit or multiple unit returns

Address No. _____ **(office use only)** **Address No.** _____ **(office use only)**

Bill to :_____ **Ship to:**_____

_____ _____

_____ _____

Purchase Order:_____ **Contact Name:**_____

Phone: _____ **Fax:**_____**E-Mail:** _____

Part II Please complete Parts II & III for each unit returned

Model No./Part No._____ **Description** _____

Range/Calibration _____ **S/N** _____

Reason for return : ☐ Failure ☐ Upgrade ☐ Verify Operation ☐ Other _____

1. Describe the conditions of the failure (Frequency/Intermittent, Physical Damage, Environmental Conditions, Communication, CPU watchdog, etc.)

_____

_____

_____

_____(Attach a separate sheet if necessary)

2. Comm. interface used: ☐ Standalone ☐ RS-485 ☐ Ethernet ☐ Modem (PLM (2W or 4W) or SNW) ☐Other:_____

3. What is the **Firmware** revision? _____ What is the **Software** &version? _____

Part III If checking "replaced" for any question below, check an alternate option if replacement is not available

A. If product is within the warranty time period but is excluded due to BBI's warranty clause, would you like the product: ☐ repaired ☐ returned ☐ replaced ☐ scrapped?

B. If product were found to exceed the warranty period, would you like the product: ☐repaired ☐ returned ☐ replaced ☐ scrapped?

C. If product is deemed not repairable would you like your product: ☐ returned ☐ replaced ☐ scrapped?

D. If BBI is unable to verify the discrepancy, would you like the product: ☐ returned ☐ replaced ☐ *see below?

* Continue investigating by contacting the customer to learn more about the problem experienced? The person to contact that has the most knowledge of the problem is: _____ phone_____

If we are unable to contact this person the backup person is: _____ phone_____

Special Requests: _____

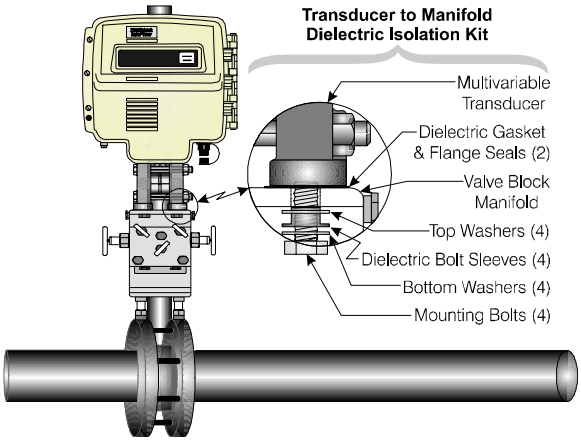
_____

Ship prepaid to: Bristol Babcock Inc., Repair Dept., 1100 Buckingham Street, Watertown, CT 06795
Phone: 860-945-2442 Fax: 860-945-3875

Bristol Babcock
Training

GET THE MOST FROM YOUR BRISTOL BABCOCK INSTRUMENT OR SYSTEM

- Avoid Delays and problems in getting your system on-line
- Minimize installation, start-up and maintenance costs.
- Make the most effective use of our hardware and software.
- Know your system.



As you know, a well-trained staff is essential to your operation. Bristol Babcock offers a full schedule of classes conducted by full-time, professional instructors. Classes are offered throughout the year at four locations: Houston, Birmingham, Orlando and our Watertown, CT headquarters. By participating in our training, your personnel can learn how to install, calibrate, configure, program and maintain any and all Bristol Babcock products and realize the full potential of your system.

For information or to enroll in any class, contact our training department in Watertown at (860) 945-2269. For Houston classes, you can also contact our Houston office, at (713) 685-6200.

A Few Words About Bristol Babcock

For over 100 years, Bristol® has been providing innovative solutions for the measurement and control industry. Our product lines range from simple analog chart recorders, to sophisticated digital remote process controllers and flow computers, all the way to turnkey SCADA systems. Over the years, we have become a leading supplier to the electronic gas measurement, water purification, and wastewater treatment industries.

On off-shore oil platforms, on natural gas pipelines, and maybe even at your local water company, there are Bristol Babcock instruments, controllers, and systems running year-in and year-out to provide accurate and timely data to our customers.

Getting Additional Information

In addition to the information contained in this manual, you may receive additional assistance in using this product from the following sources:

Contacting Bristol Babcock Directly

Bristol Babcock's world headquarters are located at 1100 Buckingham Street, Watertown, Connecticut 06795, U.S.A.

Our main phone numbers are:

(860) 945-2200
(860) 945-2213 (FAX)

Regular office hours are Monday through Friday, 8:00AM to 4:30PM Eastern Time, excluding holidays and scheduled factory shutdowns. During other hours, callers may leave messages using Bristol's voice mail system.

Telephone Support - Technical Questions

During regular business hours, Bristol Babcock's Application Support Group can provide telephone support for your technical questions.

For technical questions about TeleFlow™ products call (860) 945-8604.

For technical questions about **Control**Wave call (860) 945-2244 or (860) 945-2286.

For technical questions regarding Bristol's **OpenEnterprise** product, call (860) 945-2501 or e-mail: **openenterprise@bristolbabcock.com**

For technical questions regarding **ACCOL** products, **Open BSI Utilities**, as well as Bristol's **Enterprise Server®/Enterprise Workstation®** products, call (860) 945-2286.

For technical questions about **Network 3000** hardware, call (860) 945-2502.

You can e-mail the Application Support Group at: **bsupport@bristolbabcock.com**

The Application Support Group also maintains a service area within our main web site. Technical information, as well as software updates are available in this area. To access our web site, go to: bristolbabcock.com/services/techsupport/

For assistance in interfacing Bristol Babcock hardware to radios, contact Communication Technologies in Orlando, FL at (407) 629-9463 or (407) 629-9464.

Telephone Support - Non-Technical Questions, Product Orders, etc.

Questions of a non-technical nature (product orders, literature requests, price and delivery information, etc.) should be directed to the nearest sales office (listed below) or to your Bristol-authorized sales representative.

Major U.S. Sales Offices

Watertown, CT (860) 945-2262
Birmingham, AL (205) 980-2010
Ontario, CA (909) 923-8488
Farmington, NM (505) 327-3271
Houston, TX (713) 685-6200
Richardson, TX (972) 238-8935

Major International Sales Offices:

Bristol Babcock Ltd (UK): (441) 562-820-001
Bristol of Canada: (416) 675-3820
Bristol Babcock Asia Pacific 61 8-9455-9955
BBI, S.A. de C.V. (Mexico) (525) 254-2131

Please call the main Bristol Babcock number (860-945-2200) if you are unsure which office covers your particular area.

Visit our Site on the World Wide Web

For general information about Bristol Babcock and its products, please visit our site on the World Wide Web at: **www.bristolbabcock.com**

PIP-ENET-MAU
BRISTOL BABCOCK
ETHERNET MEDIA ACCESS UNIT
(MAU)

TABLE OF CONTENTS

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REFERENCE DOCUMENTS

(Note: These documents are not provided in this manual)

BBI ETHERNET MEDIA ACCESS UNIT (MAU)

GENERAL INTRODUCTION

The BBI Ethernet Media Access Unit (MAU) is an enclosed stand-alone device that interfaces BBI DPC 3330/3335 products (equipped with an Ethernet CPU Assembly) to IEEE 802.3 10BASE2 compatible networks.

The Media Access Unit (MAU) PCB is housed in a self contained box measuring 4.250" (wide) by 4.625" (high). Two notches are provided on the unit's base to accommodate mounting to a panel or plate.

An external 9-30 Vdc Power Supply is required to power the MAU.

10BASE2 Ethernet, Network & Interface Requirements

By definition, an Ethernet 10BASE2 LAN runs at 10Mbits and can be a maximum length of 185 meters (607 feet) per segment. Network connection and interface requirements are provided as follows:

- Maximum network length is 925 meters (3000 feet)
- Interface to the network is accommodated by J1; an RG-58 A/U type BNC connector
- Minimum distance between T-connectors is 0.5 meters (1.6 feet)
- Maximum number of connectors per segment is 30
- First and last device on each segment must be terminated on one side of their T-connector with a 50 Ohm resistor
- T-connectors must be plugged directly into the MAU. No cable (stub) is allowed between the T-connector and J1 of the MAU

COMPONENT IDENTIFICATION

The major components of the MAU are the Base, Cover, AUI Port Connector (P1), 10BASE2 Interface Connector (J1), Power Connector (TB1), Fuse (F1) and the Loop-back Jumper (JP1).

Ethernet CPU Engine Attachment Unit Interface (AUI) Connector P1

P1 is a 15-pin male D-Type connector that provides an interface between an Ethernet CPU Attachment Unit Interface (AUI) Port and the MAU. Table 1 provides the assignment and definitions of the 15-pin AUI Port Connector P1.

Table 1 - MAU/AUI Connector P1

Pin #	Description	Pin #	Description	Pin #	Description
1	Collision Shield	6	Not Connected	11	Transmit Shield
2	Collision +	7	Not Connected	12	Receive ((DI) -
3	Transmit (DO) +	8	Shield	13	Not Connected
4	Receive Shield	9	Collision -	14	Not Connected
5	Receive (DI) +	10	Transmit (DO) -	15	Not Connected

An AUI/MAU transceiver cable can be a maximum length of 45 meters (150 feet). The use of a cable manufactured for industrial environments is recommended.

Figure 1 provides the dimensions of the BBI MAU. Figure 2 shows the BBI MAU with cover removed.

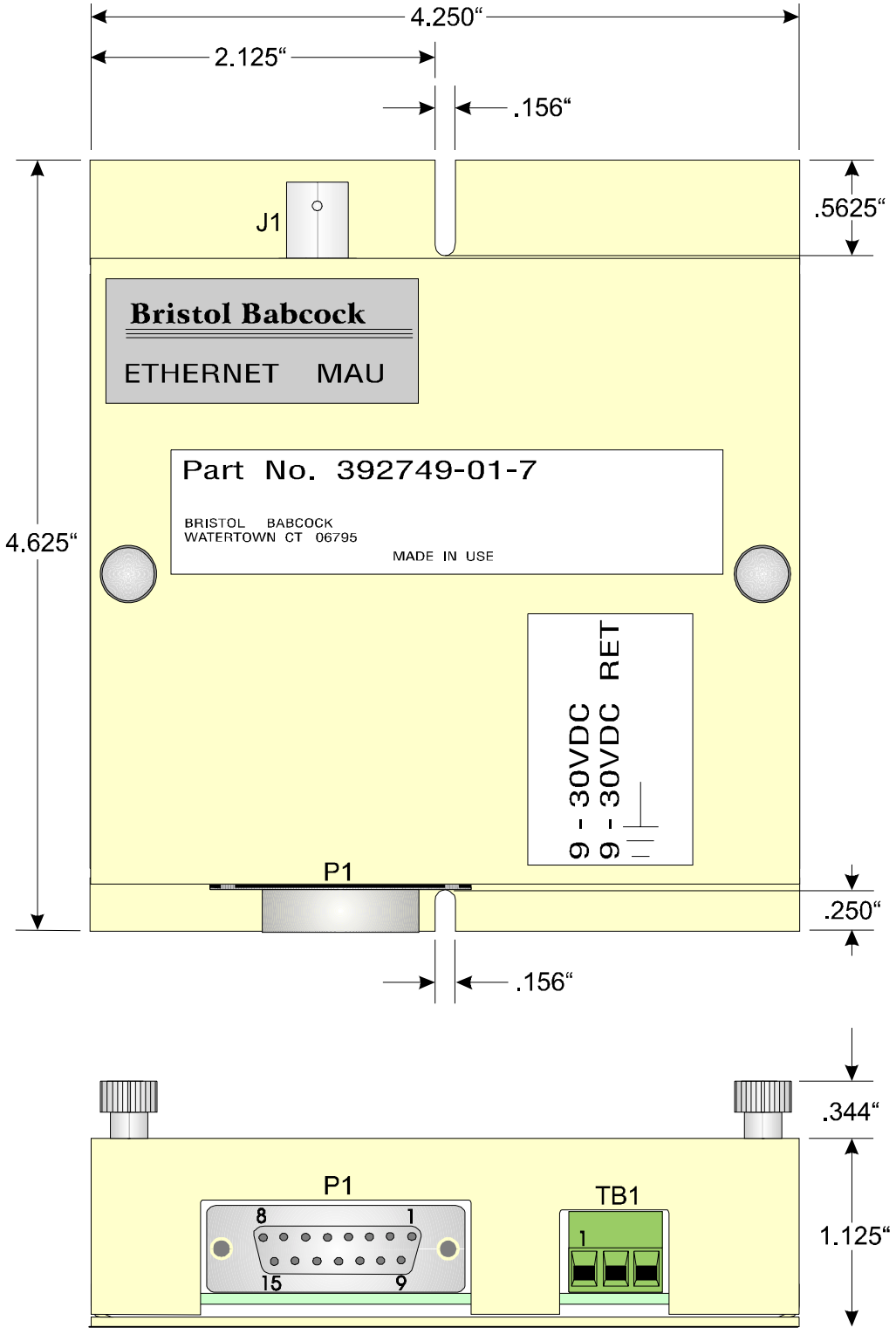

Figure 1 - BBI Media Access Unit Dimensions

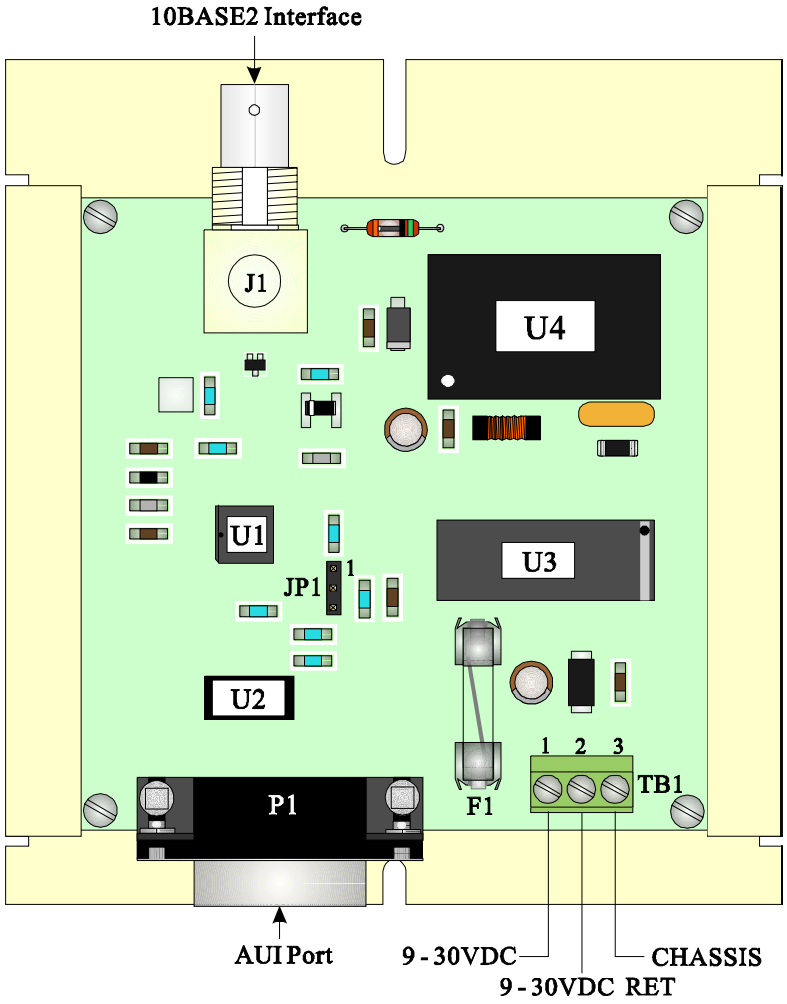

Figure 2 - BBI Media Access Unit (Cover Removed)

MAU/Ethernet 10BASE2 Interface Connector J1

Connection to the thin-wire (10BASE2) Ethernet is made via the MAU's BNC connector J1. Tee connectors must be plugged directly into the MAU. No cable (stub) is allowed between the Tee connector and J1 of the MAU. The first and last device on each segment must be terminated on one side of their Tee connector with a 50-ohm resistor. Figure 3 shows the MAU with a BNC T-connector installed on J1.

MAU Power Connector TB1

Connector TB1 provides an interface to an external power supply. Input power can range from 9 to 30 Vdc. TB1-1 is designated +VDC Input, TB1-2 is designated -VDC Input and TB1-3 is the Chassis Ground terminal. The external power supply must be capable of delivering a continuous 1.8 Watts of power, e.g. (200 mA Max. @ 9Vdc), (100 mA Max. @ 18Vdc), (75 mA Max. at +24Vdc) & (60mA Max. @ 30Vdc).

MAU Fuse F1

Fuse F1 is rated at 0.25 Amps (see Figure 2).

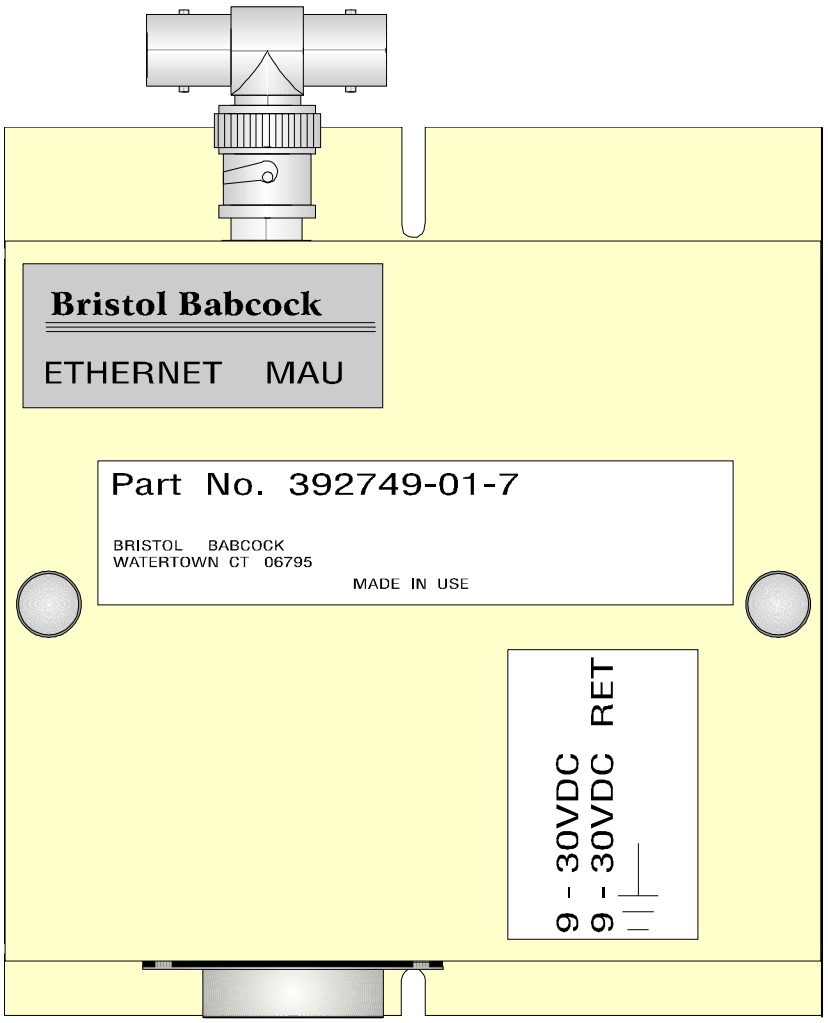

Figure 3 - MAU with BNC Tee Connector installed on 10BASE2 Intf. Connector J1

Jumper JP1

SQE test (Heartbeat) Jumper JP1 is provided to test the integrity of the MAU/AUI interface and the MAU circuitry. The MAU can generate a test signal on the Collision pair to indicate to the DTE that it has recognized the end of a transmission and that the Collision pair is operational. When JP1 is installed in position 1 to 2, the SQE test is disabled. The SQE test is enabled when JP1 is installed in position 2 to 3 (its normal position).

ETHERNET DIAGNOSTICS

Bristol Babcock Diagnostics are available (see 33XX Diagnostics Manual - D4041) to test the operation and integrity of the PCNET (Ethernet) Controller and Ethernet port hardware on the Ethernet CPU Board. An Ethernet Diagnostic Menu can be entered from either the Communication Diagnostic Menu or the Diagnostic Test Category Menu. The Loop-Back Out AUI Port Poke Point must be pressed to test the hardware associated with the AUI Port (including the MAU).

To configure the MAU for loop-back testing, the coaxial connections to the associated BNC T-connector must be disconnected and two (2) 250 Ohm BNC terminators must be installed

on the BNC T-connector. Once the MAU has been configured, the Loop-Back Out AUI Poke Point can be activated. If the Loop-Back Out AUI Poke Point is pressed while the MAU is attached to the Ethernet backbone, a Failure Status will be posted.

If either a "No Hardware Present" or "Error Information Returned" message is displayed, ensure that the loop-back test requirements have been properly established. If test requirements have been met and the cable associated with the AUI port and the Ethernet CPU assembly is known to be good, the MAU should be replaced with a good unit.

In the case of a "Loop-Back Send Failed," "Loop-Back Receive Failed" or Loop-Back Compare Failed" message, check the cable in question and the MAU. If the cable associated with the AUI port and the Ethernet CPU assembly is known to be good, the MAU should be replaced with a good unit.

SPECIFICATIONS

Environmental Specifications

Temperature:	Operating: 0°C to +70° C (+32°F to 158°F)
Relative Humidity:	10-95% RH Non-condensing
Vibration:	10-150 Hz @ 1g 150-2000 Hz @ 0.5g
RFI Susceptibility:	10 volts/meter 20 MHz to 500 MHz

Power Requirements

External Power Supply Range:	+9Vdc to +30Vdc
	The external power supply must be capable of delivering a continuous 1.8 Watts of power, e.g. (200 mA Max. @ 9Vdc), (100 mA Max. @ 18Vdc), (75 mA Max. at +24Vdc) & (60mA Max. @ 30Vdc).

Ethernet Media Access Unit (MAU) Assembly
Special Instructions for Class I, Division 2 Hazardous Locations

1. The BBI Ethernet Media Access Unit (MAU) is listed by Underwriters Laboratories (UL) as nonincendive and is suitable for use in Class I, Division 2, Groups A, B, C and D hazardous locations or non-hazardous locations only. Read this document carefully before installing a nonincendive BBI Ethernet Media Access Unit. In the event of a conflict between the Ethernet Media Access Unit User Manual (PIP-ENET-MAU) and this document, always follow the instructions in this document.

2. Wiring must be performed in accordance with Class I, Division 2 wiring methods as defined in Article 501-4 (b) of the National Electrical Code, NFPA 70 for installations within the United States, or as specified in Section 18-152 of the Canadian Electrical Code for installation in Canada.

3. **WARNING: EXPLOSION HAZARD - Substitution of components may impair suitability for use in Class I, Division 2 environments.**

4. **WARNING: EXPLOSION HAZARD - When situated in a hazardous location, turn off power before servicing/replacing the unit and before installing or removing I/O wiring.**

5. **WARNING: EXPLOSION HAZARD - Do Not disconnect equipment unless the power has been switched off or the area is known to be nonhazardous.**

READER RESPONSE FORM

Please help us make our documentation more useful to you! If you have a complaint, a suggestion, or a correction regarding this manual, please tell us by mailing this page with your comments. It's the only way we know we're doing our job by giving you correct, complete, and useful documentation.

DOCUMENT NUMBER: PIP-ENET-MAU

TITLE: *Bristol Babcock Ethernet Media Access Unit (MAU) Product Information Package*

ISSUE DATE: JULY, 2000

COMMENT/COMPLAINT:

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