PRiZM™

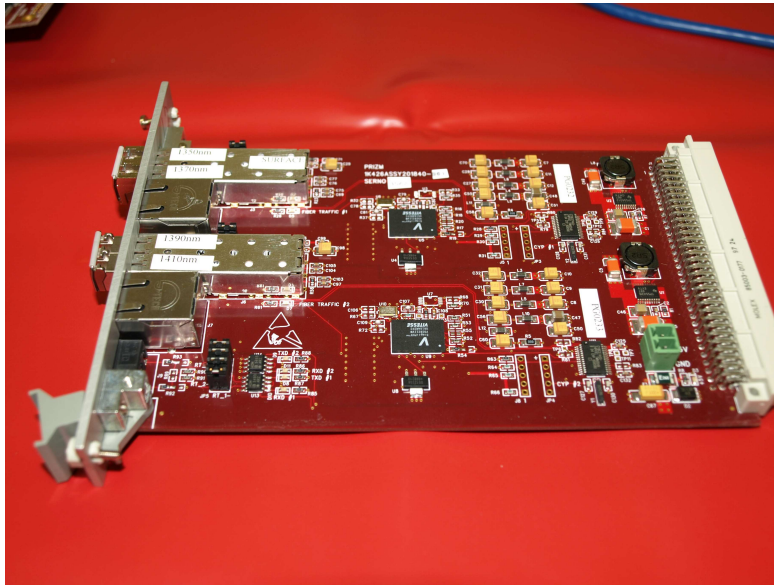# VME Dual Port Gigabit Ethernet Media Converter Board (P/N 201840-xxx) User's Manual And Troubleshooting Guide

February 24, 2009
Rev B

MANUAL REVISION HISTORY

REVISION NUMBER	DATE	BY	REASON FOR REVISION
A	8/7/08	GSG	ORIGINAL
B	2/24/09	IB	Updated contact information to reflect Moog Components Group

TABLE OF CONTENTS

1   VME Dual Port Gigabit Ethernet Board, P/N: 201840-xxx

The Prizm VME Dual Port Gigabit Ethernet Media Converter board provides a fiber optic link to remote two independent Gigabit Ethernet links over fiber optic cable. This board was designed to specifically to support a Gigabit Ethernet sonar – the Reson 7125 but the board can be used in any application requiring Gigabit Ethernet. An industry standard pluggable small-form-factor (SFP) Gigabit Ethernet (GBE) fiber optic module is employed to allow easy customization of the fiber optic link characteristics. Single mode fiber is typically used with this board and optical links can easily exceed 10 kilometers. Multimode fiber can also be supported but with drastically reduced optical link distance – typically less than 1 kilometer depending on the fiber specifics.

This board has to be linked with another Gigabit Ethernet board to complete the Ethernet connection.

NOTE: The Gigabit Ethernet board will only work with Gigabit Ethernet devices. This board will not support 10 or 100 Mbps Ethernet.

The Gigabit Ethernet board will operate as either a subsea or surface interface board, so it can be used as a spare for either location. The optical modules used on the board are inherently bi-directional and care must be taken to ensure the correct optical port (either TX or RX) is connected, depending on the board configuration and system location. While the optical module's receiver will operate on all of the 16 CWDM (coarse wave division multiplexing) wavelengths (1270 to 1610nm), the module's transmitter only emits at a single wavelength so care must be taken to ensure the correct wavelength is used.

For non-CWDM applications, Prizm can supply the board with SFP's that contain an internal bi-direction WDM (wave division multiplexers) for single-fiber operation.

1.1   VME Dual Port Gigabit Ethernet Board Revision History:

The Gigabit Ethernet board has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design..

1.2   VME Dual Port Gigabit Ethernet Board Dash (-) Number Definitions

The Gigabit Ethernet board has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001A original configuration.

1.3   VME Dual Port Gigabit Ethernet Board Operation:

The Gigabit Ethernet board has three main electrical connectors: two Ethernet RJ-45 connectors and the DIN backplane connector for DC power. The board also has a single 2-pin Phoenix DC power connector if the board is used without a VME rack and backplane.

The RJ-45 connectors (J4 and J7) are located at the left side of the board and are standard 8-pin Ethernet connectors with an integrated transformers. The RJ-45 connectors each have a pair of integrated Ethernet status LEDs.

There is single DIN backplane connector (J1) mounted on the tight side of the board for acquiring +5VDC power. Also a green 2-pin Phoenix connector (J2) is located on the on the lower right side of the board for supplying the board with DC operating power if the backplane is not used. Pin 1 (upper pin of the J2 connector and labeled "+5V") is the +5VDC input and pin 2 (the bottom pin and labeled "GND") is the ground.

The SFP optical modules (J3 and J6) are located on the left side of the board.

NOTE: On power-up of the board, both LEDs within RJ-45 connectors J4 and J7 will briefly flash ON then OFF to indicate that the GBE chips (U5 and J9) are starting. Even if the two boards are optically connected, neither LED on RJ-45 connectors J4 and J7 will light until a valid GBE signal is present at BOTH ends of the fiber optic link. Once valid GBE signals are seen at both ends of the link then the LEDs on J4 and J7 will activate.

1.3.1   Gigabit Ethernet Board Indicators and Controls:

LEDS:
There are 3 through-hole right angle LED indicators on the top of the board. There are no LEDs on the bottom of the board.

Top of Board

LED	Indication
D3 (Green)	Located at the lower right of the board, labeled "+5V", serves as an indicator that +5VDC power is available to the board.
D5 (Green)	Located on the upper left of the board, labeled "FIBER TRAFFIC #1". LED blinks ON briefly when power is applied to the board, otherwise it is not lit.
D7 (Green)	Located on the left center of the board, labeled "FIBER TRAFFIC #2". LED blinks ON briefly when power is applied to the board, otherwise it is not lit.
D9 (Green)	Located on the lower left of the board, labeled 'TXD #2', provides an indication that the Cypress microprocessor has responded to a data request from the PMON2 computer. This LED is ON for the duration of the transmitted data.
D11 (Green)	Located on the lower left of the board, labeled 'RXD #2', provides an indication that the Cypress microprocessor has received a data request from the PMON2 computer. This LED is

LED	Indication
	ON for the duration of the received data.
D8 (Green)	Located on the lower left of the board, labeled 'TXD #1', provides an indication that the Cypress microprocessor has responded to a data request from the PMON2 computer. This LED is ON for the duration of the transmitted data.
D10 (Green)	Located on the lower left of the board, labeled 'RXD #1', provides an indication that the Cypress microprocessor has received a data request from the PMON2 computer. This LED is ON for the duration of the received data.

Bottom of Board

LED	Indication
D1 (Green)	Located at the upper front edge of the board, labeled "+3.3V", serves as an indicator that +3.3V DC is being generated by the on-board DC-DC power supply. Supply voltage 5V must be present for this LED to be active.
D4 (Green)	Located on the upper front edge of the board, labeled "FIBER #1", provides an indication that the transceiver module has detected the presence of an input signal on the fiber link. When 'ON' indicates that this board has a good level of received optical power from the remote unit A. NOTE: THIS LED WILL BE ON WHETHER ETHERNET DATA IS PRESENT OR NOT.
D6 (Green)	Located on the upper front edge of the board, labeled "FIBER #2", provides an indication that the transceiver module has detected the presence of an input signal on the fiber link. When 'ON' indicates that this board has a good level of received optical power from the remote unit B. NOTE: THIS LED WILL BE ON WHETHER ETHERNET DATA IS PRESENT OR NOT.

FUSES:
There is one fuse for this board. All fuses are the self-resetting PTC type and should
quire replacement by the user.

F1:   1.1 Amp PTC, DC input fuse at J2

SWITCHES:
There are no switches on this board.

TRIMPOTS:
There are no trimpots on this board.

CONNECTORS:
There are a total of 9 connectors on the board.

J1:   96-pin DIN backplane connector

J2:   2-pin Phoenix connector for DC power entry

J2	DC Power 2-pin Phoenix Connector
o 1	+5VDC Input
o 2	Ground

J3:   SFP optical module for Link #1

J4:   RJ-45 GBE Ethernet connector for Link #1

J4	Gigabit Ethernet RJ-45 Connector	Left	o	o	o	o	o	o	o	o	Right
		Pin #	8	7	6	5	4	3	2	1	

Pin #	1000Mbps
1	A+
2	A-
3	B+
4	C+
5	C-
6	B+
7	D+
8	D-

J5:   5-pin header for U5 programming – do not use

J6:   SFP optical module for Link #2

J7:   RJ-45 GBE Ethernet connector for Link #2

J6	Gigabit Ethernet RJ-45 Connector	Left	o	o	o	o	o	o	o	o	Right
		Pin #	8	7	6	5	4	3	2	1	

Pin #	1000Mbps
1	A+
2	A-
3	B+
4	C+
5	C-
6	B+
7	D+
8	D-

J8:   5-pin header for U9 programming – do not use

J9:   3-pin Phoenix connector for RS-485 PMON2 Diagnostics

J9	3-pin Phoenix Connector for Diagnostics
o 1	RT+

o	2	Ground
o	3	RT-

JUMPER POSTS:
There are 4 jumper posts on this board.

JP1   1 o==o 2   enables SFP Laser transmitter for J3

JP2   1 o==o 2   enables SFP Laser transmitter for J6

JP3   Cypress programming header for U12 – do not use

JP4   Cypress programming header for U11 – do not use

1.3.2   VME Dual Port Gigabit Ethernet Board Specifications:
Number of Ethernet links: 2 per board
Data rates supported: Gigabit Ethernet only

1.3.3   Gigabit Ethernet board Dimensions:
Printed circuit board (PCB): 3.937 inches x 6.299 inches
                                         (100mm x 160 mm)

1.3.4   Gigabit Ethernet board Power Requirements:
The Gigabit Ethernet board utilizes approximately 2.5 Watts of power.
*   5.0VDC input, approximately 500mA

1.3.5   Power Section Testing

NOTE: The connectors and components on the bottom of the Gigabit Ethernet board have pins that are connected to internal supply voltages and ground. If these pins are inadvertently shorted together or to a common chassis ground, the board fuse (F1) will trip/reset.

If both the "+5V" LED and the "+3.3V" LED is out:
*   Check for continuity of PTC fuse F1 with an ohmmeter.
*   Replace PTC fuse if open.

If only the "+3.3V" LED is out:
*   Verify +5VDC voltage is present at the source
*   Replace the board with a spare, nothing repairable.

1.3.6   Optical Section Testing

1.3.7   Ethernet Testing

If the Ethernet link is out or has errors:

- As this board will only work with Gigabit Ethernet traffic, verify that the devices at both ends of the link are indeed Gigabit Ethernet devices.
- Verify that the Ethernet devices at both ends of the link are powered up.
- Verify that both of the dual LEDS at J4 and J7 are lit to confirm Ethernet activity at the RJ-45 connector.
- Attempt to PING from one device to the other.
- If the channel is still not operating correctly, first check the field wiring. If the wiring appears correct, then first replace the subsea Gigabit Ethernet board with a spare and check the link again. If the problem is still there, replace the surface Gigabit Ethernet board, with a spare and check the link again.