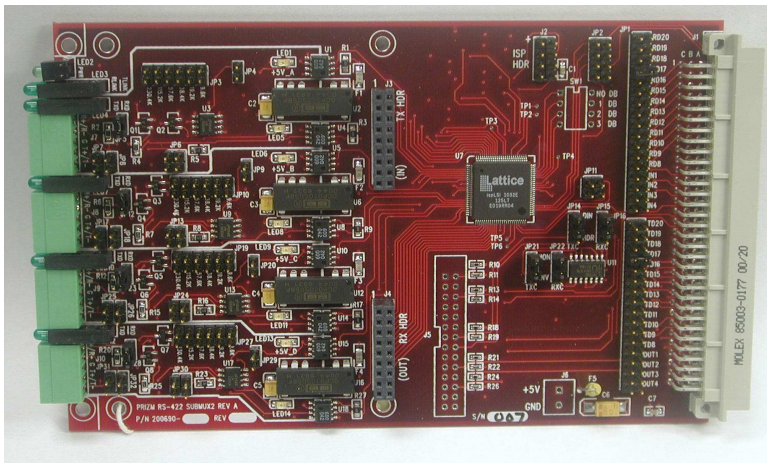
PRIZM™

RS-422/485 Submux2 Motherboard (P/N 200690-xxx) and Daughtercards (4 ch. RS-232 P/N 970391-xxx, 4ch. RS-485 / 2 ch. RS422 P/N 980430-xxx, and Trigger Interface P/N 200700-XXX)

User's Manual

And

Troubleshooting Guide



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Rev. D

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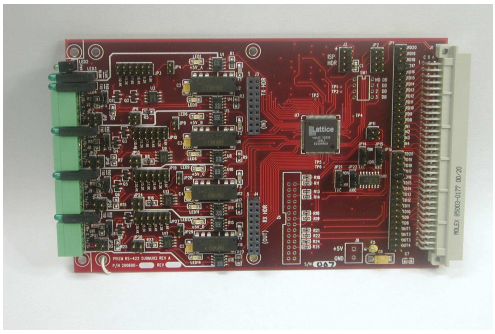
1 RS-422/485 Submux2 Motherboard, Part Number 200690-xxx.



The Prizm RS-422 / 485 Sub-multiplexer (Submux2) motherboard provides four RS-422 or RS-485 channels that are multiplexed onto a single Prizm high-speed serial data channel. Motherboard channel selection of RS-422 or RS-485 can be simply done by selecting a few jumpers and can be accomplished on a channel-by-channel basis for mixed data applications. With the addition of up to three additional pluggable daughter boards, a total of 16 independent serial channels can be carried on a single Submux2. The combinations of types of channels (RS-232, RS-422, and/or RS-485) will vary depending on the type and configuration of daughtercards. Multiple Submuxs can be used on a system depending on configuration of other channels within the system.

Each RS-232, RS-422 or RS-485 data channel is electrically isolated and independently powered. Each RS-232 or RS-485 channel can support up to 115.4 Kilobaud while each RS-422 channel can support at least 250 Kilobaud

Note: The Submux2 motherboard is NOT compatible with the earlier Submux1 motherboard however all of the earlier daughterboards ARE compatible with the Submux 2 motherboard. The Submux2 motherboard should be replaced as set.

1.1 RS-422/485 Submux2 Revision History:

The Submux2 motherboard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design

PCB Revision A/Assembly Revision B Incorporates following ECO:

ECN 201205C	–	Add fail safe resistors to RS-485 circuit.
ECN 200690-01	-	Change fuse from FU0005 to FU0014
ECN 200690-02	-	Add glitch filter to RS-485 circuit

1.2 RS-422/485 Submux2 Dash (-) Number Definitions

The Submux2 motherboard has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001 original configuration.

1.3 Manual Revision History:

The manual has gone through the following revisions:

Revision A		Original
Revision B	1/12/01	Incorporated DC Power measurements
Revision B2	1/26/01	Minor corrections
Revision C	4/19/01	Added in Trigger Interface
Revision D	2/24/09	Updated contact information to reflect Moog Components Group

1.4 RS-422/485 Submux Motherboard Operation:

On VIDEO 3 systems, the Submux2 motherboard is connected to the PRIZM fiber optic modem via the backplane. On older VIDEO1 and VIDEO 2 systems, the Submux2 is connected to the Prizm fiber optic multiplexer either directly through the backplane or optionally it may be connected via ribbon cable to a Video board. On the systems that utilize the ribbon cable, if the Submux2 is connected to Video Board #1 in the surface unit, it's companion Submux2 board set must be connected to Video Board #1 in the sub-sea unit.

There are four green 5-pin Phoenix MicroCombicon connectors on the on the front of the Submux2 motherboard; the top pin is for transmitted data (TXD), the bottom pin for received data (RXD) and the middle pin for signal ground (GND).

1.4.1 RS-422/485 Submux2 Front Panel Indicators:

There is a single green LED indicator (LED2) at the top of the board to indicate +5VDC power status. LED2 will be lit if +5VDC is available.

The status of the high-speed data channel linking the surface Submux2 to the vehicle Submux2 motherboard is indicated by a dual green LED indicator (LED4) which is the second row of LEDs from the top of the board. The left (or bottom) LED indicates the receive link status (RLINK) from the Prizm multiplexer. If this LED is lit, the Submux2 board is receiving both RX clock and RX data from the multiplexer. The right (or top) LED indicates the transmit link status (TLINK) to the Prizm multiplexer. If this LED is lit, the Submux2 board is receiving the TX clock and is generating TX data. Both LEDs on LED4 MUST be lit before sub-multiplexed data will travel through the Prizm multiplexer to the other Submux2 board (and vice versa).

Once both LEDs on LED4 are lit, the individual RS-422/485/232 data channels are active. The dual green LEDs (LED4, 7, 10, and 12) will flash to indicate transmit and receive data traffic on a per channel basis. For each of the channels, the left (or bottom) LED indicates activity on the TXD set of pins and the right (or top) LED indicates activity on the RXD set of pins.

Note: Sometimes the flashing may be to fast to see and the LED may appear to be on all the time.

Note: Since the data channels are electrically isolated from each other and from the Prizm multiplexer DC ground, testing of the channels with an oscilloscope or meter requires that the appropriate channel ground wire be attached to the test equipment's ground.

1.4.2 RS-422/485 Submux2 Motherboard Specifications:

Number of data Channels:	4 on Motherboard (RS-422 or RS-485), up to 16 channels total with 3 daughtercards in place
Data type supported:	RS-232, RS-422, and RS-485
Data rates supported:	RS-232 - up to 115 Kbaud RS-485 - up to 230 Kbaud RS-422 - above 250 Kbaud
Per channel sample rate:	3.125 Msps(typical) for each of the 16 channels.

1.4.3 RS-422/485 Submux2 Dimensions:

VME 3-U format - 100 mm wide x 160 mm long x 20 mm thick (3.937 x 6.299 x 0.80 in)

VME 3-U PCB and faceplate in rack: 20 mm wide x 128 mm high (0.8 in x 5.05 in)

1.4.4 RS-422/485 Submux2 Power Requirements:

+5 Volts at 0.53 Amps (2.65 Watts)

1.5 Submux2 Motherboard Troubleshooting

In normal operation the following front panel mounted LED status should be observed:

+5VDC power LED (LED2) – Lit green on front panel
LINK LED (dual LED3) on front panel
left RLINK LED - Lit green if receiving link from Modem
right TLINK LED - Lit green transmitting link to Modem
RS-422/485 Data Activity LEDs (dual LED on each channel, LED4, 7, 10,12):
-- TXD LED - Left (or bottom) LED lit green if data going out of channel
-- RXD LED - Right (or top) LED lit green if data going into channel

In normal operation the following surface mounted LED status should be observed:

Channel 1 Isolated +5VDC power LED (LED1) – Lit green
Channel 1 RS-485 Activity LED (LED5) – Lit green to enable receiving RS-485 data (default condition)

Channel 2 Isolated +5VDC power LED (LED6) – Lit green
Channel 2 RS-485 Activity LED (LED8) – Lit green to enable receiving RS-485 data (default condition)

Channel 3 Isolated +5VDC power LED (LED9) – Lit green
Channel 3 RS-485 Activity LED (LED11) – Lit green to enable receiving RS-485 data (default condition)

Channel 4 Isolated +5VDC power LED (LED13) – Lit green
Channel 4 RS-485 Activity LED (LED14) – Lit green to enable receiving RS-485 data (default condition)

1.5.1 Submux2 Motherboard Board Level Testing

If DC power LED is out:

- Make sure +5VDC is available at the backplane connector.
- If using external +5VDC at J6, check 2Amp fuse (F1) with ohmmeter, replace with another PICO fuse if blown otherwise this fuse is not in circuit

If + 5VDC is measured at connector and DC Power LED is not lit green:

- Check LED circuit

If +5VDC is not found:

- Test for power at the backplane and power supply (See Power Supply and Backplane sections of the manual).
- Replace board

If the TLINK LED (right (or top) LED) is out:

- If +5VDC power is available, TLINK LED should be always lit. LED will be off for a fraction of a second after board is plugged in.
- Replace board

If the RLINK LED (left (or bottom) LED) is out:

- Check that local Modem board is plugged in
- Check that Submux2 board at other end of link is plugged in.
- Check that the multiplexer on the remote end is operating by checking the Modem's DATA and FIBER LEDs.
- Run the Submux2 data loop back test described below, checking each channel and its LEDs
- If still not operational, replace with spare board

If the RLINK and all the RXD/TXD LEDs are flickering:

- Check for high link error rate which will cause the Modem's DATA LED to flicker and cause the Modem's ERR LED to flicker or light solid

If high data link errors are noted:
- Check the fiber optic cable and all connections
- Replace the Modem with a spare

If either RXD/TXD link LEDs are out:
- Check isolated +5VDC on that channel by checking if the appropriate surface mounted LED is lit green (LED1, 6, 8, or 13).
- If RXD LED does not light, check surface mount fuse (F1, F2, F3, or F4) for that channel with an ohmmeter, replace fuse if blown
- Check that Submux2 board at other end of link is plugged in
- Run Submux2 data loop back test (see Submux2 data loopback test in Submux2 section of manual), checking each channel and its LEDs
- If still not operational, replace with spare board

If one or more data channels are out:
- Run the Submux2 data loop back test described below, checking each channel and its LEDs
- If RXD LED does not light, check surface mount fuse (F1, F2, F3, or F4) for that channel with an ohmmeter, replace fuse if blown
- Change the RS-422/485 driver chip channel on the channel that is out, using procedure described below in section 1.4.3
- Replace board with spare.

If no spare is available:
- Move data connector to a spare working channel, if available

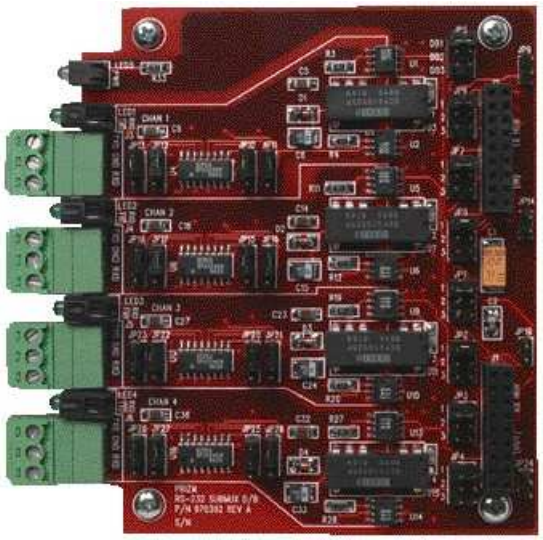
1.5.2 Submux2 Motherboard Data Loop-Back Test

With a Submux2 in both the vehicle (ROV) and surface units, run RS-422 data into pins 1 (+) and 2 (-) of the connector of the channel being tested. The RS-422 data can be input into either the ROV or surface Submux2. On the other end of the link, short pins 1 and 4 (the positive signals) and pins 2 and 5 (the negative signals) of the Submux2 channel being tested. This will allow the two Submux2 boards to talk to each other in loopback. Both RX and TX LEDs on both boards should be lit and/or flickering. If any of the LEDs are not operating, check one of the other channels. If the LEDs operate on that channel, replace Submux2 with a spare board or use the working channels only.

1.5.3 Test Data Channels

If an appropriate serial data test generator is available (or a PC with Communications software, or even a square wave generator) the individual channels can be tested on a channel-by-channel basis. This test can be done for all channels on the motherboard and all daughterboards. The user must be sure that the test signal levels are compatible with the interface/channel being tested.

2 4-Channel RS-232 Daughterboard, Part Number 970391-xxx



The Prizm 4-channel RS-232 Daughter board supports 4 independent, optically isolated RS-232 serial data channels, when plugged onto a Submux motherboard. Up to a total of 3 daughter boards may be stacked on one motherboard. The maximum data rate that this board supports is 115Kbaud. This board can be intermixed with the 4-channel RS-485/ 2 channel RS-422 Daughter board.

2.1 4-Channel RS-232 Daughterboard Revision History

The RS-232 Submux daughterboard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design

2.2 4-Channel RS-232 Daughterboard Dash (-) Numbers

The RS-232 Submux daughterboard has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001 original configuration.

2.3 4-Channel RS-232 Daughter board Operation:

Each RS-232 channel circuit has it's own 5VDC DC-DC converter and opto-couplers. The RS-232 channels are always active. Any data rate, up to the maximum of 115 Kbaud, is transparently passed through to the other end of the link, therefore there is no baud rate setting to deal with.

The RS-232 driver chip used on each of the four channels of this board has two independent channels per chip. As each individual RS-232 channel needs only one of these drivers, if a driver is blown out, the user can change the jumpers to bypass a failed driver. (See Troubleshooting Section 2.4 for details)

The selection of the daughterboard identity is handled by jumper posts JP1 though JP8. A single jumper shunt should be placed on each of the jumper posts to select daughterboard #1 with "DB1", daughterboard #2 with "DB2" or daughterboard #3 with "DB3".

There are 4 green three pin Phoenix connectors on the on the front of the board. One pin for transmit, one pin for ground, and one pin for receive.

Note: Each daughterboard set (one surface and one sub-sea) should have a different board identity (i.e. DB1, DB2 or DB3) or damage to the daughterboards or motherboard may result.

2.3.1 4-Channel RS-232 Daughterboard Indicators:

There is a single green LED indicator (LED5) at the top of the board to indicate +5VDC power status; LED5 will be lit if +5VDC is available on the daughterboard. The dual green LEDs (LED1, 2, 3 and 4) will flash to indicate transmit and receive data traffic on a per channel basis. The left LED (or bottom if board is laid flat) indicates transmitted RS-232 data (out of the board) from the other Submux board through the Prizm multiplexer. The right LED (or top if board is laid flat) indicates received RS-232 (into the board from the local RS-232 device) that will be transferred to the other Submux board.

2.3.2 4-Channel RS-232 Daughterboard Specifications:

Number of data Channels:	4 per daughterboard
Data type supported:	RS-232
Data rates supported:	RS-232 - up to 115 Kbaud
Per channel sample rate:	3.125 Msps typically for each of the channels, determined by motherboard

2.3.3 4-Channel RS-232 Daughterboard Dimensions:

Custom format - 100 mm wide x 86 mm long x 13 mm thick
(3.937 in x 3.40 in x 0.50 in)

VME 3-U PCB and faceplate in rack: None

2.3.4 4-Channel RS-232 Daughterboard Power Requirements:

Power requirements are covered under Submux motherboard Power Requirements.

2.4 RS-232 Submux Daughtercard Troubleshooting

(MUST BE USED WITH SUBMUX MOTHERBOARD)

In normal operation the following LED status should be observed:

DC power LED (LED5) – Lit green
RS-232 Data Activity LEDs (dual LED on each channel, LED1 thru LED4):
-- TXD LED - Left LED lit green if data going out of channel
-- RXD LED - Right LED lit green if data going into channel

2.4.1 RS-232 Submux Daughtercard Board Level Testing

If DC power LED is out:

- Make sure 5VDC is available at the backplane connector.
- Check 2Amp fuse (F1) with ohmmeter, replace with another PICO fuse if blown.

If + 5VDC is measured at connector and DC Power LED is not lit green:

- Check LED and transistor circuit

If +5VDC is not found:

- Test for power at the backplane and power supply (See Power Supply and Backplane sections of the manual).

Note: Power must be checked for both the motherboard and daughterboard.

If either RXD/TXD link LEDs are out:

- Check daughterboards on each end of the link to verify that the same board number (1, 2 or 3) positions have been selected at JP1 - JP8.
- If RXD LED does not light, check surface mount fuse (F1, F2, F3, or F4) on top of board for that channel with an ohmmeter, replace fuse if blown
- Check that Submux board at other end of link is plugged in
- Run Submux data loop back test (see Submux data loopback test in Submux section of manual), checking each channel and its LEDs
- If still not operational, replace with spare board

If one or more data channels are out:

- Run the Submux data loop back test described below, checking each channel and its LEDs.
- If RXD LED does not light, check surface mount fuse (F2, F3, F4, or F5) for that channel with an ohmmeter, replace fuse if blown
- Change the RS-232 driver chip on the channel that is out, using procedure described in Submux section of manual

- Replace board with spare

If no spare is available:
- Move data connector to a spare working channel, if available

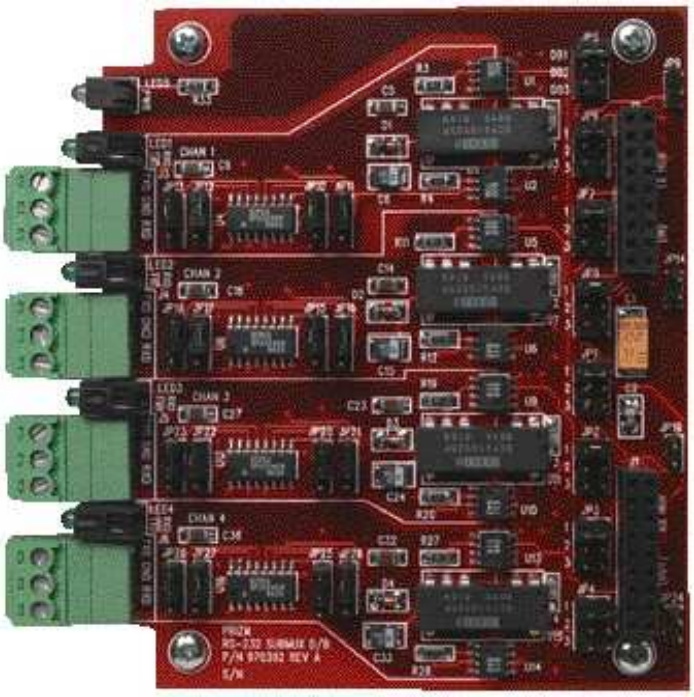
2.4.2 RS-232 Daughterboard Data Loop-back Test

With a Submux or Submux and RS232 daughterboard in both the ROV and surface units, run RS-232 data into pins 1 and 3 of the connector of the channel being tested. The RS-232 data can be input into either the ROV or surface Submux. On the other end of the link, short pins 1 and 3 of the Submux channel being tested. This will allow the two Submux boards to talk to each other in loopback. Both RX and TX LEDs on both boards should be lit and/or flickering. If any of the LEDs are not operating check one of the other channels. If the LEDs operate on that channel, replace Submux with a spare board or use the working channels only.

2.4.3 RS-232 Driver Chip Channel Selection

The RS-232 driver chip used on each of the four channels of this board has two independent drivers per chip. As each individual RS-232 channel needs only one of these drivers, the four 3-position jumpers allow for the selection of one of the two drivers. If a driver is blown out, the user can change the jumpers to bypass the failed driver. For example, on channel 1 of the Submux motherboard JP29, JP30, JP31, JP32 control the selection of the driver. (See Submux motherboard jumper configuration for details.) Call Moog Components Group for technical assistance if you have any questions about this procedure.

3 4-Channel RS-485 / 2-Channel RS-422 Daughterboard, Part Number 980430-xxx



The Prizm 4-channel RS-485 Daughterboard supports 4 independent half-duplex (Two way communication, but only one way at a time) RS-485 serial data channels or 2 full-duplex RS-422 channels when plugged onto a Submux motherboard. Up to a total of 3 daughterboards may be stacked on one motherboard. This board can be intermixed with the 4-channel RS-232 Daughterboard or even used to convert RS-232 to RS-485 in blocks of 4 channels. The 4-channel RS-485 Daughterboard has four independent optically isolated serial channels. The maximum data rate that this board supports for RS-485 is 115 Kbaud. Each RS-422 channel can support up to 230 kilobaud.

For simplicity this board will be referred to as the "4-Channel RS-485 Board" in subsequent paragraphs.

3.1 4-Channel RS-485 Daughterboard Revision History:

The RS-485 Submux daughterboard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design.

PCB Revision A/Assembly Revision B Updated Several resistors to support 115.2 Kbaud RS-485 applications. Fully compatible with prior revision.

3.2 4-Channel RS-485 Daughterboard Dash (-) Number Definitions:

The RS-485 Submux daughterboard has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001 original configuration.

3.3 4-Channel RS-485 Daughterboard Operation:

Jumpers can be set on the daughterboard to select one or two channels of RS-422. (See Jumper Configuration) Each RS-485 channel circuit has it's own 5VDC DC-DC converter and optocouplers. As RS-422 requires twice as many connections as RS-485 (a pair for receive and a pair for transmit), the second RS-485 channel (and the forth RS-485 channel if two RS-422 channels are selected) is disabled when RS-422 is enabled.

To simplify RS-485 operation, the daughterboard is factory configured in "autobaud" mode by selecting 57.6Kbaud (JP10 for channel 1, JP13 for channel 2, JP17 for channel 3, and JP20 for channel 4). This mode will support the vast majority of applications.

Note: Call Prizm for help with specific settings or equipment.

The selection of the daughterboard identity is handled by jumper posts JP1 though JP8. A single jumper shunt should be placed on each of the jumper posts to select daughterboard #1 with "DB1", daughterboard #2 with "DB2" or daughterboard #3 with "DB3".

Note: Each daughterboard set (one surface and one sub-sea) should have a different board identity (i.e. DB1, DB2 or DB3of channels or damage to the daughterboards or motherboard may result.

There are 4 gray or black three-pin Phoenix connectors on the front of the board, each with one pin for transmit, one pin for ground, and one pin for receive.

3.3.1 Setting RS-485 Data Rates

This function has been factory pre-set to automatically accommodate any data rate from 300 baud up to and including 57.6Kbaud. To change or verify factory selection, refer to the RS-485/422 Submux Daughter Board jumper configuration table in this manual.

3.3.2 Selecting RS-422

Jumpers allow RS-485 channels 1 and 2 (or 3 and 4) to be turned into 4-wire full duplex RS-422 channels. (See jumper configuration table)

When RS-422 is selected:

- Channel 1 (or 3) becomes RS-422 receive (RX) channel
- Channel 2 (or 4) becomes RS-422 transmit (TX) channel

3.3.3 4-Channel RS-485 Daughterboard Indicators:

There is a single green LED indicator (LED1) at the top of the board to indicate +5VDC power status; LED1 will be lit if +5VDC is available on the daughterboard. The dual green LEDs (LED3, 5, 7 and 9) will flash to indicate transmit and receive data traffic on a per channel basis. The left LED (or bottom if board is laid flat) indicates transmitted RS-485/422 data (out of the board) from the other Submux board through the Prizm multiplexer. The right LED (or top if board is laid flat) indicates received RS-485/422 (into

the board from the local RS-485/422 device) that will be transferred to the other Submux board.

The single red surface mounted LED on the top side of the Daughterboard, in the middle of each channel (LED2, 4, 6, and 8) will be lit whenever the RS-485 receiver is enabled.

3.3.4 4-Channel RS-485 Daughterboard Specifications:

Number of data Channels:	4 per daughterboard
Data type supported:	4 channels of RS-485 or 2 channels of RS-422 or 2 RS-485 and 1 RS-422
Data rates supported:	RS-485 - up to 115 Kbaud RS-422 - up to 230 Kbaud
Per channel sample rate:	3.125 Msps typically for each of the channels, determined by motherboard

3.3.5 4-Channel RS-485 Daughterboard Dimensions:

Custom format - 100 mm wide x 86 mm long x 13 mm thick
(3.937 in x 3.40 in x 0.50 in)

VME 3-U PCB and faceplate in rack: None

3.3.6 4-Channel RS-485 Daughterboard Power Requirements:

Power requirements are covered under Submux motherboard Power Requirements.

3.4 RS-485/RS-422 Submux Daughterboard Troubleshooting

(MUST BE USED WITH SUBMUX MOTHERBOARD)

In normal operation the following LED status should be observed:

DC power LED (LED1) – Lit green
Front panel RS-485 Data Activity LEDs
(dual LED on each channel, LED3, LED5, LED7, LED9):
-- TXD LED - Left LED lit green if data going out of channel
-- RXD LED - Right LED lit green if data going into channel
Center of board RS-485 Receive Active LEDs
(single red surface mount LED2, LED4, LED6, LED8):
red LED - lit red if channel in receive mode,
may flash with data traffic
Front panel RS-422 Data Activity LEDs (channels 1 and 3 only):
-- Channel 1- RXD/TXD LEDs - Lit green if RS-422 traffic on channel 1
-- Channel 3- RXD/TXD LEDs - Lit green if RS-422 traffic on channel 2
NOTE: Channel 2 and 4 RXD/TXD LEDs will not be lit.

- No baud rate settings are required at any rate up to 256Kbaud

3.4.1 Board Level Testing

If DC power LED is out:

- Make sure 5VDC is available at the backplane connector.
- Check power connector and wiring to both rack power supplies.

If + 5VDC is measured at connector and DC Power LED is not lit green:

- Check LED and transistor circuit

If 5VDC is not found:

- Test for power at the backplane and power supply (See Power Supply and Backplane sections of the manual).

Note: Power must be checked for both the motherboard and daughterboard.

If either RX/TX link LEDs are out:

- Check daughterboards on each h end of the link to verify that the same board number (1, 2 or 3) positions have been selected at JP1 - JP8.
- If RXD LED does not light, check surface mount fuse (F1, F2, F3, or F4) on bottom of board for that channel with an ohmmeter, replace fuse if blown
- Check that Submux board at other end of link is plugged in
- Run RS-232 CHANNEL DATA TEST or RS-422 CHANNEL DATA LOOP BACK TEST below as appropriate, checking each channel and its LEDs
- If still not operational, replace with spare board

3.4.2 RS-485 Channel Data Test

RS-485 is a half-duplex communication process and requires a host computer running RS-485 software at one end and a slave RS-485 device at the other end to test a data channel. First verify that the host computer and slave RS-485 device will communicate correctly when direct connected with cable between the host and slave. There will be only two transmit/receive signals (RT+ and RT-). The voltage levels for RS-485 are 0 to 5VDC (differential TTL). Then you can test a Prizm RS-485 channel.

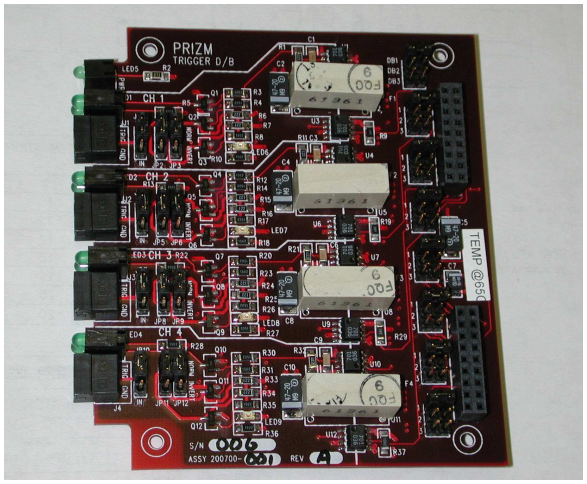
With a Submux and RS-485/422 daughterboard in both the ROV and surface units and the appropriate channel configured for RS-485, run RS-485 data into the channel to be tested. The RS-485 data can be input into either the ROV or surface Submux. The host computer should be able to communicate with the slave device with no errors. Both RX and TX LEDs on both boards should be lit and/or flickering whenever the computers are talking. If any of the LEDs are not operating check one of the other channels. If the LEDs operate on that channel, replace RS-485 daughterboard and/or Submux motherboard with a spare board or use the working channels only.

3.4.3 RS-422 Channel Data Loopback Test

RS-422 is a full-duplex communication process and a host computer running RS-422 software at one end can either communicate with itself (loopback mode) or with another RS-422 computer at the other end to test a data channel. There will be two transmit signals (T+ and T-) and two receive signals (R+ and R-). The voltage levels for RS-422 are 0 to 5VDC (differential TTL). First verify that the host computer will communicate correctly when directly connected with a loopback cable. Then you can test a Prizm RS-422 channel.

With a Submux and RS-422 daughterboard in both the ROV and surface units, run RS-422 data into channels 1 or 3 [PIN1(R+), PIN2(GND), PIN3(R-)] and monitor the transmit data from channels 2 or 4 [PIN1(T+), PIN2(GND), PIN3(T-)] of the RS-422 daughterboard to be tested. The RS-422 data can be input into either the ROV or surface RS-422 daughterboard. On the other end of the link, short channels 1 (J3) to 2 (J4) (J3-1 to J4-1, J3-2 to J4-2 and J3-3 to J4-3) or channels 3 (J5) to 4 (J6) (J5-1 to J6-1, J5-2 to J6-2 and J5-3 to J6-3). This will allow the two RS-422 daughterboards to talk to each other in loop back. The host computer should be able to communicate with itself with no errors. Both RX and TX LEDs on both boards should be lit and/or flickering. If any of the LEDs are not operating check the other channel. If the LEDs operate on that channel, replace RS-422 daughter board and/or Submux motherboard with a spare board or use the working channel if one of the two channels is operating.

4 Trigger Interface Daughtercard, Part Number 200700-xxx.



The Prizm Trigger Interface Daughtercard provides four channels of Input or Output selectable interface for use with most Acoustic Responder channels. This board is meant for use as a daughter-card on the standard PRIZM Submux1 or Submux2 motherboard. Refer to the Submux1 or Submux II manual for a description of those particular cards and the standard data daughtercards.

Each trigger channel is electrically isolated and independently powered. The board contains jumper selections for Input/Output as well as Normal/Invert for both Input and Output signals.

4.1 Trigger Interface Daughtercard Revision History:

The Trigger Interface Daughtercard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design
on is fully compatible with the original.

4.2 Trigger Interface Daughtercard Dash (-) Number Definitions

The Trigger Interface Daughtercard has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001 original configuration. Intended for use with SIMRAD-compatible responders, provides for 15volt levels on the output. The Simrad system requires a positive going pulse for triggering of the responder.

-002 Intended for use with Accusonic/ORE-comptible responders, provides TTL (5VDC) levels on the output. The ORE system requires a negative going pulse for triggering of the responder.

4.3 Trigger Interface Daughter board Operation:

Each channel circuit has it's own DC-DC converter and opto-couplers to provide isolation from of the I/O signals from the other channels and multiplexer system.

The selection of the daughterboard identity is handled by jumper posts JP13 though JP20. A single jumper shunt should be placed on each of the jumper posts to select daughterboard #1 with “DB1”, daughterboard #2 with “DB2” or daughterboard #3 with “DB3”.

Note: Each daughterboard set (one surface and one sub-sea) should have a different board identity (i.e. DB1, DB2 or DB3) or damage to the daughterboards or motherboard may result.

There are 4 black two pin Phoenix connectors on the on the front of the board. Pin 1 is the trigger input/output signal, while pin 2 is the corresponding ground/shield.

The board contains jumpers to allow the user to configure each channel for input or output (JP1 4, 7 & 10). Typically the vehicle channels will selected as Output and the Surface channels will be selected as Input.

Each channels input and output are also jumper selectable for Normal or Inverted operation (JP2, 5, 8 & 11 for the Output and JP3,6,9 &12 for the Input). Responder systems that utilize a positive going pulse should be configured for Normal Input and Output, while responder systems that require a negative going pulse should be configured for Inverted operation on the Input and Output.

4.3.1 Trigger Interface Daughtercard Indicators:

There is a single green LED indicator (LED5) at the top of the board to indicate +5VDC power status; LED5 will be lit if +5VDC is available on the daughterboard.

There are 4 surface mount LEDS (LEDs 6–9) on the board top layer to indicate isolated power to each of the channels.

The dual green LEDs (LED1, 2, 3 and 4) associated with each channel will flash to indicate Input and Output traffic on a per channel basis. The left LED (or bottom if board is laid flat) indicates an input signal is present while the right LED (or top if board is laid flat) indicates an output signal is present.

4.3.2 Trigger Interface Daughterboard Specifications:

Number of data Channels:	4 per daughterboard
Data type supported:	Trigger Responder Pulse
Data rates supported:	N/A
Per channel sample rate:	3.125 Msps typically for each of the channels, determined by motherboard

4.3.3 Trigger interface Daughterboard Dimensions:

Custom format - 100 mm wide x 86 mm long x 13 mm thick
(3.937 in x 3.40 in x 0.50 in)

VME 3-U PCB and faceplate in rack: None

4.3.4 Trigger Interface Daughterboard Power Requirements:

The Trigger Interface utilizes approximately 500mA @ 5VDC.

4.4 Trigger Interface Daughtercard Troubleshooting

(MUST BE USED WITH SUBMUX MOTHERBOARD)

In normal operation the following LED status should be observed:

DC power LED (LED5) – Lit green
Trigger I/O Data Activity LEDs (dual LED on each channel, LED1 thru LED4):
-- Input LED - Left LED lit green if data going into of channel
-- Output LED - Right LED lit green if data going out of channel

4.4.1 Trigger Interface Daughtercard Board Level Testing

POWER RELATED
If DC power LED is out to both the Motherboard and Daughtercard:

- Make sure 5VDC is available at the backplane connector.
- Check 2Amp fuse (F1) on Motherboard with ohmmeter, replace with another PICO fuse if blown.

If the Motherboard has power but the Daughtercard DC Power LED is not lit:

- Verify +5VDC at the motherboard to daughter-card transmit and receive headers (J4 and J5) on the motherboard
- Check Power LED on the daughtercard.

If the Daughtercard Power LED (LED5) is on, but channels do not seem to be working:

- Verify that the individual channel Power LEDs (LED6-9) are lit
  - If they are not, check the fuse for each channel (F1-F4)
- Verify the actual power to each channel by measuring the isolated power for each channel at C2,4,8 & 10 (Power should be in +15VDC+/-10%)

SIGNAL RELATED (assumes all Power Related Items checked out OK)
If either the local Input or remote Output LED are not lighting when input signal is applied:

- Verify the input signal is present with a scope.
- Check daughterboards on each end of the link to verify that the same board number (1, 2 or 3) positions have been selected at JP13 – JP20.
- Verify that no other daughtercard on the motherboard stack is addressed as the same daughtercard.
- Check that Submux board at other end of link is plugged in
- Run Submux motherboard data loop back test (see Submux data loopback test in Submux section of manual), checking each channel and its LEDs to verify the Submux motherboard is working
- If still not operational, replace with spare board

If no spare is available:

- Move data connector to a spare working channel, if available.