



DATA COMM FOR BUSINESS



O9400R

SDH/SONET ADM/TM



Features:

- 6U height, full front access (ETSI) shelf
- Hot-swappable cross-connect modules, tributary modules and power modules
- Temperature controlled fan tray
- Aggregate cross-connect modules (controller modules)
 - Up to STM-1/4/16 (OC-3/12/48) aggregate lines with software configurable (CC16)
 - Up to STM-1/4 (OC-3/12) aggregate lines with software configurable (CC4)
- Tributary modules
 - 8 tributary slots
 - Dual ports STM-1/4 (OC-3/12) module
 - Triple ports E3/T3 module
 - 16/32/63 ports E1/T1 tributary module
 - 1 GbE and 8 FE tributary module with L2 switch
 - 1 GbE or 8 FE tributary module without L2 switch
 - 7 FOM module
- Power Modules
 - DC module (-36 to -72 Vdc)
 - AC/DC hybrid module (90 to 240 Vac; -36 to -72 Vdc)
 - Dual power (1+ 1) protection
- Protection
 - Controller-Cross-connect Unit (XCU) protection, MSP (1+1) , SNCP/UPSR
 - Tributary protection
 - E1/T1: Card, Port, Line
 - E3/T3: Line
 - B155/622: MSP, SNCP/UPSR
 - Ethernet
 - FOM: Line
- TM, ADM, and cross-connect
- Full cross-connect at VC11/VC12/VC3/VC4 levels
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT, BCP, LCAS and non-LCAS
- Ethernet Order Wire (EOW) using VoIP technology
- Management
 - Console port, VT100 menu-driven
 - SNMP port: support v1 and v3
 - Telnet
 - Centralized management with Loop's EMS/iNMS over DCC channel
 - LoopView GUI EMS Element Management System
 - TMN management (Loop-iNMS) with full FCAPS and end-to-end circuit management
 - SSH
- RoHS compliant

Loop-O9400R STM-1/4/16 (OC-3/12/48) is a standard compliant high density NGN SDH/SONET ADM/TM with full T1/E1 cross-connect rack system. The O9400R designs to have full add and drop capability up to:

- For controller STM-1/4 (OC-3/12) aggregate cross connect module, the capability up to:
 - 1 STM-4 tributaries
 - 8 STM-1 tributaries
 - 18 E3/T3 tributaries
 - 378 E1/T1 tributaries
 - 48 10/100M Ethernet EoS tributaries
 - 6 GbE EoS tributaries
- For controller STM-1/4/16 (OC-3/12/48) aggregate cross connect module, the capability up to:
 - 4 STM-4 tributaries
 - 16 STM-1 tributaries
 - 24 E3/T3 tributaries
 - 504 E1/T1 tributaries
 - 64 10/100M Ethernet EoS tributaries
 - 8 GbE EoS tributaries
 - 56 FOM tributaries

With up to 4 STM-1/4/16 (OC-3/12/48) aggregate interfaces on cross-connect modules and 16 STM-1 (OC-3) interfaces on tributaries, the Loop-O9400R can offer the service provider a versatile protection scheme including SNCP(UPSR), and MSP (1+1) protection for both ring and linear network topology.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The Loop-O9400R provides powerful Operation, Administration, Maintenance and Provisioning (OAM&P) functionality, including fault management, performance monitoring, configuration management, and network security management. Through console port, LAN port, In-band E1, and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

Powerful SDH Loop's EMS/NMS

The Loop-O9400R provides a complete set of operation interfaces that are consistent with the Telecommunication Management Network (TMN) concept (ITU Recommendation M.30, G.784) for SDH/SONET Network Element/Operations System (NE/OS), NE/NE, and NE/Craft communications. A user can easily operate the Loop-O9400R locally or remotely for centralized management.






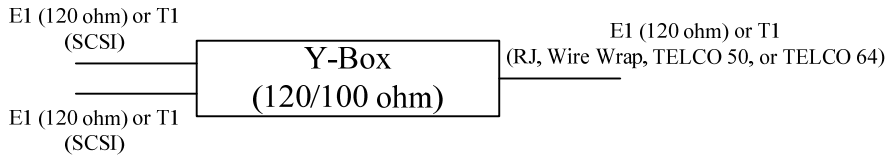
Ordering Information

To specify options, choose from list below:

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

Note: If different environmental requirements are needed, please contact Loop's Marketing & Sales Team regarding availability.

Model	Description	Note
Main Unit		
Loop-O9400-R-CHA-G	6U height Rack chassis for O9400 without CPU and power modules	
CPU Modules and Supporting Plug-in Modules		
Loop-O9400-R-CC16-G	CPU module with cross-connect unit and two STM-1/4/16 (OC-3/12/48) interfaces without SFP (mini-GBIC) optical modules	One required for each chassis Order two for redundancy
Loop-O9400-R-CC4-G	CPU module 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-O9400-R-CBA-G	Connector Board	One required for each chassis
Loop-O9400-R -FANA-G	Fan Tray with temperature controlled board	One required for each chassis
Loop-O9400R-FILR-G	Air Filter Rack for O9400R, air filter included.	
Loop-O9400R-FILRCMA-G	Air Filter Rack with cable management for O9400R, 2U (88mm), air filter included	
Tributary Plug-in Modules		
Loop-O9400-R-16TE-G	16 E1(120 ohm) or 16 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-32TE-G	32 E1(120 ohm) or 32 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-63TE-G	63 E1(120 ohm) or 63 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-16E75-G	16 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-32E75-G	32 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-63E75-G	63 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-B16-G	STM-1/4 (OC-3/12) software programmable interface plug-in module without SFP (mini-GBIC) optical modules	Order two for redundancy
Loop-O9400-R-9EoS4NSW-G	1 GbE or 8FE software programmable interface plug-in module without L2 switch	Order two for redundancy
Loop-O9400-R-9EoS4SW-G	1 GbE and 8FE interface plug-in module with L2 switch	Order two for redundancy
Loop-O9400-R-3TE3-G	3 T3 or 3 E3 software programmable interface plug-in modules	Order two for redundancy
Loop-O9400-R-7FOM-G	7-port Fiber Optical Interface with 7 SFP housings (SFP not included)	Order two for redundancy 7 FOM plug-in card only applies to O9400R-CC16
Software		
Loop-O9400-R-3M13	A software key to activate the 3TE3 module to have M13 /Mx3 function for T3 interface only	
Accessories		
User's Manual		

Loop-O9400-R-UMA	Optional, paper copy of User Manual. A CD version of the manual is already included as part of the standard package.	
Power Modules		
Loop-O9400-R-SD48-G	Single -48Vdc (-36 to -72Vdc) power module	<ul style="list-style-type: none"> For redundancy purposes, ordering a second plug-in module will provide dual power. For AC power module, choose an appropriate power cord.
Loop-O9400-R-SAD-G	Single AC and DC (coexistent) power module (90 to 240Vac, 50/60Hz and -36 to -72Vdc)	
Power Cord		
Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	AC power cord for China	
Air Filter		
Loop-O9400R-FIL	Air Filter to fit Loop-O9400R-FILR Air Filter Rack	
Order Wire Phone		
Loop-O9400-R-OW-G	Ethernet Order Wire Phone (using VoIP Technology)	
SIP Proxy Server		
Loop-O9400-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.
Conversion Panels		
Loop-ACC-P-1SCSI-16RJ-G	One SCSI to sixteen RJ (1u height) without cable	Used with: Loop-O9400-R-16TE-G, Loop-O9400-R-32TE-G, Loop-O9400-R-63TE-G
Loop-ACC-P-1SCSI-16WW-G	One SCSI to sixteen Wire Wrap (1u height) without cable	Used with: All types of ET and E75 plug-in cards
Loop-ACC-P-1SCSI-16BNC-G	One SCSI to sixteen BNC (1.5u height) without cable	Used with: Loop-O9400-R-16E75-G, Loop-O9400-R-32E75-G, Loop-O9400-R-63E75-G
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-O9400-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-O9400-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-O9400-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-O9400-R-16TE-G,
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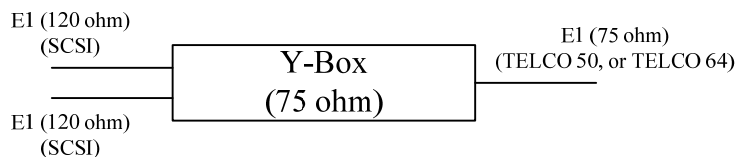
Loop-ACC-Y-2SCSI-1T64P16-16TE-G	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to one TELCO 64 (E1(120 ohm) or T1) connectors (16 ports per TELCO connector) without cable	Using with Loop-O9400-R-16TE-G,
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Loop-ACC-Y-4SCSI-4T50P8-32TE-G	1u 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-O9400-R-32TE-G, Loop-O9400-R-63TE-G
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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-O9400-R-32TE-G, Loop-O9400-R-63TE-G
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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-O9400-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-O9400-R-16TE-G
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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-O9400-R-32TE-G, Loop-O9400-R-63TE-G
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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-O9400-R-16TE-G
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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-O9400-R-16TE-G
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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-O9400-R-32TE-G, Loop-O9400-R-63TE-G
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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-O9400-R-32TE-G, Loop-O9400-R-63TE-G
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Conversion Cable

Loop-ACC-CAB-SCSI68M-200-1SCSI68M-G	SCSI68/ Male to one SCSI68/Male; Length 200 cm	Used for all Conversion Panels and Y-box Panels
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Note: Please contact sales representative near you for further detail info.

Blank Panels

30.001076.A00LF	Blank panel for power supply slots	
30.001077.A00LF	Blank panel for other slots	

SFP Optical/Electrical Module Plug-in Tables

2.5G Optical SFP Module Characteristic

2.5G (mini GBIC) Dual Fiber Commercial (0 to 70°C)	PLB2D	Single-mode optical module with dual uni-directional fiber, 2.5G, 1310nm, 15Km, LC connector with DDM	▪ Use 2 fibers for all SFP optical modules
	PLB4D	Single-mode optical module with dual uni-directional fiber, 2.5G, 1310nm, 40Km, LC connector with DDM	
	PLC8D	Single-mode optical module with dual uni-directional fiber, 2.5G, 1550nm, 80Km, LC connector with DDM	

622M bps Optical SFP Module Characteristic

622M~1.25G mini GBIC Dual Fiber	PKB1W	Single mode optical module with dual uni-directional fiber, 622M~1.25G, 1310nm, 10Km, LC connector w/o DDM, S-4.1/IR1/1000Base-LX	Use 2 fibers for all SFP optical modules
155~622Mbps mini GBIC Dual Fiber	PJB2W	Single mode optical module with dual uni-directional fiber, 155~622M, 1310nm, 15~20Km, LC connector w/o DDM, S-4.1/IR1	
	PJB5W	Single mode optical module with dual uni-directional fiber, 155~622M, 1310nm, 50Km, LC connector w/o DDM, L-4.1/LR1	
	PJC8W	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 80Km, LC connector w/o DDM, S-4.2/LR2	
	PJB2D	Single mode optical module with dual uni-directional fiber, 155~622M, 1310nm, 15~20Km, LC connector with DDM, S-4.1/IR1	
	PJB4D	Single mode optical module with dual uni-directional fiber, 155~622M, 1310nm, 40Km, LC connector with DDM, L-4.1/LR1	
	PJB5D	Single mode optical module with dual uni-directional fiber, 155~622M, 1310nm, 50Km, LC connector with DDM, L-4.1/LR1	
	PJC8D	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 80Km, LC connector with DDM, L-4.2/LR2	
	PJCXW	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 120Km, LC connector w/o DDM, L-4.2 extended distance	
	PJCXD	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 120Km, LC connector with DDM, L-4.2 extended distance	
	PJCRD	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 160Km, LC connector with DDM, L-4.2 extended distance	
	PJCYD	Single mode optical module with dual uni-directional fiber, 155~622M, 1550nm, 200Km, LC connector with DDM, L-4.2 extended distance	

155~622Mbps Bi-directional Single Fiber Commercial (0 to 70°C)	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	▪ 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	▪ 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

155Mbps Optical SFP Module Characteristic

SFP 155 Mbps (mini GBIC)	MHATW	Multi mode optical module with dual uni-directional fiber, 155M, 850nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	Use 2 fibers for all SFP optical modules
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Dual Fiber	MHBTW	Multi mode optical module with dual uni-directional fiber, 155M, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	
	PHB3W	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1/Fast Ethernet	
	PHB5W	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector w/o DDM, L-1.1/LR1/Fast Ethernet	
	PHCUW	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector w/o DDM, L-1.2/LR2Fast Ethernet	
	PHCXW	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector w/o DDM, L-1.2 extended distance	
	PHB3D	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector with DDM, S-1.1/IR1/Fast Ethernet	
	PHB5D	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector with DDM, L-1.1/LR1/Fast Ethernet	
	PHC8D	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 80Km, LC connector with DDM, L-1.2/LR2	
	PHCUD	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector with DDM, L-1.2/LR2/Fast Ethernet	
	PHCXD	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector with DDM, L-1.2 extended distance	
	PHCRD	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 160Km, LC connector with DDM, L-1.2 extended distance	
	PHCYD	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 200Km, LC connector with DDM, L-1.2 extended distance	
	PHCZD	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 240Km, LC connector with DDM, L-1.2 extended distance	

155 Mbps Bi-directional Single Fiber Commercial (0 to 70°C)	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

155 Mbps Electrical transceiver	EHNAC	Electrical transceiver module, 155M, 100m, mini-BNC coaxial connector	
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NOTE: For other special optical modules, please contact your nearest Loop sales representative.

LOOP-O9400R SDH/SONET ADM/TM PRODUCT SPECIFICATIONS

Max. Number of Cross-connect Modules

- 4 STM-1/4 (OC-3/12) aggregate lines
- 4 STM-1/4/16 (OC-3/12/48) aggregate lines

Max. Number of Tributary Modules for STM1/4 (OC3/12) Cross-connect Module

- 1 STM-4 (OC-12) tributaries
- 8 STM-1 (OC-3) tributaries
- 18 E3/T3 tributaries
- 378 E1/T1 tributaries
- 6 GbE EoS tributaries
- 48 10/100M Ethernet EoS tributaries

Max. Number of Tributary Modules for STM1/4/16 (OC3/12/48) Cross-connect Module

- 4 STM-4 (OC-12) tributaries
- 16 STM-1 (OC-3) tributaries
- 24 E3/T3 tributaries
- 504 E1/T1 tributaries
- 8 GbE EoS tributaries
- 64 10/100M Ethernet EoS tributaries

SFP Module Characteristics

Aggregate Lines and STM-1/4/16 (OC-3/12/48) tributary Modules Characteristics

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PLB2D	Dual uni-directional fiber	2.5G	1310nm	LC with DDM	15 Km
PLB4D	Dual uni-directional fiber	2.5G	1310nm	LC with DDM	40 Km
PLC8D	Dual uni-directional fiber	2.5G	1550nm	LC with DDM	80 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	1310nm	LC without DDM	20 Km
PJE2W	Single bi-directional fiber	155~622M	1550nm	LC without DDM	20 Km
PJD4W	Single bi-directional fiber	155~622M	1310nm	LC without DDM	40 Km
PJE4W	Single bi-directional fiber	155~622M	1550nm	LC without DDM	40 Km
PJD6W	Single bi-directional fiber	155~622M	1310nm	LC without DDM	60 Km
PJE6W	Single bi-directional fiber	155~622M	1550nm	LC without DDM	60 Km
PJQ8W	Single bi-directional fiber	155~622M	1510nm	LC without DDM	80 Km
PJR8W	Single bi-directional fiber	155~622M	1590nm	LC without DDM	80 Km
PJQXW	Single bi-directional fiber	155~622M	1510nm	LC without DDM	120 Km
PJRXW	Single bi-directional fiber	155~622M	1590nm	LC without DDM	120 Km
PJD2D	Single bi-directional fiber	155~622M	1310nm	LC with DDM	20 Km
PJE2D	Single bi-directional fiber	155~622M	1550nm	LC with DDM	20 Km
PJD4D	Single bi-directional fiber	155~622M	1310nm	LC with DDM	40 Km
PJE4D	Single bi-directional fiber	155~622M	1550nm	LC with DDM	40 Km
PJD6D	Single bi-directional fiber	155~622M	1310nm	LC with DDM	60 Km
PJE6D	Single bi-directional fiber	155~622M	1550nm	LC with DDM	60 Km

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
MHATW	Dual uni-directional fiber	155M	850nm	LC without DDM	2 Km
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
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 Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PHD2W	Single bi-directional fiber	155M	1310nm	LC without DDM	20 Km
PHE2W	Single bi-directional fiber	155M	1550nm	LC without DDM	20 Km
PHD4W	Single bi-directional fiber	155M	1310nm	LC without DDM	40 Km
PHE4W	Single bi-directional fiber	155M	1550nm	LC without DDM	40 Km
PHD6W	Single bi-directional fiber	155M	1310nm	LC without DDM	60 Km
PHE6W	Single bi-directional fiber	155M	1310nm	LC without DDM	60 Km
PHD8W	Single bi-directional fiber	155M	1550nm	LC without DDM	80 Km
PHE8W	Single bi-directional fiber	155M	1310nm	LC without DDM	80 Km
PHQ8W	Single bi-directional fiber	155M	1510nm	LC without DDM	80 Km
PHR8W	Single bi-directional fiber	155M	1590nm	LC without DDM	80 Km
PHQXW	Single bi-directional fiber	155M	1510nm	LC without DDM	120 Km
PHRXW	Single bi-directional fiber	155M	1590nm	LC without DDM	120 Km
PHQXW	Single bi-directional fiber	155M	1510nm	LC without DDM	160 Km
PHRXW	Single bi-directional fiber	155M	1590nm	LC without DDM	160 Km
PHQXW	Single bi-directional fiber	155M	1510nm	LC without DDM	200 Km
PHRXW	Single bi-directional fiber	155M	1590nm	LC without DDM	200 Km

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

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		

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		

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 (unframed E1/T1), 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, BCP, 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, BCP, LCAS(G.7042) and non-LCAS		

7 FOM

Fiber Optical Interface

Port number	7		
Source	Laser	Line Code	Scrambled NRZ
Wavelength	1310 \pm 50 nm, 1550 \pm 40 nm		
Optical Line Rate	38.84Mbps		
Connector	SFP housing with LC type		
Reach	2~240 Km (For more detail, please refer to the SFP table below)	Protection	1+1 Line Protection

System Clock

Clock Source	Internal clock 4 aggregate lines clocks (STM-1/4 (OC-3/12)) 6 tributary clocks 2 external input clocks (ITU-T G.703 - 2.048 Mhz or E1 for STM-1/4, T1 for OC-3/12)
Clock Output	2 external output (E1 for STM-1/4, T1 for OC-3/12)

Management Interface

LED	Multi colors
Console	Electrical: RS232, DCE Connector: DB9, female User interface: Menu driven VT-100
Telnet	
SNMP	SNMPv1, RFC1213
OSS interface	10/100BaseT FE (IEEE 802.3u)
NE/NE interface	DCC/HDLC/PPP/Ethernet type II, In-band E1

Alarm Input/Output

Inputs			
Ports	4	Activation current	3 mA
Internal resistance	1K	Deactivation current	1.5 mA
Connectors	RJ45		
Outputs			
Ports	4	Max. rating of relay	3Vdc/1A; 125Vac/0.5A

Initial insul. resist. Min. 100M ohm (at 500Vdc)
Connectors RJ45

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

7 FOM card

Optical Fiber Local and remote loopbacks
E1 Test Pattern To optical direction or backplane direction

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, RBC 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

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

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

Power

AC and DC coexistent module 90 to 240Vac, 50/60Hz, -48Vdc (-36 to -72Vdc)
DC module -48Vdc (-36 to -72Vdc)

Physical and Environmental

Dimensions for 6U 433 x 264 x 223.5mm (W/H/D)
Dimension for Air Filter Rack 433 x 22 x 223.5mm (WxHxD)
Dimension for Air Filter Rack A with cable management 433 x 88 x 223.5mm (WxHxD)
Dimension for Y-Box 432 x 44 x 100 mm (Wx HxD)
Dimension for Conversion Panel RJ connector: 432 x 44 x 23mm (WxHxD)
WW connector: 432 x 44 x 40mm (WxHxD)
BNC connector: 432 x 66 x 53mm (WxHxD)
Temperature 0 to 50°C
Humidity 0-95%RH (non-condensing)
Mounting Desk-top stackable, 19/23 inch rack mountable

Standards Compliance

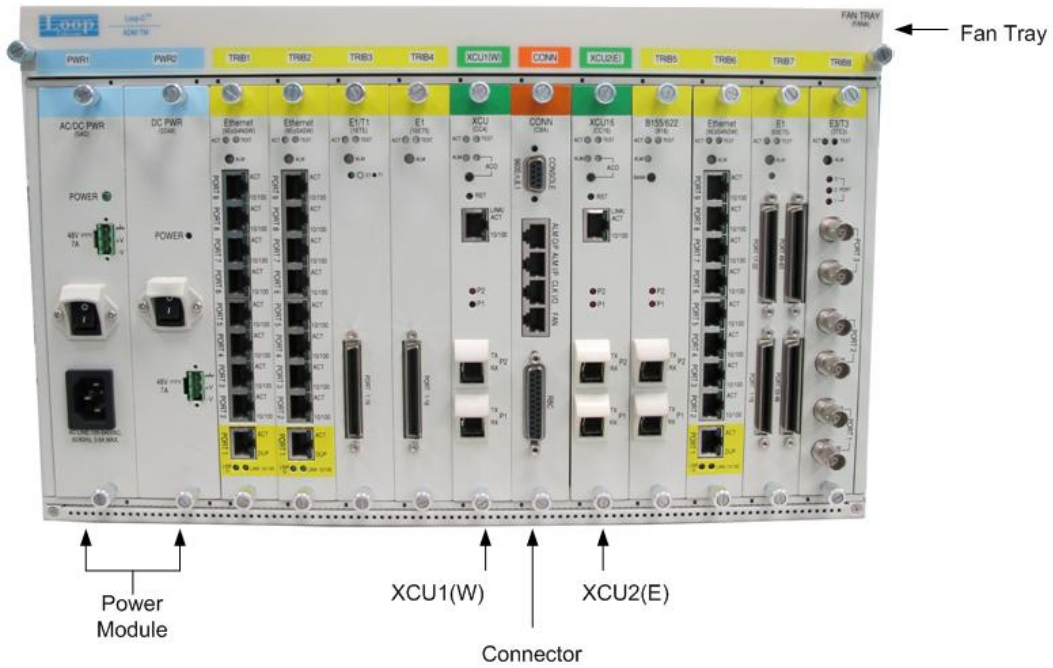
ITU-T G.703, G.707, G.751, G.747, G.7041, G.7042, G.775, G.783, G.806, G.813, G.823, G.824, G.826, G.841, G.747, X.86, G.664
 ANSI T1.105, T1.107
 IEEE 802.1q (VLAN), 802.1w (RSTP), 802.1s(MSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.3u, 802.1p (QoS)

Certification

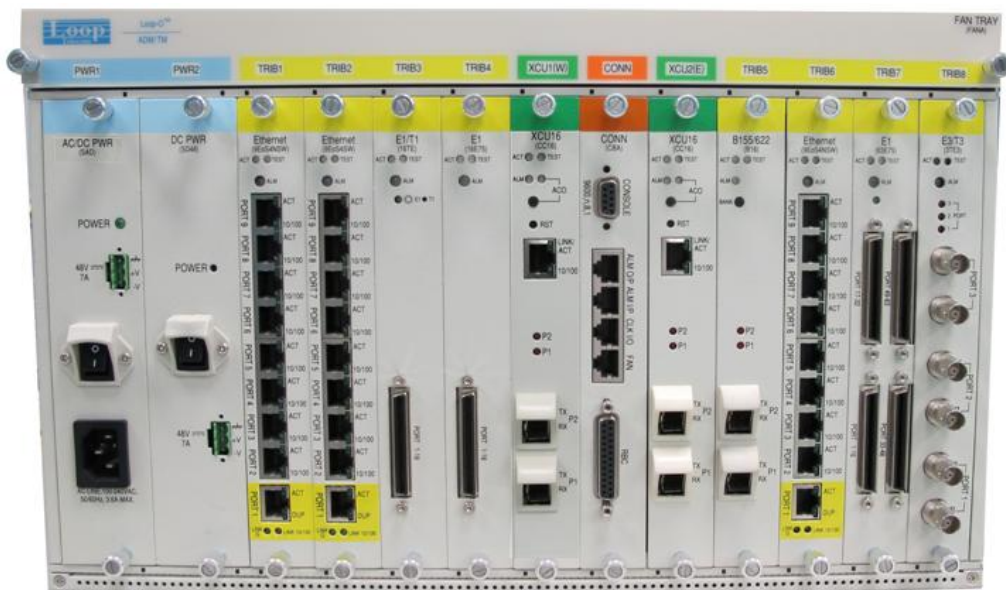
EMC FCC Part 15 Subpart B, Class A; EN 55022, Class A; EN55024; EN300 386
 Safety IEC60950-1/EN 60-950-1

Loop-O9400R Front Panel

Controller STM-1/4 (OC-3/12)



Controller STM-1/4/16 (OC-3/12/48)



Loop-O9400R Card Type and Capacity Reference Table

Table 1 STM-1/4 (OC3/12) aggregate line

In this table, STM-4 could also be OC-12; STM-1 could also be OC-3; E1 could also be T1; and E3 could also be T3.

SLOTS	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU1(W)	CONNECTOR	XCU2(E)	TRIB 5	TRIB 6	TRIB 7	TRIB 8	
GLOBAL PAYLOAD SDH	155M		155M		8 x 155M			8 x 155M	2 x 155M	N/A	4 X 155M	N/A
Tributary (Plug-in Modules)								1 x 155M	1 x 155M	2 x 155M	2 x 155M	
Link without MSP	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM-1	STM-1	STM-1 (2 ports)	STM-1 (2 ports)
	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM-1	STM-1	STM-4	N/A
	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM-1 (2 ports)	N/A	STM-1 (2 ports)	STM-1 (2 ports)
Link with MSP (1+1)	STM-1	STM-1(B)	STM-1	STM-1(B)	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)
	STM-1	STM-1(B)	STM-1	STM-1 (B)	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM1-1 (2 ports)	STM-1 (2 ports) (B)	STM-4	STM-4 (B)
Link with SNCP Ring *See Note 1	N/A	N/A	N/A	N/A	STM-1/4 (2 ports)			STM-1/4 (2 ports)	STM-1	STM-1	STM-1 (2 ports)	STM-1 (2 ports)
Link with Link with SNCP Ring & MSP (1+1) *See Note 2	N/A	N/A	N/A	N/A	STM-1/4 (2 ports)			STM-1/4 (2 ports)	N/A	N/A	N/A	N/A
Max 378 E1 (Single)	63 E1	N/A	63 E1	N/A					63 E1	63 E1	63 E1	63 E1
Max 252 E1 (Protection)	63 E1	63 E1 (B)	63E1	63 E1 (B)					63 E1	63 E1 (B)	63 E1	63 E1 (B)
Max. 18 E3 (Single)	3 E3	N/A	3 E3	N/A					3 E3	3 E3	3 E3	3 E3
Max 12 E3 (Protection)	3 E3	3 E3 (B)	3 E3	3 E3 (B)					3 E3	3 E3 (B)	3 E3	3 E3 (B)
Max 48 10/100 BT 6x 1000BT (Single)	8x10/100 BT 1 x 1000BT	N/A	8x10/100BT 1 x 1000BT	N/A					8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100 BT 1 x 1000BT
Max 32 10/100 BT 4 x 1000 BT (Protection)	8x10/100 BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)				8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100 BT 1 x 1000BT (B)	

Note: (B) backup/protection

Note 1: XCU1(W) port 1 and XCU2(E) port 1 form Ring #1

XCU1(W) port 2 and XCU2(E) port 2 form Ring #2

Trib5 port 1 and Trib6 port 1 form Ring #3

Trib7 port 1 and Trib8 port 1 form Ring #4

Trib7 port 2 and Trib8 port 2 form Ring #5

Total Capacity 5 Rings.

Note 2: XCU1(W) port 1 and XCU2(E) port 1 with MSP (1+1) protection

XCU1(W) port 2 and XCU2(E) port 2 with MSP (1+1) protection

XCU1(W) port 1 and XCU2(E) port 2 form a ring

These four ports form one STM-1/4 Main Ring with MSP (1+1) protection

Loop-O9400R Card Type and Capacity Reference Table

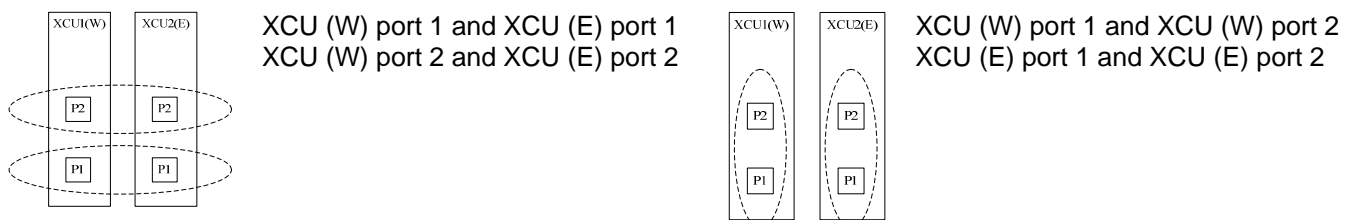
Table 2 STM-1/4/16 (OC3/12/48) aggregate line

In this table, STM-16 could be OC-48, STM-4 could also be OC-12; STM-1 could also be OC-3; E1 could also be T1; and E3 could also be T3.

SLOTS	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU1(W)	CONNECTOR	XCU2(E)	TRIB 5	TRIB 6	TRIB7	TRIB 8	
GLOBAL PAYLOAD SDH	4 X 155M	N/A	4 X 155M	N/A	2 x 2.5G		2 x 2.5G	4 X 155M	N/A	4 X 155M	N/A	
	2 x 155M	2 x 155M	2 x 155M	2 x 155M					2 x 155M	2 x 155M	2 x 155M	
Tributary (Plug-in Modules)												
Link without MSP	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	
	STM-4	N/A	STM-4	N/A	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-4	N/A	STM-4	N/A	
Link with MSP (1+1) See Note 1	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)	
	STM-4	STM-4 (B)	STM-4	STM-4 (B)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-4	STM-4 (B)	STM-4	STM-4 (B)	
Max 504 E1 (Single)	63 E1	63 E1	63 E1	63 E1				63 E1	63 E1	63 E1	63 E1	
Max 252 E1 (Protection)	63 E1	63 E1 (B)	63 E1	63 E1 (B)				63 E1	63 E1 (B)	63 E1	63 E1 (B)	
Max. 24 E3 (Single)	3 E3	3 E3	3 E3	3 E3			3 E3	3 E3	3 E3	3 E3		
Max 12 E3 (Protection)	3 E3	3 E3 (B)	3 E3	3 E3 (B)			3 E3	3 E3 (B)	3 E3	3 E3 (B)		
Max 64 10/100 BT 8x 1000BT (Single)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT			8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT		
Max 32 10/100 BT 4 x 1000 BT (Protection)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)			8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)		
Max 56FOM (Single)	7 FOM	7 FOM	7 FOM	7 FOM			7 FOM	7 FOM	7 FOM	7 FOM		
Max 28 FOM (Protection)	7 FOM	7 FOM (B)	7 FOM	7 FOM (B)			7 FOM	7 FOM (B)	7 FOM (B)	7 FOM (B)		

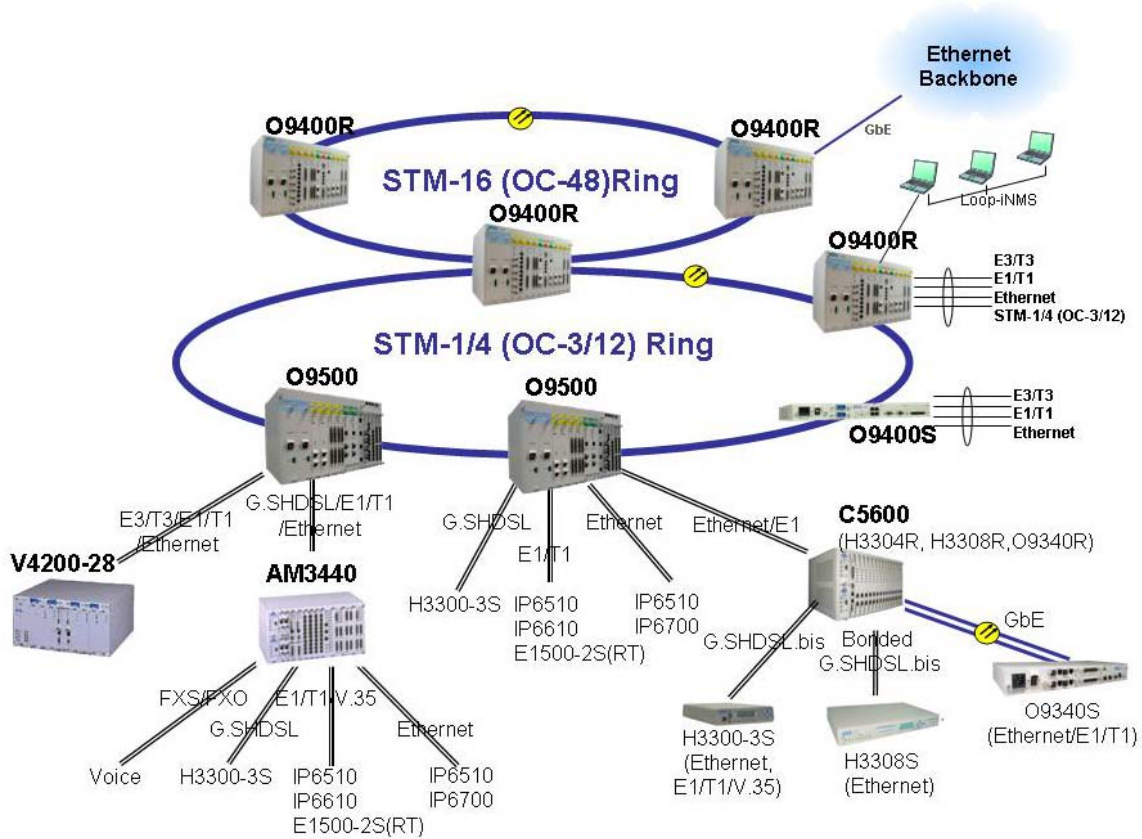
Note: (B) backup/protection

Note 1: With MSP (1+1) protection, the protection pair on XCU (W) and XCU (E) are as follow:



Applications:

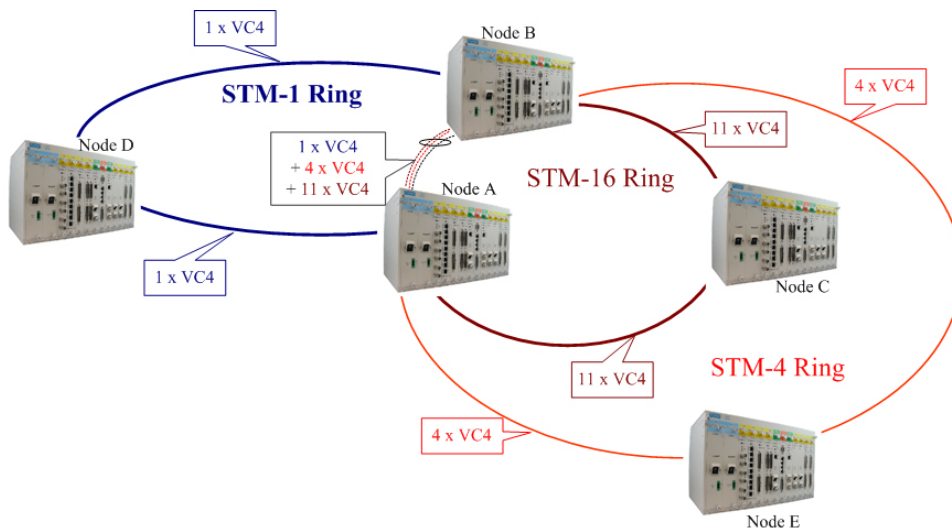
1. Total Solution for IP/Voice Data Application



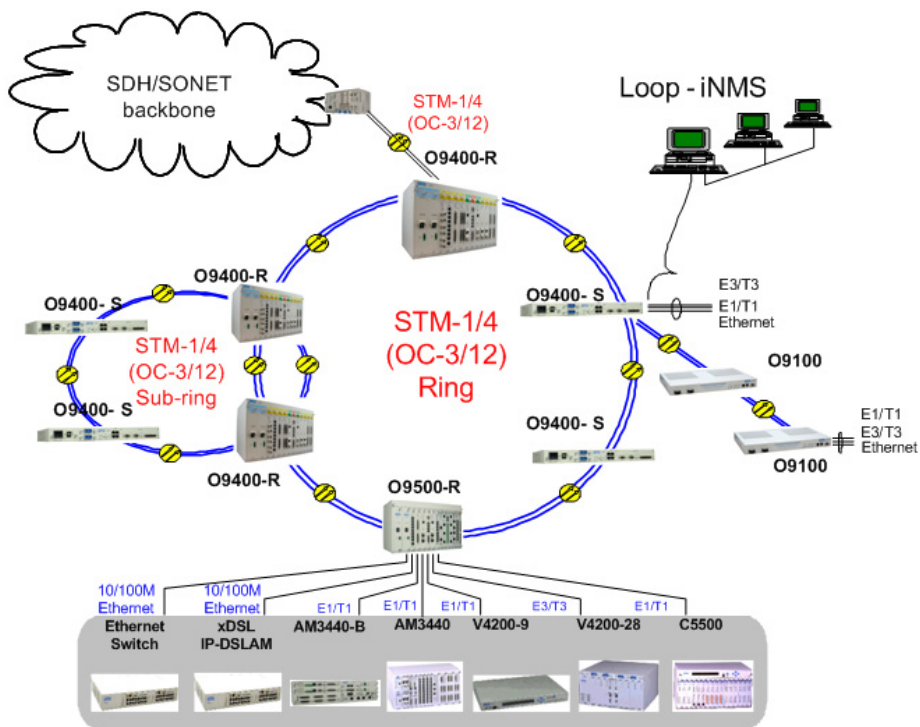
2. Rings with STM-1/4/16 (CC16) capability

With STM-16 (CC16) capability, multi-rings can share the bandwidth in one optical line.

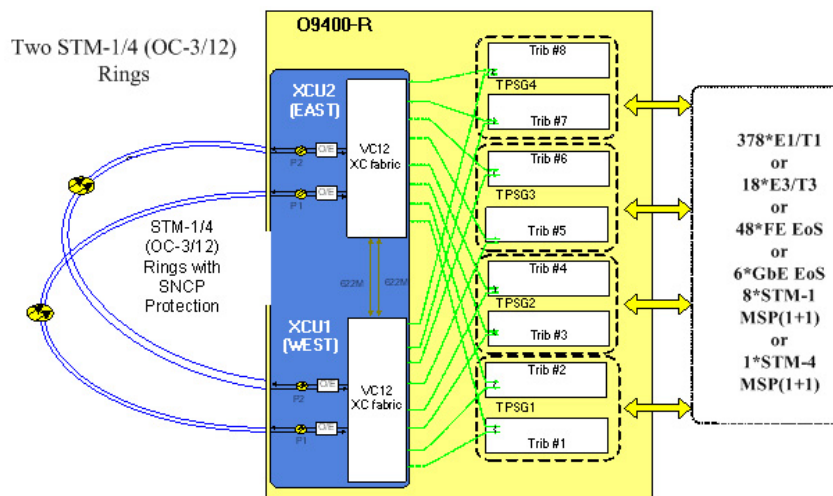
The Node A, B, and C form a STM-16 Ring; Node A, B, and E form a STM-4 Ring; Node A, B, and D form STM-1 Ring, The Node A and Node B only need one optical line to connect these three Rings.



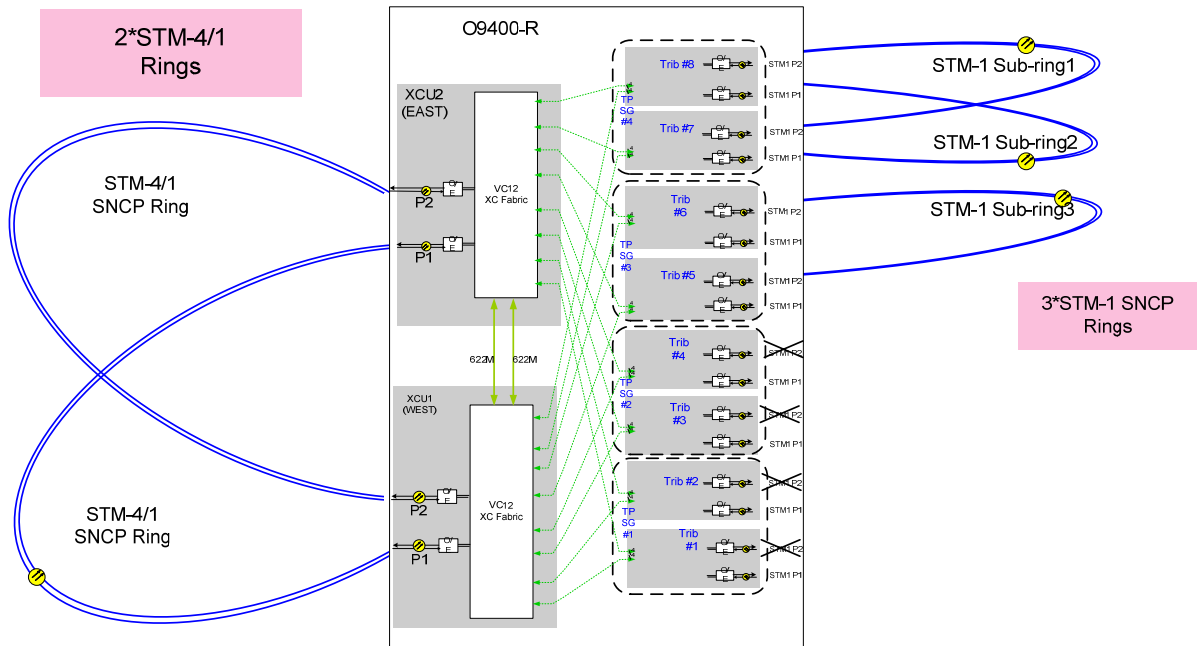
3. Rings with STM-1/4 Applications



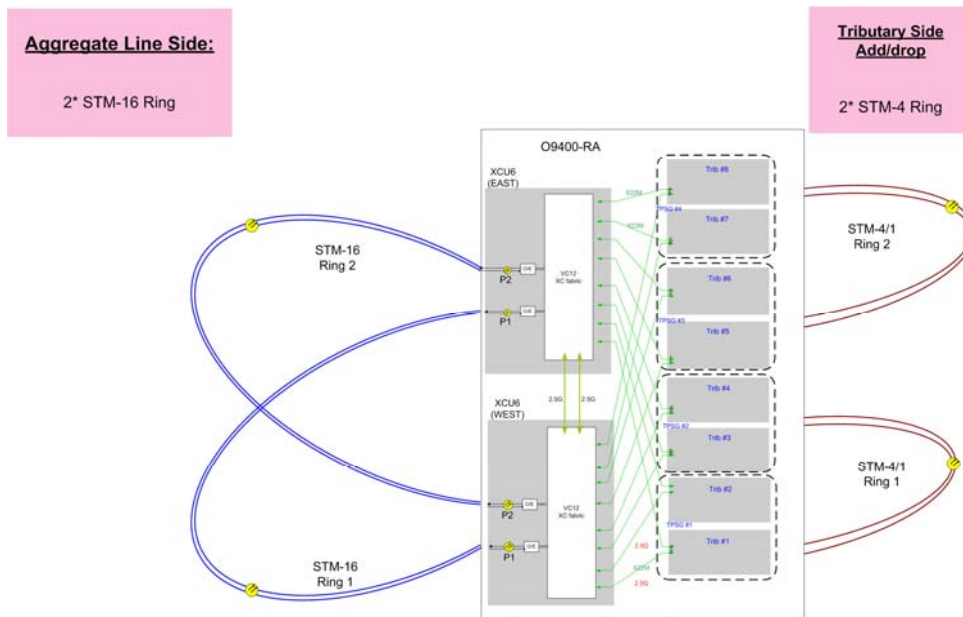
4. Two Ring Protection (CC4)



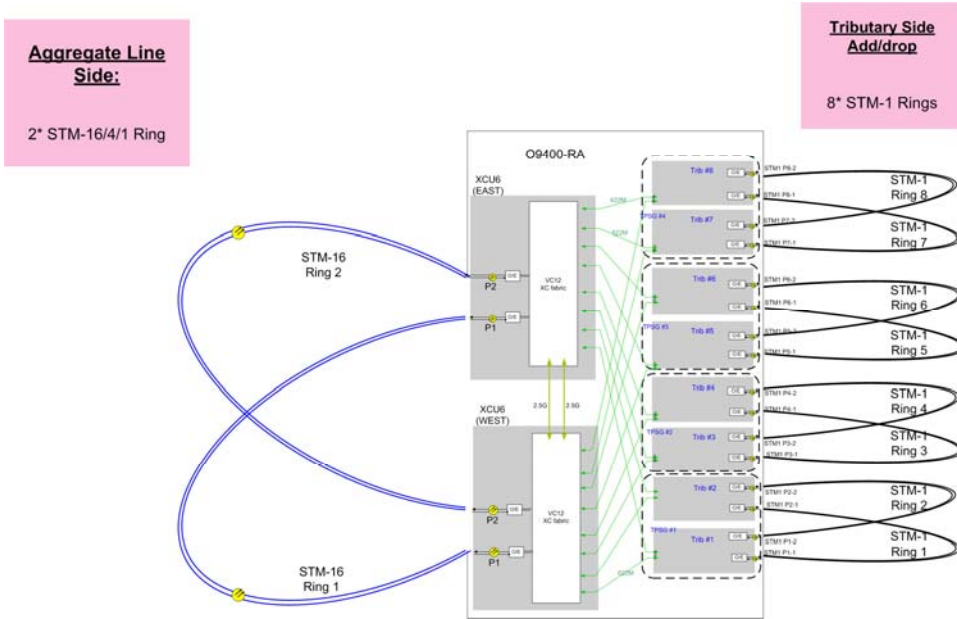
5. Five Rings (CC4)



6. 2*STM-16 Ring + 2*STM-4 Ring (CC16)

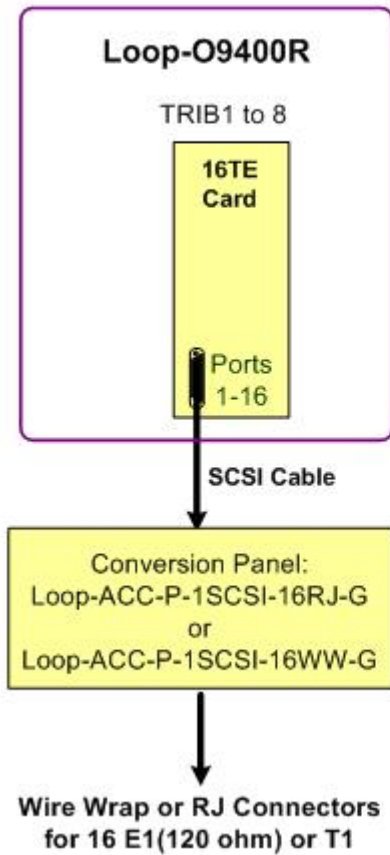


7. 2*STM-16 Ring + 8*STM-1 Ring (CC16)

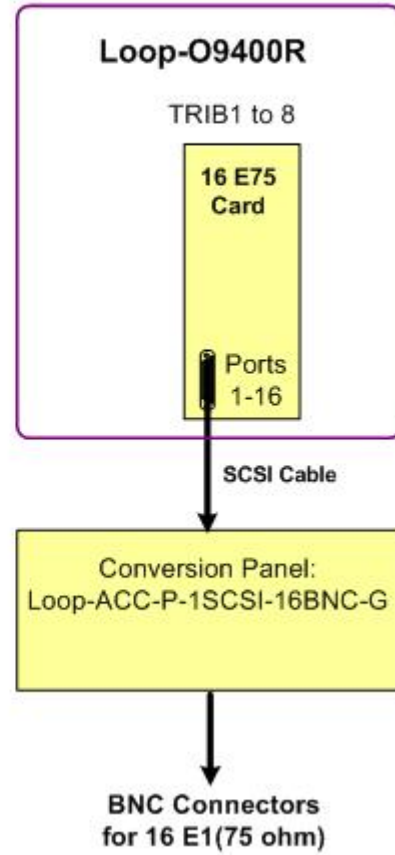


Conversion Panel Illustrations

(A) 16TE Converted to WireWrap/RJ Connectors



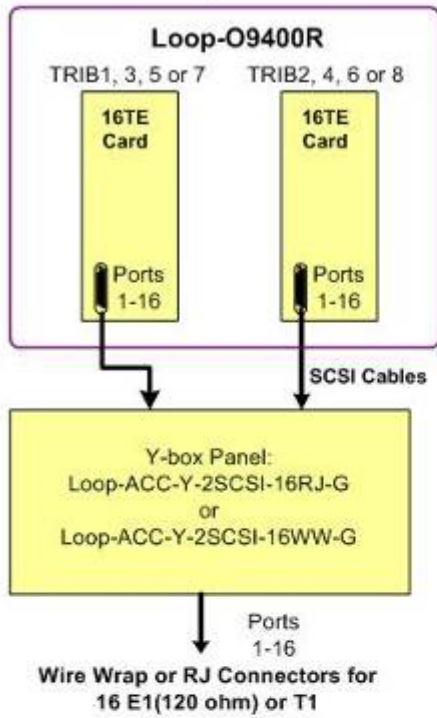
(B) 16E75 Converted to BNC Connectors



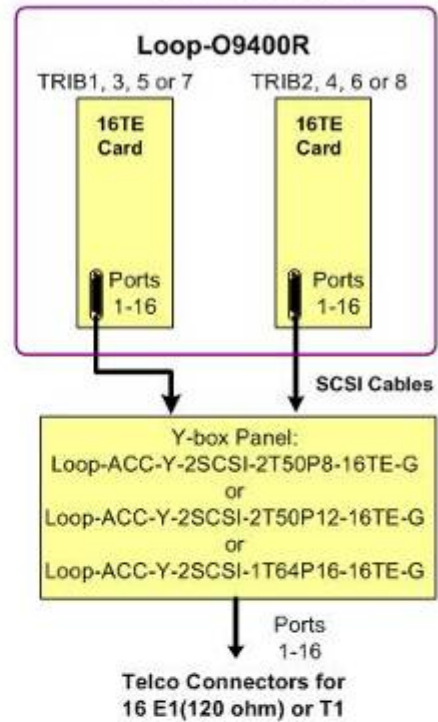
Note: One conversion panel has the capacity to handle sixteen ports. The sixteen port applications illustrated above require only one conversion panel. Thirty-two port (32TE, 32E75) applications will require two conversion panels and sixty-three port (63TE, 63E75) applications will require four conversion panels.

Y-box Illustrations

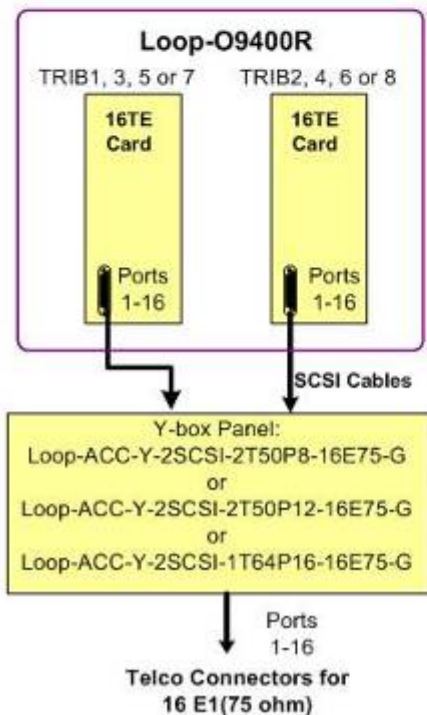
(A) 16TE Card/Port Protection via Y- box Panel to 16 E1(120 ohm) or T1 WireWrap/RJ Connectors



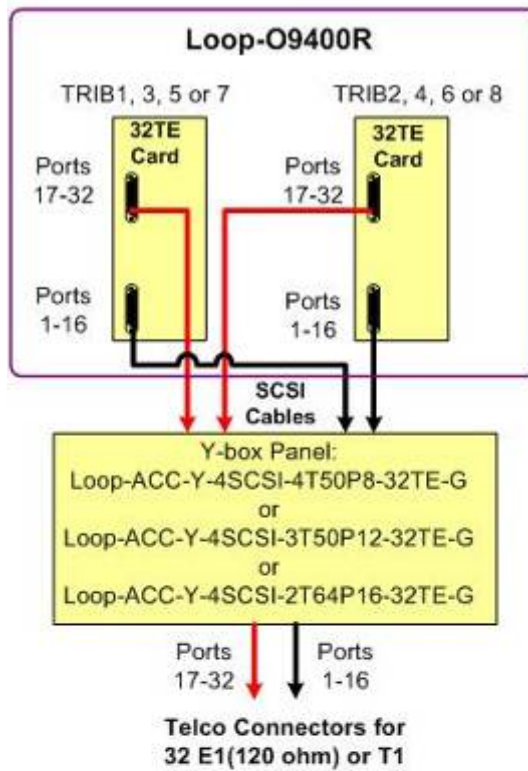
(B) 16TE Card/Port Protection via Y- box Panel to Telco 16 E1(120 ohm) or T1 Connectors



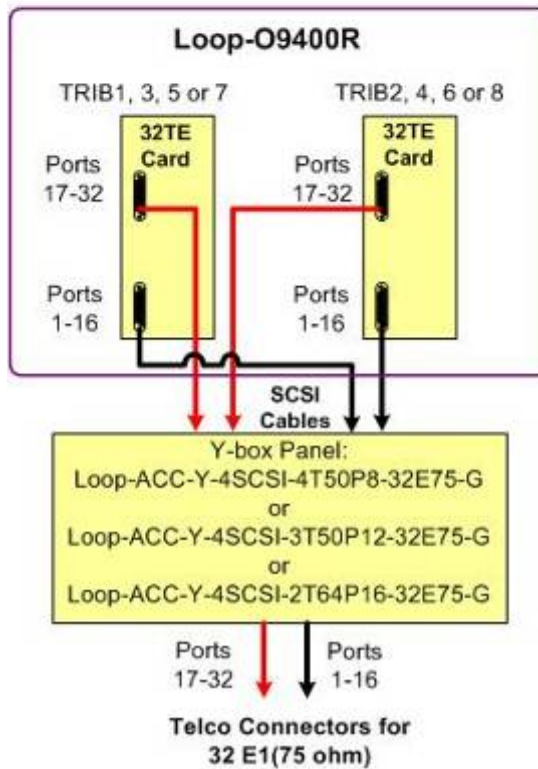
(C) 16TE Card/Port Protection via Y- box Panel to Telco 16 E1(75ohm) Connectors



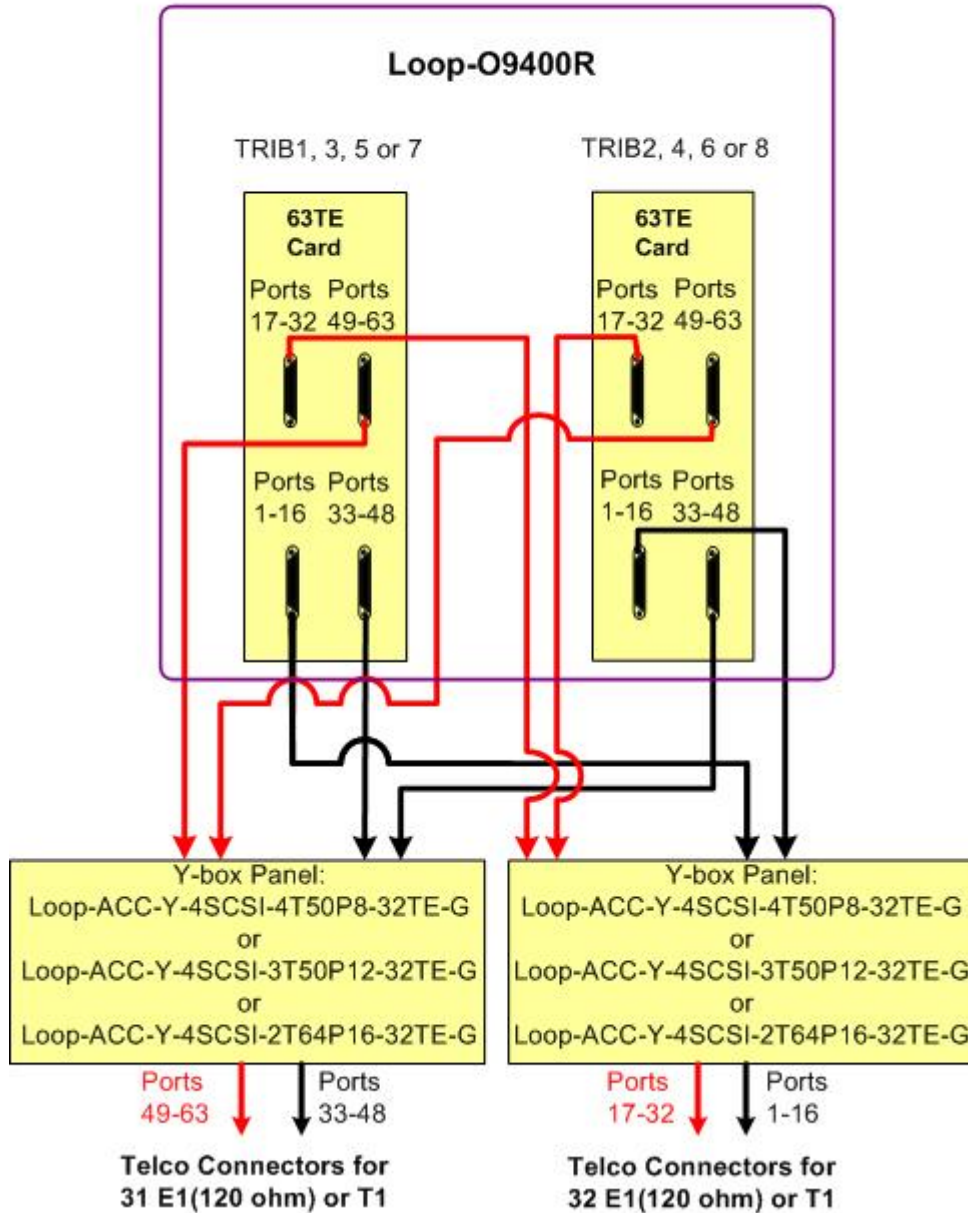
D 32TE Card/Port Protection via Y- box Panel to Telco 32 E1(120 ohm) or T1 Connectors



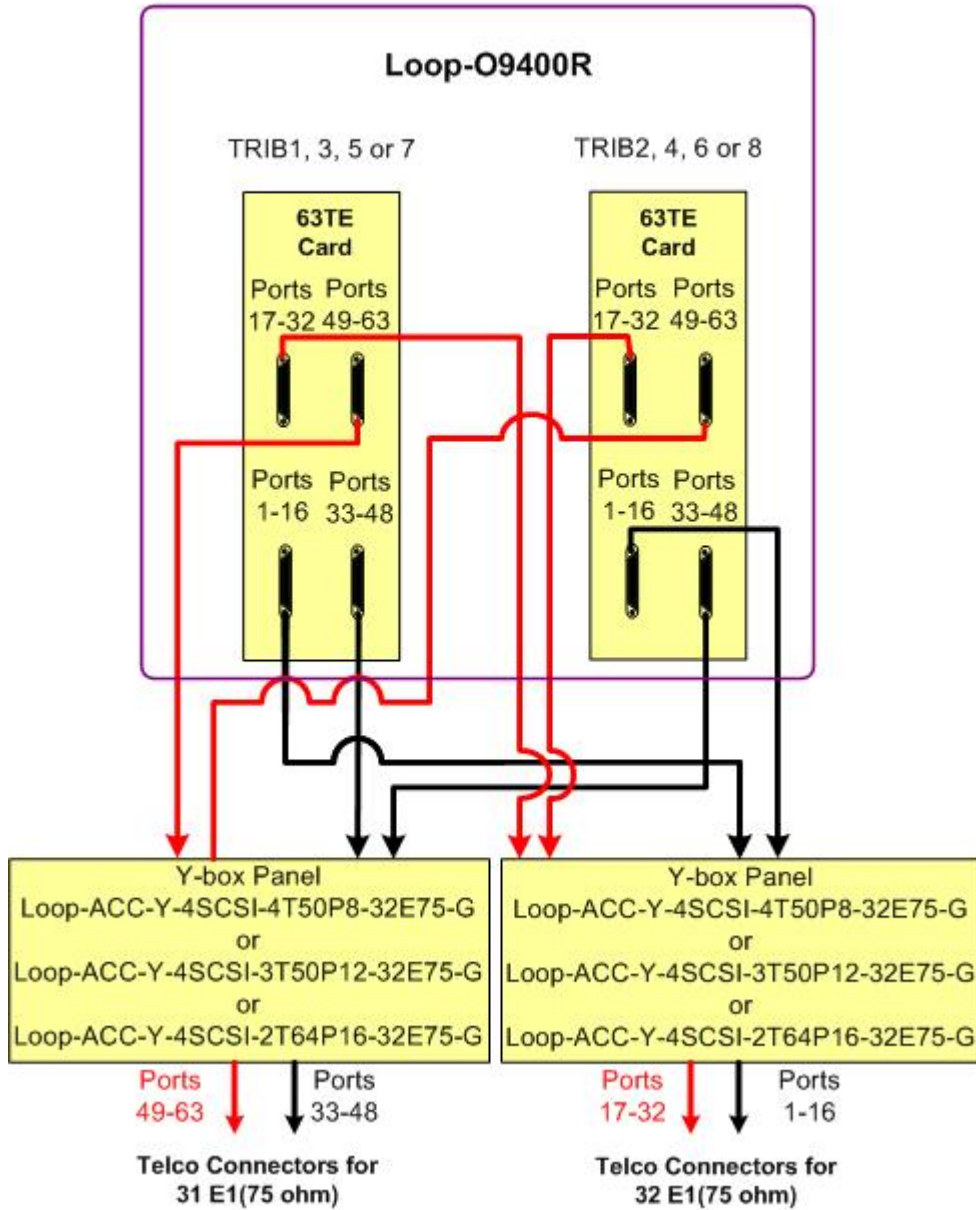
E 32TE Card/Port Protection via Y- box Panel to Telco 32 E1(75 ohm) Connectors



F 63TE Card/Port Protection via Y-box Panel to Telco Connectors for 32 E1(120 ohm) or T1 and Telco Connectors for 31 E1(120 ohm) or T1



Ⓒ 63TE Card/Port Protection via Y- box Panel to Telco Connectors for 32 E1(75 ohm) and Telco Connectors for 31 E1(75 ohm)



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