



Loop-O9170S SDH STM-1 MUX



Features

- 1U height ETSI/ANSI shelf unit (front/rear access)
 - Standalone, wall mount, and rack mount
 - SDH STM-1 TM
 - Aggregate port
 - 2 SFP optical housing
 - MSP 1+1 protection and SNCP
 - On-board tributaries on fixed slot
 - 8-port E1 ports with 1 DB37* or 6 E1 ports with RJ48 connectors
 - Four 10/100 (FE) Ethernet ports
 - On-board tributary on TG3 slot (manufacture option)
 - 4-port RS232 and 4-port FXS
 - 4-port RS485 and 4-port FXS
 - 4-port RS232 and 4-port RS485
 - 8-port FXS
 - 8-port FXO
 - 8-port RS232
 - 8-port RS485.
 - Optional modules on TG4 slots (manufacture option)
 - 4-port E&M
 - 4-port RS232 and 4-port RS485*
 - 8-port FXS*
 - 8-port FXO*
 - 8-port RS232*
 - 8-port RS485*
 - Optional modules on TG5 slots (manufacture option)
 - 4-port E&M
 - 8-port FXS*
 - 8-port FXO*
 - 8-port RS232*
 - 8-port RS485*
 - 4-port E1*
- (* Future Option)
- Power Modules
 - Hot swappable DC power -48 Vdc
 - Dual DC power module for redundancy
 - DS0 cross-connect fabric with TG3, TG4, TG5 modules and SNMP
 - Networking protection

Description

Loop-O9170S is an economical, cost-effective SDH STM-1 Mux designed to combine digital access interfaces including TDM, IP, and voice interfaces into STM-1 optical lines for convenient transport and switching. Through STM-1 uplink, O9170S provides VC-12 standard E1s and Ethernet supporting VCAT, GFP, and LCAS protocol.

The O9170S is a comprehensive SDH STM-1 multiplexer platform for traditional telecom businesses and broadband information business applications, and a blending trend which adapts Metropolitan Area Network as well as audio and information business in all Private Networks.

The O9170S provides two optical line signals at STM-1 with protection schemes including MSP(1+1) and SNCP protection in both ring and linear network topologies.

On the aggregate side, the O9170S has two STM-1 ports supporting 1+1 protection. On the tributary side, the O9170S has four Ethernets and 8-port E1, as well as options of Voice (FXS/FXO/E&M) and DTE (RS232/RS485) interfaces.

All interfaces are fully compliant with the relevant ANSI standards and ITU recommendations. The O9170S provides fault management, performance monitoring, configuration management, and network security management. Through the console port, LAN port and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces. The O9170S supports the LOOPView GUI EMS (Element Management System).

- MSP (1+1) and SNCP protection
- Support External
- /Internal/Line/E1 clock
- Supports VCAT, GFP, and LCAS
- Performance monitoring
- Alarm suppression, masking, and reporting
- Management:
 - Console port
 - SNMP port
 - Centralized management with Loop's EMS over DCC channel
 - LoopView GUI EMS
 - Telnet support

Ordering Information

To specify options, choose from the list below:

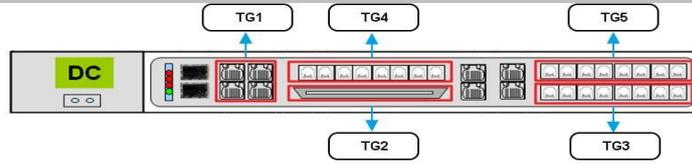
Model	Description	Note
Loop-O9170-S-4FE-tg2-tg3-tg4-tg5-pp1-pp2- G	1u height standard equipment with 2 SFP optical housing, 4 Ethernet ports	<ul style="list-style-type: none"> • Where tg2, tg3, pp1, pp2, opt modules are defined in the table below. • Order SFP modules separately from SFP Optical Module Brochure.

Accessories

User's Manual		
Loop-O9170-S-UM	Paper copy of User Manual. Note: Standard package includes CD version	
Conversion Connector		
Loop-ACC-COV-1DB37F-8RF75	One DB37 female to eight (8TX/8RX) 1.0/2.3 RF male (75ohm impedance) conversion adaptor	
Conversion Cables		
Loop-ACC-CAB-DB37F-100-8RJ48F	DB37/Female to eight RJ48C/Female cable; Length: 100 cm	Use for 8E1DB120
Loop-ACC-CAB-DB37F-100-16BNCF	DB37/Female to sixteen BNC/Female cable; Length: 100 cm	Use for 8E1DB75
Loop-ACC-CAB-RJ45M-180-1DB09F	RJ45/Male to DB9/Female RS232 Conversion cable; Length: 180 cm	Use for console port
Power Adaptor (All power adaptor are RoHS compliant)		
Loop-ACC-APX-090- G	90 Watt, AC (100~250 Vac) to DC (48 Vdc) power adaptor	Please order power cord separately.
Power Cord (All power cord are RoHS compliant)		
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	
Blank Panel		
30.001455.A00LF-G	Blank panel for single DC power slot	
SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.		

Tributary Group (TG)



Where **tg2** is a manufacture option used to select E1 type for the Tributary Group2 (TG2) slot (Must select one)

Tg2=	Description	Note
6E1RJ	6E1 (120 ohm) on board, RJ48 connector	<ul style="list-style-type: none"> Conversion cable not included <p style="text-align: right;">(* Future Option)</p>
8E1DB75*	8E1 (75 ohm) on board, DB37 connector	
8E1DB120*	8E1 (120 ohm) on board, DB37 connector	

Where **tg3** is a manufacture option used to select Tributary Group3 (TG3) slot type (Must select one)

Tg3=	Description	Note
8FXO	8-port FXO with RJ11 connector	
8FXS	8-port FXS with RJ11 connector	
4FXS/4RS232	4-port RS232 and 4-port FXS (RJ11)	
4FXS/4RS485	4-port RS485 and 4-port FXS (RJ11)	
4RS232/4RS485	4-port RS232(RJ11) and 4-port RS485(RJ11)	
8RS232	8-port RS232 with RJ11 connector	
8RS485	8-port RS485 with RJ11 connector	

Where **tg4** is a manufacture option used to select Tributary Group4 (TG4) slot type

Tg4=	Description	Note
Q2EM-m-n	2-Wire 4-port E&M with RJ48 connector	Where code m and n are defined in the following table
Q4EM-m-n	4-Wire 4-port E&M with RJ48 connector	
8FXS*	8-port FXS with RJ11 connector	(* Future Option)
8FXO*	8-port FXO with RJ11 connector	(* Future Option)
8RS232*	8-port RS232 with RJ11 connector	(* Future Option)
8RS485*	8-port RS485 with RJ11 connector	(* Future Option)
4RS232/4RS485*	4-port RS232(RJ11) and 4-port RS485(RJ11)	(* Future Option)

Where **tg5** is a manufacture option used to select Tributary Group5 (TG5) slot type

Tg5=	Description	Note
Q2EM-m-n	2-Wire 4-port E&M with RJ48 connector	Where code m and n are defined in the following table
Q4EM-m-n	4-Wire 4-port E&M with RJ48 connector	
8FXS*	8-port FXS with RJ11 connector	(* Future Option)
8FXO*	8-port FXO with RJ11 connector	(* Future Option)
8RS232*	8-port RS232 with RJ11 connector	(* Future Option)
8RS485*	8-port RS485 with RJ11 connector	(* Future Option)
4E1RJ*	4-port E1 (120 ohm) with RJ48 connector	(* Future Option)

For Quad 2W/4W E&M card:

- Where **m** is used to select QEM card signaling side (must select one):

m =	Description	Note
B	B (carrier side) connects to A side.	
A	A (exchange side) connects to B side. A side M lead to B side M lead, A side E lead to B side E lead.	

- Where **n** is used to select QEM card signaling type (must select one):

n =	Description	Note
0	For voice transmission only.	Circuit Type doesn't matter.
1	Type I (Original) E&M Signaling Circuit	M lead provides discharge for the A side.
2	Type II Circuit. This design attempts to reduce ground noise by adding two leads: SB (Signal to Battery) and SG (Signal to Ground)	Reduced ground noise. Ground current is eliminated at the cost of two more wires per circuit.
3	Type III Circuit. The SG lead serves as a discharge for the M lead. Reduces delay caused by combination of (a) low current electronic detectors, and (b) long runs of the E and M leads.	Type III is rare because ground currents on the E return would cause noise
4	Type IV Circuit. Based on the Type 2 circuit. This E&M circuit provides symmetry.	
5	Type V Circuit. For applications where ground noise is not an issue. Based on the Type 2 circuit.	

Where **pp1** is used to select 1st power module.

pp1=	Description	Note
SD48	Single DC pluggable power module (-48Vdc, -36 to -72Vdc)	<ul style="list-style-type: none"> For redundancy purpose, order second DC power plug-in module
SA*	Single AC pluggable power module	<ul style="list-style-type: none"> O9170 support single AC only (* Future Option)

Where **pp2** is used to select 2nd power module.

pp2=	Description	Note
SD48	Single DC pluggable power module (-48Vdc, -36 to -72Vdc) supply	<ul style="list-style-type: none"> For redundancy purpose, order second DC power plug-in module

Note: The combination of pp1 and pp2 power modules:

For ETSI unit (all power modules in front)

- pp1=SD48 (single DC power plug-in)
- pp1=SA (single AC power plug-in)
- pp1=SD48, pp2=SD48 (dual DC power plug-in)

For ANSI unit (one power module in front, one power module at rear)*

- pp1=SD48 (single DC power plug-in at rear)
- pp1=SA (single AC power plug-in)
- pp1=SD48, pp2=SD48 (dual DC power plug-in at rear)

Loop-O9170S Product Specifications

SFP Daughter Card Modules (refer to SFP optical brochure for detail)

Aggregate Lines

E1 Interface

Number of E1	DB37 connector: 8 E1/per port RJ48C connector: 6 E1		
Line Rate	2.048 M bps \pm 50 ppm	Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Line Code	HDB3	Jitter	ITU G.823
Input Code	ITU G.703	Framing	unframed
Output Code	ITU G.703	Impedance	75 ohm coax/120 ohm twisted pair
Connector	1. DB37 (75ohm) male with conversion connector 2. DB37 (120ohm) male 3. RJ48C		

Fast Ethernet (FE) Interface

Number of Port	4		
Line Rate	10/100M bps	Mapping	n x VC12
Process Protocol	VCAT, GFP(G.7041), and LCAS (G.7042)	Connector	RJ45
Standard	IEEE 802.3x (flow control)		

RS232/RS485 Interface

Number of Port	4 or 8		
ASYNCR Data Rate	200,300, 600, 1200, 2400, 4800, 9600, 19.2K		
SYNC	not supported		
Connector	RJ11	Interface	DCE only

FXS/FXO Voice Interface

FXS/FXO Connector	4 or 8 RJ11		
Encoding	A-law or μ -law, user selectable together for all		
AC Impedance	Balanced 600ohms		
Longitudinal Conversion Loss	> 46dB		
Cross talk measure	Max -70dBm0		
Gain Adjustment	0 dB 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		
FXO	Ringing REN	0.5B (AC)	
	Detectable Ringing	25 Vrms	
	Loop Resistance	\leq 1800 Ω	
	DC Impedance (ON-HOOK)	> 1M Ω	
	DC Impedance (OFF-HOOK)	235 Ω @ 25mA feed 90 Ω @ 100mA feed	
FXS Loop Feed	-48Vdc or -24Vdc 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 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: PLAR Optional functions: PLAR ON/PLAR bit programmable.		
Signaling Bit A,B,C,D	Programmable 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.

E&M Interface

Connector	4 RJ45
Encoding	A-law or μ -law, user selectable together for all
Impedance	Balanced 600 ohms
Gain Adjustment (Per-port setting)	0dB step for transmit (D/A) gain 0dB step for receive (A/D) gain
I/O Power Range	A/D Analog input level: -66 dBm (0.00039 Vrms) ~ + 3 dBm (1.09 Vrms) D/A Analog output level: -66 dBm (0.00039 Vrms) ~ + 4 dBm (1.22 Vrms)
Frequency Response	± 0.5 dB at 0 dBm0 input
Longitudinal Conversion Loss	> 46dB
Total Distortion	> 35 dB at 0 dBm0 input
Idle Noise	< -65 dBm0p
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
Signaling	Type 1, Type 2, Type 3, Type 4, and Type 5, Transmit only
Modems	Full compatibility with V.90 modems
	<ul style="list-style-type: none"> All in-band signaling tones are carried transparently by the digitizing process. Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.

System Clock

Clock Source	Internal Cock Two Line Clocks: East STM1 line, West STM1 line Dedicated External clock and tributary line
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Management

LEDs	Multi-color LEDs
Console Port	Electrical: RS232 Connector: RJ45 (female, DCE) Protocol: Menu driven VT-100
Telnet	
SNMP	SNMPv1 (RFC1213)
Outband Interface	Using DCC channel, user selectable 3, 9 or 12 channels

Diagnostics System

Loopback Test	Direction: to optical lines, to tributary lines
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Unit E1

Loopback Test	Direction: to optical lines, to tributary lines
BERT Test	E1 interface Direction: to optical lines, to tributary lines

Unit Ethernet

Lane Loopback Test	Direction: to optical lines
Wan Loopback Test	Direction: to optical lines, to tributary lines
Wan-to-Wan Loopback Test	Direction: to tributary lines

Unit RS232/RS485

Loopback Test	Direction: to TSI, to DTE
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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	Power Loss, TS Sync Loss, SNCP Switch, MSP Switch, Login/Logout, FOM Equip/Unequip		
	SDH 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-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-UNEQ

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

Power

DC Power -48 Vdc (-36 to -72Vdc)
Power Consumption Maximum 50 Watts

Physical

Dimensions 480 x 44 x 220 mm. (W x H x D)
Temperature 0 to 50°C
Humidity 0-95%RH (non-condensing)
Mounting Desk-top, 19-inch rack mountable, and wall mountable

Standards Compliance

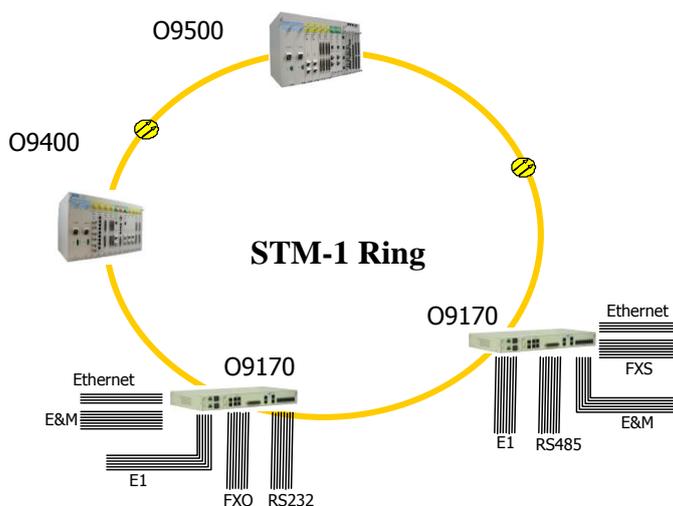
ITU G.664, G.707, G.7041, G.7042, G.775, G.783, G.806, G.823, G.747, X.86
ANSI T1.105, T1.107
IEEE 802.1q (VLAN), 802.1w (RSTP), 802.1s (MSTP)
 802.3x (flow control)
IETF RFC2236 (IGMP Snooping), RFC1213 (SNMPv1)

Certification

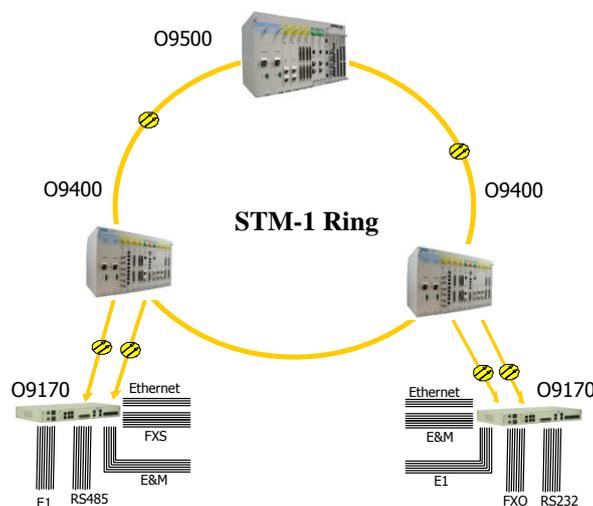
EMC EN55022 Class A, EN55024
Safety EN60950-1

Application Illustration

ADM mode typical application (SNCP Protection)



TM mode typical application (MSP Protection)



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