

# Loop-O9310

## 4E1 Fiber Optical Mux

### Features

- Up to 4 E1 links on one fiber
- Support 10/100 BaseT Ethernet: Bridge mode, maximum transmission bandwidth 22Mbps (optional)
- Support one V.35, X.21, RS449/V.36, RS232/V.28, RS530 or RS530A interface
- Supports multiple optical fiber transmission distances
- Supports single mode and multi-mode fiber modules
- Supports BNC or RJ45 connectors for 4 E1s (manufacture option)
- Supports console, Ethernet for SNMP management
- Supports SNMP management and LoopView management
- Slave remote unit can be managed through EOC
- Non-manageable model can be configured



### 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-O9310 can multiplex up to 4 E1 signals for transmission over an optical fiber, resulting in longer reach without repeaters and superior performance compared to copper media.

The Loop-O9310 also supports an optional 10 /100 BaseT ethernet port, an optional V.35, X.21, RS449/V.36, RS232/V.28 or RS530(A) with DTE/DCE selection.

Loop-O9310 offers two models: (1) SNMP manageable and (2) non-manageable.

SNMP manageable model has a master unit with CPU, used to manage a slave unit, and a slave unit without CPU, managed by the master unit through EOC.

Basic non-manageable model without CPU provides system setup and loopback by DIP switches setting.

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

## Ordering Information

To order specify:

Model	Description	Note
<b>Main Unit without SNMP management</b>		
Loop-O9310-cc-OPT-pp	Fiber Optical MUX w/o CPU	
<b>Main Unit with SNMP management</b>		
Loop-O9310-CPU-cc-OPT-pp-Add	Fiber Optical MUX w/ CPU	
<b>Accessory</b>		
<b>User's Manual</b>		
Loop-O9310-UM	User's Manual (paper hard copy-optional). A CD version of the manual is already included as standard equipment.	
<b>Power Cord</b>		
Loop-ACC-PC-EU	AC power cord for Europe	
<b>Cable</b>		
Loop-ACC-CAB-DTE-004	DSUB-25pin/Male to DSUB-15/Female X.21 Conversion cable L:30 cm	

■ where **cc** =

<b>4E-RJ</b> for RJ48C connector (120 ohm)
<b>4E-BNC</b> for BNC connector (75 ohm)

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

OPT =	Description	Note
<b>SAA</b>	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km reach (20dB) - <b>S1.1 physical layer*</b>	<ul style="list-style-type: none"> <li>• Use 2 fibers</li> <li>• * ITU-T Rec G.957 application code</li> </ul>
<b>SBB</b>	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km reach (30dB) - <b>L1.1 physical layer*</b>	
<b>SCC</b>	single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km reach (20dB) - <b>S1.1 physical layer*</b>	
<b>SDD</b>	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km reach (12dB) - <b>S1.2 physical layer*</b>	
<b>SEE</b>	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km reach (40dB) - <b>L1.2 physical layer*</b>	
<b>SSM</b>	single optical module with single bi-directional fiber ( <b>master</b> ), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB) - <b>S1.1/ S1.2 physical layer*</b>	<ul style="list-style-type: none"> <li>• 1310 nm from master to slave</li> <li>• Order <b>SSM</b> to use with <b>SSS</b></li> <li>• Use 1 fiber</li> <li>• * ITU-T Rec G.957 application code</li> </ul>
<b>SSS</b>	single optical module with single bi-directional fiber ( <b>slave</b> ), 1310 nm receive and 1550 transmit, SC optical connector, 30 km reach (20dB) - <b>S1.1/ S1.2 physical layer*</b>	<ul style="list-style-type: none"> <li>• 1550 nm from slave to master</li> <li>• Order <b>SSS</b> to use with <b>SSM</b></li> <li>• Use 1 fiber</li> <li>• * ITU-T Rec G.957 application code</li> </ul>

**For other optical modules:**

<b>MMSnn</b>	Other special optical modules for special order	<ul style="list-style-type: none"> <li>• <b>nn = 01 to 99 (contact sales for details)</b></li> </ul>
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■ where **pp** is used to select power supply:

pp =	Description	Note
<b>SA</b>	Single AC power supply (100-240 Vac)	<ul style="list-style-type: none"> <li>• <b>For AC choose an appropriate power cord</b></li> </ul>
<b>SD24</b>	Single DC power supply (24Vdc: 18-36 Vdc)	
<b>SD48</b>	Single DC power supply (48Vdc: 36-72 Vdc)	

■ where **Add** is used to select other additional options:

Add =	Description	Note
<b>LCD</b>	LCD front panel	only with CPU
<b>DTE</b>	Software-selectable DTE or DCE interface port with DB25 connector that	1. Only with CPU

	supports the V.35, X.21, RS449/V.36, RS232/V.28, <b>EIA530</b> and <b>EIA530A</b> protocols.	2. Conversion Cable <ul style="list-style-type: none"> <li>● V.35 via DB25P to M34S (1-foot) conversion cable</li> <li>● X21 via DB25P to DB15S (1-foot) conversion cable</li> <li>● RS449/V.36 via DB25P to DB37S (1-foot) conversion cable</li> </ul>
<b>BR</b>	10/100M Bridge	only with CPU
<b>BRDTE</b>	Bridge and DTE Card	1. Only with CPU 2. Conversion Cable <ul style="list-style-type: none"> <li>● V.35 via DB25P to M34S (1-foot) conversion cable</li> <li>● X21 via DB25P to DB15S (1-foot) conversion cable</li> <li>● RS449/V.36 via DB25P to DB37S (1-foot) conversion cable</li> </ul>

**Example :**

■ **Loop-O9310-CPU-4E-RJ-SAA-SD48-LCD-BRDTE =**

Loop-O9310 4E1 RJ48C connector (120 ohm) Fiber Optical MUX with CPU, dual optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km reach (20dB), single DC (48Vdc) power supply, LCD display, Bridge and DTE card.

**Loop-O9310 4E1 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			

**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
Single	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	4	Line Impedance	120Ω twisted pair, 75Ω for BNC
Line Rate	2.048 Mbps ±50 ppm	Connector	RJ48C, BNC
Line Code	HDB3	Output Signal	ITU G.703

**Bridge**

10/ 100 Mbps half/ full duplex ethernet bridging and 22Mbps 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

**DTE interface**

Port Number	1 port	Connector	DB25S
Data Rate	Nx64kbps (N=1~32)	Clock Mode	External, Internal, Received (Selectable)
Type	<b>Software-selectable V.35, X.21, RS449/V.36, RS232/V.28, RS530 and RS530A</b>		

**Clock**

Source Internal, Line, E1

**Console**

Connector DB9 at front panel  
Electrical RS232 interface

**SNMP**

Connector RJ45 at front panel  
Protocol Telnet

Protocol Menu driven VT-100 terminal  
Baud Rate 9600, 19200, 38400, 57600, 115200

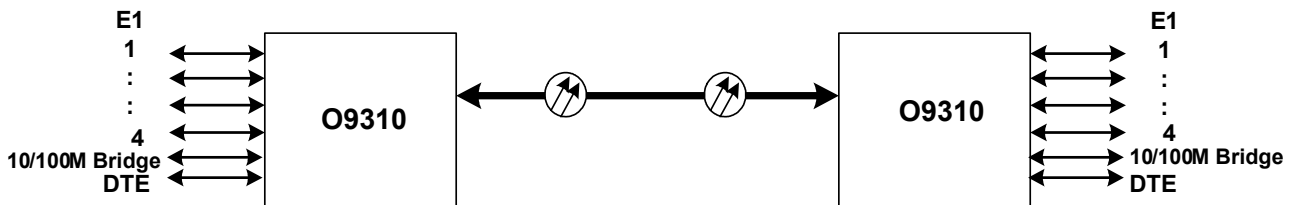
**Physical/Electrical**

**Dimensions** 216 x 55 x 285 mm. (W x H x D)  
Mounting Stand-alone  
Power Source (AC) 100 to 240 Vac, 50/ 60 Hz  
Power Source (DC) 24Vdc : 18-36 Vdc  
48Vdc : 36-72 Vdc  
Power Consumption < 10 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 Illustration***



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