PRIZM™
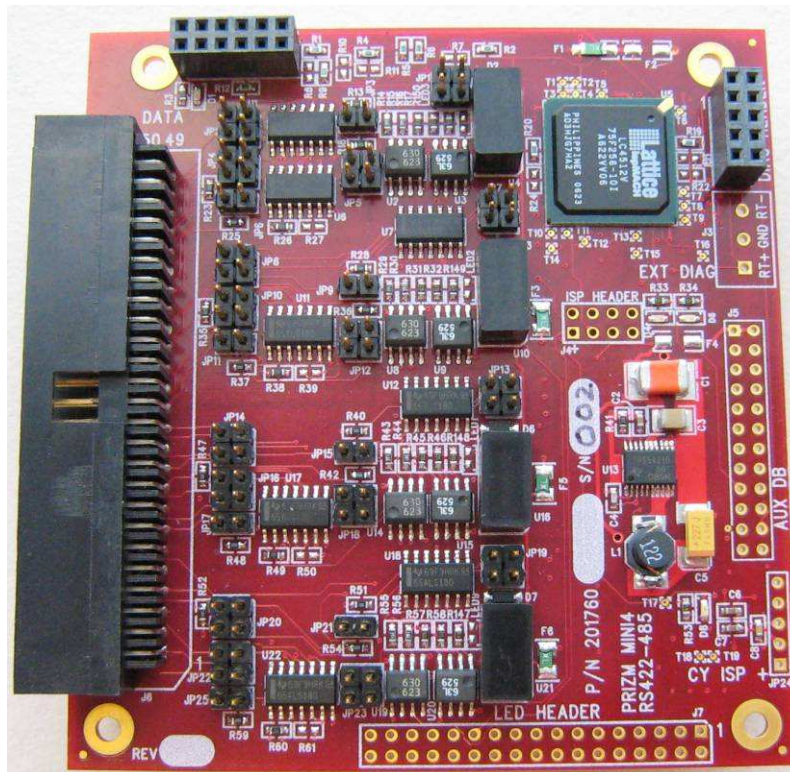
8-Port RS-422/485 Daughterboard (P/N 201760-xxx)

**User's Manual
And
Troubleshooting Guide**

**February 24, 2009
Rev. B**

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1   RS-422/485 Daughterboard, Part Number 201760-xxx.

The Prizm RS-422/485 daughterboard provides eight (8) RS-422 or RS-485 pair-wise isolated data channels that are multiplexed onto a single Prizm high-speed serial data channel onto Mini4 or MiniMux2 Motherboard. Daughterboard channel selection of RS-422 or RS-485 can be simply done by selecting a few jumper posts and can be accomplished on a channel-by-channel basis for mixed data applications. Please refer to the table to for appropriate jumper configuration. With an additional pluggable auxiliary daughter board, more independent serial channels can be carried. The combinations of types of channels (RS-232, RS-422, and/or RS-485) will vary depending on the type and configuration of daughterboards. Up to two (2) RS-422/485 daughterboards can be used on a Mini4 system. MiniMux2 only supports one (1) daughterboard.

Each pair of RS-422/485 data channels are electrically isolated and independently powered. Each RS-422/485 channel can support up to 115.4 Kilobaud.

1.1 RS-422/485 Daughterboard Revision History:

The Submux3 motherboard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A/Assembly Revision A Original design

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

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

-001 Original configuration.
-002 With LED Display Header J7 placed

1.3 Manual Revision History:

The manual has gone through the following revisions:

Revision A   Preliminary
Revision B   Updated contact information to reflect Moog Components Group

1.4 RS-422/485 Daughterboard Operation:

On Mini4 and MinMux2 systems, the daughterboard is connected to the motherboard via the 12-pin motherboard connector. Individual serial channels are multiplexed on the daughterboard and interfaced to the motherboard as a single high-speed serial link.

2 Connectors

J6 – Data Connector
There is 50-pin dual-row rectangular Amp connector on the on the front of the daughterboard.
Mfg p/n – 2-103167-2

Mating Connectors
          AMP p/n - 4-87631-1 (Prizm p/n CN0314) type- unstamped
          AMP p/n – 4-87631-2 (Stamped)
          AMP p/n – 4-87631-2 (Stamped with strain relief)

Signal Name	Pin	Pin	Signal Name
R1+	1	2	T1+
GND_ISO_A	3	4	GND_ISO_A
R1-	5	6	T1-
R2+	7	8	T2+
GND_ISO_A	9	10	GND_ISO_A
R2-	11	12	T2-
Isolation barrier			Isolation barrier
R3+	13	14	T5+
GND_ISO_B	15	16	GND_ISO_B
R3-	17	18	T3-
R4+	19	20	T4+
GND_ISO_B	21	22	GND_ISO_B
R4-	23	24	T4-
Isolation barrier			Isolation barrier
R5+	25	26	T5+
GND_ISO_C	27	28	GND_ISO_C
R5-	29	30	T5-
R6+	31	32	T6+
GND_ISO_C	33	34	GND_ISO_C
R6-	35	36	T6-
Isolation barrier			Isolation barrier
R7+	37	38	T7+
GND_ISO_D	39	40	GND_ISO_D
R7-	41	42	T7-
R8+	43	44	T8+
GND_ISO_D	45	46	GND_ISO_D
R8-	47	48	T8-
N/C	49	50	N/C

J1		Motherboard Connector			
VDC Supply	1	o o	2	VDC Supply
RXD_DB	3	o o	4	TXD_DB
GND	5	o o	6	GND
RXC_DB	7	o o	8	TXC_DB
RCV LINK	9	o o	10	Future
RXC_DB2	11	o o	12	TXC_DB2

J2		Diagnostics Header			
RT+	1	o o	2	RT-
GND	3	o o	4	GND
GND	5	o o	6	GND
+5V	7	o o	8	+5V
+5V	9	o o	10	+5V

J3 – Diagnostics Connector

Pin 1	– RT+
Pin 2	– GND
Pin 3	– RT-

J4 – ISP Header (Not Customer Accessible)

J5 – Auxiliary Daughterboard Connector

Signal Name	Pin	Pin	Signal Name
+5V	1	2	+5V
RX9	3	4	TX9
RX10	5	6	TX10
RX11	7	8	TX11
RX12	9	10	TX12
RX13	11	12	TX13
RX14	13	14	TX14
GND	15	16	GND
SYNC_IN	17	18	FUTURE_AUX_DB
RT+	19	20	RT-
RX15	21	22	TX15
RX16	23	24	TX16

J7 – LED Header

Signal Name	Pin	Pin	Signal Name
GND	1	2	+5V (optional)
R1	3	4	T1
R2	5	6	T2
R3	7	8	T3
R4	9	10	T4
R5	11	12	T5
R6	13	14	T6
R7	15	16	T7
R8	17	18	T8
	19	20	
	21	22	
	23	24	
	25	26	
	27	28	
	29	30	
	31	32	
	33	34	

3   RS-422/485 Daughterboard Troubleshooting

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

D1	+5VDC power LED Lit green
D9	RLINK LED - Lit green if receiving link from Modem
D10	TLINK LED - Lit green if receiving link from Modem
D8	+3.3VDC power LED Lit green
LED9	Channels 1&2 Isolated +5VDC power - LED Lit green
LED1	Channels 3&4 Isolated +5VDC power - LED Lit green
LED2	Channels 5&6 Isolated +5VDC power - LED Lit green
LED3	Channels 7&8 Isolated +5VDC power - LED Lit green

RS-422/485 Data Activity LEDs

In normal operation with data traffic the following right angle bi-color LEDs, mounted on the edge of the board (under the data connector) should be observed:

D32	Channel 1 lit RED for Tx, lit GREEN for Rx
D30	Channel 2 lit RED for Tx, lit GREEN for Rx
D26	Channel 3 lit RED for Tx, lit GREEN for Rx
D25	Channel 4 lit RED for Tx, lit GREEN for Rx
D22	Channel 5 lit RED for Tx, lit GREEN for Rx
D19	Channel 6 lit RED for Tx, lit GREEN for Rx
D17	Channel 7 lit RED for Tx, lit GREEN for Rx
D14	Channel 8 lit RED for Tx, lit GREEN for Rx

4   RS-422/485 Daughterboard Board Level Testing

i.   If DC power +5V LED (D1) is out:
- Make sure +5VDC is available at the motherboard connector J1.
- Check 2Amp fuse (F1) with ohmmeter, replace with another fuse if blown

ii. If DC power 3.3 LED (D8) is out:
- Problem with the 5V to 3.3V DC-DC converter circuit on the board. Not field serviceable. Replace the board.

iii Faulty isolated power supply for channel pairs:
- LED9 – Out Ch1&2 will not work
- LED1 – Out Ch3&4 will not work
- LED2 – Out Ch5&6 will not work
- LED3 – Out Ch7&8 will not work

4.1.1 RS-422/485 Daughterboard Data Loop-Back Test

With a daughterboard in both the vehicle (ROV) and surface units, run RS-422 data into pins 1 (+) and 5 (-) of the connector of channel 1 (as an example) being tested. The RS-422 data can be input into either the ROV or surface board. Connect the Rx to pins 2 and 6.. On the other end of the link, short pins 1 and 2 (the positive signals) and pins 5 and 6 (the negative signals) of the daughterboard channel 1 being tested. This process can be repeated on every channel of the board. This will allow the two daughterboards 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 daughterboard with a spare board or use the working channels only.

4.1.2 Test Data Channels
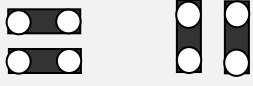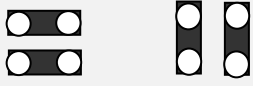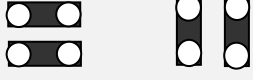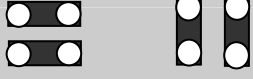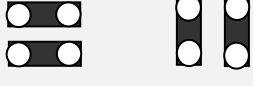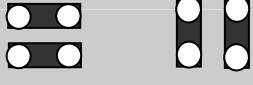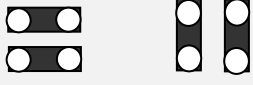
If an appropriate serial data test generator is available (or a PC with Communications software, or even a square wave generator) the individual channels can be tested on a

channel-by-channel basis. This test can be done for all channels on the daughterboard. The user must be sure that the test signal levels are compatible with the interface/channel being tested.

5   RS-422/485 Daughterboard – Auxiliary Daughterboard Options

The Prizm 8-channel RS-422/485 daughterboard supports 8 pair wise isolated RS-422/485 serial data channels, when plugged onto a Mini4 motherboard. Up to a total of 2 daughter boards may be stacked on one motherboard. The maximum data rate that this board supports is 115Kbaud. 201760 daughterboard can be intermixed with the 16-channel RS-232 daughterboard (**Prizm p/n - 210610**) or used with a Tritech Trigger/Responder (**Prizm p/n – 201600**) board as its auxiliary daughterboard. Custom boards auxiliary boards for this daughterboard would be designed in the future per customer requirements.

6   Jumper Configuration Table

	RS-422	RS-485		RS-485 with 100 Ω termination
Ch1	No Jumpers Placed ○ ○ / ○ ○	JP 22	& JP 23	JP 25
Ch2	No Jumpers Placed ○ ○ / ○ ○	JP 20	& JP 19	JP 21
Ch3	No Jumpers Placed ○ ○ / ○ ○	JP 16	& JP 18	JP 17
Ch4	No Jumpers Placed ○ ○ / ○ ○	JP 14	& JP 13	JP 15
Ch5	No Jumpers Placed ○ ○ / ○ ○	JP 10	& JP 12	JP 11
Ch6	No Jumpers Placed ○ ○ / ○ ○	JP 8	& JP 7	JP 9
Ch7	No Jumpers Placed ○ ○ / ○ ○	JP 4	& JP 5	JP 6
Ch8	No Jumpers Placed ○ ○ / ○ ○	JP 2	& JP 1	JP 3