

Rear Panel Interfaces

5

This section discusses the electrical interfaces available from the rear panel. All locations are as viewed from the rear of the unit unless otherwise specified.

5.0 DM240XR Connections

All DM240XR connections are made to labeled connectors located on the rear of the unit. Any connection interfacing to the DM240XR must be the appropriate mating connector. DM240XR Optional Data Interfaces are shown in Figures 5-1b – 5-1h.



Figure 5-1a. DM240XR Rear Panel Connectors

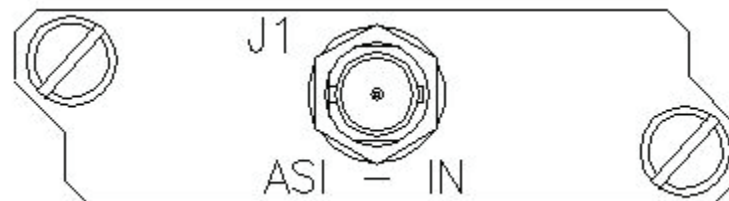


Figure 5-1b. DM240XR Rear Panel Connectors (ASI IN)

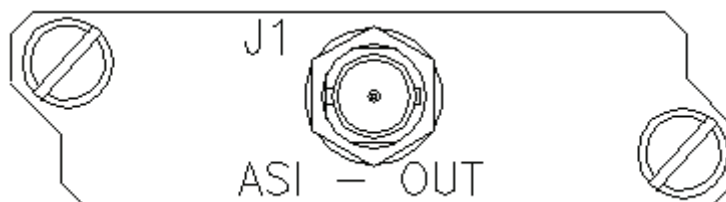


Figure 5-1c. DM240XR Rear Panel Connectors (ASI OUT)

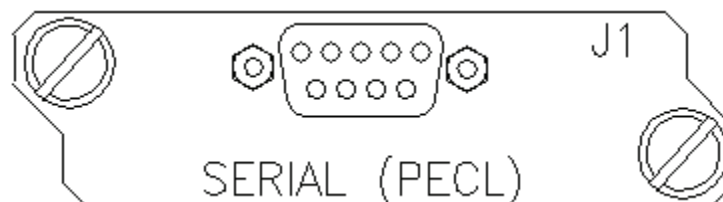


Figure 5-1d. DM240XR Rear Panel Connectors (Serial PECL)

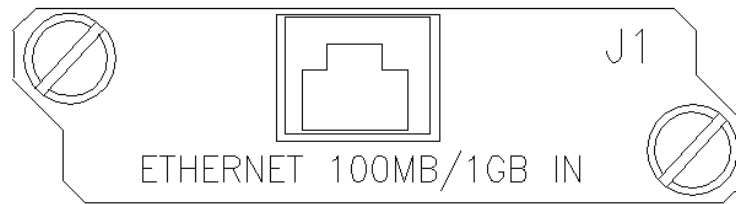


Figure 5-1e. DM240XR Rear Panel Connectors (Ethernet)

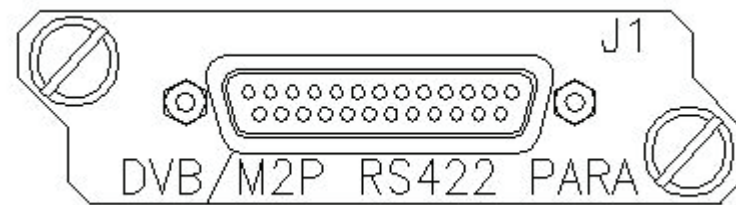


Figure 5-1f. DM240XR Rear Panel Connectors (DVB/M2P RS422 PARA)

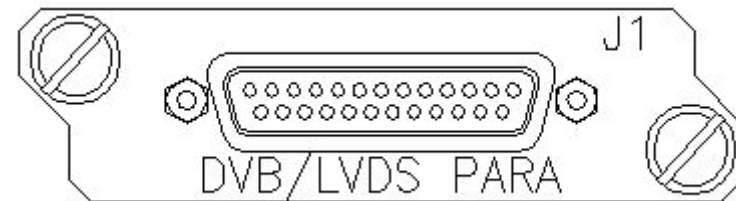


Figure 5-1g. DM240XR Rear Panel Connectors (DVB/LVDS PARA)



Figure 5-1h. DM240XR Rear Panel Connectors (HSSI)

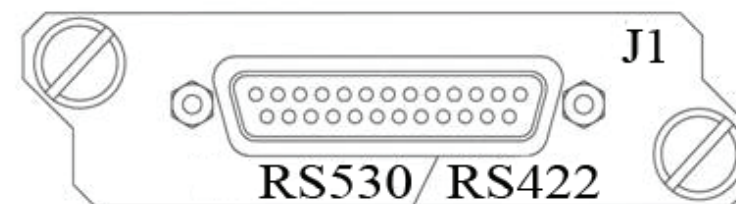


Figure 5-1i. DM240XR Rear Panel Connectors (RS530/RS422)

5.1 AC Power

The unit is powered from a 100 – 240 VAC, 50 – 60 Hz source. Maximum unit power consumption is 25 W. The switch turns power on and off to the unit. A chassis ground connection can be made at the stud located to the lower right of the AC Power Connector.

5.2 Compact Flash Interface (J5)

The Compact Flash Interface allows a Compact Flash Card to be inserted for the following four main functions:

- Normal Operation
- Feature Upgrade
- Firmware Update
- Custom Configuration

5.2.1 Feature Upgrade

If the customer requires feature upgrades such as 8PSK or 16QAM operation, contact the Radyne Sales Department for ordering information.

Once the customer has the Feature Upgrade Card, the following steps are performed:

1. Power off the unit.
2. Remove compact Flash Card.
3. Install the Feature Upgrade Compact Flash Card.
4. Power on the unit.
5. The Event LED (yellow) may blink while the feature upgrade is being added.
6. The Remote LED (green) will flash when the feature upgrade is complete, and observe that the display reads: "STATE 0004 SUCCESSFUL".
7. Power off the unit.
8. Remove the upgrade Compact Flash Card.
9. Reinstall the Compact Flash Card that was removed in Step 2.



NOTE

If the red Fault LED illuminates, contact the Radyne Corporation Customer Service Department.

The loaded features will be available the next time the unit is powered on.

5.2.2 Firmware Update

To upgrade the firmware, a new Compact Flash Card with the upgraded firmware is required for each unit.

1. Power off the unit.
2. Remove Compact Flash.
3. Install new Compact Flash.
4. Power on unit.
5. Verify the firmware under the "SYSTEM MENU".

5.2.3 Custom Configuration

For a custom configuration, the customer orders a Custom Configuration Compact Flash Card.

Perform the following steps:

1. Power off the unit.
2. Install the Custom Configuration Compact Flash Card.
3. Power the unit on.

The unit will operate in the custom configuration as long as the Compact Flash Card is installed. If the card is removed and power is cycled, the original operation is restored.

5.3 Ethernet Interface (J6)

The Ethernet Interface (J2) can be used for the monitor & control functions of the unit. The physical interface is a standard female RJ-45 Connector. Refer to Section 4.4 for programming details.

5.4 External Reference (Input)

The External Reference Input (J8) is supplied to allow the customer to phase-lock the modulator's internal oscillator to an external reference.

This female BNC Connector accepts a 1.5 – 5 Vp-p @ 50 Ohms. The frequency range of the external reference is 1 – 10 MHz in 8 kHz steps.

5.5 Remote Port (I/O)

The Remote Port Interface (J4) can be used for the monitor & control functions of the unit. The physical interface is a female 9-Pin D-Sub Connector. This bi-directional port complies with RS-485 Electrical Specifications. Refer to Section 7.6 for protocol and programming details. Pinouts are listed in Table 5-1.

Table 5-1. J4 - RS-485 Remote Control- 9-Pin 'D' Female			
Pin No.	Signal	Description	Direction
1	Tx (B)	Transmit Data (+)	Output
5	GND	Ground	---
6	Tx (A)	Transmit Data (-)	Output
8	Rx (B)	Receive Data (+)	Input
9	Rx (A)	Receive Data (-)	Input

5.6 Terminal Port (I/O)

The Terminal Port Interface (J1) can be used for the monitor & control functions of the unit. The physical interface is a female 9-Pin D-Sub Connector. This bi-directional port complies with RS-232 Electrical Specifications. Refer to Section 4.7 for terminal interface details. The pinouts are listed in Table 5-2.

Table 5-2. J1 - RS-232 Terminal Port - 9-Pin 'D' Female			
Pin No.	Signal Name	Description	Direction
3	TxD	Transmit Data	Output
2	RxD	Receive Data	Input
5	GND	Ground	---
7	RTS	Request to Send	Output
8	CTS	Clear to Send	Input

5.7 Alarm Port

The Alarm Connector (J3) is used to indicate the fault condition of the modulator to external equipment. This male 9-Pin D-Sub Connector provides connection to two Form-C relays and an open collector output. The user can distinguish between major and minor alarms with the relays. Refer to Table 5-3 for connector pinouts. Table 5-4 below describes the alarm indications.

Table 5-3. Alarm Connector J3 Pin Assignment	
Pin No.	Connection
1	Relay 1 NO
2	Relay 1 C
3	Relay 1 NC (Major Alarm)

4	Ground
5	No Connect
6	Mod Fault (Open Collector)
7	Relay 2 NO
8	Relay 2 C
9	Relay 2 NC (Minor Alarm)

Table 5-4. Alarm Indications	
Alarm	Pin Description
None	1 – 2 shorted, 7 – 8 shorted, open collector output driven low
Minor	1 – 2 shorted, 8 – 9 shorted, open collector output driven low
Major	2 – 3 shorted, 7 – 8 shorted, open collector output open

5.8 IF Output Port (J10 & J11)

The DM240XR is designed to support IF and L-band frequencies. The rear panel of the DM240XR has separate IF and L-Band connectors. Refer to figure 5.1a.

The IF frequency is programmable from 50-90Mhz to 100-180Mhz. The IF port is a 75 ohm BNC connector (J10). The output power level is programmable from –25 to 0dBm in 0.1 dBm steps..

The L-Band frequency is programmable from 950 to 2050Mhz. The L-band port is a 50 Ohm SMA female connector (J11). The output power level is programmable from -25 to 0 dBm in 0.1 dBm steps.

5.8.1 Output Monitor Port (J9)

The output monitor port on the DM240XR is an SMA female connector. The monitor is a sample of the output frequency that is –20dBc +/-5dB from the output frequency power level.

5.9 RF Redundancy Switch Control (J2)

The Each modulator has a 9-pin D-sub connector for the switch. A 1:1 cable is connected from each modulator to the switch. The pinout for the control connector is listed in Table 5-5.

Table 5-5. RF Switch Control 9-pin 'D' Female (J2)			
Pin No.	Signal	Description	Direction
5	Signal Ground	Modulator GND	Output
9	Backup Select	One modulator is designated as Backup. This line is tied low on the Backup Mod Control connector.	Input
1	+DC	+12V DC power	Output
2	nPrime_Sel	Forces On-Line output to Prime	Output

7	nBackup_Sel	Forces On-Line output to Backup	Output
8	Local Fault	Fault output of modulator	Output
4	Distant Fault	State of distant modulator	Input
3	Switch-State	Switch state monitor. Logic '1' = Prime Online	Input
6	NC	---	---

5.10 Built in ASI/Advanced ASI Interface (J7)

The “Built In” ASI/AASI comes standard on every DM-240XR unit. This ASI interface is supported on the BNC Connector. The interface complies with DVB ASI Electrical Specifications. The maximum data rate is 216 Mbps.

The AASI Interface is a specialized mode of the normal ASI Interface. The interface allows the user to input a variable rate data stream into the modulator (as long as the input data rate does not exceed the programmed data rate). The AASI Interface inserts MPEG-2 Null Packets to provide a constant data rate to the modulator.

5.11 Plug-In Interface Cards (PIICs)

The DM-240XR provides the customer with 2 standard PIIC slots. With PIIC interfaces there is greater flexibility for changing and upgrading the terrestrial interface. Each of the interfaces described below consists of a single card with a metal back plate. Each interface can be plugged into one of two slots on the rear of the unit (Figure 5-4).

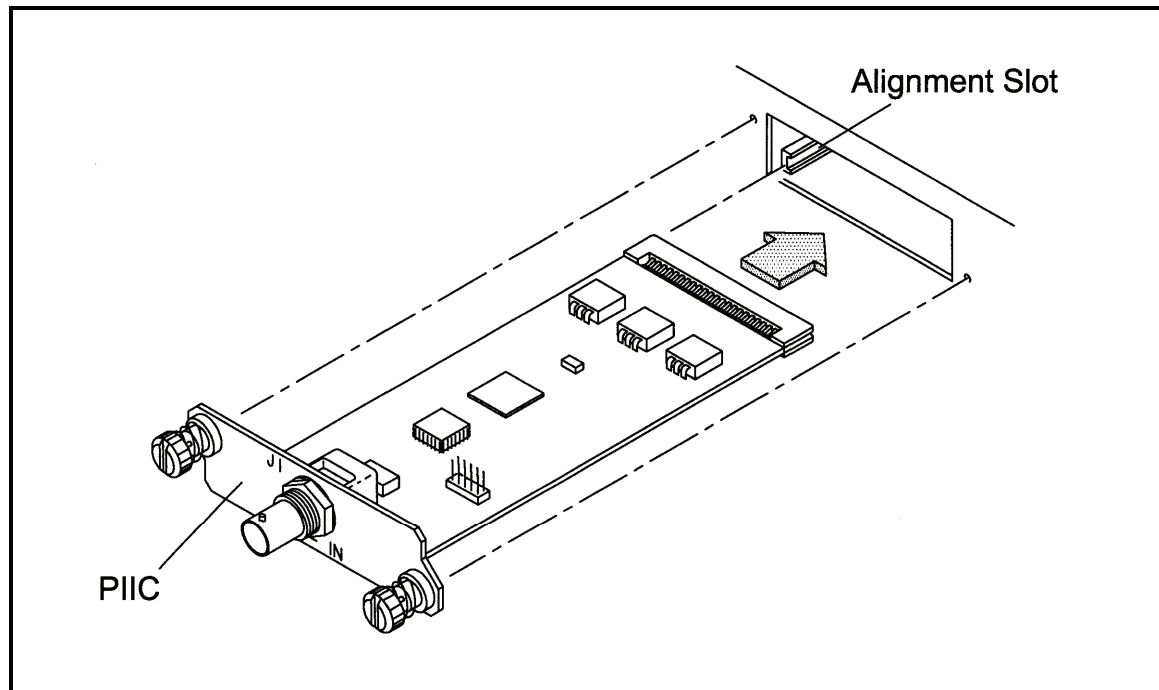


Figure 5-4, Typical PIIC

To insert the PIIC, slide the card completely into the appropriate slot (1 or 2) ensuring that it lines up with the alignment slots. When the PIIC is fully seated, tighten the two screws hand tight

5.11.1 ASI PIIC

This interface supports two terrestrial interface types.

5.11.1.1 ASI (Asynchronous Serial Interface)

The ASI interface is supported on the BNC Connector (Figure 5-1b). The interface complies with DVB ASI Electrical Specifications. The maximum data rate is 216 Mbps.

5.11.1.2 AASI (Advanced Asynchronous Serial Interface)

The AASI Interface is a specialized mode of the normal ASI Interface (Figure 5.1b). The interface allows the user to input a variable rate data stream into the modulator (as long as the input data rate does not exceed the programmed data rate). The AASI Interface inserts MPEG-2 Null Packets to provide a constant data rate to the modulator.

5.11.2 ASI Monitor

Incoming data from the active PIIC slot is output on this interface (Figure 5-1c), allowing the customer to monitor the incoming data stream. The interface complies with DVB ASI Electrical Specifications.

5.11.3 Parallel RS-422 Interface

This interface supports two terrestrial interface types and complies with RS-422 Electrical Specifications (Figure 5.1f).

5.11.3.1 M2P (Parallel, RS-422)

M2P is supported on the DB-25 female connector. It complies with RS-422 Electrical Specifications. Refer to Table 5-5 for pinouts for this connector. The maximum data rate is 238 Mbps.

Table 5-5. M2P RS-422 Parallel - 25-Pin Female		
Pin No.	Signal Name	Direction
1	OUTCLK+	Output
14	OUTCLK-	Output
2	CLK+	Input
15	CLK-	Input
3	SYNC+	Input
16	SYNC-	Input
4	VALID+	Input
17	VALID-	Input
5	D0+	Input
18	D0-	Input
6	D1+	Input

19	D1-	Input
7	D2+	Input
20	D2-	Input
8	D3+	Input
21	D3-	Input
9	D4+	Input
22	D4-	Input
10	D5+	Input
23	D5-	Input
11	D6+	Input
24	D6-	Input
12	D7+	Input
25	D7-	Input
13	Not Connected	-

5.11.3.2 DVB (Parallel, RS-422)

The DVB Interface is also supported on the DB-25 Female Connector. It complies with RS-422 Electrical Specifications. The pinouts for this connector are given in Table 5-6.

Table 5-6. DVB RS-422 Parallel, 25-Pin Female		
Pin No.	Signal Name	Direction
1	Clock +	Input
2	System GND	Ground
3	D7 +	Input
4	D6 +	Input
5	D5 +	Input
6	D4 +	Input
7	D3 +	Input
8	D2 +	Input
9	D1 +	Input
10	D0 +	Input
11	DVALID +	Input
12	PSYNC +	Input
13	Cable Shield	Input
14	Clock -	Input
15	System GND	Ground

16	D7 -	Input
17	D6 -	Input
18	D5 -	Input
19	D4 -	Input
20	D3 -	Input
21	D2 -	Input
22	D1 -	Input
23	D0 -	Input
24	DVALID -	Input
25	SYNC -	Input

5.11.4 Parallel LVDS Interface

This interface is identical to the Parallel RS-422 Interface except that it complies with the LVDS Electrical Specification.

5.11.5 HSSI Interface

The HSSI (High-Speed Serial Interface) complies with the HSSI Functional and Electrical Specifications. The physical interface is a 50 Pin SCSI-2 Type Connector. Electrical levels are ECL. The pin outs for this interface are listed in Table 5-9.

Table 5-9. HSSI (High-Speed Serial Interface) 50-Pin Connector				
Pin No. (+)	Pin No. (-)	Signal Name	Description	Direction
1	26	SG	Signal Ground	---
2	27	RT	Receive Timing	Output
3	28	CA	DCE Available	Output
4	29	RD	Receive Data	Output
5	30	LC	Loopback Circuit C	Output
6	31	ST	Send Timing (SCT)	Output
7	32	SG	Signal Ground	---
8	33	TA	DTE Available	Input
9	34	TT	Terminal Timing (SCTE)	Input
10	35	LA	Loopback Circuit A	Input
11	36	SD	Send Data	Input
12	37	LB	Loopback Circuit B	Input
13	38	SG	Signal Ground	---
14 - 18	39 - 43	5 Ancillary to DCE	Reserved	Input

19	44	SG	Signal Ground	---
20 - 23	45 - 48	4 Ancillary from DCE	Reserved	Output
24	49	TM	Test Mode	Output-

5.11.6 Ethernet 100/1000 Base-T Interface

The PIIC Ethernet Data Interface (Figure 5-1e) is a full duplex 100/1000 BaseT supported by an RJ45 connector . The EDI supports the input of generic UDP packets or Pro-MPEG COP3 formatted packets. With the Pro-MPEG input, a powerful video-specific packet-based forward error correction (FEC) algorithm is also available providing a cost-effective solution for error recovery in video streams transported over public or private IP networks.

5.11.7 EIA-530 /RS-422 Serial Interface

The EIA-530 Port is an RS-422 Connection. It is a 25-Pin Female “D” Connector. Refer to Figure 5-3 and Table 5-10 for pinouts.

Table 5-10. RS530 (RS-422) Connector			
Pin No.	Signal Name	Signal	Direction
1	Shield	---	---
2	Send Data A (-)	SD-A	Input
4	Request To Send A (-)	RS-A	Input
5	Clear To Send A (-)	CS-A	Output
6	DCE Ready)	DM-A	Output
7	Signal Ground	SGND	---
11	Terminal Timing B (+)	TT-B	Input
12	Send Timing B (+)	ST-B	Output
13	Clear T Send B (+)	CS-B	Output
14	Send Data B (+)	SD-B	Input
15	Send Timing A (-)	ST-A	Output
18	Local Loopback	LL	Input
19	Request To Send B (+)	RS-B	Input
20	Data Terminal Ready A (-)	TR-A	Input
21	Remote Loopback	RL	Input
22	Ring Indicator	IC	Output
23	Signal Common	RC	
24	Terminal Timing A (-)	TT-A	Input
25	Test Mode	TM	Output

5.11.8 G.703 Interface (Contact factory for availability)

The G.703 Interface supports the following G.703 Rates: E1, T1, E2, T2, E3, T3, and STS-1. The interface complies with G.703 Electrical Specifications. Table 5-11 lists the data rate and physical interface for each rate.



NOTE

All balanced rates use Pins 1 (-) and 9 (+) of the DB-15 connector.

Table 5-11. Available G.703 Interfaces

G.703 Rate	Data Rate (Mbps)	Wire Type	Connector	Impedance (Ohms)	Coding
E1	2.048	Coax	Female BNC	75	HDB3
E1	2.048	Pair	DB-15	120	HDB3
T1	1.544	Pair	DB-15	100	AMI/B8ZS
E2	8.448	Coax	Female BNC	75	HDB3
T2	6.312	Coax	Female BNC	75	B8ZS
T2	6.312	Pair	DB-15	110	B6ZS
E3	34.368	Coax	Female BNC	75	HDB3
T3	44.736	Coax	Female BNC	75	B3ZS
STS-1	51.84	Coax	Female BNC	75	B3ZS