QUICK INSTALLATION GUIDE FOR PAIRGAIN™ TECHNOLOGIES HIGAIN™ CO MANAGEMENT SHELVES MODEL HMS-308

LIST 1, PAIRGAIN #150-1275-01 CLEI CODE: T1MFT004RA

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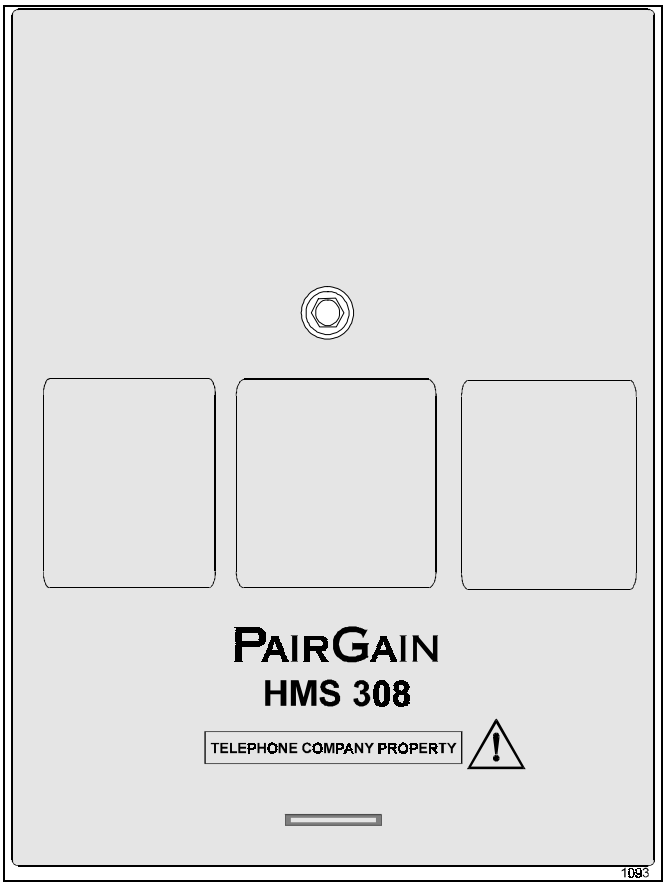


Figure 1. HMS-308. The HMS-308 HiGain Management shelf houses a maximum of eight HLU or ELU-319s and one HMU-319.

A. PRODUCT OVERVIEW

1. DESCRIPTION AND FEATURES

1.01 This practice provides installation instructions for the HMS-308 HiGain Management Shelf. A brief discussion of the HiGain Management System environment is also provided. The HMS-308 HiGain Management Shelf accommodates up to eight HLU or ELU-319 line units. C.O. T1 repeaters such as Wescom 3192-9L, 9B, 9T or Larus 1181 or equivalent can also be housed in this shelf. The shelf allows the line units to be connected to a FOX-2 fiber distribution system and controlled by a remote network management system through a single HMU-319 Shelf Control Unit.

1.02 Revision History of this practice.

Revision 01—February 14, 1996

a) Initial release.

Revision 02—May 23, 1996

a) Corrections to alarm relay description.

b) Additions to installation procedure.

c) Addition of Section 3 - Certification.

1.03 Features of the HMS-308 HiGain Management Shelf:

- Slots for up to eight line units or C.O. T1 repeaters
- A slot for an optional HMU-319 management unit
- DS1 input and output connectors which interface directly with the FOX-2 DS1 I/O connectors
- G.703 input and output connectors which interface directly to PairGain 75 ohm and 120 ohm HCP-322 connector panels
- Two HDSL I/O connectors
- One RS-232 Network Management connector
- Five alarm signals accessible from WW pins
- -48V input power and ground connections on a terminal block
- Wall mounting or 19” or 23” rack mounting
- Front-access units and connectors
- Slide-on, locking shelf cover
- Mounting kit that includes rack-mount brackets, cable ties, and miscellaneous mounting hardware.

2. SPECIFICATIONS

Operating Temperature and Humidity

-40°C to +60°C, 5% to 95% (non-condensing)

Storage Environment and Humidity

-40°C to +70°C, 5% to 95% (non-condensing)

Dimensions

Height: 10.175 in. (25.84 cm)
Width: 7.625 in. (19.36 cm)
Depth: 12.125 in. (30.80 cm)

Weight

17.3 lbs. (38 kg)

3. CERTIFICATION

3.01 UL Recognized: The HMS-308 List 1 is a UL Recognized component. Use normal caution when installing or modifying telephone lines. Dangerous voltages may be present. It is also considered imprudent to install telephone wiring during a lightning storm. Always disconnect all telephone lines and power connections before servicing or disassembling this equipment.

3.02 CSA Certification: The HMS-308 List 1 has been tested and found to comply with CSA Standard C22.2-950 with telecommunications features.

3.03 Refer to the installation section of the appropriate instruction manual for the unit you are installing for:

- Cabling information
- Proper connections
- Grounding information

All wiring external to this product should follow the provisions of the current edition of the National Electric Code.

The UL and CSA marks can be viewed by removing the top cover of the HMS-308. They are located near the center of the top card guide.

4. LIMITED WARRANTY

4.01 PairGain Technologies, Incorporated warrants its products to be free of defective and faulty workmanship from the date of shipment for a period of 36 months, under normal use. PairGain's obligation, under this warranty, is to any such product which is returned during the warranty period per PairGain's instructions, and to which product, at PairGain's sole option, is determined to be defective upon examination at our plant.

4.02 The transportation charges from the Buyer to PairGain will be prepaid by the Buyer. When the equipment is shipped back to the Buyer, PairGain will pay the charges, unless no trouble is found (NTF), in which case, the buyer will pay for the shipment.

4.03 PairGain may use reconditioned parts for such repair or replacement. This warranty does not apply to any product which has been repaired, worked upon, or altered by persons not authorized by PairGain, or, in PairGain's sole judgment, has been subjected to misuse, accident, fire or other casualty, or operation beyond its design range.

4.04 Repaired products are guaranteed through a 90-day warranty period or through the end of the original warranty period, whichever is greater.

5. TECHNICAL ASSISTANCE

5.01 PairGain Technical Assistance is available 24 hours a day, 7 days a week by contacting PairGain's Customer Service Engineering group at one of the following numbers:

Telephone:	**(800) 638-0031**
	(714) 832-9922
Fax:	**(714) 832-9924**

During normal business hours (8:00 AM to 5:00 PM, Pacific Time, Monday through Friday, excluding holidays), technical assistance calls are answered directly by a Customer Service Engineer. At other times, a request for technical assistance is handled by an on-duty Customer Service Engineer through a callback process. This process results in a callback within 30 minutes of initiating the request. In addition, PairGain maintains a computer bulletin board system for obtaining current information on PairGain products, product troubleshooting tips and aids, accessing helpful utilities, and posting requests or questions. This system is available 24 hours a day by calling (714) 730-3299. Transmission speeds up to 28.8 kbps are supported with a character format of 8-N-1.

B. FUNCTION AND DESCRIPTION

6. HIGAIN MANAGEMENT SYSTEM

6.01 HiGain provides 1.544 Mbps full duplex transmission over two unconditioned, non-loaded copper loops. This is done at distances up to 12,000 feet (24 AWG) or 9,000 feet (26 AWG), without repeaters, removal of bridged taps, or other conditioning on loops which meet Carrier Serving Area (CSA) guidelines. The system provides DS1 interfaces at the central office (CO) and the remote end, with remote provisioning and performance monitoring.

6.02 The typical HiGain Management system consists of a Network Element and a Management Station (see Figure 2). The HMS-308 is the Network Element. It includes up to eight High-bit-rate Digital Subscriber Line (HDSL) subsystems and the HMU-319.

6.03 Each subsystem has a line unit and remote unit. The system's line units, as well as a HiGain Management Unit (HMU), are housed in the HMS-308. The HMU controls the line units in the shelf.

6.04 Each HLU-319 interfaces with a DSX-1 cross-connect on 0 to 655 feet of wire. The HLU-319 transports the data on two 784 kbps full duplex 2B1Q HDSL pairs from the cross-connect to an HRU.

6.05 Each ELU-319 interfaces with a PairGain 75 ohm G.703 List 1 or a 120 ohm G.703 List 2 HCP-322 connector panel.

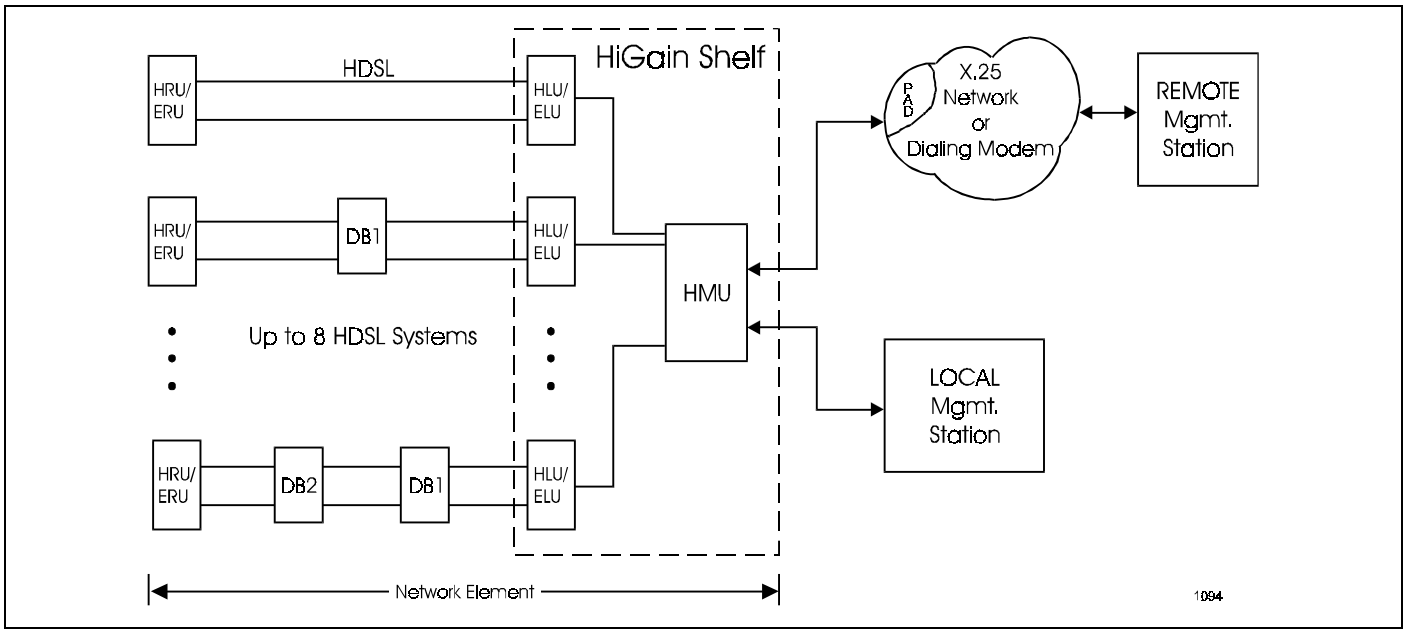


Figure 2. HiGain Management System. The HMS-308 HiGain Management system consists of a Network Element which includes a Management Station and up to 8 HDSL subsystems.

7. SHELF DESCRIPTION

7.01 The HMS-308 shelf (see Figure 1) is 10.175" H x 7.625" W x 12.125" D, excluding mounting brackets. Rack-mounting brackets for use with either 19" or 23" racks are supplied. The shelf may also be wall mounted, either from the back or from either side, using the three mounting holes on any of these surfaces.

- The HMS-308 accommodates a maximum of eight line units and one HMU-319 Management Unit.

7.02 Table 1 lists the shelf's connectors and terminal strips, and Figure 4 illustrates the HMS-308 backplane connectors. Signal and pin assignments for these connections are listed in Tables 2 through 7.

7.03 An interface diagram of the HMS-308 is provided in Figure 3. The HDSL Loop 1 uses the Span_Tx connections to the slots. The HDSL Loop 2 uses the Span_Rx connections. Illustrations of these connectors are shown in Figure 4, and pin-out designations are given in Tables 5 through 7.

7.04 The shelf provides power (TB1) and alarm (TB2) connections, with backplane communications between the HMU slot and the other card slots (see Figures 5 and 6 for details). The rear of HMS-308 shelf includes four male 50-pin Amphenol-type connectors for DSX/G.703 (J11 and J12) and HDSL Span (J13 and J14). These provide Tip and Ring connections for all cards in the shelf. The mating female connector is:

- 50 Pin: AMP Kit No. 2-22913-1 for 24 - 26 AWG

7.05 One RS-232 communication port (J10) allows an optional management system to be connected to the HiGain system (see Table 2).

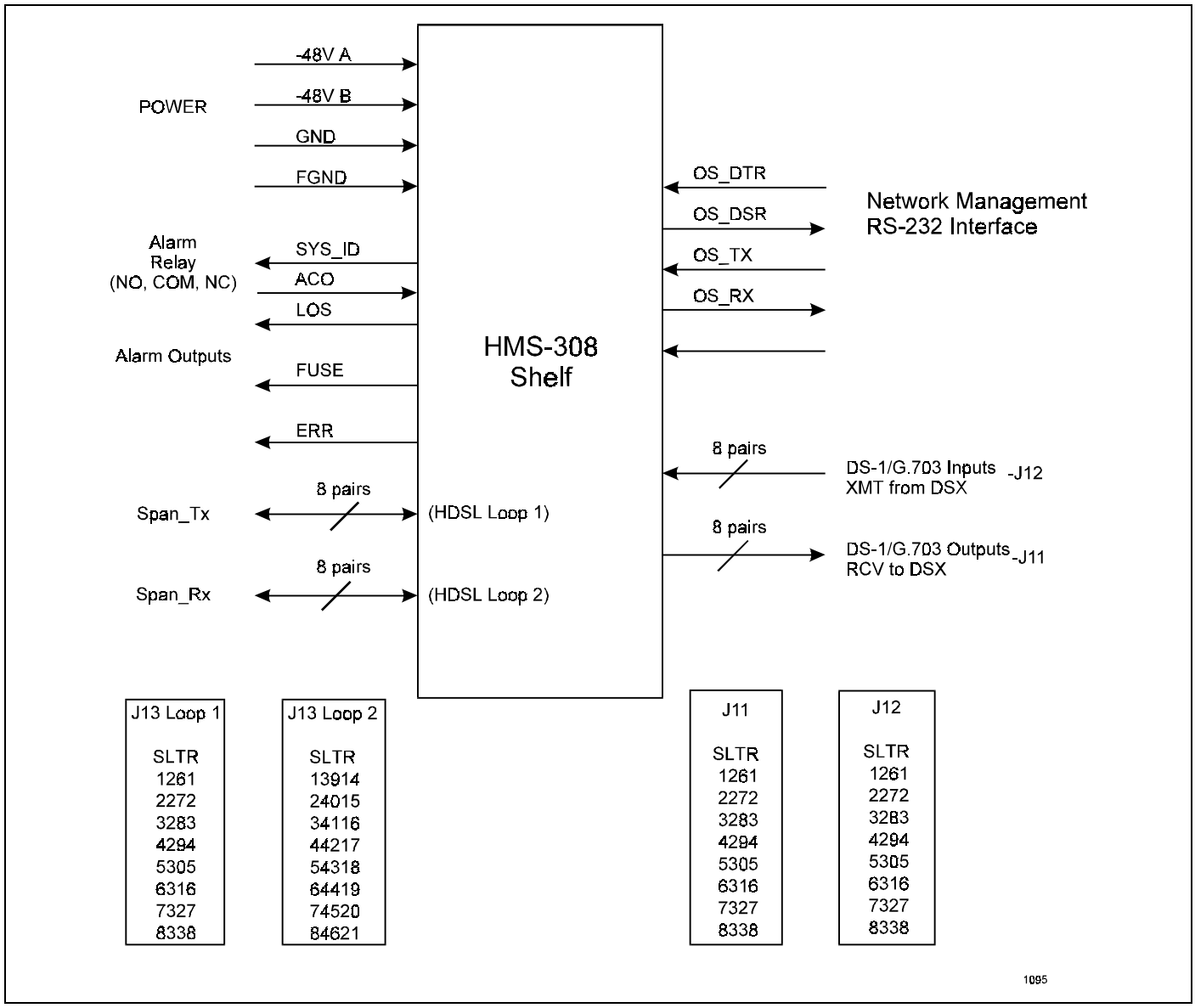


Figure 3. HMS-308 Interface Diagram.

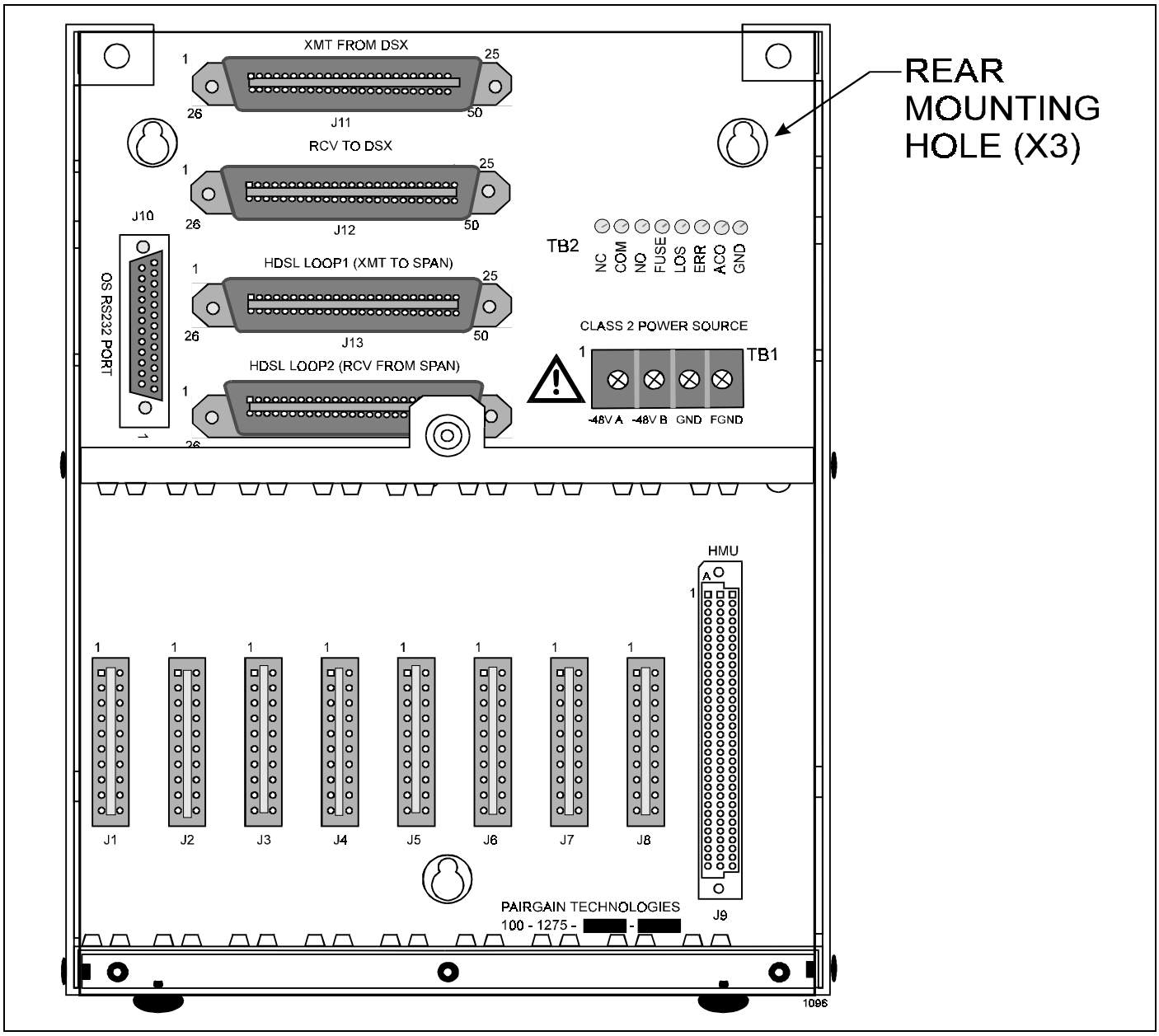


Figure 4. HMS-308 HiGain Management Shelf. The above illustration shows the HMS-308 without the front cover, which displays the connectors, the terminal blocks, and the rear mounting holes.

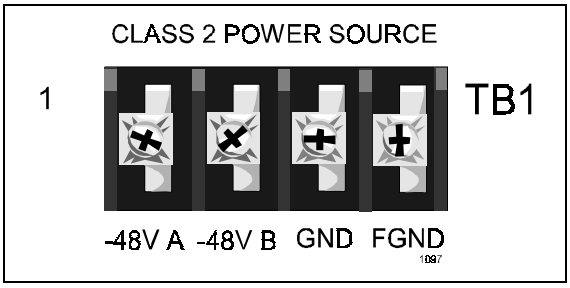


Figure 5. Terminal Block TB1.

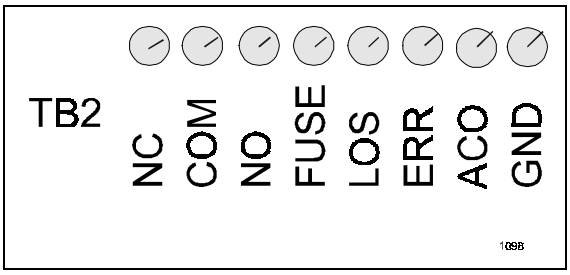


Figure 6. Terminal Block TB2.

8. SHELF ALARMS

8.01 The shelf alarms are available at Terminal Block TB2, as shown in Figure 6.

8.02 The LOS alarm connects to pin H on every slot. This alarm, normally floating, is connected to ground (HLU-319, List 1) or to +5 VDC (HLU-319, List 2D).

8.03 The fuse alarm connects to pin 10 of every slot. It is normally open and switches to -48V if the -48V fuse in any of the line units opens.

8.04 The Alarm N.O. output provides access to an alarm relay located on the optional HMU-319 management card. This fail-safe alarm relay normally energizes and connects the C contact to N.C. for all normal operating conditions. This relay will de-energize and connect the C terminal to the N.O. terminal if a minor alarm occurs in any line unit or if the shelf loses power.

8.05 Note: If a line unit which is asserting a shelf alarm is accessed by a HMU-319 List 3 TAO session, that line unit will disable shelf alarms for the duration of the session.

C. SITE REQUIREMENTS AND INSTALLATION

9. SITE REQUIREMENTS

9.01 A typical HiGain unit, without doublers, consumes a maximum of 18 Watts at 0.423 A from the CO -48 VDC battery supply. Eight Watts are dissipated in the HLU-319.

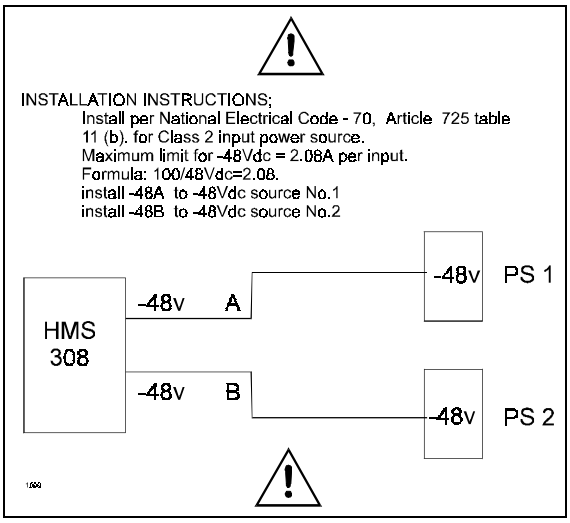
10. INSTALLATION PROCEDURE

10.01 The HMS-308 shelf can be mounted to a 19" or 23" rack by using the mounting brackets (included). This shelf may also be wall mounted, either from the back or from either side, using the three mounting holes on any of these surfaces.

a) If the shelf is to be mounted to a 19" or 23" rack, attach the mounting brackets to the shelf using one of the available mounting positions. Secure the shelf to the rack using the shelf's side-mounting brackets.

b) For rear-wall or side-mounting, attach to the wall using the mounting holes. The mounting surface should be 3/4" plywood or other material of equal or greater strength. Use three #10 wood screws or bolts for mounting. Use drilling templates provided with this shelf. (Rear-mounting holes are shown in Figure 4.)

c) See Figure 7 below for installation instructions for UL Class 2 compliance.



d) Connect the power and frame ground inputs to TB1, as shown in Figure 5.

e) Connect the alarm inputs to TB2, as shown in Figure 6.

f) Connect the HDSL and DSX-1/G.703 inputs to the shelf by plugging the DSX-1/G.703 interface cables into J11 and J12 (see Figure 4). Then, plug the HDSL cables into J13 and J14. Note: It is recommended that the radius of any cable bend be at least 5 times the diameter of the cable. To meet this recommendation, some installations will require that cables whose diameter is 0.47" or less be used.

g) If an optional HMU-319 is to be installed, connect an asynchronous RS-232 cable from an optional remote management system to J-10. Pin assignments are listed in Table 2.

h) Install the line units and optional HMU-319 management unit in the shelf, as described in their applicable practices.

i) Apply operating power to the shelf. Refer to the HLU practice for additional information.

CAUTION:

For proper heat dissipation, the HMS-308 must be mounted vertically without any obstruction of the ventilation holes on either the top or bottom surfaces.

Allow a minimum of 1/2" clearance from the bottom of the shelf, and 1-3/4" clearance from the top of the shelf.

TABLE 1. HMS-308 CONNECTOR TYPES

HMS-308	Connectors
J11, J12, J13, J14	Amphenol 50-pin Male
J1 - J8	20-pin
J9	DIN 96-pin Female
J10	DB-25 (Female)
TB1	4-pos. Terminal Block
TB2 (not labeled)	5-pin wire-wrap

TABLE 2. J10 - RS-232 PORT (DTE)

Pin No.	Signal	Direction
2	Transmit Data (TD)	Out
3	Receive Data (RD)	In
6	Data Set Ready (DSR)	In
7	Ground (GND)	—
20	Data Terminal Ready (DTR)	Out
If the DTR and DSR handshakes are not used, wire pins 6 and 20 together.		

TABLE 3. LINE UNIT SLOT CONNECTIONS (XX = SLOT NUMBER, 01 THROUGH 08)

Pin	Signal Name	Bussed/Dedicated	I/O	Function
1	XMT/DSX-1/G.703_Rxx	Dedicated	I	XMT/DSX-1/G.703 Ring, Slot xx
A	XMT/DSX-1/G.703_Txx	"	I	XMT/DSX-1/G.703 Tip, Slot xx
2	RCV/DSX-1/G.703_Rxx	"	O	RCV/DSX-1/G.703 Ring, Slot xx
B	RCV/DSX-1/G.703_Txx	"	O	RCV/DSX-1/G.703 Tip, Slot xx
3	n/c	"	"	"
C	n/c	"	"	"
4	n/c	"	"	"
D	n/c	"	"	
5	GND	Bussed	I	Battery Ground
E	ERR_ALM	"	N/A	Error Alarm Bus
6	HDSL L1_Rxx	Dedicated	I/O	HDSL Loop 1 Ring, Slot xx
F	HDSL L1_Txx	"	I/O	HDSL Loop 1 Tx Tip, Slot xx
7	NMA_xx	"	I/O	NMA Bus to HMU card
H	LOS_ALM	Bussed	O	LOS Alarm Bus
8	-48V	"	I	-48V Battery Input
J	FGND	"	I	Frame Ground
9	HDSL L2_Rxx	Dedicated	I/O	HDSL Loop 2 Ring, Slot xx
K	HDSL L2_Txx	Dedicated	I/O	HDSL Loop 2 Tip, Slot xx
10	F_ALM	Bussed	O	Fuse Alarm Bus
L	n/c	"	"	"

TABLE 4. HMU SLOT CONNECTIONS

	J9 ROW A	
Pin	Signal Name	I/O
1	NMA_1	I/O
2	NMA_2	I/O
3	NMA_3	I/O
4	NMA_4	I/O
5	NMA_5	I/O
6	NMA_6	I/O
7	NMA_7	I/O
8	NMA_8	I/O
9	n/c	
10	n/c	
11	n/c	
12	n/c	
13	n/c	
14	n/c	
15	n/c	
16	n/c	
17	n/c	
18	n/c	
19	n/c	
20	n/c	
21	n/c	
22	n/c	
23	n/c	
24	n/c	
25	n/c	
26	n/c	
27	n/c	
28	n/c	
29	n/c	
30	n/c	
31	-48V_A	I
32	-48V_A	I

	J9 ROW B	
Pin	Signal Name	I/O
1	n/c	
2	n/c	
3	n/c	
4	n/c	
5	F_ALM	I
6	LOS_ALM	I
7	ERR_ALM	N/A
8	GND	I
9	n/c	O
10	n/c	O
11	GND	O
12	n/c	
13	n/c	
14	n/c	
15	(reserved*)	
16	n/c	
17	n/c	
18	n/c	
19	n/c	
20	n/c	
21	n/c	O
22	OS_TX	O
23	OS_RX	I
24	n/c	I
25	OS_DTR-	O
26	OS_DSR-	I
27	n/c	I
28	n/c	I
29	n/c	I
30	n/c	
31	-48V_B	I
32	-48V_B	I

	J9 ROW C	
Pin	Signal Name	I/O
1	n/c	
2	n/c	
3	n/c	
4	n/c	
5	n/c	
6	n/c	
7	n/c	
8	n/c	
9	n/c	
10	n/c	
11	n/c	
12	n/c	
13	n/c	
14	n/c	
15	n/c	
16	n/c	
17	n/c	
18	n/c	
19	ALARM_NC	O
20	ALARM_COM	O
21	ALARM_NO	O
22	EXT_ACO	I
23	n/c	
24	n/c	
25	n/c	
26	n/c	
27	n/c	
28	FGND	I
29	FGND	I
30	n/c	
31	GND	I
32	GND	I

* Reserved for burn-in function for HMU-319.

D S X - 1

TABLE 5. J11 TX

Cable Pin No.		Card
HMS-308	Slot	Pin No.
26	1	B (Tip)
1	1	2 (Ring)
27	2	B
2	2	2
28	3	B
3	3	2
29	4	B
4	4	2
30	5	B
5	5	2
31	6	B
6	6	2
32	7	B
7	7	2
33	8	B
8	8	2

TABLE 6. J12 RX

Cable Pin No.		Card
HMS-308	Slot	Pin No.
26	1	A (Tip)
1	1	1 (Ring)
27	2	A
2	2	1
28	3	A
3	3	1
29	4	A
4	4	1
30	5	A
5	5	1
31	6	A
6	6	1
32	7	A
7	7	1
33	8	A
8	8	1

H D S L

TABLE 7. J13 LOOP 1

Cable Pin No.		Card
HMS-308	Slot	Pin No.
26	1	F (Tip)
1	1	6 (Ring)
27	2	F
2	2	6
28	3	F
3	3	6
29	4	F
4	4	6
30	5	F
5	5	6
31	6	F
6	6	6
32	7	F
7	7	6
33	8	F
8	8	6

TABLE 8. J14 LOOP 2

Cable Pin No.		Card
HMS-308	Slot	Pin No.
26	1	K (Tip)
1	1	9 (Ring)
27	2	K
2	2	9
28	3	K
3	3	9
29	4	K
4	4	9
30	5	K
5	5	9
31	6	K
6	6	9
32	7	K
7	7	9
33	8	K
8	8	9