DATA COMM FOR BUSINESS

Loop-O9500R SDH/SONET IMAP

Features

- 6U height, full front access (ETSI) shelf
- TM, ADM and DCS (full cross-connect) at DS0, VC11, VC12, VC3, VC4
- Aggregate cross-connect modules (controller modules)
  - Up to STM-1/4/16 (OC-3/12/48) aggregate lines with software configuration (CC16)
  - Up to STM-1/4 (OC-3/12) aggregate lines with software configuration (CC4)
- Hot-swappable cross-connect modules, tributary modules and power modules.
- Tributary Modules
  - High-Speed (High Density) access tributary modules (HS)
  - Low-Speed access tributary modules (LS)
- Power Modules
  - DC Module (-48/-125/-250 Vdc)
  - Dual Power (1+1) Protection
- Protection Scheme
  - Tributary protection
    - E1/T1: card, port, line
    - E3/T3: line
    - B155/622: MSP, SNCP/UPSR
    - Ethernet
    - 7 FOM: line
  - Cross-connect unit (XCU) protection
    - MSP
    - SNCP/UPSR
- DS0-SNCP protection
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT, LCAS and non-LCAS
- Ethernet Order Wire (EOW) using VoIP technology
- Alarm suppression, masking and reports
- Management
  - Console port, VT100 menu-driven
  - SNMP Port
  - Telnet and SSH
  - Centralized management with Loop's EMS/NMS over DCC channel
  - Loop-iNET GUI EMS
  - TMN management(Loop-iNMS) with full FCAPS and end-to-end circuit management
  - Support DCC pass through
- RoHS compliant

Description

The Loop-O9500R SDH/SONET IMAP (Integrated Multi-Services Access Platform) is an economical STM-1/4/16 (OC-3/12/48) access multiplexer designed to provide integrated access to STM-1/4/16 (OC-3/12/48) optical lines. Access is provided through either a non-blocking VC11/VC12/VC3/VC4 cross-connect with HS tributary modules or through an additional non-blocking DS0 cross-connect fabric with LS tributary modules.

With up to 4 STM-1/4/16 (OC-3/12/48) aggregate interfaces on cross-connect modules and 8 STM-1 (OC-3) interfaces on tributaries, the Loop-O9500R SDH/SONET IMAP offers service providers a versatile protection schemes including SNCP(UPSR) and MSP(1+1) protection for both ring and linear network topologies. The O9500R 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, FOM and Fast Ethernet/Gigabit Ethernet over STM-1/4/16 (OC-3/12/48). Ethernet signals are mapped onto STM payload through standard techniques such as 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 O9500R SDH/SONET IMAP provides full Operation, Administration, Maintenance and Provisioning (OAM&P) functionality. Users can easily operate the O9500R locally or remotely for centralized management via Loop-iNET (EMS) and Loop-iNMS (Integrated NMS).

Loop-O9500R Tributary Modules

Type	Module	Description	
High-speed/ High Density (HS)	B155/622	STM-4 (OC-12) tributaries	2 STM-4 MSP 1+1 or 1 STM-4 Sub-ring SNCP or 2 STM-4 without protection
		STM-1 (OC-3) tributaries	4 STM-1 MSP 1+1 or 4 STM-1 Sub-ring SNCP or 8 STM-1 without protection
	E1/T1	63 port E1/T1 tributaries	
		32 port E1/T1 tributaries	
		16 port E1/T1 tributaries	
	E1(75 ohm)	63 E1(75 ohm) plug-in card	
		32 E1(75 ohm) plug-in card	
		16 E1(75 ohm) plug-in card	
	E3/T3	3 T3 or 3 E3 software programmable interface with M13/Mx3 function for T3 interface only	
	B2G5	STM-16/OC-48 software configurable interface plug-in module without SFP (mini-GBIC) optical modules	
	Ethernet	8FE+1GbE Ethernet over SDH card (9EoS4SW with / 9EoS4NSW without L2 switch)	
	4GEoSDH	4GbE Ethernet over SDH card with L2 switch (XCU-CC16 only)	
	7FOM	7 port FOM tributaries	
Low-speed (LS) Single slot	RTB	8-port Bridge/Router	
	4E1/4T1	4-channel E1/T1	
	3E1/3T1	3-channel E1/T1	
	2GH	2-channel G.SHDSL (2 pairs) without line power	
	4GH	4-channel G.SHDSL (1 pairs) without line power	
	8CD	8-channel G.703 card at 64 Kbps data rate	
	1C37/4C37	1 or 4 channel C37.94 (low-speed optical)	
	8RS232	8-channel RS232/V.24	
	8DC	8-channel Dry Contact I/O	
	8DCB	8-channel Dry Contact I/O type B	
	8E&M	8-channel 2W/4W E&M	
	12FXS	12-channel FXS	
	12FXO	12-channel FXO	
	Conference	2 RS232, 2 FXS, and 2 E&M ports	
	12MAGA*	12-channel Magneto	
	TDMoEA*	4 GbE for TDM signal over Ethernet	
	8DBRA	8-channel Data Bridge	
	8UDTEA	8-channel DTE	
	1FOMB	1 port FOM (1FOMB)	
	OCUDPA	8-channel OCU/DP	
	6UDTEA	6-channel DTE	
Low-speed (LS) Dual slot	24FXS	24-channel FXS	
	24FXO	24-channel FXO	
	TTA	Four ports for DTT input and output.	

*Future Option

Note A Dual-Slot module takes up two adjacent single slots.

Ordering Information

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

Model	Description	Notes
Main Unit		
Loop-O9500-R-CHA-**G**	6U height Rack chassis for O9500R without CPU and power	
Loop-O9500-R-CHAA-**G**	6U height Rack chassis support up to 2.5G Mbps mapping bandwidth for O9500R without CPU and power	
Controller Modules (CPU)		
Loop-O9500-R-CC16-**mgmt**-**G**	Controller module with cross-connect unit and two STM-1/4/16 (OC-3/12/48) interfaces without SFP (mini-GBIC) optical modules	・Order two for redundancy. ・Please order SFP optical modules separately from SFP optical modules brochure ・Use with Loop-O9500-R-CHAA-**G** ・For **mgmt** option, please refer to the table below for detail information
Loop-O9500-R-CC4-**mgmt**-**G**	Controller module with cross-connect unit and two STM-1/4 (OC-3/12) interfaces without SFP (mini-GBIC) optical modules	・Order two for redundancy. ・Please order SFP optical modules separately from SFP optical modules brochure ・Use with Loop-O9500-R-CHA-**G** or Loop-O9500-R-CHAA-**G** ・For **mgmt** option, please refer to the table below for detail information
Connector Board and Fan Modules		
Loop-O9500-R-CBA-**G**	Connector Board	・CBA or CBB is required for each chassis.
Loop-O9500-R-CBB-**G**	Connector Board with EoW using VoIP technology	・CBA or CBB is required for each chassis. ・You can use regular analog phone for order wire function in CBB.
Loop-O9500-R-FANA-**G**	Fan Board	・One required for each chassis.

■ Where **mgmt** is used to select the following functions. Please replace **mgmt** with your selection, or leave it blank for nothing.

mgmt=	Description	Notes
LCT	LCT activation license is included	Used with Loop-LCT Graphical Configuration Software for management
[blank]	No configuration tool for management	

Feature Activation License		
Loop-O9500-R-LCT(CC4)	Feature Activation License for O9500R-CC4 CPU card to support LCT Graphical Configuration Software	Used with Loop-LCT Software
Loop-O9500-R-LCT(CC16)	Feature Activation License for O9500R-CC16 CPU card to support LCT Graphical Configuration Software	Used with Loop-LCT Software

High Speed or High Density Tributary Modules

Loop-O9500-R-16TE-**G**	16 E1 (120 ohm) or 16 T1 software programmable plug-in card	· The 16/32/63TE modules 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	
Loop-O9500-R-63TE-**G**	63 E1 (120 ohm) or 63 T1 software programmable plug-in card	
Loop-O9500-R-16E75-**G**	16 E1(75 ohm) plug-in card	· The 16/32/63E75 modules can also be used in the Loop-O9400R.
Loop-O9500-R-32E75-**G**	32 E1(75 ohm) plug-in card	
Loop-O9500-R-63E75-**G**	63 E1(75 ohm) plug-in card	
Loop-O9500-R-3TE3-**G**	3 T3 or 3 E3 software programmable interface plug-in card	· The 3TE3 and 3TE3M13 modules can also be used in the Loop-O9400R.
Loop-O9500-R-3TE3M13-**G**	3 T3 or 3 E3 software programmable interface plug-in modules with M13 /Mx3 function for T3 interface only	
Loop-O9500-R-7FOM-**G**	7-port Fiber Optical Interface with 7 SFP housings (SFP not included)	· This card can also be used in the Loop-O9400R. · Please order SFP optical modules separately from SFP optical modules brochure
Loop-09500-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-4GESW-**G**	4 GbE card with 2 combo and 2 optical (10/100/1000BaseT) interface plug-in module with L2 switch	· Available on O9500R-CHAA chassis' tributary slot 3 and 4 only with CC16 controller · SFP optical modules are not included. Please order SFP modules separately. · Order two for redundancy
Loop-O9500-R-B16-**G**	STM-1/4 (OC-3/12) software configurable p lug-in card without SFP (mini-GBIC) optical modules	· This card can also be used in the Loop-O9400R.
Loop-O9500-R-B2G5-**G**	STM-16/OC-48 software configurable interface plug-in module without SFP (mini-GBIC) optical modules	· Applicable to O9400R-CHAA chassis' tributary slot 3 and 4 only with CC16 controller · SFP optical modules are not included. Please order SFP modules separately. · Order two for redundancy.

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	· For **cc** option, please refer to the table below for detail information This card can also be used in the Loop-AM3440-A/B/C
Loop-O9500-R-3T1-**G**	3-channel T1 Interface	· For software version 3.02.01 or newer versions.

		· This card can also be used in the Loop-AM3440-A/B/C
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- **LSFOM** –**G**	1- channel C37.94 plug-in card	· For **LSFOM** option, please refer to the table below for detail information · This card can also be used in the Loop-AM3440-A/B/C.
Loop-O9500-R-4C37- **LSFOM** –**G**	4- channel C37.94 plug-in card	
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 2RJ48 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-8DBRA-RJ-**G**	8-channel data bridge plug-in card, with 8 RJ48 connectors for 8 data bridge Async ports	· This card can also be used in the Loop-AM3440-A/B/C
Loop-O9500-R-8DBRA-DB-**G**	8-channel data bridge plug-in card, with 2 RJ48 connectors and 2DB44 connectors for 8 data bridge Async ports	· Two conversion cables are included (DB44 connector to two DB25 and one DB9 connector; (Loop-ACC-CAB-DB44M-100-2DB25F-1DB09F-DB).
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	· This card can also be used in the Loop-AM3440-A/B/C.
Loop-O9500-R-TDMoEA-PPM-**G***	TDMoEA card with 2 GbE combo interfaces and 2 Ethernet interfaces (10/100/1000BaseT) plug-in module. Support G.823 Traffic	· The SFP module is not included in the TDMoEA card. · Please order separately for SFP optical modules from SFP optical brochure · This card can also be used in the Loop-AM3440-A/B/C
Loop-O9500-R-6UDTEA- **G**	6-port universal data interface card that supports three software configurable modes: Port 1 to 4: two DB44 connectors Port 5 to 6: two RJ48 connectors **Mode 1**: Port 1 to 4: RS232/RS422/X.21, Async/Sync 64kbps and subrate with V.110 encoding Port 5 to 6: RS232 for ASYNC only **Mode 2**: Port 1 to 4: X.21/RS422/V.35/V.36/V.54/EIA530/RS449 SYNC N*64k (N=1~32) Port 5 to 6: Disabled **Mode 3**:	No conversion cable is included. Please order conversion cable separately from below table. Six conversion cable types are available: Loop-ACC-CAB-DB44M-100-2DB25F-VB (For V.35, V.36, RS232) Loop-ACC-CAB-DB44M-100-2DB15F-VB (For X.21) Loop-ACC-CAB-DB44M-100-1DB15F-1DB25F-VB (For V.35, V.36, RS232, X.21) Loop-ACC-CAB-DB44M-100-2M34F-VB (For V.35) Loop-ACC-CAB-DB44M-100-

	Port 1 to 3: X.21/RS422/V.35/V.36/V.54/EIA530/RS449 SYNC N*64k, (N=1~32). Port 4: X.21/RS422 SYNC, N*64k, (N=1~20). Port 5 to 6: RS232 N*64k (N=1~6) oversampling for ASYNC data.	2DB37F-VB (For RS449) Loop-ACC-CAB-DB44M-100-1DB37F-1M34F-VB (For V.35)
Loop-O9500-R-8UDTEA-**opm**-G	8-port universal data interface card that supports RS232/RS422/RS485 DCE interface which is software configurable Available options: Terminal Server, Omnibus, Clock Pass Through, and full-/half duplex modes	· For **opm** option, please refer to the table below for detail information. · 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	· For **x** option, please refer to the table below.
Loop-O9500-R-12MAG-A-1G-**x**-G*	12-channel Magneto ring-one-time plug-in module w/ L1. GND	· 12MAG-A-1G2 includes all function of 12MAG-A cards. · This card can also be used in the Loop-AM3440-A/B/C
Loop-O9500-R-12MAG-A-12-**x**-G*	12-channel Magneto ring-one-time plug-in module w/ L1, L2	
Loop-O9500-R-12MAG-A-1G2-**x**-G*	12-channel Magneto ring-one-time plug-in module w/ L1, L2, and L1. GND	
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. · 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 · O9500-R-12FXS-S1-PWR-G* *Future Option
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.	· 24FXO-GM includes all FXO card functions. · These cards will occupy two slots. · These cards can also be used 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-1FOMB-**opt**-**G**	1FOMB Fiber Optical Interface with 1x9 optical port	· For **opt** option, please refer to the table below for detail information
Loop-O9500-R-OCUDPA	8-channel OCU-DP plug-in module	· Only **non-RoHS** compliant model available · Not for AM3440 Series
Loop-O9500R-6CDA-cdm-G	6-channel G.703 Interface at 64 Kbps data rate. Per port configurable for Co-directional or Contra-directional interfaces.	· For **cdm** option, please refer to the table below for detail information. · CC16*

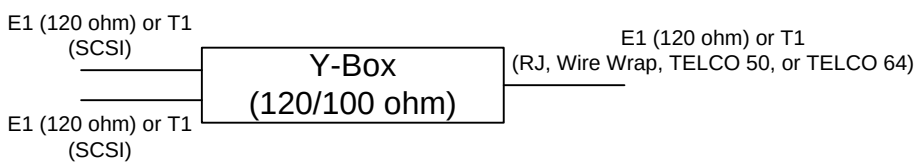
Low Speed Tributary Modules (Dual Slots)

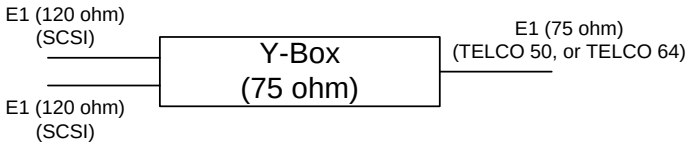
Loop-O9500-R-24FXS-sn-**pt**-**G**	24-channel FXS plug-in card with 600/900 Impedance, Battery Reverse, Loop Start and PLAR Without Ground Start and Metering Pulse	· 24FXSA-GMP includes all FXS card functions. · These cards will occupy two slots. · These cards can also be used in the Loop-AM3440-A/B/C · For **sn** option, please refer to the table below for detail information · For **pt** option, please refer to the table below for detail information
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 e with 600/900 Impedance, Battery Reverse, Loop Start, PLAR, [Ground Start] and [Metering Pulse].	
Loop-O9500-R-24FXSA-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	· 24FXO-GM includes all FXO card functions. · These cards will occupy two slots. · These cards can also be used in the Loop-AM3440-A/B/C
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].	
Loop- O9500-R-TTA-**pwr**-**G**	Dual slot transfer trip plug-in module for O9500R-CC4. Four ports for DTT input and output.	· For **pwr** option, please refer to the table below for detail information.

Feature Activation License

Loop-O9500-R-3M13	Feature Activation License for O9500-R 3TE3 module to support M13/Mx3 function for T3 interface only	· Use with 3TE3 HS tributary module
Loop-O9500-R-ERING	Feature Activation License for O9500-R controller module to support framed E1 PDH-Ring function	· Use with 4E1 or FOM LS tributary modules
Loop-O9500-R-TRING	Feature Activation License for O9500-R controller module to support framed T1 PDH-Ring function	· Use with 4T1 LS tributary modules

Accessories

SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure. **Note**: Non-Loop SFP modules are not guaranteed to work with our equipments. It is strongly recommended to buy Loop-logo SFP modules.		
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.	
Power Modules		
Loop-O9500-R-SD48-**G**	Single power module -48Vdc	・For redundancy purposes, order 2 single DC.
Loop-O9500-R-SD48/125-**G**	Single power module (300W) Input, 48Vdc/125Vdc (36 to 140Vdc)	・For redundancy purposes, order 2 single DC. ・CC16*
Loop-O9500-R-SD125/250-**G**	Single power module (300W) Input 125Vdc/250Vdc (100 to 260Vdc)	・For redundancy purposes, order 2 single DC. ・CC16*
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	・This power adaptor is only for Loop-O9500-R-SD48.
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	
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.	
Conversion Panels		
Loop-ACC-P-1SCSI-16RJ-**G**	1u panel for one SCSI to 16 RJ connectors without cable 432x44x23mm (WxHxD)	・Use with 16/32/63TE HS tributary modules ・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 connectors without cable 432x44x40mm (WxHxD)	・Use with 16/32/63TE or 16/32/63E75 HS tributary modules ・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 432x66x53mm (WxHxD)	・Use with 16/32/63E75 HS tributary modules ・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	Use 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	Use 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	Use 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	Use 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	Use 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	Use with Loop-O9500-R-32TE-**G** or 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	Use with Loop-O9500-R-32TE-**G** or 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	Use with Loop-O9500-R-32TE-**G** or Loop-O9400-R-63TE-**G**
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	Use 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	Use with Loop-O9500-R-32TE-**G** or 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	Use 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	Use 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	Use with Loop-O9500-R-32TE-**G** or 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	Use with Loop-O9500-R-32TE-**G** or Loop-O9500-R-63TE-**G**

	connector) without cable	
Y-Box (All Y-Box are RoHS compliant)		
Loop-VV-B-**G**	1 for 1 protection Y-Box with BNC connectors (4-E1)	Use with Loop-O9500-R-4E1-**BNC**-**G**
Loop-VV-R-**G**	1 for 1 protection Y-Box with RJ48C connectors (16-E1)	Use with Loop-O9500-R-4E1-**RJ**-**G**
Loop-VV-T-**G**	1 for 1 protection Y-Box with RJ48C connectors (16-T1)	Use with Loop-O9500-R-4T1-**G**
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** Loop-O9500-R-8DBRA-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 AM3440-A.

For 4E1 and 3E1 card:

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

cc =	**Description**	**Notes**
RJ	RJ48C connector	
BNC	BNC connector	

For 8UDTEA card:

- Where **opm** is used to select 8UDTEA functions:

opm =	**Description**
DCE	Support RS232/RS422/RS485 DCE interface which is software configurable
TS	Support Terminal Server Function and DCE
OMNI	Support Omnibus Function and DCE
CPT	Support Clock Pass Through function and DCE
TSOMNI	Support Terminal Server, Omnibus Function and DCE
HD	Support RS232/RS422/RS485 DCE interface with Full- and Half-Duplex modes
TSHD	Support Terminal Server Function and DCE with Full- and Half-Duplex modes
OMNIHD	Support Omnibus Function and DCE with Full- and Half-Duplex modes
TSOMNIHD	Support Terminal Server, Omnibus Function and DCE with Full- and Half-Duplex modes
FULL	Support Terminal Server, Omnibus Function, Clock Pass Through and DCE with Full- and Half-Duplex modes
Feature Activation License	**Description**
Loop-O9500-R-8UDTEA-UPGR-TS	Feature Activation License for O9500-R 8UDTE card to support Terminal Server function
Loop-O9500-R-8UDTEA-UPGR-OMNI	Feature Activation License for O9500-R 8UDTE card to support Omnibus function
Loop-O9500-R-8UDTEA-UPGR-CPT	Feature Activation License for O9500-R 8UDTE card to support Clock Pass Through function
Loop-O9500-R-8UDTEA-UPGR-TSOMNI	Feature Activation License for O9500-R 8UDTE card to support Terminal Server function and Omnibus function
Loop-O9500-R-8UDTEA-UPGR-HD	Feature Activation License for O9500-R 8UDTE card to support Full- and Half-Duplex modes
Loop-O9500-R-8UDTEA-UPGR-TSHD	Feature Activation License for O9500-R 8UDTE card to support Terminal Server function with Full- and Half-Duplex modes
Loop-O9500-R-8UDTEA-UPGR-OMNI	Feature Activation License for O9500-R 8UDTE card to support Omnibus function

HD	with Full- and Half-Duplex modes
Loop-O9500-R-8UDTEA-UPGR-TSOMNIHD	Feature Activation License for O9500-R 8UDTE card to support Terminal Server function and Omnibus function with Full- and Half-Duplex modes
Loop-O9500-R-8UDTEA-UPGR-FULL	Feature Activation License for O9500-R 8UDTE card to support Terminal Server, Omnibus and Clock Pass Through functions with Full- and Half-Duplex modes

For 1FOMB Card:

■ where **opt** is used to select optical module type:

opt =	**Description**	**Notes**
SAA	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km- ***S1.1 physical layer***	• Use 2 fibers • * ITU-T Rec G.957 application code
SBB	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km - ***L1.1 physical layer***	
SCC	single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km - ***S1.1 physical layer***	
SDD	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km - ***S1.2 physical layer***	
SEE	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km - ***L1.2 physical layer***	
SSM	single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach - ***S1.1/ S1.2 physical layer***	• 1310 nm from master to slave • Order **SSM** to use with **SSS** • Use 1 fiber • * ITU-T Rec G.957 application code
SSS	single optical module with single bi-directional fiber (slave), 1310 nm receive and 1550 transmit, SC optical connector, 30 km reach - ***S1.1/ S1.2 physical layer***	• 1550 nm from slave to master • Order **SSS** to use with **SSM** • Use 1 fiber • * ITU-T Rec G.957 application code

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

For 8-channel 2W/4W E&M card:

■ Where **x** is used to select all of voice card signaling bits. If this option is not required, omit the **x** field in the ordering code.

	x =	**Description**	**Note**
8EM	**E**	Follows ETSI signaling bits	
	A	Follows ANSI signaling bits	Jumper selectable for all channels
	R	Reverse for ON-HOOK and OFF-HOOK signaling bits exchange	
	AR	Follows ANSI signaling bits and reverse bit	
	ER	Follows ETSI 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:

1. For S (customer's special bit), please contact your nearest Loop sales representative.
2. If x is not selected from table above, the default setting for signaling bits is ETSI and for trunk condition is ON-HOOK.

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**
sn = omit	FXS Loop Feed = -48 Vdc with 25 mA current limit; alarm tone enable; normal ring	
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	with -48Vdc or -125Vdc power modules	

PWR1613	with -48Vdc power modules complied with IEEE 1613 standard	Only for 12FXS

For Magneto Card:

■ 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	

For Transfer Trip (TTA) Card:

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

pwr=	Description	Note
24*	Complied with 24/48V voltage	*Future option
48	Complied with 48/125V voltage	
125*	Complied with 125/250V voltage	*Future option

For 6CDA Card:

■ Where **cdm** is used for co-directional/contra-directional mode selection. Must select one from table below.

cdm=	Description	Note
cc	Supports G.703 Contra-directional controlling (DCE) and Co-directional interface configuration	
mixed	Supports G.703 Contra-directional controlling (DCE), Contra-directional subordinate (DTE) and Co-directional interface configuration	

For C37.94 Card:

■ Where **LSFOM** is to select **LS**-**F**iber **O**ptical **M**odule option, each module has 5 letters.

LSFOM	Description										Notes
Code	Mode		Data Rate		Wave Length		Distance		Connector		
	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	
ZHHTT	Z	Multi-mode	H	155 M	H	820nm	T	2km	T	ST connector	1 * 8 Separate transceiver & receiver
QHATT	Q	Multi-mode	H	155 M	A	850nm	T	2km	T	ST connector	1 * 9
NFB3T	N	Single mode	F	125 M	B	1310nm	3	30km	T	ST connector	
QFBTT	Q	Multi-mode	F	125 M	B	1310nm	T	2km	T	ST connector	
NHC2S	N	Single mode	H	155 M	C	1550nm	2	20km	S	SC connector	
NHCUS	N	Single mode	H	155 M	C	1550nm	U	100km	S	SC connector	

Firmware Upgrade		
Loop-O9500-card -FWUPGR	Firmware Upgrade and Warranty Renewal. The Customer whose warranty has lapsed or desire to have a firmware upgrade can purchase this option. This will upgrade the firmware to the most current version and provide an additional 12 months of support.	For available card types, please refer to the table below for detail information.

For Firmware Upgrade:

■ **Where card is used to select card type:**

card=	Description
CC4	Controller module with cross-connect unit and two STM-1/4 (OC-3/12) interfaces without SFP (mini-GBIC) optical modules
CC16	Controller module with cross-connect unit and two STM-1/4/16 (OC-3/12/48) interfaces without SFP (mini-GBIC) optical modules
16TE	16 E1 (120 ohm) or 16 T1 software programmable plug-in card
32TE	32 E1 (120 ohm) or 32 T1 software programmable plug-in card
63TE	63 E1 (120 ohm) or 63 T1 software programmable plug-in card
16E75	16 E1(75 ohm) plug-in card
32E75	32 E1(75 ohm) plug-in card
63E75	63 E1(75 ohm) plug-in card
B16	STM-1/4 (OC-3/12) software configurable plug-in card without SFP (mini-GBIC) optical modules
9EoS4NSW	1 GbE or 8FE software programmable plug-in card without L2 switch
9EoS4SW	1GbE and 8FE plug-in card with L2 switch
3TE3	3 T3 or 3 E3 software programmable interface plug-in card
7FOM	7-port Fiber Optical Interface with 7 SFP housings (SFP not included)
1FOMB	1-port Fiber Optical Interface
RTB	RTB card
3E1	3-port E1 card
3T1	3-port T1 card
2GH	2-port G.SHDSL card
4GH	4-port G.SHDSL card
12/24FXS	12/24 FXS card
12/24FXO	12/24 FXO card
8E&M	8-port E&M card
8RS232	8 RS232 card
8DBRA	8 Data Bridge A card
Conference	Conference card
OCUDPA	8 channel OCU DP card
B2G5	STM-16/OC-48 interface card
6UDTEA	6-channel UDTEA
8UDTEA	8-channel UDTEA
6CDA	6-channel G.703 Interface at 64 Kbps data rate. Per port configurable for Co-directional or Contra-directional interfaces.
TTA	Transfer Trip Card

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.

Loop-O9500R SDH/SONET IMAP Product Specification

High Speed or High Density Tributary Modules

Max. Number of Aggregate Lines on Controller Modules
4 x STM-1/4 (OC-3/12) aggregate optical lines (CC4) or
4 x STM-1/4/16 (OC-3/12/48) aggregate optical lines (CC16)

Max. Number of HS Tributary Lines for CC4 Controller Module
1 x STM-4 (OC-12) tributaries without protection
6 x STM-1 (OC3) tributaries without protection
12 x E3/T3 tributaries without protection
252 x E1/T1 tributaries without protection
4 x GbE and 32 x FE EoS with build in L2 switch tributaries without protection
28 x FOM tributaries without protection

Max. Number of HS Tributary Lines for CC16 Controller Module
2 x STM-4 (OC-12) tributaries without protection
8 x STM-1 (OC3) tributaries without protection
12 x E3/T3 tributaries without protection
252 x E1/T1 tributaries without protection
4 x GbE and 32 x FE EoS with build in L2 switch tributaries without protection
8 x GbEoS without build in L2 switch tributaries without protection
28 x FOM tributaries without protection

T1 Interface

Line Rate	1.544 Mbps ± 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 ± 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/120Ω 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 ± 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 ± 20ppm	Jitter	ITU G.824
Line Code	B3ZS	Framing	Unframed, M13/Mx3 (unframed E1/T1), G.747
Input Signal	ITU G.703	Impedance	75Ω 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
Prrocess 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		

7 FOM

Port number	7		
Source	Laser	Line Code	Scrambled NRZ
Wavelength	1310 ± 50 nm, 1550 ± 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

4 GbESW Card

SFP Module Characteristics(Please refer to SFP optical module brochure for detail)

Combo Gigabit Ethernet(GbE) Interface

Number of Ports	2
Speed	10/100/1000 Base-TX or 100/1000 Base-FX
Function	RJ45 Interface • 10/100/1000 BaseT, auto-negotiation • Auto MDI/MDIX • Force mode: duplex (half/full), speed (10/100/1000M) SFP Housing • Rx power low alarm
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection

B2G5 STM-16/OC-48 Interface Card Specifications

Total Ports	2
Data Rate	2,488.320 Mbit/s
Optical Line Coding	NRZ after scrambling
Application code	S-16.1 or L-16.1 or L-16.2
Connector Type	SFP LC connector

Gigabit Ethernet (GbE) Interface

Number of Port	2
Speed	Speed 100/1000 Base-FX
Function	Rx power low alarm
Connector	LC for optical GbE

Gigabit Ethernet Function

Line Rate	10/100/1000 Mbps	Mapping	N x VC11, 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)	Multiplexing	G.707

	IGMP Snooping
	QoS
Process Protocol	VCAT, GFP(G.7041), LAPS, BCP, LCAS (G.7042) and non-LCAS
Bridge	802.1d
	MAC learning (maximum MAC table 16K entry)
VLAN	IEEE 802.1q bridging
	Supports tag stacking, up to 2 VLAN tags
	VLAN packet transparent
QoS/CoS	Eight priority queues
	Packet classification based on the 802.1p user priority, IPV4 ToS (DiffServ)
	The scheduling algorithm of the priority queue follows either Strictly Priority or Weighted Round-Robin (WRR).

Standards Compliance

IEEE	802.1q, 802.1p, 802.3, 802.3u, 802.3ab, 802.3z, 802.1s, 802.1w, 802.1x
	G.7041, G.7042

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		

Network Line Interface – 3T1

Line Rate	1.544 Mbps ± 32 ppm	Framing	D4/ESF
Line Code	AMI/B8ZS	Output Signal	DSX-1 w/0, -7.5, -15 dB LBO
Input Signal	DSX-1 0dB to -30dB w/ALBO	Connector	RJ48C
Jitter	AT&T TR 62411	Pulse Template	AT&T TR 62411
Data Rate	n * (64) Kbps (n = 1 to 24)	Surge Protection	FCC Part 68 Sub Part D

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

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

NOTE: Operation Wavelength 820nm~1550nm

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 -		**Outputs -**	
8-channel	2-port per card, 4-pair per port	8-channel	8-pair per card
Connector	RJ45	Connector	Screw type
Internal Resistance	100 K	Initial Insulation Resistance	Min. 1000M ohm (at 500 Vdc)
Activation Current	3 ma	Max. Current	2A
Deactivation Current	1.5 ma	Max. Voltage	220 Vdc, 250 Vac
Allowable Current	4 ma		

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 x 64K bps, 1≤ n ≤32 (≤ 8Mbps 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)

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, 38.4K
	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 connecters (one DB9S and two DB25S)
Electrical	RS232 Interface, DCE

Data Bridge Card

Data Port	Up to twelve 8-port data bridge card (each card supports up to 120 DS0 for data bridge)	
Feature	20 end points per multi-drop circuit to into a logical ended 56K or 64K channel Per port supports bridge function to N remote Trib. Site (N=1~20)	
Data Rate	Asynchronous	Support to receive 1200 to 19200 bps asynchronous data via oversampling channel
Bridge function	one port with one DS-0 to many (Maximum is 20 for remote Tributary data box)	

20 drops for each DS0 to remote Tributary data box and 8 ports RS232 shared the 128 channels.

6CDA G.703 co-directional and Contra-directional Interface Card

Data Port	6-port
Interface	cc mode : ITU G.703 64 Kbps co-directional and Contra-directional controlling (DCE) interface mixed mode : ITU G.703 64 Kbps co-directional, Contra-directional controlling (DCE) and Contra-directional subordinate (DTE) interface
Connector	120ohm, RJ48
Line Distance	Up to 500 meters
Alarm	Co-directional : LOS and insert AIS(All 1) Contra-directional : LOO (Loss Of Octet)
Loopack	DTE Payload Loopback, Local Loopback

6UDTEA Universal Data Interface Card

Mode 1 (Sub-Rate mode)

DTE Interface (X.21/RS232/RS422)

Data Port	Up to 4 (Port1 to Port4)		
MUX	Maximum 4 subrate port / 64Kbps		
Data Rate	Asynchronous	Mux mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K
		Independent mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K
	Synchronous	Mux mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K,
		Independent mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K, 48K, 64K
Connector	DB44 (Port1, Port2), DB44 (Port3, Port4)		
Alarm	Remote Alarm RTS Loss		
Loopback	To-DTE To-DS1 (To Line)		
Electrical	DCE		
Protocol	V.110		

DTE Interface (RS232)

Data Port	Up to 2 (Port5 and Port6)		
MUX	Maximum 6 subrate port / 64Kbps		
Data Rate	Asynchronous	Mux mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K
		Independent mode	0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K
Connector	RJ48-ASYNC (Port5, Port6)		
Alarm	Remote Alarm RTS Loss		
Loopback	To-DTE To-DS1 (To Line)		
Electrical	DCE		
Protocol	V.110		

Mode 2 (N*64K Mode)

DTE Interface (X.21/RS232/RS422/V.35/V.36/EIA530/RS449)

Data Port	Up to 4 (Port 1 to 4)
Data Rate	Synchronous N*64kbps, N = 1 to 32 Asynchronous mode is not supported.
Connector	DB44 (Port 1, Port 2), DB44 (Port 3, Port 4)
Alarm	RTS Loss
Loopback	To-DTE To-DS1 (To Line)
Electrical	DCE

Note: When oversampling is enabled in MOD2, port 5 ~ 6 will be disabled.

Mode 3 (Hybrid Mode)

DTE Interface (X.21/RS422/V.35/V.36/V.54/EIA530/RS449)

Data Port	Up to 4 (Port 1 to 4)
Data Rate	N*64kbps, N = 1 to 32 for port 1 ~ 3 N*64Kbps, N = 1 to 20 for port 4
Connector	DB44 (Port 1, Port 2), DB44 (Port 3, Port 4)

Alarm	RTS Loss
Loopback	To-DTE
	To-DS1 (To Line)
Electrical	DCE
Data Port	Up to 2 (Port 5, Port 6)
MUX	Maximum 2 oversampling port / 64Kbps
Data Rate	Asynchronous 200, 300, 0.6K, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K
Connector	RJ48 (Port 5, Port 6)
Alarm	Remote Alarm
	RTS Loss
Loopback	To-DTE
	To-DS1 (To Line)
Electrical	DCE

8UDTEA (RS232/RS422/RS485) Universal Data Interface Card

Data Port	8 port UDTE card
ASYNC Data Rate	200,300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K, 128K bps by oversampling
Connector	RJ48C
Interface	DCE only
Flow Control (RS232 only)	Hardware (RTS and DTR), none
Loopback function	DTE to DTE loopback; DTE to Line loopback

1FOMB

Source	MLM Laser	Line Code	Scrambled NRZ
Wavelength	1310 ± 50 nm, 1550 ± 40 nm 50 Km reach	Detector Type	PIN-FET

NOTE: Longer or shorter, 15 to 120Km, on special order.

Voice Card 12 MAGA (MagnetoA)*

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- E&M (8EM)

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)	-16 to +7 dB / 0.1dB step for transmit (D/A) gain -16 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 (12FXS, 24FXS, 24FXO)

12 FXS/FXO Connector	Twelve RJ11	
24 FXS/FXO Connector	One RJ21X femail connector	
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	FXS: -21 to +3 dB / 0.1dB step transmit & receive FXO: -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	±0.5dB	
FXO	Ringing REN	0.5B (AC)
	Detectable Ringing	25 Vrms
	Loop Resistance	≤ 1800 Ω
	DC Impedance (ON-HOOK)	> 1M Ω
	DC Impedance (OFF-HOOK)	235 Ω @ 25mA feed 90 Ω @ 100mA feed
FXS Loop Feed	-48Vdc with 25mA current limit per port Jumper Selectable: 25mA(default=25mA), 30mA, or 35mA(sn=S1)	
FXS Signalling	Normal / PLAR: Private Line Auto Ring down	
FXS Ringing	1 REN at 5K meters per port 16.7Hz, 20Hz, 25Hz, 50Hz, user selectable for all ports Jumper selectable: 64, 76, and 85 Vrms (triangle wave), (default= 76 Vrms for Ring Voltage) 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR ON	
FXS Tone	Alarm Tone: 480Hz/620Hz/-24dBm Ring Back Tone: 440Hz/480Hz/-19dBm	
FXS functions	Basic functions: Bettary Reverse, Loop Star, PLAR Optional functions: PLAR ON/PLAR bit programmable, Ground Start, and/or Meter Pulse.	
Signaling Bit A,B,C,D	Programable bit	

- 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.

TDMoEA*

Combo Gigabit Ethernet(GbE) Interface

Number of Ports	2
Speed	10/100/1000M bps
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection

Gigabit Ethernet(GbE) Interface

Number of Port	2
Speed	10/100/1000 BaseT
Connector	RJ45

Ethernet Function

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) entr Packet Delay Variation: - 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 80 (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: 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 Pause frame issued when the traffic exceeding the limited rate before packet dropped followin IEEE802.3X
Link Aggregation	WAN support link aggregation

Jitter & Wander

PPM: per G.823 Traffic

Standard Compliance

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

OCU/DP Interface

Ports	8 Ports for each card
Line Status Indicator	Per Port 1 dual color LED; Red for LOS, Green for SYNC
Network Connector	RJ48S
Electrical network connection	Tip/Ring and Tip1/Ring1
Transmit Source Impedance	135 Ohms +/- 20%
Receive Input Impedance	135 Ohms +/- 20%
Receiver Sensitivity/ Dynamic Range	0 to 43 dB loop loss at 72K & 56K 0 to 34 all other rates Automatic line equalization
Pulse Amplitude	+/- 1.5 V (+/- 10%) peak, all rates except 9.6k +/- 0.75 V (+/- 10%) peak at 9.6k Bipolar Return to zero, 50% duty cycle
Sealing Current	Typically 16 mA DC
Operating Modes	4-wire DDS Switched 56 support is optional.
Circuit Rates	SYNC: 2.4, 4.8, 9.6, 19.2, 56, 72kbps (64k) clear channel Conforms with AT&T Pub 41458
Encoding and decoding rules	Use bipolar violation to indicate control information: Idle, out of service, Zero substitution using unframed loops
Maintenance control	DSU Non-latching loop-back code (for 2.4, 4.8, 9.6, 19.2, 56k circuit rate) DSU Latching loop-back (TIP, LSC, LBE, FEV) code (for 72k circuit

	rate)
	Machine maintenance OCU/DP card operation: Payload loopback OCU loopback Local loopback Bi-directional loopback V.54 remote loopback code
Fault and Performance	Custom defined remote loopback code BERT test support all ones, all zeros, 2047, 511, 63 pattern. LOS, OOS, ES, SES and UAS alarm. Current, last 96 registry and 7 days performance storage.
Environment	Operating: 0-50°C Storage: -25-75°C Humidity: Up to 90% RH non-condensing
Specification Standard	ANSI T1.410; AT&T Pub 62319, AT&T Pub 62310, ITU-T V.54

Conference Card

RS232 Interface

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

FXSA Voice Interface

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 (programmab
Signaling	Loop Start, DTMF

E&M Voice Interface

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)

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

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	Maximum switching voltage	110 V DC, 125 V AC
Deactivation Current	1.5 ma		
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

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, 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
Alarm History		SONET	Line	LOS-PI, LOF-S, TIM-S, SD-L , SF-L , AIS-L , RDI-L , REI-L UAS, B1-BIP, B2-BIP
			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	Single/ Dual power module, -48 Vdc: -36 to -72 Vdc Single/ Dual power module, 48/125 Vdc: 36 to 140 Vdc, 300 Watts max. Single/ Dual power module, 125/250 Vdc: 100 to 260 Vdc, 300 Watts max

Physical and Environmental

Dimensions for 6U	433mm x264mm x 223.5mm (W/H/D)
Temperature	-5 to 50°C
Humidity	0-95%RH (non-condensing)
Mounting	Desk-top stackable, 19/23 inch rack mountable

Certifications

EMI/EMC	EN55022 Class A, EN55024, EN60950-1 FCC Part 15 Class A,
Safety	IEC 61850-3, IEEE 1613

Note for IEC 61850-3 and IEEE1613:

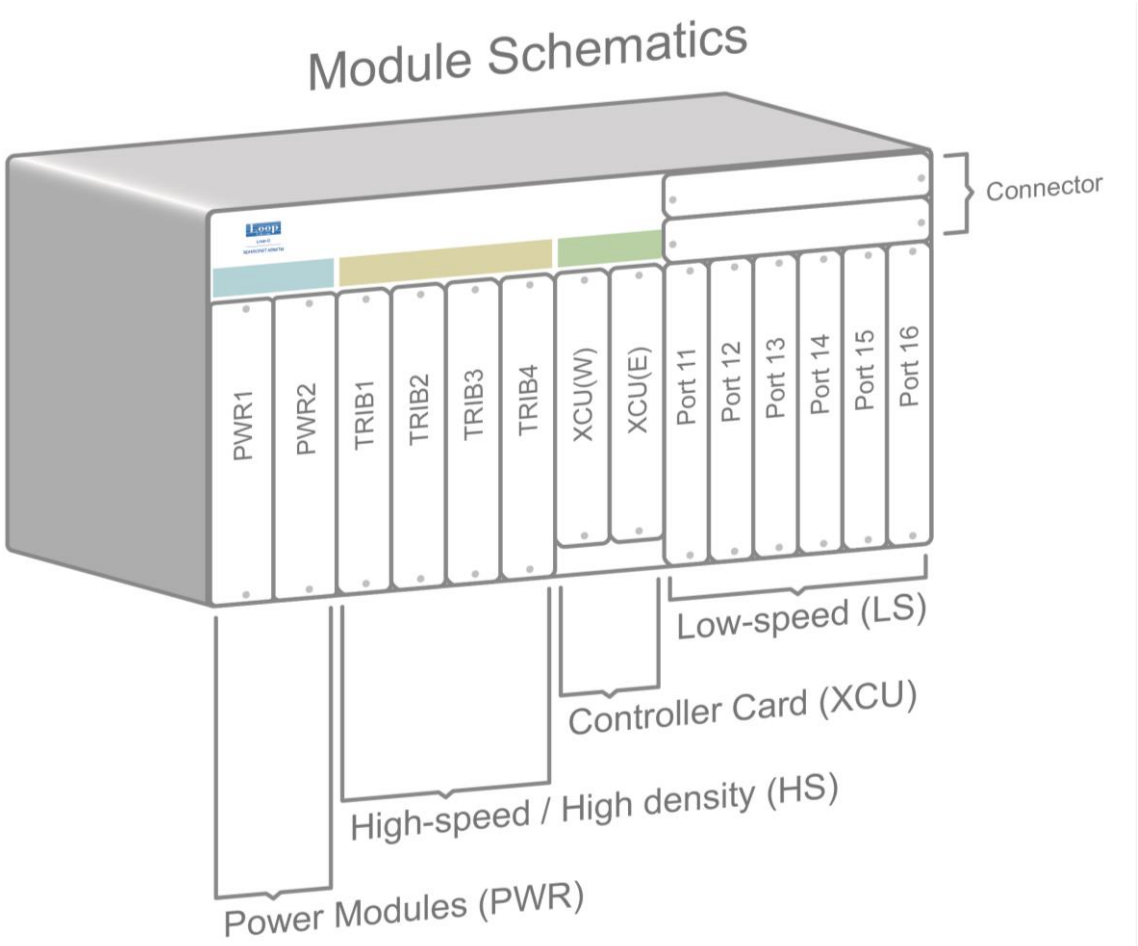
(1) The certification only applies to O9500-R with 48Vdc/150W power module
(2) The magento card does not support IEC 61850-3 and IEEE 1613
(3) Use shielding cable with the following modules:

- RS232-X.50 module
- DTE of Conference module
- Input Port of Dry Contact module
- RS232 X.50-8 module
- SNMP of XCU
- Console port of XCU
- Input Port of Dry Contact B module

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

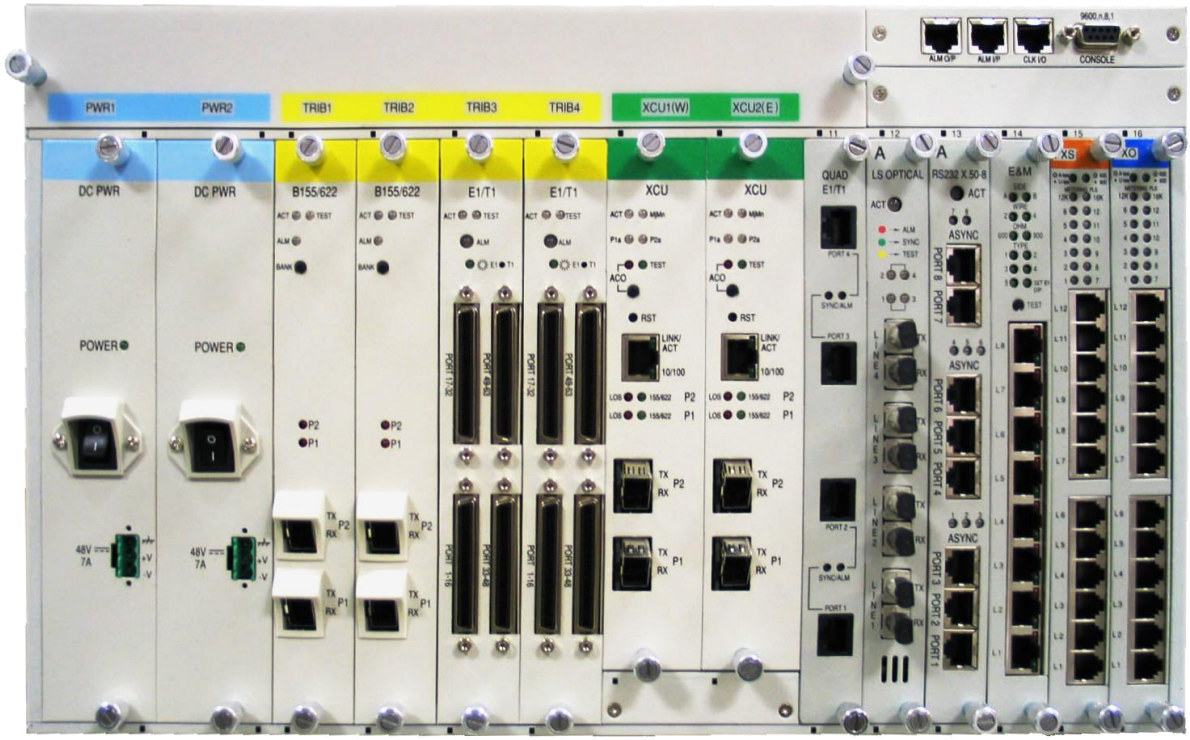


O9500R Low-speed Tributary Modules

Low-speed Module	Channel	Maximum Channels	
		TRIB 11~16 each	System
1FOMB	FOM	1	6
RTB	FE	8	48
2/4 channel G.SHDSL	G.SHDSL	2/4	12/24
4E1/T1	E1/T1	4E1/4T1	21E1/24T1
3E1/T1	E1/T1	3	18
8CD	G.703	8	48
6CDA	G.703	6	36
1C37/4C37	C37.94	1/4	4/24
8DC	Dry Contact	8	48
8DCB	Dry Contact	8	48
8RS232	RS232	8	48
Conference Card	FXS/E&M/RS232	6	36
12FXS	FXS	12	72
12FXO	FXO	12	72
12MAGA*	Magneto	12	72
8E&M	E&M	8	48
TDMoEA*	TDMoE	4	24
8DBRA	RS232	8	48
8UDTEA	RS232/RS422/RS449	8	48
OCUDPA	OCU/DP	8	48
6UDTEA	RS232/X.21/V.35*/V.36*/EIA530*	6	36

*Future Option

O9500R High-speed Tributary Modules with XCU-CC4 on CHA Chassis



In the tables below, STM-16 is equivalent to OC-48, STM-4 to OC-12; STM-1 to OC-3; E1 to T1; and E3 to T3.

Table 1 High-speed Configuration without Protection

High-seed Module	Channel	Maximum Channels						
		Tributary (Plug-in Modules)				Controller Cards		System
		TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU 1	XCU 2	
E1/T1	E1/T1	63/32/16	63/32/16	63/32/16	63/32/16	N/A	N/A	252
E3/T3	E3/T3	3	3	3	3	N/A	N/A	12
Ethernet	FE	8	8	8	8	N/A	N/A	32
	GbE	1	1	1	1	N/A	N/A	4
XCU, B155/622	STM-1	2	2	1	1	2	2	10
	STM-4	1 Note 1		N/A	N/A	2	2	5
7FOM	FOM	7	7	7	7	N/A	N/A	28

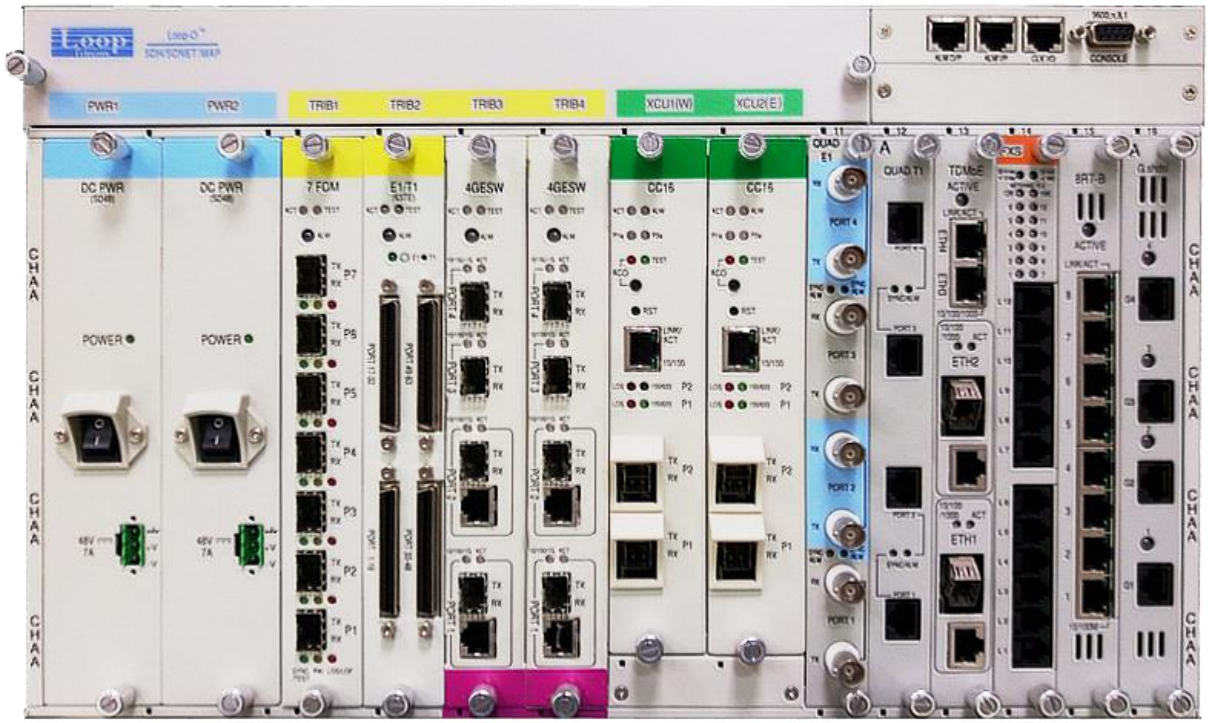
Table 2 High-speed Configuration with Protection

High-seed Module	Channel	Maximum Channels						
		Tributary (Plug-in Modules)				Controller Cards		System
		TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU 1	XCU 2	
E1/T1	E1/T1	63/32/16	**(B)** 63/32/16	63/32/16	**(B)** 63/32/16	N/A	N/A	126
E3/T3	E3/T3	3	**(B)** 3	3	**(B)** 3	N/A	N/A	6
Ethernet	FE	8	**(B)** 8	8	**(B)** 8	N/A	N/A	16
	GbE	1	**(B)** 1	1	**(B)** 1	N/A	N/A	2
XCU, B155/622	STM-1	2	**(B)** 2	2	**(B)** 2	2	**(B)** 2	6
	STM-4	1	**(B)** 1	N/A	N/A	2	**(B)** 2	3
7FOM	FOM	7	**(B)** 7	7	**(B)** 7	N/A	N/A	14

(B) signifies backup/protection

Note 1 Only one tributary STM-4/OC12 channel is compatible with XCU-CC4 without protection in either TRIB 1 or TRIB 2 slot.

O9500R High-speed Tributary Modules with XCU-CC16 on CHAA Chassis



In the tables below, STM-16 is equivalent to OC-48, STM-4 to OC-12; STM-1 to OC-3; E1 to T1; and E3 to T3.

Table 1 High-speed Configuration without Protection

High-seed Module	Channel	Maximum Channels						
		Tributary (Plug-in Modules)				Controller Cards		System
		TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU 1	XCU 2	
E1/T1	E1/T1	63/32/16	63/32/16	63/32/16	63/32/16	N/A	N/A	252
E3/T3	E3/T3	3	3	3	3	N/A	N/A	12
Ethernet	FE	8	8	8	8	N/A	N/A	32
	GbE	1	1	1	1	N/A	N/A	4
4GEoSDH	GbE	N/A	N/A	4	4	N/A	N/A	8
XCU, B155/622	STM-1	2	2	2	2	2	2	12
	STM-4	1		1		2	2	6
XCU	STM-16	N/A	N/A	N/A	N/A	2	2	4
7FOM	FOM	7	7	7	7	N/A	N/A	28

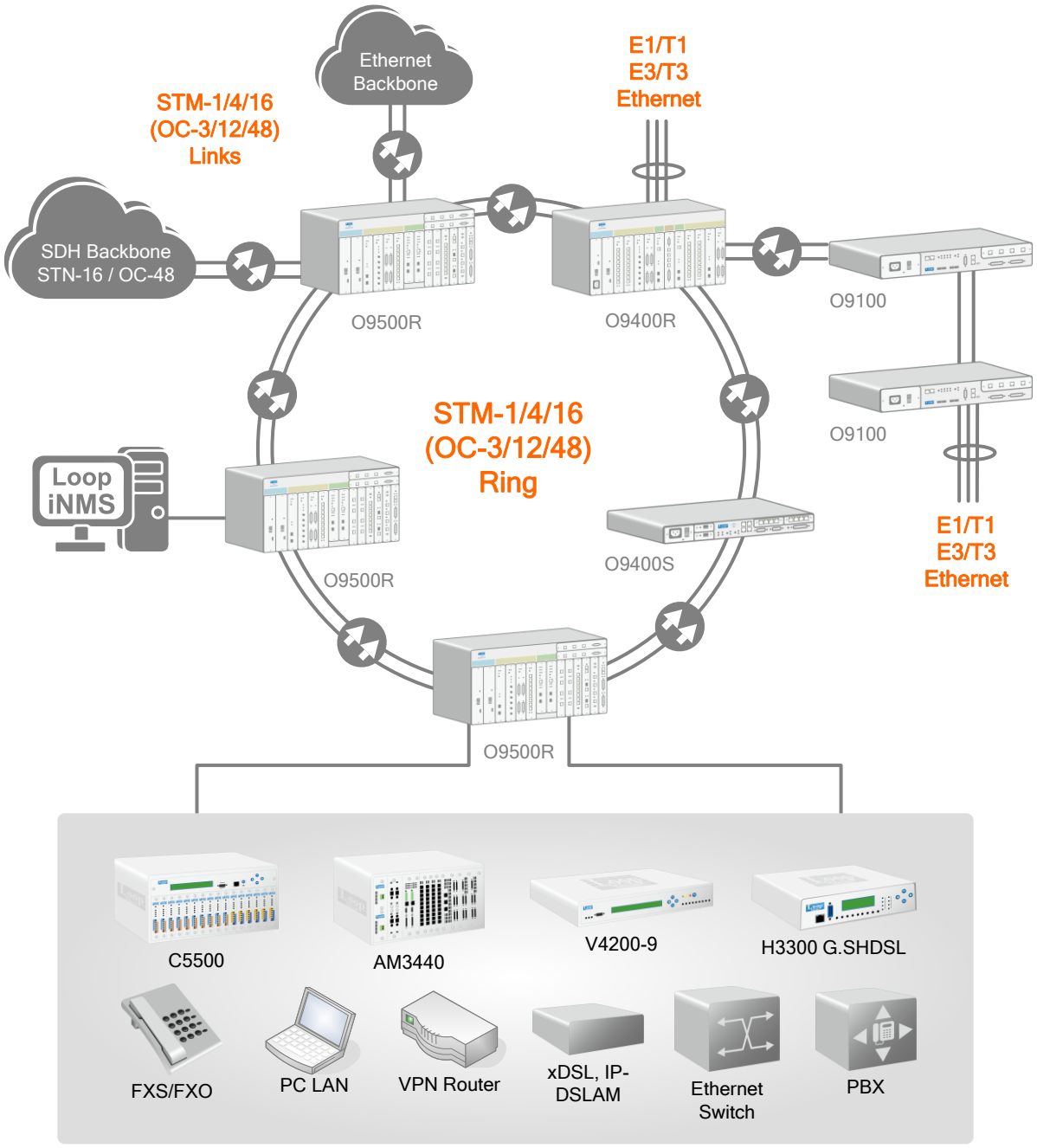
Table 2 High-speed Configuration with Protection

High-seed Module	Channel	Maximum Channels						
		Tributary (Plug-in Modules)				Controller Cards		System
		TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU 1	XCU 2	
E1/T1	E1/T1	63/32/16	**(B)** 63/32/16	63/32/16	**(B)** 63/32/16	N/A	N/A	126
E3/T3	E3/T3	3	**(B)** 3	3	**(B)** 3	N/A	N/A	6
Ethernet	FE	8	**(B)** 8	8	**(B)** 8	N/A	N/A	16
	GbE	1	**(B)** 1	1	**(B)** 1	N/A	N/A	2
4GEoSDH	GbE	N/A	N/A	4	**(B)** 4	N/A	N/A	4
XCU, B155/622	STM-1	2	**(B)** 2	2	**(B)** 2	2	**(B)** 2	6
	STM-4	1	**(B)** 1	1	**(B)** 1	2	**(B)** 2	4
XCU	STM-16	N/A	N/A	N/A	N/A	2	**(B)** 2	2
7FOM	FOM	7	**(B)** 7	7	**(B)** 7	N/A	N/A	14

(B) signifies backup/protection

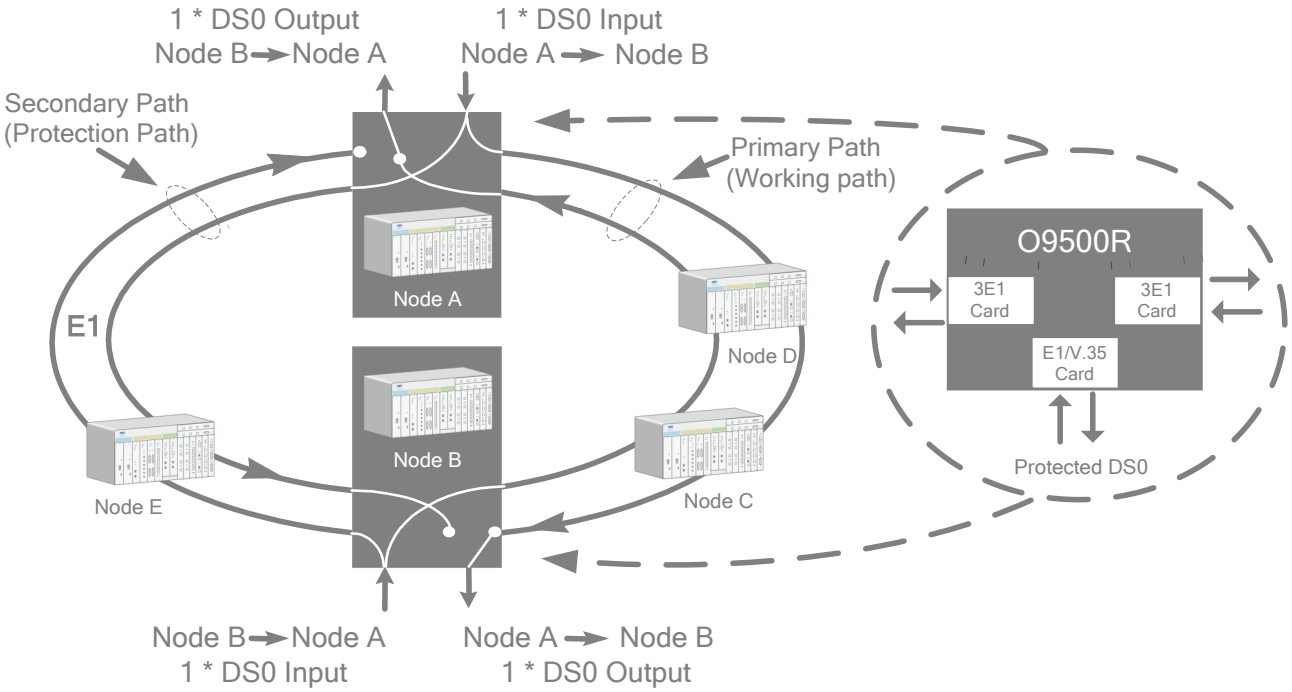
Application Illustrations

O9500R can be configured as either a Terminal Multiplexer (TM), a Linear Add/Drop Multiplexer (ADM), or as a cross-connect (DACS) within the same enclosure. With UPSR/SNCP and MSP (1+1) protection, O9500R can easily provide a well-protected transmission path and integrated access with various applications as shown below.

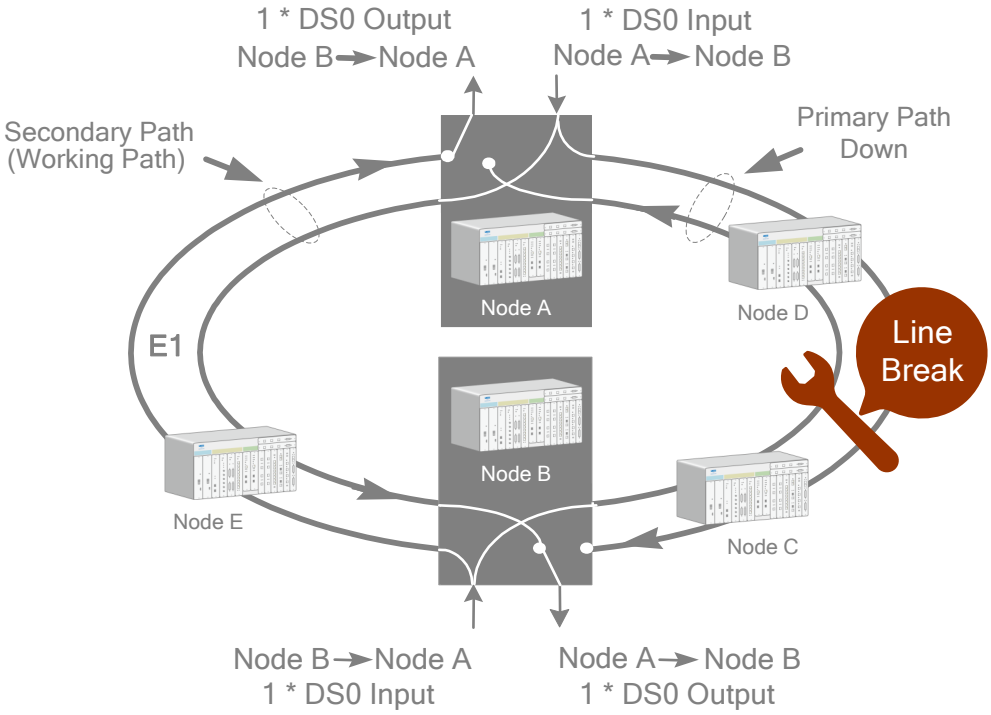


ADM, TM, and DACS Application

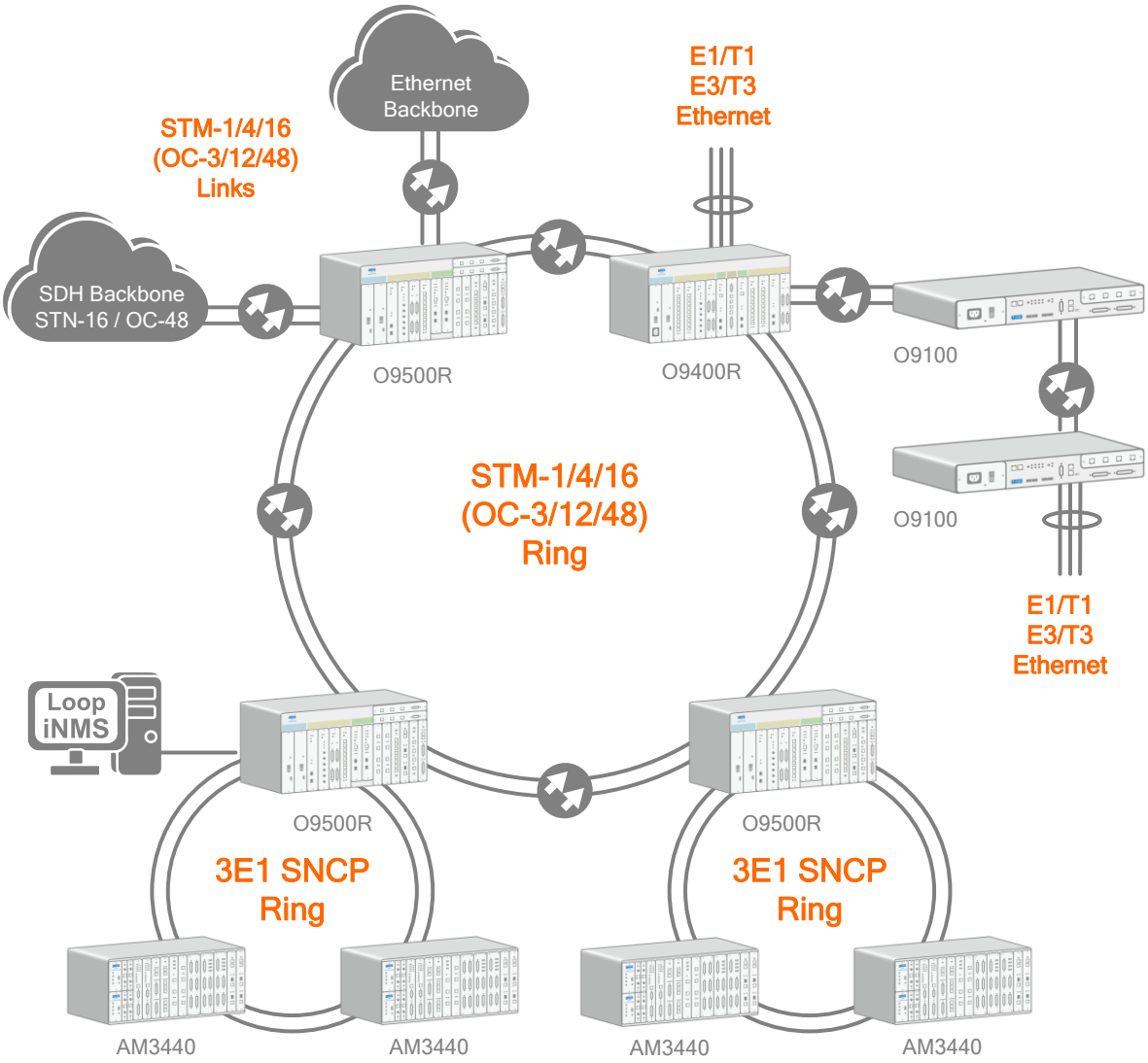
The diagram below illustrates the DS0 signal path in normal condition. The DS0 signal travels on both primary path and secondary path. The primary path is configured to be the working path and the secondary path is configured to be the protection path.



The diagram below illustrates the DS0 signal path in faulty condition. When the primary path is broken, the secondary path will automatically become the working path.



DS0 SNCP Protection Architecture with 3E1 Plug-in Cards



SNCP/ULSR Ring Protection at Circuit Level

Data Comm for Business, Inc.
2949 CR 1000 E
Dewey, IL 61840
Voice 8004DCBNET (800.432.2638)
Fax 217.897.1331
Info www.dcbnet.com/contact.html
Web www.dcbnet.com