



Cabling Summary

Introduction

This appendix contains details on the MGX 8850 cabling.



Note

In all cable references, the transmit direction is away from the switch, and the receive direction is towards the switch.

T3 Trunk Cabling

A trunk cable connects each T3 port on the BNC-2T3 back card to a T3 port on the co-located BPX-8600-series node. Refer to Table B-1 and Table B-2 for details.

Table B-1 Trunk Cables

Cable Parameter	Description
Type:	75-ohm coax cable (RG-59 B/U for short runs, AT&T 734A for longer runs). Two per T3 line (XMT and RCV).
Max. Length:	450 feet max. between the BPX 8600-series node and the MGX 8850 node.
Connector:	Terminated in male BNC; Rx is received from trunk, Tx is transmitted to trunk.

Table B-2 T3 Connector Pin Assignments

Connector	Description
Rx BNC	Receive T3 from trunk
Tx BNC	Transmit T3 to trunk

Frame Relay Cabling

This section describes the cabling and connector pinouts for the Frame Relay cards.

T1 Cabling

Trunk cables connect the customer DSX-1 cross-connect point or T1 Channel Service Unit (CSU) to the node at the T1 back card. Refer to Table B-3 and Table B-4 for details.

Table B-3 T1 Trunk/Circuit Line Cabling Specification

Cable Parameter	Description
Cable Type:	Western Electric 22 AWG, ABAM individually shielded twisted pair (100 ohm balanced). Two pair per T1 line (1 transmit and 1 receive).
Cable Connector:	Male DB-15 subminiature.
Max. Cable Length:	533 ft. (162 m) maximum between the MGX 8850 node and the first repeater or CSU. Selection of cable length equalizers.

Table B-4 T1 Connector Pin Assignments

Pin No.	Description
1	Transmit, Tip
2	Transmit Pair Shield
3	Receive, Tip
4	Receive Pair Shield
9	Transmit, Ring
11	Receive, Ring



Note

Transmit direction is towards the T1 trunk.

E1 Cabling

BNC Connector

E1 trunk cables connect the customer DSX-1 cross-connect point or E1 Channel Service Unit (CSU) to the node at the FRSM E1 back card (BNC-8E1). Refer to Table B-5 and Table B-6.

Table B-5 E1 Trunk/Circuit Line Cabling Specification

Cable Parameter	Description
Cable Type:	75-ohm coax cable for unbalanced connection. Two cables/pairs (1 transmit, 1 receive) per E1 line.
Cable Connector:	Two female BNC for unbalanced connection; male DB15 for balanced connection. Refer to Tables A-2 and A-3 for pinouts.
Max. Cable Length:	Approximately 100 meters maximum between the MGX 8850 node and the first repeater or CSU. Equalizer for cable length.

Table B-6 E1 Connector Pin Assignments (unbalanced)

Connector	Description
Rx BNC	Receive E1 from trunk
Tx BNC	Transmit E1 to trunk

DB15 Connector

E1 trunk cables connect the customer DSX-1 cross-connect point or E1 CSU to the node at the FRSM E1 back card (DB15-8E1). Refer to Table B-7 and Table B-8.

Table B-7 E1 Trunk/Circuit Line Cabling Specification

Cable Parameter	Description
Cable Type: DB15-8E1	Western Electric 22 AWG, ABAM individually shielded twisted pair (120 ohm balanced). Two pair per T1 line (1 transmit and 1 receive).
Cable Connector:	Male DB-15 subminiature.
Max. Cable Length:	533 ft. (162 m) maximum between the MGX 8850 node and the first repeater or CSU. Selection of cable length equalizers.

Table B-8 E1 Connector Pin Assignments

Pin No.	Description
1	Transmit, Tip
2	Transmit Pair Shield
3	Receive, Tip
4	Receive Pair Shield
9	Transmit, Ring
11	Receive, Ring

**Note**

Transmit direction is towards the E1 trunk.

12IN1-S4 V.35/X.21 Back Card

The back card for the MGX-FRSM-HS1/B is the 12IN1-S4. Each port on the back card connects through a DTE version or DCE version of the Cisco 12IN1 cable. For the signals on the back card, see Table B-10 and Table B-11. The tables show the signal acronym, signal name, and signal source. The signal depends whether the backcard connector is either DTE or DCE and whether the backcard has been set as either X.21 or V.35 as shown in Table B-9. For the part numbers of the standard and non-standard versions of the 12IN1 cables, see Table B-12.

Table B-9 12IN1-S4 cable types

Cable Type	X.21	V.35
DCE	X.21 DCE	V.35 DCE
DTE	X.21 DTE	V.35 DTE

**Note**

The cable type and part number are printed on a plastic band located near the smaller connector.

Table B-10 V.35 signals

Signal	Name	Source
RTS	Request to Send	DTE
DTR	Data Terminal Ready	DTE
CTS	Clear To Send	DCE
DSR	Data Set Ready	DCE
DCD	Data Carrier Detect	DCE
GND	Ground	both
B_LL	Local Loopback	DTE
GND	Ground	both
TxD+	Transmit Data	DTE
TxD-	Transmit Data	DTE
RxD+	Receive Data	DCE
RxD-	Receive Data	DCE
TXCE	Secondary Clear to Send	DTE
TXCE	Secondary Clear to Send	DTE
RxC+	Receive Clock	DCE
RxC-	Receive Clock	DCE
TxC+	Transmit Clock	DCE
TxC-	Transmit Clock	DCE

Table B-11 X.21 Signals

Signal	Name
Mode_2	Local connections
Mode_DCE	Local connections
Gournd	Shield Ground
O_TXD/RSC+	Transmit +
OTXD/RXD-	Transmit -

Table B-11 X.21 Signals (continued)

Signal	Name
O_RTS/CTS+	Control +
O_RTS/CTS-	Control -
I_RDX/TXD+	Receive +
I_RXD/TXD-	Receive -
ICTS/RTS+	Indication +
I_CTS/RTS-	Indication -
I_RXC/TXCE+	Timing +
I_RXC/TXCE-	Timing -
GND	CCT Ground

Table B-12 Cable Part Numbers for MGX-FRSM-HS1/BV

Type of Cable	Far End Connector	Part Number
X.21 DTE	male	72-1440-01
X.21 DCE	fremale	72-1427-01
V.35 DTE	male (standard)	72-1428-01
V.35 DTE	female (atypical)	72-1436-01
V.35 DCE	female (standard)	72-1429-01
V.35 DCE	male (atypical)	72-1437-01
V.35 DTE-DCE		72-1441-01
Straight-through		72-1478-01
Loopback plug		72-1479-01

HSSI Port Connectors

The High Speed Serial Interface (HSSI) port connects through a female SCSI-II connector. This connector accords with ANSI/TIA/EIA-613. Refer to Table B-13 for the pinouts.

Table B-13 Pinouts for SCSI-II Connector

Pin No.	Name	Signal Function	Polarity	Signal Source
11	SD	Send Data	+	DTE
36			-	
4	RD	Receive Data	+	DCE
29			-	
6	ST	Send Timing	+	
31			-	
2	RT	Receive Timing	+	

Table B-13 Pinouts for SCSI-II Connector (continued)

Pin No.	Name	Signal Function	Polarity	Signal Source
27			-	
6	TT	Terminal Timing	+	DCE
13			-	
3	CA	DCE Available	+	DCE
28			-	
8	TA	DTE Available	+	DTE
33			-	
10	LA	Loop Ckt A	+	DTE
35			-	
12	LB	Loop Ckt B	+	DTE
37			-	
5	LC	Loop Ckt C	+	DCE
30			-	
1,26,7,32,13,3 8,19,44,25,50	SG	Signal Ground		

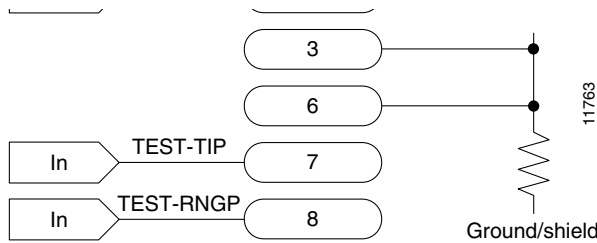
Cabling for RJ-48 Connectors on T1 and E1 Ports

For T1 and E1 ports that connect through a RJ-48 connector, each connector has:

- Transmit TIP pin
- Transmit RING pin
- Receive TIP pin
- Receive RING pin
- Two pins for shielded ground

An illustration of the connector wiring appears in Figure B-1.

Figure B-1 RJ-48 Connectors



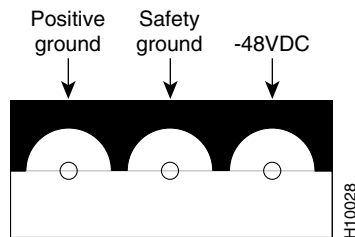
DC Power Cabling

DC Power connections are made to the DC Power Entry Modules at the rear of the MGX 8850 node. (See Figure B-2.) See Table B-14 and Table B-15 for acceptable cable and wire types. Cisco normally does not provide wiring for DC-powered systems. See Table B-14 for details on DC wiring.

Table B-14 DC Power Wiring

Cable Parameter	Description
Wiring:	Three conductor, 12 AWG recommended wire gauge, min. 60°C insulation rating, copper conductors only. Solid or stranded wires. Wire insulation stripped back 0.25 in (6 mm) at the MGX 8850 connector end.
Connection:	EURO Block.

Figure B-2 DC Power Connections



AC Power Cabling

Either Cisco Systems or the customer can provide the AC power cord. See Table B-15 for the power cords that Cisco can supply. In addition, you can special-order AC cables with other plugs or different lengths. If you want to construct the power cord, it must mate with an IEC320 16/20A male receptacle on the back of the AC power module.

Table B-15 AC Power Cables

Cable Parameter	Description
Cable:	Provided with 8 feet (2.3 m) of 3-conductor wire with plug.
Plug: customer end	20 A NEMA L620, 3-prong plug (domestic U.S.) 13 A 250 Vac BS1363, 3-prong fused plug (UK, Ireland) CEE 7/7 (Continental Europe) AS3112 (Australia/New Zealand) CEI23-16/VII (Italy)

Control and Clock Cabling

This section describes the cables that can connect to the PXM-UI card.

Maintenance and Control Ports

The Maintenance (or Modem) port and the Control (or Console) port connect a node to an ASCII terminal, workstation, or modem for remote alarm reporting or system monitoring. Refer to Table B-16 for a description of the cabling and Table B-17 for the pinout of the associated RJ-48 connector.

Table B-16 Maintenance and Control Port Cabling

Cable Parameter	Description
Interface:	EIA/TIA-232—both are DTE ports.
Suggested Cable:	24 AWG, 25-wire. A straight-through EIA/TIA-232 cable provides a terminal or printer connection. For an interface with modems on either port, a null modem cable may be necessary.
Cable Connector:	RJ-48, subminiature, male. Table B-17 contains a list of the port pin assignments.
Max. Cable Length:	50 feet (15 m)

Table B-17 Maintenance and Control Port Pin Assignments

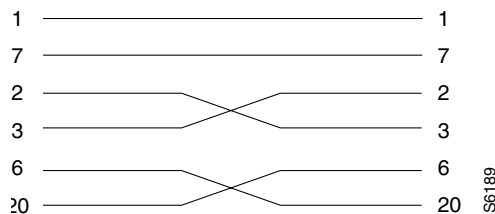
Pin No.	Name	Description
1	RTS out	Request to Send
2	DTR out	Data Terminal Ready
3	TxD	Transmit Data
4	GND	Chassis ground

Table B-17 Maintenance and Control Port Pin Assignments (continued)

Pin No.	Name	Description
1	RTS out	Request to Send
5	GND	Chassis ground
6	RxD	Receive Data
7	DSR	Data Set Ready
8	CTS	Clear to Send

Modem Cable

shows a modem cable that is used for connecting modems to the MGX 8850 control and maintenance ports.

Figure B-3 Null Modem Cable

External Clock Input Cabling

The external clock input cable connects the external clock inputs through the T3E3-D, T3E3-B and SMF-155 EXT. TMG. connectors. The clock may be 1.544 Mbps for T3E3-D or 2.048 Mbps for T3E3-D. See Table B-18 through Table B-21.

T1/E1 Clock Cabling

The DB15 clock port can accept a T1 or E1 BITS clock input.

Table B-18 External Clock Cabling—T3E3-D or SMF-155

Cable Parameter	Description
Cable Type:	Western Electric 22 AWG, ABAM individually shielded twisted pair (100 ohm balanced). One pair per T1 line (1 receive).
Cable Connector:	Male DB-15 subminiature. Refer to Table B-19 for pinouts.
Max. Cable Length:	533 ft. (162 m) maximum between the MGX 8850 node and the first repeater or CSU. Selection of cable length equalizers is used. Wire build-out is required.

Table B-19 T1 Connector Pin Assignments for EXT.TMG

Pin No.	Description
1	
2	Transmit Pair Shield
3	Receive, Tip
4	Receive Pair Shield
9	
11	Receive, Ring

E1 Clock Cabling

Table B-20 E1 Clock Cabling—T3E3-B

Cable Parameter	Description
Cable Type	75-ohm coax cable for unbalanced connection. One cable pair per E1 clock input.
Cable Connector:	One female BNC for unbalanced connection; male DB15 for balanced connection.
Max. Cable Length:	Approximately 100 meters maximum between the MGX 8850 node and the first repeater or CSU. Equalizer for cable length.

Table B-21 E1 Connector Pin Assignments for EXT.TMG (unbalanced)

Connector	Description
Rx BNC	Receive E1 from trunk

External Alarm Cabling

The external alarm cable connects to the Alarm connector on the PXM-UI card. See Table B-22 for physical characteristics of the cable and Table B-23 for the pinouts.

Table B-22 External Alarm Cabling

Cable Parameter	Description
Interface:	Dry-contact relay closure.
Wire:	24 AWG, shielded, 6-pair.
Connector:	DB-15, Subminiature, male.

Table B-23 Network Alarm Pin Assignments

Pin No.	Alarm	Description
1	Audible—Major	Normally open
2		Common
9		Normally closed
4	Visual—Major	Normally open
5		Common
12		Normally closed
7	unused	n.c.
8	unused	n.c.
3	Audible—Minor	Normally open
11		Common
10		Normally closed
6	Visual—Minor	Normally open
14		Common
13		Normally closed
15	unused	n.c.

Standard MGX 8850 Cables

For a list of the standard cables that Cisco can supply for the MGX 8850 switch, see Table B-24. The suffix to the model number indicates the length of the cable. For example, 5610-50 indicates a 50-foot cable. Cables are available in standard lengths of 10 ft. (3 m), 25 ft. (7.6 m), 50 ft. (15 m), 75 ft. (22.8 m), and 100 ft. (30 m). Lengths of 100 ft. (30 m) to 600 ft. (183 m) are available through a special order.

Where applicable, Table B-24 includes the gender of the connector and the number of pins. For example, EIA/TIA-232/M25-M25 indicates a cable terminated with a male DB25 at both ends.

Table B-24 Standard Cables Available from Cisco

Model Number	Description	Usage
T3-E3-10	75 Ω coax/BNC-BNC, 10'	T3 or E3 trunk interface
T3-E3-25	25'	
T3-E3-50	50'	
T3-E3-75	75'	
T3-E3-xx	length to be specified	
5620	EIA/TIA-232/M25-F25	PXM-UI maintenance port to control terminal, WAN Manager, or external window device
5621	EIA/TIA-232/M25-M25 special	Control or maintenance port to modem
5601	Ground cable	DC power

Table B-24 Standard Cables Available from Cisco (continued)

Model Number	Description	Usage
5670	Molex-pigtail	DC power
5671	Spade lug-pigtail	DC power

Redundancy Y-Cable

Special Y-cables provide line redundancy where applicable. (The Service Resource Module can also provide redundancy where certain Y-cables do not apply.) Table B-25 lists the Y-cables used with various MGX 8850 cards.

Table B-25 Y-Cable Product Names for Applicable Cards

Applicable Card Name	Connector Hardware	Type/Standard Interface	Product Number
PXM-UI	RJ45	EIA/TIA-232	CAB-5684-06 (6-inch Y)
PXM-UI	RJ45	EIA/TIA-232	CAB-5684-18
PXM-UI	RJ45	T1 BITS Clock	CAB-5686-06 (6-inch Y)
PXM-UI	SMB	E1 BITS Clock	CAB-5681-06 (6-inch Y)
PXM-UI	SMB	E1 BITS Clock	CAB-5681-18 (18-inch Y)
PXM-UI	DB15	Alarm Output	CAB-5607-10 (10-inch Y)
PXM-4-155	SC	SMF, MMF	CAB-SMF-Y-SC
PXM-1-622	SC	SMF	CAB-SMF-Y-SC
PXM-2T3E3	BNC	75 ohm, coaxial	CAB-T3E3-Y
MGX-BNC-3T3-M	BNC	75 ohm, coaxial	CAB-T3E3-Y
MGX-FRSM-2T3E3	BNC	75 ohm, coaxial	CAB-T3E3-Y
MGX-CESM-T3E3	BNC	75 ohm, coaxial	CAB-T3E3-Y
MGX-FRSM-HS2	SCSI2		CAB-SCSI2-Y
SMSCFC010250-01M	SC to FC		72-1246-01