



# Loop-O 9300 Fiber Optical Mux



1U height unit



2U height unit



3U height unit

## Features :

- Up to 16 E1 links on one fiber
- Support Quad RS232 to 64Kbps async (Optional)
- Support Quad V.35 (Optional)
- Support 10/100M Bridge (Optional)
- Support optical 1+1 line protection (Optional)
- Support power supply options:
  - Single fixed AC power supply
  - Hot swappable dual AC or DC power supply
- Local and remote performance indicators
- Local and remote loopbacks for optical link and each E1 link
- Management through Console port, Ethernet port, Telnet and SNMP agents.
- Office alarm contacts
- LCD display (Optional)
- Multicolor LED indicators

## Description

Loop Telecom's Loop-O Fiber Optical Mux product family provides ideal solutions for building fiber-based E1 networks. As one of this family, model Loop-O 9300 can multiplex up to 16 E1 signals for transmission over an optical fiber, resulting in longer reach without repeaters and superior performance compared to copper media.

The Loop-O 9300 also supports an optional 10 /100 BaseT port, an optional Quad RS232 async ports to 64Kbps, and Quad V.35.

To select protection level, users can choose either a single pair or dual pair fiber, either a single power supply or dual supplies.

Loop-O 9300 offer management through Console port, Ethernet port, Telnet and SNMP agents, so Loop-O 9300 support local control and diagnostics using 2-line by 16-character LCD display (optional) and keypads or DB9S console port. The unit also support local and remote monitoring and diagnostics through the use of front panel switches and LED indicators. Contacts for office alarms are available.

Application for Loop-O include interconnections for LAN, WAN, SONET/SDH, ATM and DLC.

**CERTIFIED  
ISO-9001**

# Ordering Information

To order specify:

Model	Description	Note
Loop-O 9300-cc-n-OPT-pp-Add	Manufacture to order	
Loop-O 9300-SA	Single AC power	For power redundancy, order extra power supply
Loop-O 9300-SD48	Single DC power	

■ where **cc** =

cc =	Connector (Impedance)	4-RS232 (optional using Add = 55)	10/100M Bridge (optional using Add = BR)	Quad V.35 (optional using Add = V35)	Main Chassis
R1	RJ48C (120 ohm)	✓	✓		1U height
D1	DB37 (120 ohm)	✓	✓		1U height
B2	BNC (75 ohm)	✓	✓		2U height
B3	BNC (75 ohm)	✓		✓	3U height

■ where **n** =

n =	Description	Note
4E	4 E1 lines	
8E	8 E1 lines	
12E	12 E1 lines	
16E	16 E1 lines	

■ where **OPT** =

OPT =	Description	Note
SAA	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km reach (20dB)	• Use 2 fibers
SBB	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km reach (30dB)	• Use 2 fibers
SCC	single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km reach (20dB)	• Use 2 fibers
SDD	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km reach (12dB)	• Use 2 fibers
SEE	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km reach (40dB)	• Use 2 fibers
DAA	dual optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km reach (20dB)	• Use 4 fibers
DBB	dual optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km reach (30dB)	• Use 4 fibers
DCC	dual optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km reach (20dB)	• Use 4 fibers
DDD	dual optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km reach (12dB)	• Use 4 fibers
DEE	dual optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km reach (40dB)	• Use 4 fibers
SSM	single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB)	• 1310 nm from master to slave • Order <b>SSM</b> to use with <b>SSS</b> • Use 1 fiber
SSS	single optical module with single bi-directional fiber (slave), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB)	• 1550 nm from slave to master • Order <b>SSS</b> to use with <b>SSM</b> • Use 1 fiber
DSM	dual optical modules with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB)	• 1310 nm from master to slave • Order <b>DSM</b> to use with <b>DSS</b> • Use 2 fibers
DSS	dual optical modules with single bi-directional fiber (slave), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB)	• 1550 nm from slave to master • Order <b>DSS</b> to use with <b>DSM</b> • Use 2 fibers

■ where pp =

Power Supply Module	Type	Note
pp = AC for fixed AC power	Fixed	Units delivered with the fixed <b>AC</b> option have a built-in power supply module. These units will not accept plug-in power supply modules.
pp = SA for single AC power supply SD48 for single DC power supply (48Vdc)	Plug-in	<ul style="list-style-type: none"> <li>Units delivered with the <b>SA or SD48</b> option have a chassis that will accept any one or two of the available plug-in modules.</li> <li>For redundancy purposes, ordering a second plug-in module will provide dual power.</li> <li>All plug-in+ modules are interchangeable. If a unit is one day moved to a site with a different power source, the plug-in module(s) can be changed.</li> </ul>

■ where Add =

Options	Note
Add =	<ul style="list-style-type: none"> <li>Multiple option choices can be selected.</li> <li>Quad V.35 is only supported in 3U height chassis</li> </ul>
55 for 4-RS232	
V35 for Quad V.35 with M34 connectors (see Note)	
BR for 10/100M Bridge	
LCD for LCD front panel	

### Example :

■ Loop-O 9300-RJ1-8E-DBB-SD48-55-BR-LCD =

Loop-O 9300 in 1U height chassis with RJ48C connector, 8 E1 lines, dual optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km reach (30dB), 48Vdc single DC power supply, 10/100M Bridge LCD display.

■ Loop-O 9300-SD48 = 48Vdc single DC power supply. (Redundant power for above example)

## Loop-O 9300 Fiber Optical Mux Product Specifications

### Optical Fiber Interface

Source	MLM Laser	System Gain	30 dB
Wavelength	1310 ± 50 nm, 1550 ± 40 nm	Line Code	Scrambled NRZ
Power	-26 or -8 dBm	Detector Type	PIN-FET
Receiver Sensitivity	-38 dBm at BER < 10 <sup>-10</sup>	Fiber Type	Single mode
50 Km reach		Protection	Optional 1+1 APS

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

### Optical Fiber Interface Characteristics

Optical Module	Fiber Direction	Wavelength (nm)	Connector	Distance (km)	Power (dB)
Single	Dual uni-direction	1310	SC (Subscriber Connector)	30	20
		1310	SC (Subscriber Connector)	50	30
		1310	FC (Fiber Connector)	30	20
		1550	SC (Subscriber Connector)	20	12
		1550	SC (Subscriber Connector)	100	40
Dual	Dual uni-direction	1310	SC (Subscriber Connector)	30	20
		1310	SC (Subscriber Connector)	50	30
		1310	FC (Fiber Connector)	30	20
		1550	SC (Subscriber Connector)	20	12
		1550	SC (Subscriber Connector)	100	40
Single	Single bi-direction (master)	1310/1550	SC (Subscriber Connector)	30	20
	Single bi-direction (slave)	1310/1550	SC (Subscriber Connector)	30	20
Dual	Single bi-direction (master)	1310/1550	SC (Subscriber Connector)	30	20
	Single bi-direction (slave)	1310/1550	SC (Subscriber Connector)	30	20



[For discussion on whether to choose uni-directional or bi-directional fiber option, see white paper with that title.](#)

### E1 Line Interface

Number of E1 lines	Up to 16	Line Impedance	120Ω twisted pair, 75Ω for BNC
Line Rate	2.048 Mbps ±50 ppm	Connector	RJ48C, BNC, DB37
Line Code	HDB3	Output Signal	ITU G.703

**NOTE:** Other Impedance, 100Ω and 110Ω, on special order.

### Bridge

- 10/ 100 Mbps half/ full duplex ethernet bridging and 100 Mbps operation on the HDLC port
- ANSI/ IEEE Std. 802.1D MAC Bridging capabilities (without spanning tree algorithm)
- Automatic MAC table learning and aging
- Support VLAN and extended Ethernet frame support

### 4-RS232

Connector	DB25
Data Rate	Up to 64Kbps async

### SNMP Port

Connector	RJ45 at rear panel
Protocol	Telnet

### V.35

Port Number	4 ports
Data Rate	Nx64kbps (N=1~32)
Connector	M34
Clock Mode	External, Internal, Received (Selectable) DTE/DCE programmable

### Console

Connector	DB9 at front panel
Electrical	RS232 interface
Protocol	Menu driven VT-100 terminal
Baud Rate	9600, 19200, 38400, 57600, 115200

### Switches and Contacts

- Power, Alarm Cut-Off, Reset, A & B dip switches for command setup, and ENTER for command execute.
- Major and Minor alarm contact closures, DB9F connector.

### Indicators

- Power, Major & Minor Alarms, System Fail, Abnormal Operation, Electrical Failure.
- Receive signal indications for all E1s.
- Local optical signal receive indication, working and protection.
- Remote optical signal receive indication, working and protection.
- Laser operation, working and protection.
- Command execution complete.

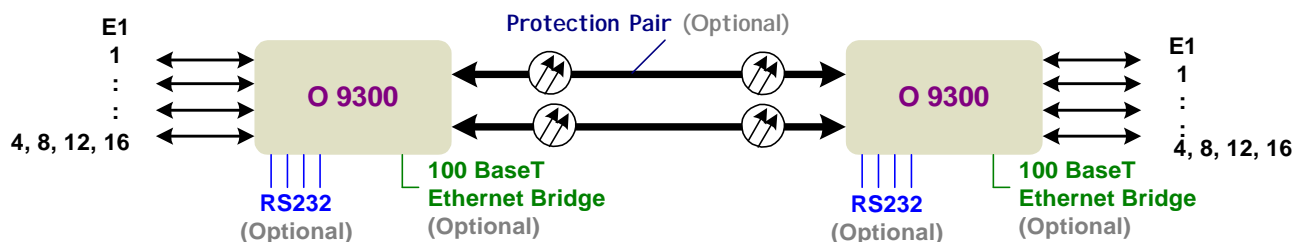
### Physical/Electrical

Dimensions for 1U	44 x 432 x 255 mm (H xWx D)
Dimensions for 2U	88 x 432 x 255 mm (H xWx D)
Dimensions for 3U	132 x 432 x 255 mm (H xWx D)
Mounting	Stand-alone, 19 or 23 inch rack mount
Power Source	-42 to -60 Vdc or 100 to 240 Vac, 50/ 60 Hz
Power Protection	Optional 1+1 APS
Power Consumption	< 30 W
Temperature Range	0°C to 50°C
Humidity	0% - 95% RH (non-condensing)

### Diagnostics Test

Optical Fiber	Local and remote loopbacks
E1 Lines	Local and remote loopbacks

## **Application Illustrations**

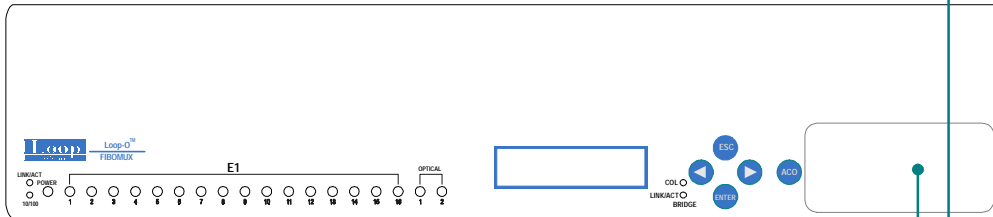


# Front Panel Views

## 1U Height Chassis with LCD Display



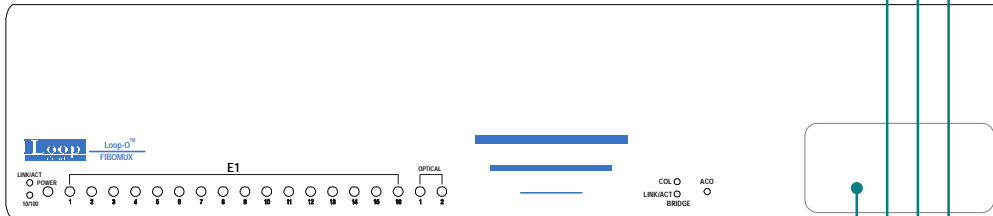
## 2U Height Chassis with LCD Display



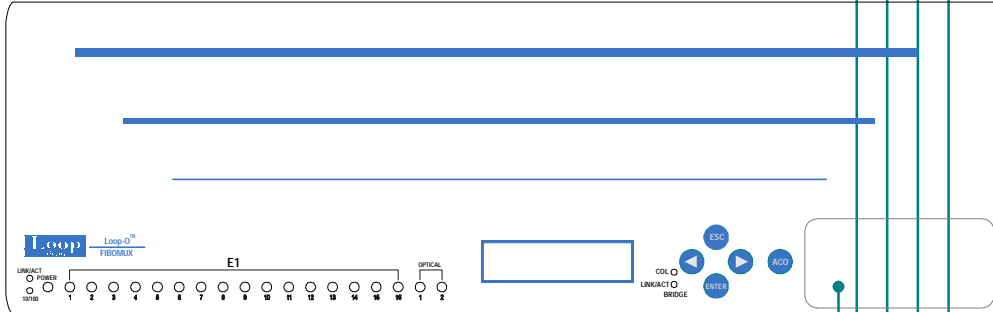
## 1U Height Chassis without LCD Display



## 2U Height Chassis without LCD Display

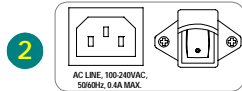


## 3U Height Chassis with LCD Display



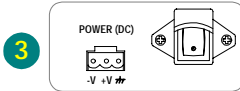
1

Blank Panel =  
on board fixed AC power supply



2

AC plug-in power supply



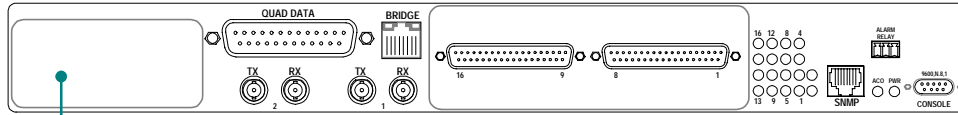
3

DC plug-in power supply

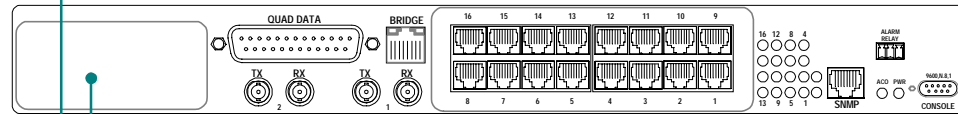


# Rear Panel Views

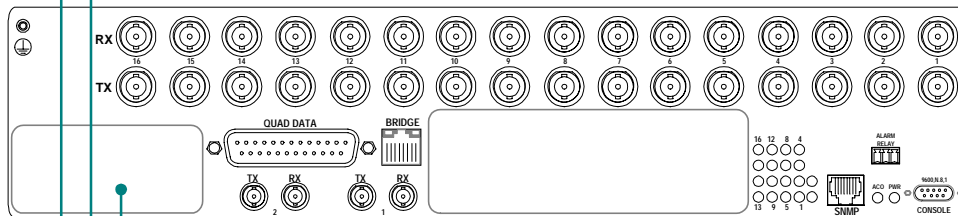
1U Height Chassis with DB37 connector



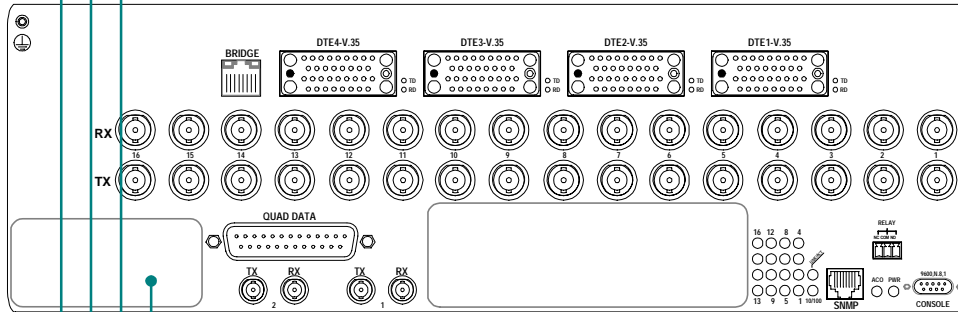
1U Height Chassis with RJ48C connector



2U Height Chassis with BNC connector



3U Height Chassis

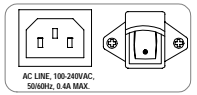


1



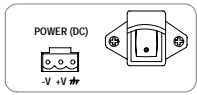
Blank Panel =  
on board fixed AC power supply

2



AC plug-in power supply

3



DC plug-in power supply



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