



Loop-O9500 SDH/SONET IMAP



Features

- 6U height, full front access (ETSI) shelf
- TM, ADM and DCS (full cross-connect) at DS0, VC11, VC12, VC3, VC4
- Dual STM-1/4 (OC-3/12) Optical Ring Uplinks
- Hot-swappable cross-connect modules, tributary modules and power modules.
- Tributary Modules (See Table1 below)
 - High-Speed or High Density access tributary modules (HS)
 - Low-Speed access tributary modules (LS)
- Power Modules
 - DC Module (-48Vdc)
 - Dual Power (1+1) Protection
- Protection Scheme
 - Tributary protection
 - E1/T1: Card, Port, Line
 - E3/T3: Line
 - B155/622: MSP, SNCP/UPSR
 - Ethernet: Card
 - Cross-connect Unit (XCU) protection
 - MSP, SNCP/UPSR
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT, LCAS and non-LCAS
- Full switched Ethernet capability on EoS with build-in L2 switch card
- Ethernet Order Wire (EOW) using VoIP technology
- Alarm suppression, masking and report
- Management
 - Console port, VT100 menu-driven
 - SNMP Port
 - Telnet
 - Centralized management with Loop's EMS/iNMS over DCC channel
 - LoopView GUI EMS
 - TMN management(Loop-iNMS) with full FCAPS and end-to-end circuit management
 - SSH
- RoHS compliant

Description

The Loop-O9500 SDH/SONET IMAP (Integrated Multi-Services Access Platform) is an economical STM-1/4 (OC-3/12) access multiplexer designed to provide integrated access to STM-1/4 (OC-3/12) optical lines through either a non-blocking VC11/VC12/VC3/VC4 cross-connect with HS modules or through an additional non-blocking DS0 cross-connect fabric with LS modules.

The 6U shelf supports:

- 4 HS tributary module slots
- 6 LS tributary module slots

With up to 10 optical STM-1 (OC-3) or 5 optical STM-4 (OC-12) or 10 electrical STM-1 (OC-3) line interfaces, the Loop-O9500 SDH/SONET IMAP offers service providers a versatile protection scheme including SNCP(UPSR) and MSP(1+1) protection for both ring and linear network topology. The O9500 can work with the Loop-O9100 and Loop-O9400 in the same topology.

The non-blocking VC11/VC12/VC3/VC4 cross-connect capability on High Speed (HS) is up to 20 VC4. The HS tributary modules include optical STM-1/4 (OC-3/12), E3/T3, E1/T1 interfaces and Fast Ethernet over STM-1/4 (OC-3/12). Fast Ethernet signals are mapped onto STM payload through standard techniques GFP, LAPS, VCAT, LCAS, and non-LCAS. These HS modules are identical to those used in the rack version of the Loop-O9400.

The uplink non-blocking DS0 cross-connect to HS is up to 21 E1 or 28 T1. The non-blocking DS0 cross-connect capability on Low Speed (LS) is up to 768 DS0. Through a full non-blocking DS0 cross-connect and together can act as a mini DACS. The modules include variety of TDM, IP, and voice interfaces detailed on next page. All LS modules are identical to those used in rack version of the Loop-AM3440.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The O9500 SDH/SONET IMAP provides full Operation, Administration, Maintenance and Provisioning (OAM&P) functionality.

Users can easily operate the O9500 locally or remotely for centralized management with LoopView (EMS) and Loop-iNMS (integrated NMS).

Table 1 Loop-O9500 Tributary Modules:

Tributary Type	Plug-in Interface Cards	Max. Capacity
High-Speed or High Density Access Tributary Modules (HS)	STM-4 (OC-12) tributaries	1 MSP 1 + 1
	STM-1 (OC-3) tributaries	4 MSP 1 + 1 or 3 Sub-ring SNCP or 6 STM-1 without protection
	63 port E1/T1 tributaries	252 E1/T1 without protection, or 126 E1/T1 with 1+1 card protection
	32 port E1/T1 tributaries	
	16 port E1/T1 tributaries	12 E3/T3 without protection, or 6 E3/T3 with 1+1 card protection
	3 port E3/T3 tributaries	
	EoS (8FE+1GbE) Ethernet card with built in L2 switch	4 GbE + 32 FE
EoS (8FE or 1GbE) Ethernet card without L2 switch	4 GbE or 32 FE	
7 port FOM card*	7 port FOM*	
Low-Speed Access Tributary Modules (LS)	Low Speed Single-Slot Cards	
	8-port Bridge/Router	48-port Bridge/Router
	4-channel E1/T1	24/24-channel E1/T1
	3-channel E1*	18-channel E1*
	2-channel G.SHDSL (2 pairs) w/o line power	12 channel G.SHDSL (2 pairs) w/o line power
	4-channel G.SHDSL (1 pairs) w/o line power	24 channel G.SHDSL (1 pairs) w/o line power
	8-channel G.703 card at 64 Kbps data rate	48-channel G.703 card at 64 Kbps data rate
	1 or 4 channel C37.94 (low speed optical)	6 or 24 channel C37.94 (low speed optical)
	8-channel RS232/V.24	48-channel RS232/V.24
	8-channel Dry Contact I/O	48-channel Dry Contact I/O
	8-channel Dry Contact I/O type B	48-channel Dry Contact I/O type B
	8-channel 2W/4W E&M	48 channel 2W/4W E&M
	12-channel FXS	72 channel FXS
	12-channel FXO	72 channel FXO
	Conference card *	Conference card *
	12-channel Magneto*	72-channel Magneto*
	TDMoE*	TDMoE*
	Low Speed Dual-Slot Cards	
	6-channel V.35	18-channel V.35
	6-channel V.36	18-channel V.36
	6-channel X.21/V.11	18-channel X.21/V.11
	6-channel EIA530/RS449	18-channel EIA530/RS449
	24-channel FXS	72-channel FXS
	24-channel FXO	72-channel FXO

Note: * Future Option
 Single-Slot Cards plug into singles slots; Dual-Slot Cards plug into two adjacent single slots

Table 2: Maximum number of channel/port on each plug-in card

Plug-in Card		Slot	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU 1	XCU 2	11~16 slot/ per card	Total
E1/T1	For HS slots		63	63	63	63	X	X	X	252 E1/T1
	For LS slots		x	x	x	x	x	x	4E1 4T1	21E1 24T1
Ethernet	FE		8	8	8	8	X	X	X	32
	GbE		1	1	1	1	X	X	X	4
Optical (SFP)	STM-1		2	2	2	2(B)	2	2	X	8
	STM-4		1	1(B)	X	X	2	2	X	4
Bridge/Router			X	X	X	X	X	X	8	48
G.SHDSL			X	X	X	X	X	X	2/4	12/24
3 E1*			X	X	X	X	X	X	3	18
G.703			X	X	X	X	X	X	8	48
C37.94			X	X	X	X	X	X	1/4	4/24
Dry Contact			X	X	X	X	X	X	8	48
Dry Contact type B			X	X	X	X	X	X	8	48
RS232/V.24			X	X	X	X	X	X	8	48
Conference* (Note 1)			X	X	X	X	X	X	6	36
12 FXS/FXO			X	X	X	X	X	X	12	72
12 Magneto*			X	X	X	X	X	X	12	72
E&M			X	X	X	X	X	X	8	48
V.35/V.36/X.21			X	X	X	X	X	X	6	18
EIA530/RS449			X	X	X	X	X	X	6	18
24 FXS/FXO			X	X	X	X	X	X	24	72

* Future Option

X: not applicable

(B) Backup

Note 1: A conference plug-in card contains two RS232 data ports, two FXS ports and two E&M ports.

Ordering Information

To order specify:

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
Main Unit		
Loop-O9500-R-CHA- G	6U height Rack chassis for O9500 w/o CPU and power	
Plug-in modules		
Loop-O9500-R-CC4- G	CPU card with cross-connect unit and two STM-1/4 (OC-3/12) interfaces without SFP (mini-GBIC) optical modules	One required for each chassis. Order two for redundancy.
Loop-O9500-R-CBA- G	Connector Board	One required for each chassis.
Loop-O9500-R-CBB- G	Connector Board with EoW using VoIP technology	One required for each chassis.
Loop-O9500-R-FANA- G	Fan Board	One required for each chassis.
High Speed or High Density Tributary Modules		
Loop-O9500-R-16TE- G	16 E1 (120 ohm) or 16 T1 software programmable plug-in card	This card can also be used in the Loop-O9400R.
Loop-O9500-R-32TE- G	32 E1 (120 ohm) or 32 T1 software programmable plug-in card	This card can also be used in the Loop-O9400R.
Loop-O9500-R-63TE- G	63 E1 (120 ohm) or 63 T1 software programmable plug-in card	This card can also be used in the Loop-O9400R.
Loop-O9500-R-16E75- G	16 E1(75 ohm) plug-in card	Order two for redundancy. This card can also be used in the Loop-O9400R.
Loop-O9500-R-32E75- G	32 E1(75 ohm) plug-in card	Order two for redundancy. This card can also be used in the Loop-O9400R.
Loop-O9500-R-63E75- G	63 E1(75 ohm) plug-in card	Order two for redundancy. This card can also be used in the Loop-O9400R.
Loop-O9500-R-B16- G	STM-1/4 (OC-3/12) software configurable plug-in card without SFP (mini-GBIC) optical modules	This card can also be used in the Loop-O9400R.
Loop-O9500-R-9EoS4NSW- G	1 GbE or 8FE software programmable plug-in card without L2 switch	This card can also be used in the Loop-O9400R.
Loop-O9500-R-9EoS4SW- G	1GbE and 8FE plug-in card with L2 switch	This card can also be used in the Loop-O9400R.
Loop-O9500-R-3TE3- G	3 T3 or 3 E3 software programmable interface plug-in card	This card can also be used in the Loop-O9400R.
Loop-O9500-R-3M13- G	A software key to activate the 3TE3 module to have M13/Mx3 function for T3 interface only	This card can also be used in the Loop-O9400R.
Loop-O9500-R-7FOM- G	7-port Fiber Optical plug-in card	Future Option

Low Speed Tributary Modules (Single Slot)

Loop-O9500-R-4E1-cc- G	4-channel E1 plug-in card.	This card can also be used in the Loop-AM3440-A /B/C. For cc option, please refer to the table below for detail information
Loop-O9500-R-4T1- G	4-channel T1 plug-in card	This card can also be used in the Loop-AM3440-A /B/C.
Loop- O9500-R-3E1-cc- G	3-channel E1 plug-in card with DS0 (64K bps) SNCP protection	(future option) For cc option, please refer to the table below for detail information
Loop-O9500-R-2GH- G	2-channel G.SHDSL plug-in card (2 pair)	This card can also be used in the Loop-AM3440-A/B/C.
Loop-O9500-R-4GH- G	4-channel G.SHDSL plug-in card (1 pair)	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8DC- G	8-channel dry contact plug-in card with maximum voltage 100 Vdc or 250 Vac	This card can also be used in the Loop-AM3440-A /B/C.
Loop- O9500-R-8DCB- G	8-channel dry contact type B plug-in card with maximum voltage 220 Vdc or 250 Vac	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8CD- G	8-channel G.703 plug-in card at 64 Kbps data rate	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-1C37- G	1- channel C37.94 plug-in card	This card can also be used in the Loop-AM3440-A /B/C
Loop-O9500-R-4C37- G	4- channel C37.94 plug-in card	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8RS232-RJ- G	8-port RS232 plug-in card with X.50 subrate multiplexing scheme and X.54 encoding, with 8 RJ48 connectors for 8 RS232 Async ports	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8RS232-DB- G	8-port RS232 plug-in card with X.50 subrate multiplexing scheme and X.54 encoding, with 2 RJ48 connectors and 2 DB44 connectors for Async and Sync ports	Two conversion cables are included. (Each cable has one DB44 connector to one DB9 and two DB25 connectors). This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-RTB- G	8-LAN port/64 WAN ports router/bridge plug-in card	This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-Conf- G	Conference plug-in card with two RS232 data ports, two FXS ports and two E&M ports	(Future option) This card can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R-8EM-x- G	8-channel 2W/4W E&M plug-in card with 8 RJ45	"8EM" card with H/W ver. F (and later versions), F/W V4.01.01 (and later versions) can also be used in the Loop-AM3440-A /B/C. For x option, please refer to the table below.
Loop-O9500-R-12MAG-1G-x- G	12-channel Magneto plug-in module w/ L1. GND	(future option)
Loop-O9500-R-12MAG-12-x- G	12-channel Magneto plug-in module w/ L1,L2	12MAG-1G2 includes all function of MAG cards.
Loop-O9500-R-12MAG-1G2-x- G	12-channel Magneto plug-in module w/ L1,L2 and L1. GND	For x option, please refer to the table below for detail information.

Loop-O9500-R-12FXS- sn-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, without Ground Start and Metering Pulse. Used with 12 RJ11.	12FXS-GMP includes all FXS Card functions. “12FXS-x” cards with H/W ver. L and F/W V.3.01.01 or newer versions. It can also be used in the Loop-AM3440-A /B/C For sn option, please refer to the table below for detail information. pt = power type For pt option, please refer to the table below for detail information
Loop-O9500-R-12FXS-P-sn-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, without Ground Start and Metering Pulse PLAR bit programmable function. Used with 12 RJ11.	
Loop-O9500-R-12FXS-M-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXS-MPP-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR and PLAR bit programmable function, [Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXS-GS-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Ground Start] . Used with 12 RJ11.	
Loop-O9500-R-12FXS-GM-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR, [Ground Start, and Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXS-GMP-pt-G	12-channel FXS plug-in card with 600/ 900 Impedance, Battery Reverse, PLAR and PLAR bit programmable function, [Ground Start, and Metering Pulse]. Used with 12 RJ11.	
Loop-O9500-R-12FXO-G	12-channel FXO plug-in card with 600/ 900 Impedance, Battery Reverse, without Ground Start and Metering Pulse. Used with 12 RJ11.	12FXO-GM includes all FXO Card functions. O9500-R-12FXO-x cards <u>CANNOT BE USED</u> in the Loop-AM3440-A /B/C
Loop-O9500-R-12FXO-M-G	12-channel FXO plug-in card with 600/ 900 Impedance, Battery Reverse, [Metering Pulse] Used with 12 RJ11.	
Loop-O9500-R-12FXO-GS-G	12-channel FXO plug-in card with 600/ 900 Impedance, Battery Reverse, [Ground Start] Used with 12 RJ11.	
Loop-O9500-R-12FXO-GM-G	12-channel FXO plug-in card with 600/ 900 Impedance, Battery Reverse, [Ground Start, and Metering Pulse] Used with 12 RJ11.	
Loop-O9500-R-TDMoE-PPM-G	TDMoE card with 2 GbE combo interfaces and 2 Ethernet interfaces (10/100/1000BaseT) plug-in module Support G.823 Traffic	
Loop-O9500-R-TDMoE-PPB-G	TDMoE card with 2 GbE combo interfaces and 2 Ethernet interfaces (10/100/1000BaseT) plug-in module Support G.823 Synchronization	Future option
Low Speed Tributary Modules (Dual Slots)		
Loop-O9500-R-6X21A-G	6-channel X.21/V.11 card with DB15 connector	These cards will occupy two slots. These cards can also be used in the Loop-AM3440-A /B/C.
Loop-O9500-R -6V35A-G	6-channel V.35 plug-in card with DB25S connector, for M34. (2Mbits per channel) Please order conversion cable connector below.	
Loop-O9500-R -6V36A-G	6-channel V.36 card with DB25 connector via conversion cable to DB37	
Loop-O9500-R-6E530A-G	6-channel EIA530 plug-in card with DB25 connector	
Loop-O9500-R-6RS449A-G	6-channel EIA530/RS449 plug-in card with DB25 connector via conversion cable to DB37	

Loop-O9500-R-24FXS-sn-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and PLAR Without Ground Start and Metering Pulse	<p>24FXS-GMP includes all FXS card functions.</p> <p>These cards will occupy two slots. These cards can also be used in the Loop-AM3440-A /B/C</p> <p>For sn option, please refer to the table below for detail information</p> <p>pt=power type</p> <p>For pt option, please refer to the table below for detail information</p>
Loop-O9500-R-24FXS-P-sn-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [PLAR bit programmable]. Without Ground Start and Metering Pulse	
Loop-O9500-R-24FXS-M-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [Metering Pulse].	
Loop-O9500-R-24FXS-MPP-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [PLAR bit programmable] and [Metering Pulse].	
Loop-O9500-R-24FXS-GS-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR and [Ground Start].	
Loop-O9500-R-24FXS-GM-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [Ground Start] and [Metering Pulse].	
Loop-O9500-R-24FXS-GMP-pt-G	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [PLAR bit programmable], [Ground Start] and [Metering Pulse].	
Loop-O9500-R-24FXO-G	24-channel FXO plug-in card with 600/900 Impedance, Battery Reverse and Loop Start. Without Ground Start and Metering Pulse	<p>24FXO-GM includes all FXO card functions.</p> <p>These cards will occupy two slots. These cards can also be used in the Loop-AM3440-A /B/C</p>
Loop-O9500-R-24FXO-M-G	24-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and [Metering Pulse].	
Loop-O9500-R-24FXO-GS-G	24-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and [Ground Start].	
Loop-O9500-R-24FXO-GM-G	24-channel FXO plug-in card with 600/900 Impedance, Battery Reverse, Loop Start, [Ground Start] and [Metering Pulse].	

Accessories



User's Manual

Loop-O9500-R-UMA	Optional, paper copy of User Manual. A CD version of the manual is already included as standard package.	
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Power Modules

Loop-O9500-R-SD48-G	-48Vdc	For redundancy purposes, ordering a second plug-in module will provide dual power.
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Power Adaptor(All power adaptor are RoHS compliant)

Loop-ACC-APA-240-G	240 Watt, AC (100 to 120 Vac, 5.0A/200 to 240 Vac, 2.5A auto sensing) to DC (-48 Vdc, 5A) adaptor for USA	
Loop-ACC-APE-240-G	240 Watt, AC (100 to 120 Vac, 5.0A/200 to 240 Vac, 2.5A auto sensing) to DC (-48 Vdc, 5A) adaptor for Europe	**
Loop-ACC-APU-240-G	240 Watt, AC (100 to 120 Vac, 5.0A/200 to 240 Vac, 2.5A auto sensing) to DC (-48 Vdc, 5A) adaptor for UK	

FXO BOX

Loop-ACC-FXOBOX	Support FXO Interface Feed	
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Order wire phone

Loop-O9500-R-OW-G	Ethernet Order Wire Phone (using VoIP Technology)	
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SIP Proxy Server

Loop-O9500-R-SIP	SIP Proxy Server Basic Software	Customer must provide a MAC address so that a license key can be generated to operate the software at that address.
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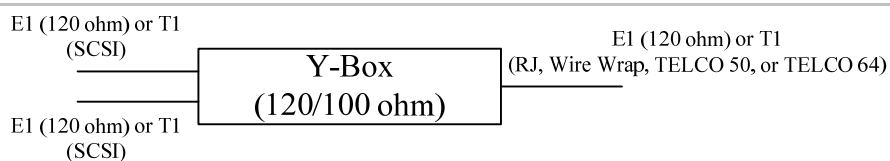
Mounting Ear

19"/23" ear mounts	A pair of 19"/23" ear mounts is supplied as part of standard package. Note: For other sizes, please contact your nearest Loop sales representative.	
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Conversion Panels

Loop-ACC-P-1SCSI-16RJ-G	1u panel for one SCSI to 16 RJ connectors without cable	Used for: -16TE, -32TE, -63TE This panel can also be used in the Loop-O9400R.
Loop-ACC-P-1SCSI-16WW-G	1u panel for one SCSI to 16 Wire Wrap without cable	Used for: -16TE, -32TE, -63TE, -16E75,-32E75,-63E75 This panel can also be used in the Loop-O9400R.
Loop-ACC-P-1SCSI-16BNC-G	1.5u panel for one SCSI to 16 BNC connectors without cable	Used for: -16E75,-32E75,-63E75 This panel can also be used in the Loop-O9400R.

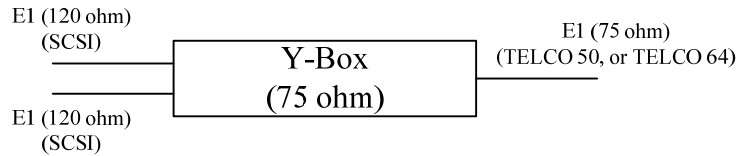
Y-box Panels for 120/100 ohm



Loop-ACC-Y-2SCSI-16RJ-G	1u Y-box 16-port panel for two SCSI (E1(120 ohm) or T1) to 16 RJ (E1(120 ohm) or T1) connectors without cable	Using with Loop-O9500-R-16TE-G,
Loop-ACC-Y-2SCSI- 16WW-G	1u Y-box 16-port panel for two SCSI (E1(120 ohm) or T1) to 16 Wire Wrap (E1(120 ohm) or T1) without cable	Using with Loop-O9500-R-16TE-G,
Loop-ACC-Y-2SCSI-2T50P8-16TE-G	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to two TELCO 50 (E1(120 ohm) or T1) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9500-R-16TE-G,
Loop-ACC-Y-2SCSI-2T50P12-16TE-G	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to two TELCO 50 (E1(120 ohm) or T1) connectors (12 ports to the first TELCO connector, 4 ports to the second TELCO connector) without cable	Using with Loop-O9500-R-16TE-G,
Loop-ACC-Y-2SCSI-1T64P16-16TE-G	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to one TELCO 64 (E1(120 ohm) or T1) connectors (16 ports per TELCO connector) without cable	Using with Loop-O9500-R-16TE-G,
Loop-ACC-Y-4SCSI-4T50P8-32TE-G	1u 32-port Y-box panel in (E1(120 ohm) or T1) for four SCSI to four TELCO 50 (E1(120 ohm) or T1) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9500-R-32TE-G, Loop-O9400-R-63TE-G
Loop-ACC-Y-4SCSI-3T50P12-32TE-G	1u 32-port Y-box panel in (E1(120 ohm) or T1) for four SCSI to three TELCO 50 (E1(120 ohm) or T1) connectors (12 ports to the first TELCO connector, 12 ports to the second TELCO connector and 8 ports to the third TELCO connector) without cable	Using with Loop-O9500-R-32TE-G, Loop-O9400-R-63TE-G

Loop-ACC-Y-4SCSI-2T64P16-32TE- G	1u 32-port Y-box panel in E1 120 ohm or T1 for four SCSI to two TELCO 64 (E1(120 ohm) or T1) connectors (16 ports per TELCO connector) without cable	Using with Loop-O9500-R-32TE- G , Loop-O9400-R-63TE- G
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Y-box Panels for 75 ohm



Loop-ACC-Y-2SCSI-2T50P8-16E75- G	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to two TELCO 50 (E1(75 ohm)) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9500-R-16TE- G
Loop-ACC-Y-2SCSI-2T50P12-16E75- G	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to two TELCO 50 (E1(75 ohm))connectors (12 ports to the first TELCO connector, 4 ports to the second TELCO) straight without cable	Using with Loop-O9500-R-32TE- G , Loop-O9500-R-63TE- G
Loop-ACC-Y-2SCSI-1T64P16-16E75- G	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to one TELCO 64 (E1(75 ohm))connectors (16 ports per TELCO connector) straight without cable	Using with Loop-O9500-R-16TE- G
Loop-ACC-Y-4SCSI-4T50P8-32E75- G	1u 32-port Y-box panel for four SCSI (E1(120 ohm)) to four TELCO 50 (E1(75 ohm))connectors (8 ports per TELCO connector) without cable	Using with Loop-O9500-R-16TE- G
Loop-ACC-Y-4SCSI-3T50P12-32E75- G	1u 32-port Y-box panel for four SCSI (E1(120 ohm)) to three TELCO 50 (E1(75 ohm))connectors (12 ports to the first TELCO connector, 12 ports to the second TELCO connector and 8 ports to the third TELCO connector) without cable	Using for Loop-O9500-R-32TE- G , Loop-O9500-R-63TE- G
Loop-ACC-Y-4SCSI-2T64P16-32E75- G	1u 32-port Y-box panel for four SCSI(E1(120 ohm)) to two TELCO 64 (E1(75 ohm))connectors (16 ports per TELCO connector) without cable	Using with Loop-O9500-R-32TE- G , Loop-O9500-R-63TE- G

Y-Box(All Y-Box are RoHS compliant)

Loop-VV-B- G	1 for 1 protection Y-Box with BNC connectors (4-E1)	Used with 4E1
Loop-VV-R- G	1 for 1 protection Y-Box with RJ48C connectors (16-E1)	Used with 4E1
Loop-VV-T- G	1 for 1 protection Y-Box with RJ48C connectors (16-T1)	Used with 4T1

Conversion Cables(All conversion cables are RoHS compliant)

Loop-ACC-CAB-SCSI68M-200-1SCSI68M- G	SCSI 68 pin/Male to SCSI 68 pin/Male Extension Cable Length:200cm	Used in Loop-O9500-R Y-box panels and conversion panels
Loop-ACC-CAB-DB44M-100-2DB25F-1DB09F-DB	DSUB-44 pin/Male to two DSUB-25 pin/Female-one DSBU-9 pin/Female Length 100cm	Used in Loop-O9500-R-8RS232-DB- G plug-in card
Loop-ACC-CAB-DB25M-30-1M34F	DSUB-25pin/Male to M34/Female V.35 Conversion cable Length: 30 cm	Used in Loop-O9500-R-6V35A- G plug-in card
Loop-ACC-CAB-DB25M-30-1DB37F	DSUB-25pin/Male to DSUB-37/Female RS449 Conversion cable Length: 30 cm	Used in Loop-O9500-R-6V36A- G and Loop-O9500-R-6R449A- G plug-in cards

Blank Panels		
30.001397.A00LF	Blank panel for CPU slot	
30.001076.A00LF	Blank panel for power supply slots	Same as that used on O9400R.
30.001077.A00LF	Blank panel for High-speed slots (Slots 1~4)	Same as that used on O9400R.
30.001027.A00LF	Blank Panel for Low-speed slots (Slots 11~16)	Same as that used on AM-3440-CHA.

For Example:

**Loop-O9500-R-CHA-G, Loop-O9500-R-CBA-G, Loop-O9500-R-FANA-G, Loop-O9500-R-CC4-G,
Loop-O9500-R-63TE-G, Loop-O9500-4E1-RJ, Loop-O9500-R-4GH, Loop-O9500-R-SD48:**

For model O9500 6U height Rack chassis with one CPU card, one connect board, and one Fan board, one 63E1 software programmable interface plug-in card, one 4-channel E1 interface with RJ48C connectors, one 4-channel G.SHDSL plug-in card (1-pair), and a single -48 Vdc power module.

SFP Optical/Electrical Module Plug-in Tables

SFP 155 Mbps (mini GBIC) Dual Fiber	MHBTW	Multi mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ Use 2 fibers for all SFP optical modules
	PHB3W	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1/Fast Ethernet	
	PHB5W	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 50Km, LC connector w/o DDM, L-1.1/LR1/Fast Ethernet	
	PHC8W	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 80Km, LC connector w/o DDM, L-1.2/LR2	
	PHCUW	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 100Km, LC connector w/o DDM, L-1.2/LR2Fast Ethernet	
	PHCXW	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 120Km, LC connector w/o DDM, L-1.2 extended distance	
	PHB3D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 30Km, LC connector with DDM, S-1.1/IR1/Fast Ethernet	
	PHB5D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 50Km, LC connector with DDM, L-1.1/LR1/Fast Ethernet	
	PHC8D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 80Km, LC connector with DDM, L-1.2/LR2	
	PHCUD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 100Km, LC connector with DDM, L-1.2/LR2/Fast Ethernet	
	PHCXD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 120Km, LC connector with DDM, L-1.2 extended distance	
	PHCRD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 160Km, LC connector with DDM, L-4.2 extended distance	
	PHCYD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 200Km, LC connector with DDM, L-4.2 extended distance	
PHCZD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 240Km, LC connector with DDM, L-4.2 extended distance		
SFP 155 Mbps (mini GBIC) Dual Fiber	MHTTW	Multi mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ Use 2 fibers for all SFP optical modules ▪ Industrial (-40 to 85°C)
155 Mbps Electrical transceiver	EHNAC	Electrical transceiver module, 155M, 100m, mini-BNC coaxial connector	

155 Mbps Bi-directional Single Fiber	PHD2W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 10~20Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PHD2W to use with PHE2W ▪ Use 1 fiber
	PHE2W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 10~20Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PHE2W to use with PHD2W ▪ Use 1 fiber
	PHD4W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PHD4W to use with PHE4W ▪ Use 1 fiber
	PHE4W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PHE4W to use with PHD4W ▪ Use 1 fiber
	PHD6W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PHD6W to use with PHE6W ▪ Use 1 fiber
	PHE6W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PHE6W to use with PHD6W ▪ Use 1 fiber
	PHD8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 80Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1490 nm from master to slave ▪ Order PHD8W to use with PHE8W ▪ Use 1 fiber
	PHE8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 80Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1570 nm from slave to master ▪ Order PHE8W to use with PHD8W ▪ Use 1 fiber
	PHQ8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1490 nm / Rx 1570 nm, 80Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1490 nm from master to slave ▪ Order PHQ8W to use with PHR8W ▪ Use 1 fiber
	PHR8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1570 nm / Rx 1490 nm, 80Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> ▪ 1570 nm from slave to master ▪ Order PHR8W to use with PHQ8W ▪ Use 1 fiber
	PHQXW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 120Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1490 nm from master to slave ▪ Order PHQXW to use with PHRXW ▪ Use 1 fiber
	PHRXW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 120Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1570 nm from slave to master ▪ Order PHRXW to use with PHQXW ▪ Use 1 fiber
	PHQRW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 160Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1490 nm from master to slave ▪ Order PHQRW to use with PHRRW ▪ Use 1 fiber
	PHRRW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 160Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1570 nm from slave to master ▪ Order PHRRW to use with PHQRW ▪ Use 1 fiber
	PHQYW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 200Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1490 nm from master to slave ▪ Order PHQYW to use with PHRYW ▪ Use 1 fiber
PHRYW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 200Km, LC connector w/o DDM, Extend distance L4.2	<ul style="list-style-type: none"> ▪ 1570 nm from slave to master ▪ Order PHRYW to use with PHQYW ▪ Use 1 fiber 	

NOTE: For other special optical modules, please contact your nearest Loop sales representative.

622M~1.25G mini GBIC Dual Fiber	PKB1W	Single mode optical module with dual uni-directional fiber, 622Mbps~1.25G, 1310nm, 10Km, LC connector w/o DDM, S-4.1/IR1/1000Base-LX	<ul style="list-style-type: none"> Use 2 fibers for all SFP optical modules
155~622Mbps mini GBIC Dual Fiber	PJB2W	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1310nm, 15~20Km, LC connector w/o DDM, S-4.1/IR1	
	PJB5W	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1310nm, 50Km, LC connector w/o DDM, L-4.1/LR1	
	PJC8W	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 80Km, LC connector w/o DDM, S-4.2/LR2	
	PJB2D	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1310nm, 15~20Km, LC connector with DDM, S-4.1/IR1	
	PJB4D	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1310nm, 40Km, LC connector with DDM, L-4.1/LR1	
	PJB5D	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1310nm, 50Km, LC connector with DDM, L-4.1/LR1	
	PJC8D	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 80Km, LC connector with DDM, L-4.2/LR2	
	PJCXW	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 120Km, LC connector w/o DDM, L-4.2 extended distance	
	PJCXD	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 120Km, LC connector with DDM, L-4.2 extended distance	
	PJCRD	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 160Km, LC connector with DDM, L-4.2 extended distance	
	PJCYD	Single mode optical module with dual uni-directional fiber, 155~622Mbps, 1550nm, 200Km, LC connector with DDM, L-4.2 extended distance	

155~622Mbps Bi-directional Single Fiber	PJD2W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector w/o DDM, S-4.1/IR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD2W to use with PJE2W ▪ Use 1 fiber
	PJE2W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector w/o DDM, S-4.2/IR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE2W to use with PJD2W ▪ Use 1 fiber
	PJD4W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector w/o DDM, S-4.1/IR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD4W to use with PJE4W ▪ Use 1 fiber
	PJE4W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector w/o DDM, S-4.2/IR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE4W to use with PJD4W ▪ Use 1 fiber
	PJD6W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector w/o DDM, L-4.1/LR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD6W to use with PJE6W ▪ Use 1 fiber
	PJE6W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector w/o DDM, L-4.2/LR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE6W to use with PJD6W ▪ Use 1 fiber
	PJQ8W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1510 nm / Rx 1590 nm, 80Km, LC connector w/o DDM, L-4.1/LR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJQ8W to use with PJR8W ▪ Use 1 fiber
	PJR8W	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1590 nm / Rx 1510 nm, 80Km, LC connector w/o DDM, L-4.2/LR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJR8W to use with PJQ8W ▪ Use 1 fiber
	PJQXW	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1510 nm / Rx 1590 nm, 120Km, LC connector w/o DDM, L-4.1/LR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJQXW to use with PJRXW ▪ Use 1 fiber
	PJRXW	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1590 nm / Rx 1510 nm, 120Km, LC connector w/o DDM, L-4.2/LR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJRXW to use with PJQXW ▪ Use 1 fiber
	PJD2D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector with DDM, S-4.1/IR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD2D to use with PJE2D ▪ Use 1 fiber
	PJE2D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector with DDM, S-4.2/IR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE2D to use with PJD2D ▪ Use 1 fiber
	PJD4D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector with DDM, S-4.1/IR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD4D to use with PJE4D ▪ Use 1 fiber
	PJE4D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector with DDM, S-4.2/IR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE4D to use with PJD4D ▪ Use 1 fiber
	PJD6D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector with DDM, L-4.1/LR1	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PJD6D to use with PJE6D ▪ Use 1 fiber
	PJE6D	Single mode optical module with single bi-directional fiber, 155~622Mbps, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector with DDM, L-4.2/LR2	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PJE6D to use with PJD6D ▪ Use 1 fiber

NOTE: For other special optical modules, please contact your nearest Loop sales representative.

For 4E1 card

■ Where **cc** is used to select connector:

cc =	Description	Note
RJ	RJ48C connector	
BNC	BNC connector	

For 12/24-channel FXS card:

■ Where **sn** is used to select special function. If this option is not required, omit the **sn** field in the ordering code.

sn =	Description	Note
S1	FXS Loop Feed = -48 Vdc with 35 mA current limit	
S4	Remove alarm tone	
S5	Double ring tone transmit	

Note: For **sn** (special function), please contact your nearest Loop sales representative.

■ Where **pt** is used to select the following functions.

pt=	Description	Note
PWR	complied with -48 Vdc (SD48) power modules	
PWRIE1613	complied with IEEE1613 standard, and with -48 Vdc (SD48) power modules	

For 8E&M Card:

■ Where **x** is used to select all of voice card signaling bits:

8EM	x =	Description	Note
	E	Follows ETSI signaling bits	Jumper selectable for all channels
	A	Follows ANSI signaling bits	
	R	Reverse for ON-HOOK and OFF-HOOK signaling bits exchange	
	AR	Follows ANSI signaling bits and reverse bit	
	S	Follows customer's special bit or function assignment	
	S4	Disable the function of the test button	
	S5	Forcing all ports to be OFF-HOOK when an alarm occurs	
	S6	Forcing all ports to be ON-HOOK when an alarm occurs	

Note: For **S** (customer's special bit), please refer to SFP brochure or contact your nearest Loop sales representative.

For Magneto Card (future option)

■ Where **x** is used to select version type:

x=	Description	Note
16	16 Hz ring generator	20 Hz is the general setting for all MAG cards. For special settings (16,25,50), please specify your need by filling in the x option.
20	20 Hz ring generator	
25	25 Hz ring generator	
50	50 Hz ring generator	

Loop-O9500 SDH/SONET IMAP PRODUCT SPECIFICATION

High Speed or High Density Tributary Modules

Max. Number of Aggregate Lines

4 STM-1/4 (OC-3/12) aggregate optical lines or
4 STM-1 (OC-3) aggregate electrical lines

Max. Number of Tributary Lines

4 STM-4 (OC-12) tributaries without protection
8 STM-1 (OC3) tributaries without protection
12 E3/T3 tributaries without protection
252 E1/T1 tributaries without protection
4 GbE +32 FE EoS with build in L2 switch tributaries without protection
4 GbE or 32 FE EoS without build in L2 switch tributaries without protection

SFP Module Characteristics

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
MHBTW	Dual uni-directional fiber	155M	1310nm	LC without DDM	2 Km
PHB3W	Dual uni-directional fiber	155M	1310nm	LC without DDM	30 Km
PHB5W	Dual uni-directional fiber	155M	1310nm	LC without DDM	50 Km
PHC8W	Dual uni-directional fiber	155M	1550nm	LC without DDM	80 Km
PHCUW	Dual uni-directional fiber	155M	1550nm	LC without DDM	100 Km
PHCXW	Dual uni-directional fiber	155M	1550nm	LC without DDM	120 Km
PHB3D	Dual uni-directional fiber	155M	1310nm	LC with DDM	30 Km
PHB5D	Dual uni-directional fiber	155M	1310nm	LC with DDM	50 Km
PHC8D	Dual uni-directional fiber	155M	1550nm	LC with DDM	80 Km
PHCUD	Dual uni-directional fiber	155M	1550nm	LC with DDM	100 Km
PHCXD	Dual uni-directional fiber	155M	1550nm	LC with DDM	120 Km
PHCRD	Dual uni-directional fiber	155M	1550nm	LC with DDM	160 Km
PHCYD	Dual uni-directional fiber	155M	1550nm	LC with DDM	200 Km
PHCZD	Dual uni-directional fiber	155M	1550nm	LC with DDM	240 Km

SFP Module (Industrial)	Direction	Data Rate	Wavelength(nm)	Connector	Distance
MHTTW	Dual uni-directional	155M	1310nm	LC without DDM	2Km

SFP Electrical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
EHNAC	Dual uni-directional	155M	n.a.	Mini-BNC	100 m

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PHD2W	Single bi-directional fiber	155M	Tx1310nm/ Rx1550nm	LC without DDM	10~20 Km
PHE2W	Single bi-directional fiber	155M	Tx1550nm/ Rx1310nm	LC without DDM	10~20Km
PHD4W	Single bi-directional fiber	155M	Tx1310nm/ Rx1550nm	LC without DDM	40 Km
PHE4W	Single bi-directional fiber	155M	Tx1550nm/ Rx1310nm	LC without DDM	40 Km
PHD6W	Single bi-directional fiber	155M	Tx1310nm/ Rx1550nm	LC without DDM	60 Km
PHE6W	Single bi-directional fiber	155M	Tx1550nm/ Rx1310nm	LC without DDM	60 Km
PHD8W	Single bi-directional fiber	155M	Tx1490nm/ Rx1570nm	LC without DDM	80 Km
PHE8W	Single bi-directional fiber	155M	Tx1570nm/ Rx1490nm	LC without DDM	80 Km
PHQ8W	Single bi-directional fiber	155M	Tx1510nm/ Rx1590nm	LC without DDM	80 Km
PHR8W	Single bi-directional fiber	155M	Tx1590nm/ Rx1510nm	LC without DDM	80 Km

PHQXW	Single bi-directional fiber	155M	Tx1510nm/ Rx1590nm	LC without DDM	120 Km
PHRXW	Single bi-directional fiber	155M	Tx1590nm/ Rx15100nm	LC without DDM	120 Km
PHQRW	Single bi-directional fiber	155M	Tx1510nm/ Rx1590nm	LC without DDM	160 Km
PHRRW	Single bi-directional fiber	155M	Tx1590nm/ Rx15100nm	LC without DDM	160 Km
PHQYW	Single bi-directional fiber	155M	Tx1510nm/ Rx1590nm	LC without DDM	200 Km
PHRYW	Single bi-directional fiber	155M	Tx1590nm/ Rx15100nm	LC without DDM	200 Km

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PKB1W	Dual uni-directional fiber	622M~ 1.25G	1310nm	LC without DDM	10 Km
PJB2W	Dual uni-directional fiber	155~622M	1310nm	LC without DDM	15~20 Km
PJB5W	Dual uni-directional fiber	155~622M	1310nm	LC without DDM	50 Km
PJC8W	Dual uni-directional fiber	155~622M	1550nm	LC without DDM	80 Km
PJB2D	Dual uni-directional fiber	155~622M	1310nm	LC with DDM	15~20 Km
PJB4D	Dual uni-directional fiber	155~622M	1310nm	LC with DDM	40 Km
PJB5D	Dual uni-directional fiber	155~622M	1310nm	LC with DDM	50 Km
PJC8D	Dual uni-directional fiber	155~622M	1550nm	LC with DDM	80 Km
PJCXW	Dual uni-directional fiber	155~622M	1550nm	LC without DDM	120 Km
PJCXD	Dual uni-directional fiber	155~622M	1550nm	LC with DDM	120 Km
PJCRD	Dual uni-directional fiber	155~622M	1550nm	LC with DDM	160 Km
PJCYD	Dual uni-directional fiber	155~622M	1550nm	LC with DDM	200 Km

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PJD2W	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC without DDM	20Km
PJE2W	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC without DDM	20 Km
PJD4W	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC without DDM	40 Km
PJE4W	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC without DDM	40 Km
PJD6W	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC without DDM	60 Km
PJE6W	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC without DDM	60 Km
PJQ8W	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC without DDM	80 Km
PJR8W	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC without DDM	80 Km
PJQXW	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC without DDM	120 Km
PJRXW	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC without DDM	120 Km
PJD2D	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC with DDM	20 Km
PJE2D	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC with DDM	20 Km
PJD4D	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC with DDM	40 Km
PJE4D	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC with DDM	40 Km
PJD6D	Single bi-directional fiber	155~622M	Tx1310nm/ Rx1550nm	LC with DDM	60Km
PJE6D	Single bi-directional fiber	155~622M	Tx1550nm/ Rx1310nm	LC with DDM	60Km

EoW with VoIP Technology

Data Networking

Router or Bridge Mode of Operation

Voice Gateway

SIPv2 Session Initiation Protocol Version 2 (RFC3261, 3262, 3263, 3264)
Voice Algorithms G.711 (A-law and mu-law)
Attenuation Gain Adjustments

Physical Interfaces

Two RJ-45 Port Ethernet 100BaseT Interface (IEEE 802.3)
Two RJ-11 FXS Port For Analog Circuit Telephone Device (Tip/Ring)

Subscriber Line Interface Circuit(SLIC)

Ring Voltage 40 – 55 V_{RMS} Configurable
Ring Frequency 10Hz – 40Hz
Ring Waveform Trapezoidal and Sinusoidal
Max. Ringer Load 3 REN
On-hook/off-hook Characteristics
 On-hook voltage (tip/ring) : -50 V_{NOMINAL}
 Off-hook current : 20 mA min
 Terminating Impedance : 600 ohms

Regulatory Compliance

FCC Part 15 Class B
CE Mark
ICES-003
ESD level Class B
 Air: ± 8Kv
 Contact: ± 4Kv

Power Supply

DC Input Voltage: +5 VDC at 2.0 A Max.
Power Consumption 5 Watts

Indicator Lights

Indicator Lights/LED Power

Storage Temperature

Storage Temperature -13°F to 185°F (-25°C to 85°C)

Unit Dimensions

W x H x D 122.5mm x 43.7mm x 92.8mm

T1 Interface

Line Rate	1.544 Mbps \pm 32 ppm	Jitter	ITU G.824
Line Code	AMI/B8ZS	Framing	Unframed with a framing monitor on receiving side
Input Signal	ITU G.703 DSX-1 0dB to -6dB	Impedance	100 ohm twisted pair
Output Signal	ITU G.703 DSX-1 w/short (0-110, 110-220, 220-330, 330-440, 440-550, 550~660 (feet))	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	Bellcore GR-499-core		

E1 Interface

Line Rate	2.048 Mbps \pm 50 ppm	Jitter	ITU G.823
Line Code	AMI/HDB3	Framing	Unframed with a framing monitor on receiving side
Input Signal	ITU G.703	Impedance	75 ohm coax/120 Ω twisted pair
Output Signal	ITU G.703	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

E3 Interface

Line Rate	34.368 Mbps \pm 20ppm	Jitter	ITU G.823
Line Code	HDB3	Framing	Unframed, G.751
Input Signal	ITU G.703	Impedance	75 ohm coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

T3 interface

Line Rate	44.736 Mbps \pm 20ppm	Jitter	ITU G.824
Line Code	B3ZS	Framing	Unframed, M13/Mx3, G.747
Input Signal	ITU G.703	Impedance	75 Ω coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	Bellcore GR-499-core		

Fast Ethernet interface

Line Rate	10/100M bps	Mapping	n x VC12, n x VC3, or n x VC4
Layer2 Protocol	RSTP (802.1W), VLAN (802.1Q, 802.1P) Flow Control (802.3X) MSTP (802.1S) IGMP Snooping QoS	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, LCAS(G.7042), and non-LCAS		

Gigabit Ethernet interface

Line Rate	10/100/1000Mbps	Mapping	n x VC12, n x VC3, or n x VC4
Layer2 Protocol	RSTP (802.1W), VLAN (802.1Q, 802.1P) Flow Control (802.3X) MSTP (802.1S) IGMP Snooping QoS	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, LCAS(G.7042), and non-LCAS		

Low Speed Tributary Modules

Network Line Interface – 4E1

Line Rate	2.048 Mbps ± 50 ppm	Framing	ITU G.704
Line Code	AMI or HDB3	Connector	BNC/RJ48C
Input Signal	ITU G.703	Electrical	75 ohm Coax/120 ohm twisted pair
Output Signal	ITU G.703	Jitter	ITU G.823

Network Line Interface - 4T1

Line Rate	1.544 Mbps ± 32 ppm	Output Signal	DSX1w/0, -7.5, -15 dB LBO
Line Code	AMI or B8ZS	Framing	D4/ESF (selectable)
Input Signal	DSX-1 0 dB to -30 dB w/ALBO	Connector	RJ48C

Network Line Interface - 3E1*

Line Rate	2.048 Mbps ± 50 ppm	Framing	ITU G.704
Line Code	AMI or HDB3	Connector	BNC/RJ48C
Input Signal	ITU G.703	Electrical	75 ohm Coax/120 ohm twisted pair
Output Signal	ITU G.703	Jitter	ITU G.823
Function	Support DS0-SNCP		

G.shdsl Line Interface (2GH/4GH)

Number of ports	2 or 4
Line Rate for 4-channel G.shdsl	n x 64Kbps (n= 3 to 31)
Line Rate for 2-channel G.shdsl	n x 64Kbps (n= 3 to 15)
Line Code	16-TCPAM, full duplex with adaptive echo cancellation
Connector	RJ45
Electrical	Unconditioned 19-26 AWG twisted pair
Sealing current	Max. 20 MA source current
Clock Source	From System, Line
Diagnostic Test	G.SHDSL Loopback: To-LINE, To-bus BERT: QRSS

DTE(X.21/V.11) Interface (6X21A)

Data Port	Up to six 6-port DTE X.21 card; 1-port DTE X.21 card
Data Rate	56 or 64 Kbps, n = 1 to 32
Connector	DB15

DTE (V.35/ V.36) Interface (6V35A/6V36A)

Data Port	Up to six 6-port DTE V.35/ V.36 cards
Data Rate	56 or 64 Kbps, n = 1 to 32
Connector	For V.35 card: DB25S (optional conversion cable DB25S to M34 connector) For V.36 card::DB25S (optional conversion cable DB25S to DB37 connector)

DTE (EIA530/RS449) Interface (6 EIA530A/6RS449A)

Data Port	Up to six 6-port EIA530 DTE card
Data Rate	56 or 64 Kbps, n = 1 to 32
Connector	DB25S (optional conversion cable DB25S male to DB37 female connector for RS449)

C37.94 Interface (1/4C37)

Source	LED
Wavelength	820nm 2Km reach
Connector	ST
Optical Budget	50 Mircon core/9.6 db 62.5 Mircon core/ 15db

Dry Contact I/O card (8DC)

Inputs -		Outputs -	
8-channel	2-port per card, 4-pair per port	8-channel	8-pair per card
Connector	RJ45	Connector	Screw type
Internal Resistance	1 K	Initial Insulation Resistance	Min. 100M ohm (at 500 Vdc)
Activation Current	3 ma	Max. Current	5A
Deactivation Current	1.5 ma	Max. Voltage	100 Vdc, 250 Vac
Allowable Current	4 ma		

Dry Contact Type B Interface

Inputs -

8-channel	2-port per card, 4-pair per port
Connector	RJ45
Internal Resistance	100 K
Activation Current	3 ma
Deactivation Current	1.5 ma
Allowable Current	4 ma

Outputs -

8-channel	8-pair per card
Connector	Screw type
Initial Insulation Resistance	Min. 1000M ohm (at 500 Vdc)
Max. Current	2A
Max. Voltage	220 Vdc, 250 Vac

Co-directional (G.703) card

Interface	ITU G.703 64 Kbps co-directional interface
Connector	120ohm, RJ48
Line Distance	Up to 500 meters
Loopback	DTE Payload Loopback, Local Loopback

Router-B Interface (RTB)

Number of ports	8 LAN ports, Max. 64 WAN ports. Each WAN port has data rate $n \times 64K$ bps, $1 \leq n \leq 32$ (≤ 8 Mbps for total of all 64 WAN ports)
Physical Interface	10/100 BaseT x 8
Connector	RJ45
Routing protocol	RIP-I, RIP-II, OSPF, Static
Supporting Protocols	PPP (IPCP/BCP), MLPPP, HDLC, Frame Relay, and Cisco compatible HDLC, NAT/NAPT, DHCP
Diagnostic	Ping, Trace route
QoS	Rate limit

DTE(RS232-X.50 mux. 8-port) Interface (RS232/V.24)

Data Port	Up to twelve 8-port RS232 cards								
MUX	Maximum 5 subrate port per 64K bps								
Data Rate	Asynchronous	Mux mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K						
		Independent mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K						
	Synchronous	Mux mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K						
		Independent mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K, 48K, 64K						
	Port Number								
Card Type	1	2	3	4	5	6	7	8	
Eight RJ48	Async	Async	Async	Async	Async	Async	Async	Async	
Two DB44 + Two RJ48	Async/Sync	Async/Sync	Async	Async/Sync	Async/Sync	Async	Async	Async	
Connector	Eight RJ48 (port 1 to port 8) DB44 (port1,port2,port3), DB44 (port4,port5,port6), RJ48 (port7) and RJ48(port8)								
Conversion Cable	A three-into-one conversion cable adapts the DB44 connector to 3 connectors (one DB9S and two DB25S)								
Electrical	RS232 Interface, DCE								

Voice Card- E&M

Connector	Eight RJ45
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF
Encoding	A-law or μ -law, user selectable together for all
Impedance	Balanced 600 or 900 ohms
Longitudinal Conversion Loss	> 46dB
Longitudinal Balance	> 63dB
Gain Adjustment (Per-port setting)	-10 to +7 dB / 0.1dB step for transmit (D/A) gain -10 to +14 dB / 0.1dB step for receive (A/D) gain
I/O voice power range	A/D digital input level: -66 dBm (0.00039 Vrms) ~ + 3 dBm (1.09 Vrms) D/A analog output level: -66 dBm (0.00039 Vrms) ~ + 7 dBm (1.74 Vrms)
Signal/Distortion	> 25dB with 1004 Hz, 0dBm input
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz
Carrier connection	Side A (exchange side) and Side B (carrier side) setup by side switch
Idle Channel Noise	Max. -65 dBm0p
wire mode	2 wire and 4 wire (programmable)
Signaling	Type 1, Type 2, Type 3, Type 4, and Type 5, Transmit only (programmable)
Modems	Full compatibility with V.90 modems

All in-band signaling tones are carried transparently by the digitizing process.
Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.

Voice Card 12 MAG (Magneto)*

Connector	Twelve RJ11
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF
Encoding	A-law or μ -law, user selectable together for all
Impedance	Balanced 600 or magneto telephone impedance match
Longitudinal Conversion Loss	> 46dB
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712
Idle Channel Noise	Max. -65 dBm0p
Min Detectable Ringing Voltage	16 Vrms
Ringing Detectable Across	L1 and L2 (Tip and Ring), L1 and GND (Tip and GND)
Ringing Generation	Voltage: 76 Vrms (sine wave) Frequency: 20Hz (with optional choices of 16, 25, 50 Hz) Cadence: 1. Normal: Ring after crank 2. PLAR ON: -Single Ring Type: ring for 2 sec. and stop, or ring for 4 sec. and stop -Continuous Ring Type: 1 sec on 2 sec off, or 2 sec on 4 sec off
Ringing Send Across	L1 and L2 (Tip and Ring), L1 and GND (Tip and GND)
Signaling	Magneto MRD(Ringing across Tip and Ring or Tip and Ground)
Signaling Bit A,B,C,D	Programable
Signaling is carried transparently by the digitizing process.	
Use Magneto card default setting for communications between magneto telephones	
Use Magneto card PLAR mode setting for communications between a magneto telephone and a regular telephone	

Voice Card (12FXS, 12FXO, 24FXS, 24FXO)

Connector	12 FXS:Twelve RJ11 or 24 FXS: One RJ21X
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF
Encoding	A-law or μ -law, user selectable together for all
AC Impedance	Balanced 600 or 900 ohms (selectable together for all)
Longitudinal Conversion Loss	> 46dB
Cross talk measure	Max -70dBm0
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712
Idle Channel Noise	Max. -65 dBm0p
Variation of Gain	\pm 0.5dB
FXO	Ringing REN 0.5B (AC) Detectable Ringing 25 Vrms Loop Resistance \leq 1800 Ω DC Impedance (ON-HOOK) > 1M Ω DC Impedance (OFF-HOOK) 235 Ω @ 25 mA feed 90 Ω @ 100 mA feed
FXS Loop Feed	-48Vdc with 25mA current limit per port Jumper Selectable: 25mA, 30mA, 35mA
FXS signalling	Normal / Automatic Ring down
FXS Ringing	1 REN at 5K meters per port 16.7Hz, 20Hz, 25Hz, 50Hz, user selectable for all ports 38 to 85 Vrms (sine wave), 76 Vrms for default Ring Voltage 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR
Signaling	Loop Start, DTMF, pulse, PLAR, Battery Reverse
Optional Signaling (for special order)	Ground Start, Metering pulse (12 KHz, 16 KHz), and P(in PLAR mode, PLAR signalling bits are programmable.
Signaling Bit A,B,C,D	Programable bit
<ul style="list-style-type: none">All in-band signaling tones are carried transparently by the digitizing process.Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.	

Conference Card*

<u>RS232 Interface</u>	
Data Port	2-ports per card
ASync Data Rate	300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K
Sync	not supported
Connector	Two DB9, DCE, female
<u>FXS Voice Interface</u>	
Connector	Two RJ11
Encoding	G.723
Longitudinal Conversion Loss	> 46dB
Cross Talk Measure	Max -70dBm0
Gain Adjustment	transmit (D/A) gain 0, +6dB receive (A/D) gain +6, 0, -6dB
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input
Idle Channel Noise	Max. -65 dBm0p
Loop Resistance	Max 1800 ohm
FXS Loop Feed	-48 Vdc with 25mA current limit
FXS Ringing	2 REN 20Hz 76 Vrms 2 sec on / 4 sec off for 1 min, or 1 sec on / 2 sec off for 30 sec (programmable)
Signaling	Loop Start, DTMF
<u>E&M Voice Interface</u>	
Connector	Two RJ45
Encoding	G.723
Impedance	Balanced 600 ohms
Longitudinal Conversion Loss	> 46dB
Gain Adjustment	transmit (D/A) gain 0, +6dB receive (A/D) gain +6, 0, -6dB
Signal/Distortion	> 25dB with 1004 Hz, 0dBm input
Idle Channel Noise	Max. -65 dBm0p
Carrier Connection	Side A = exchange side, Side B = carrier side (Jumper selectable)
Phone line power+12V	Type P (Jumper enable)
Operation mode	Master, standard (Jumper selectable)
Wire Mode	4 wire
Signaling Type	Type 1, Type 4, and Type 5 (Jumper selectable)
EM Ringing	Single rainging for 5 sec only 2 sec on / 4 sec off for 1 min, or 1 sec on / 2 sec off for 30 sec (programmable)

<u>Combo Gigabit Ethernet(GbE) Interface</u>	
Number of Ports	2
Speed	10/100/1000M bps
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection
<u>Gigabit Ethernet(GbE) Interface</u>	
Number of Port	2
Speed	10/100/1000 BaseT
Connector	RJ45
<u>Ethernet Function</u>	
Basic Features	MDI/MDIX for 10/100/1000M BaseT auto-sensing Ping function contained ARP Per port, programmable MAC hardware address learn limiting (max. MAC table 8192 (8k) entry) Packet Delay Variation: <ul style="list-style-type: none"> - Unframed T1: Up to 340 ms - Framed T1: Up to 256 ms - E1: up to 256 ms - Framed T1 with CAS: Up to 192 ms
Packet Transparency	Packet transparency support for all types of packet types including IEEE 802.1q VLAN and 802.1ad (Q-in-Q)
QoS	User configurable 802.1p CoS, ToS in out going IP frame
Traffic Control	Ingress packet Rate limiting buckets per port for ethernet port Supporting Rate-based and Priority-based rate limiting for LAN port Granularity: <ul style="list-style-type: none"> a. From 64 Kbps to 1 Mbps in increments of 64 Kbps b. From 1 Mbps to 100 Mbps in increments of 1 Mbps c. From 100 Mbps to 1000 Mbps in increments of 10Mbps
Link Aggregation	Pause frame issued when the traffic exceeding the limited rate before packet dropped following IEEE802.3X WAN support link aggregation
<u>Jitter & Wander</u>	
PPM: per G.823 Traffic	
PPB: per G.823 Synchronous	
<u>Standard Compliance</u>	
IETF	TDMoIP (RFC5087), SAToP (RFC4553), CESoPSN (RFC5086)
IEEE	802.1q, 802.1p, 802.1d, 802.3, 802.3u, 802.3x, 802.3z, 802.1s, 802.1w, 802.1AX
*Future Option	

SFP Modules for TDMoE:

1.25G (mini GBIC) Dual Fiber Commercial (0 to 70°C)	MTAFW	Multi-mode optical module with dual uni-directional fiber, 1.25G, 850nm, 550m, LC connector w/o DDM, 1000Base-SX	<ul style="list-style-type: none"> Use 2 fibers for all SFP optical modules All 1.25G optical module downgrading to 622Mbps data rate will be workable
	MTAFD	Single-mode optical module with dual uni-directional fiber, 1.25G, 850nm, 550m, LC connector with DDM, 1000Base-SX	
	MTBTD	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 2Km, LC connector with DDM, 1000Base-SX+	
	MTBTW	Multi-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 2Km, LC connector w/o DDM, 1000Base-SX+	
	PTB2W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 20Km, LC connector w/o DDM, 1000Base-LX	
	PTB4W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 40Km, LC connector w/o DDM, 1000Base-LHX	
	PTC5W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 50Km, LC connector w/o DDM, 1000Base-XD	
	PTC6W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 60Km, LC connector w/o DDM, 1000Base-XD	
	PTC8W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 80Km, LC connector w/o DDM, 1000Base-ZX	
	PTC9W	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 90Km, LC connector w/o DDM, 1000Base-ZY	
	PTCVW	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 110Km, LC connector w/o DDM, , 1000Base-APD	
	PTCXW	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 120Km, LC connector w/o DDM1000Base-APD	
	PTB1D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 10Km, LC connector with DDM, 1000Base-LX	
	PTB3D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 30Km, LC connector with DDM, 1000Base-LHX	
	PTB4D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 40Km, LC connector with DDM, 1000Base-LHX	
	PTC5D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 50Km, LC connector with DDM, 1000Base-XD	
	PTC6D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 60Km, LC connector with DDM, 1000Base-XD	
	PTC8D	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 80Km, LC connector with DDM, 1000Base-ZX	
	PTC9D	Single-mode optical module, with dual unidirectional fiber, 1.25G, 1550nm, 90Km, LC connector with DDM	
	PTCVD	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 110Km, LC connector with DDM, 1000Base-APD	
PTCXD	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 120Km, LC connector with DDM, DDM1000Base-APD		
622M-1.25G (mini GBIC) Dual Fiber Commercial (0 to 70°C)	PKB1W	Single-mode optical module with dual uni-directional fiber, 622Mbps~1.25G, 1310nm, 10Km, LC connector w/o DDM, 1000Base-LX	

1.25G (mini GBIC) Bi-directional Single Fiber Commercial (0 to 70°C)	PTD1W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 10Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1310 nm from master to slave Order PTD1W to use with PTE1W Use 1 fiber
	PTE1W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 10Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1550 nm from slave to master Order PTE1W to use with PTD1W Use 1 fiber
	PTD2W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1310 nm from master to slave Order PTD2W to use with PTE2W Use 1 fiber
	PTE2W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1550 nm from slave to master Order PTE2W to use with PTD2W Use 1 fiber
	PTD4W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1310 nm from master to slave Order PTD4W to use with PTE4W Use 1 fiber
	PTE4W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> 1550 nm from slave to master Order PTE4W to use with PTD4W Use 1 fiber

PTD6W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD6W to use with PTE6W ▪ Use 1 fiber
PTE6W	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE6W to use with PTD6W ▪ Use 1 fiber
PTD1D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 10Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD1D to use with PTE1D ▪ Use 1 fiber
PTE1D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 10Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE1D to use with PTD1D ▪ Use 1 fiber
PTD2D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD2D to use with PTE2D ▪ Use 1 fiber
PTE2D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE2D to use with PTD2D ▪ Use 1 fiber
PTD4D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD4D to use with PTE4D ▪ Use 1 fiber
PTE4D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE4D to use with PTD4D ▪ Use 1 fiber
PTD6D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD6D to use with PTE6D ▪ Use 1 fiber
PTE6D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE6D to use with PTD6D ▪ Use 1 fiber
PTD8D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 80Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1310 nm from master to slave ▪ Order PTD8D to use with PTE8D ▪ Use 1 fiber
PTE8D	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 80Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> ▪ 1550 nm from slave to master ▪ Order PTE8D to use with PTD8D ▪ Use 1 fiber

NOTE: For other special optical modules, please contact your nearest Loop sales representative.

System Clock

Clock Source Internal clock
4 aggregate lines clocks (STM-1/4 (OC-3/12))
External clocks: 2.048MHz or 2.048Mbps for STM-1/4, 1.544M bps for OC-3/12

Management Interface

LED Multi colors
Console Electrical: RS232
Connector: DB9S (DCE)
Protocol: Menu driven VT-100
SNMP SNMPv1, v3 (RFC1213, RFC2863, RFC1493)
OSS interface 10/100BaseT FE (IEEE 802.3u)
NE/NE interface DCC/HDLC/Ethernet type II

Alarm Input/Output

Inputs		Outputs	
Channel	4	Channel	4
Connector	RJ45	Connector	RJ45
Internal Resistance	1K	Initial Insulation Resistance	Min. 100m ohm (at 500Vdc)
Activation Current	3 ma	Max. Rating	3 Vdc/1A
Deactivation Current	1.5 ma		125Vac/0.5A
Allowable Current	4 ma		

Diagnostics

XCU card

Loopback Test Local loopback, payload loopback, line loopback
BERT Test Optical interface Direction: to optical lines

B155/622 card

Loopback Test Local loopback, payload loopback, line loopback:
BERT Test Optical interface Direction: to optical lines

E1/T1 card

Loopback Test Local loopback, line loopback:
BERT Test E1/T1 interface Direction: to optical lines, to tributary lines

Performance Monitor

Performance Reports Performance Parameters: Error Block (EB), Background Block Error (BBE), Error Second(ES), Burst Error Second (BES), Severe Error Second (SES), Unavailable Second(UAS)

Alarm History System Alarm Alarm Cut Off, Power Loss/Uneqp, Fan Fail, Fan Module Uneqp, Overheat, TS Sync Loss, Logon and Logout, Optical Port Uneqp, Card In, Card Out, Card Type Mismatch, Card Port Number Mismatch, Card Fail, Card Registration, SNCP Switch, MSP Switch, Trib Protection Sync, Standby XCU Takeover, Standby Trib Takeover, XCU Sync, SFP Tx Fail, SFP Rx Fail, SFP Temperature, LS Protection, LS ID Mismatch

SDH/SONET Line Alarm	SDH	Line	PI-LOS RS-LOF RS-TIM MS-SD MS-SF MS-AIS MS-RDI MS-REI B1-BIP B2-BIP
		Ho-Path	AU-LOP AU-AIS HP-SD HP-SF HP-UNEQ HP-PLM HP-TIM HP-RED-P HP-RDI-S HP-RDI-C HP-LOM HP-REI
		Lo-Path	TU-LOP TU-AIS LP-SD LP-SF LP-UNEQ LP-PLM LP-TIM LP-RDI-P LP-RDI-S LP-RDI-C LP-REI LP-BIP
	SONET	Line	LOS-PI, LOF-S, TIM-S, SD-L , SF-L , AIS-L , RDI-L , REI-L UAS, B1-BIP, B2-BIP

Alarm History STS-Path LOP-P, AIS-P, SD-P, SF-P, UNEQ-P, PLM-P, TIM-P, RDI-P-P, RDI-S-P, RDI-C-P, RDI-P-P, LOM-P, REI-P, B3-BIP-P

VT-Path LOP-V, AIS-V, SD-V, SF-V, UNEQ-V, PLM-V, TIM-V, RDI-P-V, RDI-S-V, RDI-C-V, REI-V, BIP-V

Alarm Queue Contains up to 300 alarm records of latest alarm types, alarm severity, date, and time.

Electrical

DC Power -48Vdc (-36 to -72 Vdc)
Power consumption 240 Watts

Physical and Environmental

Dimensions for 6U 433mm x264mm x 223.5mm (W/H/D)
Temperature 0 to 50°C
Humidity 0-95%RH (non-condensing)
Mounting Desk-top stackable, 19/23 inch rack mountable, and wall mountable

Certifications

EMI/EMC EN55022 Class A, EN55024
FCC Part 15 Class A,
Safety IEC60950-1, IEC 61850-3, IEEE 1613

Note for IEC 61850-3 and IEEE1613:

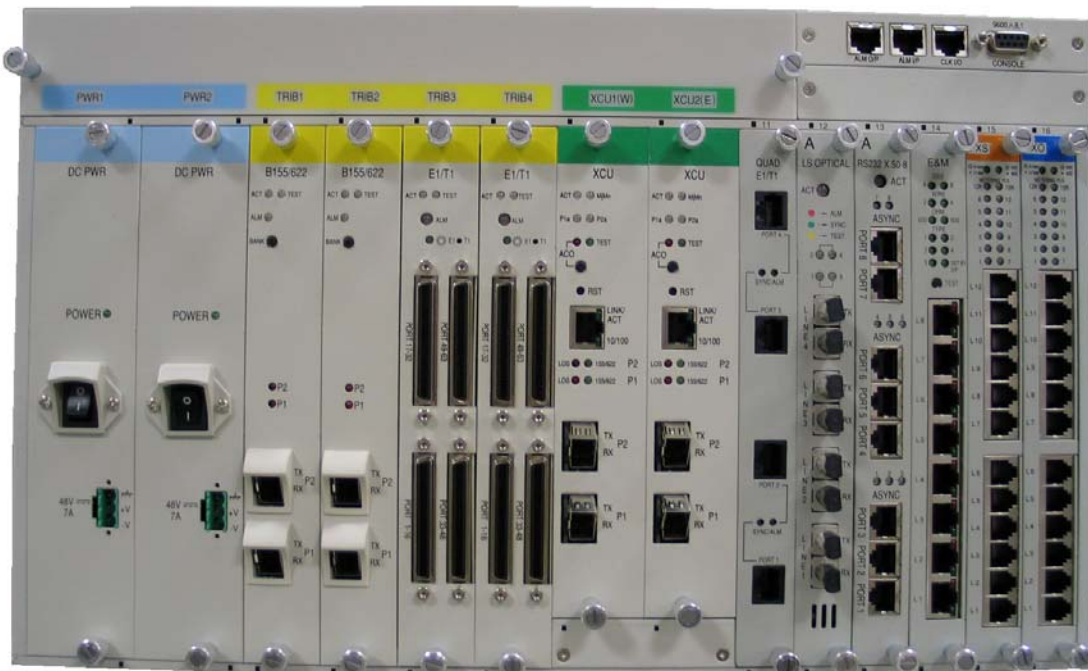
- (1) The certification only applies to O9500-R with 48Vdc/150W power module
- (2) The magento card does not support IEC 61850-3 and IEEE 1613
- (3) Use shielding cable with the following modules:

- RS232-X.50 module
- DTE of Conference module
- Input Port of Dry Contact module
- RS232 X.50-8 module
- V.35 module
- V.36/RS449/EIA530 module
- Input Port of Dry Contact B module
- X.21 module
- SNMP of XCU
- Console port of XCU

Standards Compliance

ITU-T G.707, G.7041, G.7042, G.775, G.783, G.806, G.823, G.747, X.86, G.664,
ANSI T1.105, T1.107
IEEE 802.1q (VLAN), 802.1w (RSTP), 802.1s(MSTP), 802.1ad (stack VLAN),
802.3x (flow control), 802.1p (QoS), 802.1AX

* Future Option



O9500R Hardware Configuration Chart on High Speed Slot and CPU

Figure 1 High speed tributary cards without protection

Slot	Plug-in Card	E1/T1	Ethernet		Optical (SFP)	
			FE	GbE	STM-1/OC-3	STM-4/OC12
HS	TRIB 1	63/32/16	8	1	2	1 ^{Note 2}
	TRIB 2	63/32/16	8	1	2	
	TRIB 3	63/32/16	8	1	1	X
	TRIB 4	63/32/16	8	1	1	X
	XCU 1	X	X	X	2	2
	XCU 2	X	X	X	2	2
	Max. Port of Each Interface	252	32	4	10	5

Figure 2 High speed tributary cards with protection

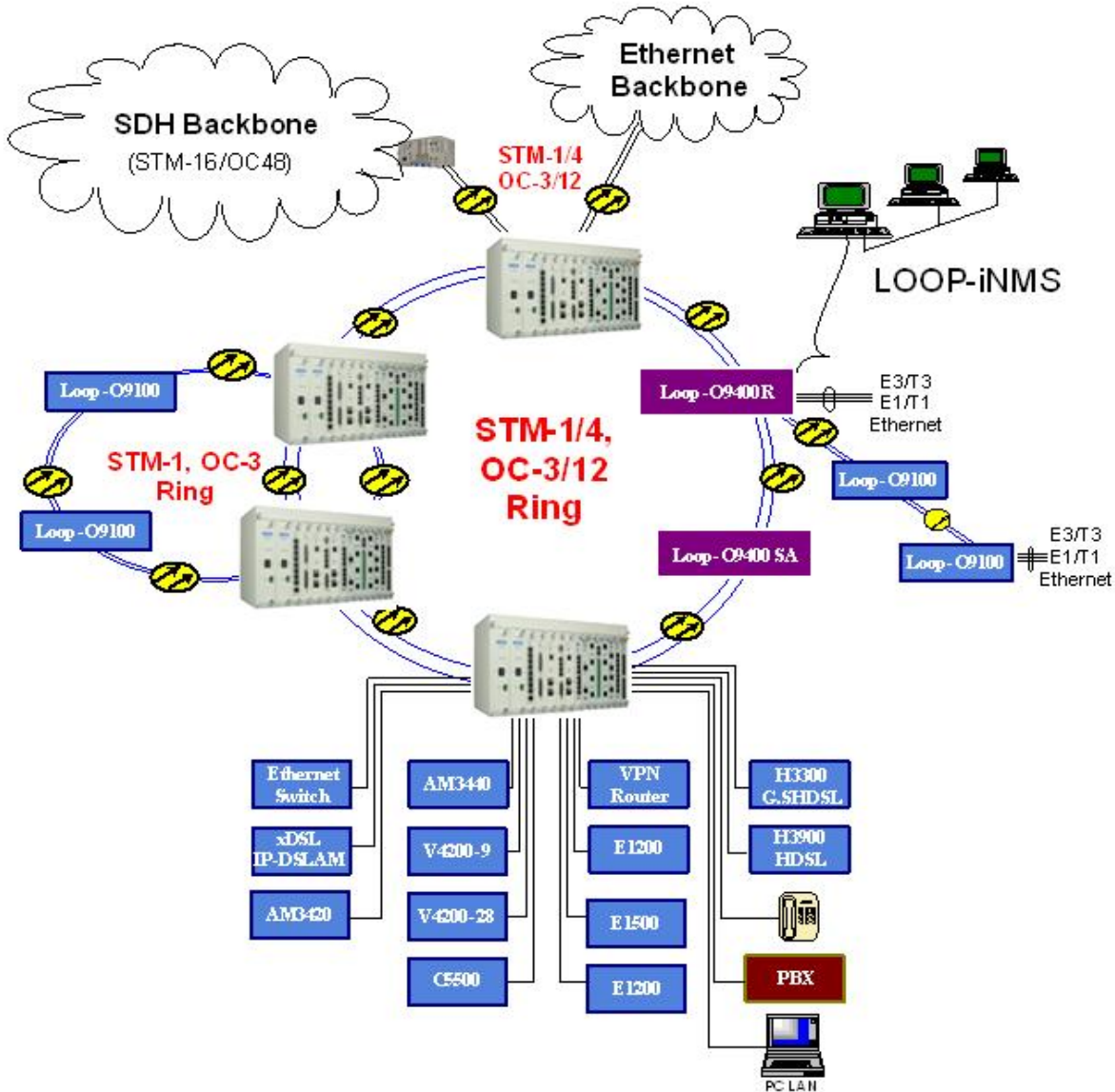
Slot	Plug-in Card	E1/T1	Ethernet		Optical (SFP)	
			FE	GbE	STM-1/OC-3	STM-4/OC12
HS	TRIB 1	63/32/16	8	1	2	1
	TRIB 2	63/32/16 (B)	8 (B)	1 (B)	2 (B)	1 (B)
	TRIB 3	63/32/16	8	1	2	X
	TRIB 4	63/32/16 (B)	8 (B)	1 (B)	2 (B)	X
	XCU 1	X	X	X	2	2
	XCU 2	X	X	X	2 (B)	2 (B)
	Max. Port of Each Interface	126	16	2	6	3

(B) backup/protection

Note 2: To set up STM-4/OC12 without protection, put only one optical-module-with-protection in either TRIB 1 or TRIB2 slot.

Application Illustration

O9500 can be configured as either a Terminal Multiplexer (TM), a Linear Add/Drop Multiplexer (ADM), or as a cross-connect (DACS) with the same enclosure. With UPSR/SNCP, and MSP(1+1) protection, the Loop-O9500 can easily provide a well-protected transmission path and integrated access in various applications as shown below.



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