

Module Specifications

B

This appendix provides information about line modules, SRP modules, and I/O modules. All line modules, with the exception of the IPsec Service and Tunnel Service module, combine with I/O modules to provide particular capabilities and connections. In this appendix, the term module assembly is used to describe the combination of a line module and an I/O module.

Topic	Page
Module Assemblies and Model Compatibility	B-1
Performance Specifications	B-4
Connection Information	B-7

Module Assemblies and Model Compatibility

Table B-1 provides a description of the module assemblies

Table B-1 Module assemblies available for ERX edge routers

Module Assembly Name	Module Assembly Description	Type	Model Compatibility	SRP Module Compatibility
CE1	Channelized E1	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
cOC3/STM1 F0	OC3/STM channelized to DS3, DS1, E1, and DS0 (single mode and multimode)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+

Table B-1 Module assemblies available for ERX edge routers (continued)

Module Assembly Name	Module Assembly Description	Type	Model Compatibility	SRP Module Compatibility
cOC12/STM4 F0	OC12/STM4 channelized to DS3, DS1, E1, and DS0 (single mode and multimode; multimode with and without SONET APS redundancy)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
CT1	Channelized T1	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
CT3	Channelized T3 (3 ports)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
CT3 12 F0	Channelized T3 (12 ports)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
E3 ATM	Unchannelized E3 for ATM	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
E3 FRAME (3 ports)	Unchannelized E3 for Frame (3 ports)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
E3 FRAME (12 ports)	Unchannelized E3 for Frame (12 ports)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
FE-2	Fast Ethernet (2 ports)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
FE-8	Fast Ethernet (8 ports)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
Gigabit Ethernet	Gigabit Ethernet (1000 Base-SX, 1000 Base-LH, 1000 Base-ZX) ^a	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+

Table B-1 Module assemblies available for ERX edge routers (continued)

Module Assembly Name	Module Assembly Description	Type	Model Compatibility	SRP Module Compatibility
HSSI	High Speed Serial Interface	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
IPSec Service	IPSec Tunnel Service	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
OC3 (dual port)	OC3/STM1 for ATM and Frame, unchannelized, concatenated (2 ports, single mode and multimode)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
OC3/STM1 ATM	Unchannelized, concatenated OC3/STM1 for ATM (4 ports, single mode and multimode)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
OC3/STM1 POS	Unchannelized, concatenated OC3/STM1 for POS (4 ports, single mode and multimode)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
OC12/STM4 ATM	Unchannelized, concatenated OC12/STM4 for ATM (single mode and multimode; with and without SONET APS redundancy)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
OC12/STM4 POS	Unchannelized, concatenated OC12/STM4 for POS (single mode and multimode; with and without SONET APS redundancy)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
SRP-5G	Switch route processor (5 Gbps)	N/A	ERX-700 system	SRP-5G
SRP-5G+	Switch route processor (5 Gbps)	N/A	ERX-705 system	SRP-5G+
SRP-10G	Switch route processor (10 Gbps)	N/A	ERX-700 system ERX-1410 system	SRP-10G

Table B-1 Module assemblies available for ERX edge routers (continued)

Module Assembly Name	Module Assembly Description	Type	Model Compatibility	SRP Module Compatibility
SRP-40G SRP-40G+	Switch route processor (40 Gbps)	N/A	ERX-1440 system	SRP-40G SRP-40G+
T3 ATM (3 ports)	Unchannelized T3 for ATM (3 ports)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
T3 FRAME (3 ports)	Unchannelized T3 for Frame (3 ports)	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G
T3 FRAME (12 ports)	Unchannelized T3 for Frame (12 ports)	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
TSM	Tunnel Service for IP Tunnels, L2F Tunnels and LNS Termination	ASIC	ERX-700 series ERX-1400 series	SRP-5G+ SRP-10G SRP-40G SRP-40G+
X.21/V.35	X.21/V.35 synchronous serial interface	Non-ASIC	ERX-700 series ERX-1410 system	SRP-5G SRP-5G+ SRP-10G

a. Newer GE I/O module uses a range of small form-factor pluggable transceivers (SFPs) that support different operating modes and distances.

Performance Specifications

Table B-2 provides details about the performance of the line module assemblies.

Table B-2 Performance specifications for module assemblies

Name	Capability	Redundancy Support	Power Use
CE1	E1 HDLC Framing	1:N redundancy	40 W
cOC3/STM1 F0 (single mode and multimode)	OC3/STM1 DS3 T1, E1 DS0 HDLC Framing	1:N redundancy	130 W

Table B-2 Performance specifications for module assemblies (continued)

Name	Capability	Redundancy Support	Power Use
cOC12/STM4 F0 (single mode and multimode, multimode with and without SONET APS redundancy)	OC12/STM4 OC3/STM1 DS3 T1, E1 DS0 HDLC Framing	<ul style="list-style-type: none"> 1:N redundancy SONET APS redundancy^a 	130 W
CT1	DS1, DS0 HDLC Framing	1:N redundancy	40 W
CT3	DS3, DS1, DS0 HDLC Framing	1:N redundancy	60 W
CT3 12 F0	DS3, DS1, DS0 HDLC Framing	1:N redundancy	130 W
E3 ATM	ATM/AAL5	1:N redundancy	60 W
E3 FRAME (3 ports)	E3 HDLC Framing	1:N redundancy	60 W
E3 FRAME (12 ports)	E3 HDLC Framing	N/A	135 W
FE-2	Ethernet (IEEE 802.3) 10/100Base-T	N/A	60 W
FE-8	Ethernet (IEEE 802.3) 10/100Base-T	N/A	130 W
Gigabit Ethernet	Ethernet (IEEE 802.3z) 1000 Base-SX 1000 Base-LH 1000 Base-ZX	Redundant port	130 W
HSSI	Up to 44.736 MHz data rate HDLC	N/A	60 W
IPSec Service	IPSec Tunnels	Multiple IPSec Service modules provide redundancy	130 W
OC3 (dual port)	OC3c/STM1 ATM/AAL5 HDLC Framing	N/A	60 W
OC3/STM1 ATM (single mode and multimode)	OC3/STM-1, ATM:AAL5	1:N redundancy	130 W

Table B-2 Performance specifications for module assemblies (continued)

Name	Capability	Redundancy Support	Power Use
OC3/STM1 POS (single mode and multimode))	OC3/STM-1, HDLC Framing	1:N redundancy	120 W
OC12/STM4 ATM (single mode and multimode)	OC12/STM-4, ATM:AAL-5	<ul style="list-style-type: none"> • 1:N redundancy • SONET APS redundancy^a 	130 W
OC12/STM4 POS (single mode and multimode)	OC12/STM-4 HDLC Framing	1:N redundancy	120 W
SRP-5G (5 Gbps)	Ethernet (IEEE 802.3) 10/100Base-T RS-232	1:1 redundancy	100 W
SRP-5G+ (5 Gbps)	Ethernet (IEEE 802.3) 10/100Base-T RS-232	1:1 redundancy	125 W
SRP-10G (10 Gbps)	Ethernet (IEEE 802.3) 10/100Base-T RS-232	1:1 redundancy	125 W
SRP-40G (40 Gbps)	Ethernet (IEEE 802.3) 10/100Base-T RS-232	1:1 redundancy	210 W
SRP-40G+ (40 Gbps)	Ethernet (IEEE 802.3) 10/100Base-T RS-232	1:1 redundancy	210 W
T3 ATM (3 ports)	ATM/AAL5	1:N redundancy	60 W
T3 FRAME (3 ports)	DS3 Subrate DS3 HDLC Framing	1:N redundancy	60 W
T3 FRAME (12 ports)	DS3 Subrate DS3 HDLC Framing	N/A	135 W
TSM	IP Tunnels LNS Termination	Multiple TSMs provide redundancy	130 W
X.21/V.35	HDLC	N/A	60 W

^a.Not all I/O modules of this type support SONET APS redundancy. See *Release Notes* for details of which I/O modules support SONET APS redundancy.

Connection Information

Table B-3 shows the names of the line modules and I/O modules that you can combine to form the different module assemblies. This table also provides cabling specifications for the I/O modules.

Table B-3 Connection information for module assemblies

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
CE1	CE1	CE1 FULL I/O	20	<ul style="list-style-type: none"> RJ-48C, 120 ohm BNC, 75 ohm via a balun panel that connects to the I/O module 	<ul style="list-style-type: none"> Use shielded cables to maintain EMC compliance. The transmitted signal complies with ITUT G.703: Physical/electrical characteristics of hierarchical digital interfaces (November 2001) for cable lengths up to 450 m (492 yards).
cOC3/STM1 multimode	cOCx/STMx F0	cOC3 STM1 F0 I/O MULTI MODE	4	SC full duplex	<ul style="list-style-type: none"> Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm Center wavelength: 1310 nm Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
cOC3/STM1 single mode intermediate reach	cOCx/STMx F0	cOC3 STM1 F0 I/O SINGLE MODE	4	SC full duplex	<ul style="list-style-type: none"> Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm Center wavelength: 1310 nm Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm Rated for 15 km (9.3 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
cOC3/STM1 single mode long reach	cOCx/STMx F0	cOC3 STM1 F0 I/O LONG HAUL	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Fiber type: 9-micron core • Rated for 40 km (24.8 miles) of 9-micron core cable
cOC12/STM4 multimode without SONET APS redundancy	cOCx/STMx F0	cOC12 STM4 F0 I/O MULTI MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
cOC12/STM4 multimode with SONET APS redundancy	cOCx/STMx F0	COC12 F0 APS MULTI MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
cOC12/STM4 single mode intermediate reach	cOCx/STMx F0	cOC12 STM4 F0 I/O SINGLE MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
cOC12/STM4 single mode long reach	cOCx/STMx F0	cOC12 STM4 F0 I/O LONG HAUL	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Fiber type: 9-micron core • Rated for 40 km (24.8 miles) of 9-micron core cable
CT1	CT1	CT1 FULL I/O	24	RJ-48C 100 ohm	<ul style="list-style-type: none"> • Use shielded cables to maintain EMC compliance. • The line interface unit supports multiple line build-outs. • Signal strength is software controlled. • The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
CT3	CT3	CT3/T3 I/O	3	BNC 75 ohm	<ul style="list-style-type: none"> The line interface unit supports two line build-outs: <ul style="list-style-type: none"> › 0–68.5 m (0–225 feet) › 69–137 m (226–450 feet) Signal strength is software controlled. The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).
CT3 12 F0	CT3/T3-F0	CT3/T3 12 I/O	12	BT43 SMB (cable that adapts to 75-ohm BNC is available)	<ul style="list-style-type: none"> The line interface unit supports two line build-outs: <ul style="list-style-type: none"> › 0–68.5 m (0–225 feet) › 69–137 m (226–450 feet) Signal strength is software controlled. The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).
E3 ATM	E3 ATM	E3 I/O	3	BNC 75 ohm	The transmitted signal complies with ITUT G.703: Physical/electrical characteristics of hierarchical digital interfaces (November 2001) for cable lengths from 0–137 m (0–450 feet).
E3 FRAME (3 ports)	E3 FRAME	E3 I/O	3	BNC 75 ohm	The transmitted signal complies with ITUT G.703: Physical/electrical characteristics of hierarchical digital interfaces (November 2001) for cable lengths from 0–137 m (0–450 feet).

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
E3 FRAME (12 ports)	COCX-F3	E3-12 FRAME I/O	12	BT43 SMB (cable that adapts to 75-ohm BNC is available)	The transmitted signal complies with ITUT G.703: Physical/electrical characteristics of hierarchical digital interfaces (November 2001) for cable lengths from 0–137 m (0–450 feet).
FE-2	FE-2	FE-2 I/O	2	RJ-45	<ul style="list-style-type: none"> For 10-Mbps operation, use CAT 3, 4, or 5 UTP cable. For 100-Mbps operation, use only CAT 5 UTP cable. The transmitted signal complies with IEEE 802.3/802.3u for cable lengths up to 100 m (328 feet).
FE-8	GE/FE	FE-8 I/O	8	RJ-45	<ul style="list-style-type: none"> For 10-Mbps operation, use CAT 3, 4, or 5 UTP cable. For 100-Mbps operation, use only CAT 5 UTP cable. The transmitted signal complies with IEEE 802.3/802.3u for cable lengths up to 100 m (328 feet).
GE 1000 Base-SX	GE/FE	GE I/O SFP ^a	1 active 1 redundant	LC full duplex	<ul style="list-style-type: none"> Tx power <ul style="list-style-type: none"> › min: –9.5 dBm › max: –4 dBm Center wavelength: 850 nm Rx input power <ul style="list-style-type: none"> › min: –17 dBm › max: –3 dBm Rated for 275 m (300 yards) over 62.5-micron core cable Rated for 550 m (601 yards) over 50-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
GE 1000 Base-LH	GE/FE	GE I/O SFP ^a	1 active 1 redundant	LC full duplex	<ul style="list-style-type: none"> • Tx power <ul style="list-style-type: none"> › min: -9.5 dBm › max: -3 dBm • Center wavelength: 1300 nm • Rx input power <ul style="list-style-type: none"> › min: -20 dBm › max: -3 dBm • Rated for 10 km (6.2 miles) over 10-micron core cable
GE 1000 Base-ZX	GE/FE	GE I/O SFP ^a	1 active 1 redundant	LC full duplex	<ul style="list-style-type: none"> • Tx power <ul style="list-style-type: none"> › min: -3 dBm › max: 2 dBm • Center wavelength: 1550 nm • Rx input power <ul style="list-style-type: none"> › min: -23 dBm › max: -3 dBm • Rated for 70 km (43.4 miles) over 10-micron core cable
GE multimode ^b	GE/FE	GE I/O MULTI MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power <ul style="list-style-type: none"> › min: -9.5 dBm › max: -4 dBm • Center wavelength: 850 nm • Rx input power <ul style="list-style-type: none"> › min: -17 dBm › max: -3 dBm • Rated for 275 m (300 yards) over 62.5-micron core cable • Rated for 550 m (601 yards) over 50-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
GE single mode ^b	GE/FE	GE I/O SINGLE MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power <ul style="list-style-type: none"> › min: –11 dBm › max: –3 dBm • Center wavelength: 1300 nm • Rx input power <ul style="list-style-type: none"> › min: –20 dBm › max: –3 dBm • Rated for 550 m (601 yards) over 62.5-micron core or 50-micron core MM fiber • Rated for 5 km (3.1 miles) over 10-micron core cable
HSSI	HSSI-3F	HSSI-3	3	Standard HSSI connector: 2-row, 50-pin, receptacle header with rails and latch blocks	<ul style="list-style-type: none"> • 50 feet (15.24 m) maximum cable length
IPSec Service	IPSEC SERVICE	No I/O module	N/A	N/A	N/A
OC3 (dual port) multimode	OC3	OC3 I/O MULTI MODE	2	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: –19 dBm › max: –14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: –30 dBm › max: –14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0–9 dB or 50-micron core cable with an optical loss of 7 dB
OC3 (dual port) single mode	OC3	OC3 I/O SINGLE MODE	2	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: –15 dBm › max: –8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: –31 dBm › max: –8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
OC3/STM1 ATM multimode	OCx/STMx ATM	OC3-4 I/O MULTI MODE	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
OC3/STM1 ATM single mode, intermediate reach	OCx/STMx ATM	OC3-4 I/O SINGLE MODE	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
OC3/STM1 ATM single mode, long reach	OCx/STMx ATM	OC3-4 I/O LONG HAUL	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Rated for 40 km (24.8 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
OC3/STM1 POS multimode	OCx/STMx POS	OC3-4 I/O MULTI MODE	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
OC3/STM1 POS single mode, intermediate reach	OCx/STMx POS	OC3-4 I/O SINGLE MODE	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
OC3/STM1 POS single mode, long reach	OCx/STMx POS	OC3-4 I/O LONG HAUL	4	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Fiber type: 9 micron core • Rated for 40 km (24.8 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
OC12/STM4 ATM multimode without SONET APS redundancy	OCx/STMx ATM	OC12 STM4 I/O MULTI MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
OC12/STM4 ATM multimode with SONET APS redundancy	OCx/STMx ATM	OC12 STM4 APS MULTI MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB
OC12/STM4 ATM single mode, intermediate reach without SONET APS redundancy	OCx/STMx ATM	OC12 STM4 I/O SINGLE MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
OC12/STM4 ATM single mode, intermediate reach with SONET APS redundancy	OCx/STMx ATM	OC12 STM4 APS SINGLE MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
OC12/STM4 ATM single mode, long reach	OCx/STMx ATM	OC12 STM4 I/O LONG HAUL	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Fiber type: 9 micron core • Rated for 40 km (24.8 miles) of 9-micron core cable
OC12/STM4 POS multimode without SONET APS redundancy	OCx/STMx POS	OC12 STM4 I/O MULTI MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0-9 dB or 50-micron core cable with an optical loss of 7 dB

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
OC12/STM4 POS multimode with SONET APS redundancy	OCx/STMx POS	OC12 STM4 APS MULTI MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -19 dBm › max: -14 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -30 dBm › max: -14 dBm • Rated for 2 km (1.2 miles) over 62.5-micron core cable with an optical loss of 0–9 dB or 50-micron core cable with an optical loss of 7 dB
OC12/STM4 POS single mode, intermediate reach without SONET APS redundancy	OCx/STMx POS	OC12 STM4 I/O SINGLE MODE	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
OC12/STM4 POS single mode, intermediate reach with SONET APS redundancy	OCx/STMx POS	OC12 STM4 APS SINGLE MODE	1 active 1 redundant	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -15 dBm › max: -8 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -31 dBm › max: -8 dBm • Rated for 15 km (9.3 miles) of 9-micron core cable
OC12/STM4 POS single mode, long reach	OCx/STMx POS	OC12 STM4 I/O LONG HAUL	1	SC full duplex	<ul style="list-style-type: none"> • Tx power: <ul style="list-style-type: none"> › min: -5.0 dBm › max: 0 dBm • Center wavelength: 1310 nm • Rx input power: <ul style="list-style-type: none"> › min: -34 dBm › max: -7 dBm • Rated for 40 km (24.8 miles) of 9-micron core cable

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
SRP (5 Gbps) ^b	SRP-5G	SRP I/O	7	<ul style="list-style-type: none"> • Terminal blocks • BNC • Wire wrap posts • RJ-45 • RS-232 (DB-9) 	See <i>Chapter 4, Cabling the ERX System</i> .
SRP (5 Gbps)	SRP-5G+	SRP I/O	7	<ul style="list-style-type: none"> • Terminal blocks • BNC • Wire wrap posts • RJ-45 • RS-232 (DB-9) 	See <i>Chapter 4, Cabling the ERX System</i> .
SRP (10 Gbps)	SRP-10G	SRP I/O	7	<ul style="list-style-type: none"> • Terminal blocks • BNC • 75 ohm • Wire wrap posts • RJ-45 • RS-232 (DB-9) 	See <i>Chapter 4, Cabling the ERX System</i> .
SRP (40 Gbps) ^b	SRP-40G	SRP I/O	7	<ul style="list-style-type: none"> • Terminal blocks • BNC • 75 ohm • Wire wrap posts • RJ-45 • RS-232 (DB-9) 	See <i>Chapter 4, Cabling the ERX System</i> .
SRP (40 Gbps)	SRP-40G+	SRP I/O	7	<ul style="list-style-type: none"> • Terminal blocks • BNC • 75 ohm • Wire wrap posts • RJ-45 • RS-232 (DB-9) 	See <i>Chapter 4, Cabling the ERX System</i> .

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
T3 ATM (3 ports)	T3 ATM	CT3/T3 I/O	3	BNC 75 ohm	<ul style="list-style-type: none"> The line interface unit supports two line build-outs: <ul style="list-style-type: none"> › 0–68.5 m (0–225 feet) › 69–137 m (226–450 feet) Signal strength is software controlled. The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).
T3 FRAME (3 ports)	T3 FRAME	CT3/T3 I/O	3	BNC 75 ohm	<ul style="list-style-type: none"> The line interface unit supports two line build-outs: <ul style="list-style-type: none"> › 0–68.5 m (0–225 feet) › 69–137 m (226–450 feet) Signal strength is software controlled. The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).
T3 FRAME (12 ports)	COCX-F3	CT3/T3 12 I/O	12	BT43 SMB (cable that adapts to 75-ohm BNC is available)	<ul style="list-style-type: none"> The line interface unit supports two line build-outs: <ul style="list-style-type: none"> › 0–68.5 m (0–225 feet) › 69–137 m (226–450 feet) Signal strength is software controlled. The transmitted signal complies with ANSI T1.102-1993: Digital Hierarchy – Electrical Interfaces (1999) for cable lengths up to 201 m (660 feet).
TSM	TUNNEL SERVICE	No I/O module	N/A	N/A	N/A

Table B-3 Connection information for module assemblies (continued)

Assembly Name and Capability	Line Module Label	I/O Module Label	No. of Ports	Connector Type	Cabling Specifications
X.21/V.35	X.21/V.35	X.21/V.35 I/O	16	200-pin proprietary socket on I/O module DB15 X.21 or DB34 V.35 at remote end	See Table B-4.

- a.The GE SFP I/O module uses a range of simple form factor pluggable transceivers (SFPs) to support different modes and cable lengths.
- b.Assembly is superseded by a newer assembly; however, assembly is supported by current software.

Cable Lengths for X.21/V.35 Cables

Serial signals can travel a limited distance without significant degradation. Slower serial signals can travel farther without degradation than faster serial signals. Table B-4 shows the maximum cable lengths you can use to prevent signal degradation at various transmission speeds.

Table B-4 Maximum cable lengths for X.21/V.35 connections

Transmission Speed (Hz)	Cable Length (Feet)	Cable Length (m)
2400	4,100	1,250
4800	2,050	625
9600	1,025	312
19200	513	156
38400	256	78
56000	102	31
2048000	25	8

