Loop-O9330
Fiber Optical Mux

Features
- 1U height, full front access (ETSI unit), or front and back access (ANSI unit)
- Rack mount, wall mount, and stand-alone
- WAN Ports
  - Two hot-swappable optical cards. One optical interface per card
  - Optical interface 1+1 protection switching (maximum 50 ms)
- Tributary ports
  - TDM Interface
    - 4 slots, each slot can be 4 E1, 4 T1, or 2 V.35 hot pluggable card
    - Up to 16 E1
    - Up to 16 T1
    - Up to 8 V.35
    - Four ports of 10/100 Mbps Ethernet bridge hot-swappable card
- Power Modules
  - Hot-swappable DC plug-in modules
(-48 Vdc: -36 to -75 Vdc), dual for redundancy
  - Hot-swappable AC plug-in module
(100 to 240 Vac), dual for redundancy
- Auto laser shutdown function is user configurable.
- Loopbacks for optical link, each E1 and T1
- Office alarm contacts
- Firmware download to local unit and remote unit
- Management port and interface
  - Multicolor LED indicators
  - One LCD and keypad on ANSI panel (optional)
  - Console port, VT100 menu-driven
  - SNMP port
  - Telnet via SNMP port
  - LoopView GUI EMS

Description
Loop Telecom's Loop-O Fiber Optical Mux product family provides ideal solutions for building fiber-based E1/T1 networks. As one of this family, the Loop-O9330 can transparently carry up to 16 channels E1/T1 or 8 channels V.35 DTE, and 100 Mbps Ethernet signals over a single fiber.

All services are transported point-to-point in a real static TDM manner, which includes a) 16 E1, 16 T1, or 8 V.35 b) 100M bps Ethernet, and c) a management channel. The bandwidth is guaranteed for full configuration of the mentioned speeds for each channel/service.

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

Loop-O9330 offers management through console port, Ethernet port, Telnet, and SNMP agents. It supports local control and diagnostics using a 2-line by 16-character LCD display and keypads or console port. The unit also supports local and remote monitoring and diagnostics. Contacts for office alarms are available.

Applications for Loop-O include interconnections for LAN, WAN, SONET/SDH, ATM, and DLC.
Loop-O9330 Fiber Optical Mux

Ordering Information

To specify options, choose from the list below.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop-O9330-S-CA-opt1-opt2-s1-s2-s3-s4-s7-pp1-pp2-add-G</td>
<td>1U height ANSI (rear &amp; front access) unit. Operating range: 0~50°C</td>
<td>• Where opt1, opt2, s1, s2, s3, s4, s7, pp1, pp2, and SFP modules are defined in the tables below.</td>
</tr>
<tr>
<td>Loop-O9330-S-CE-opt1-opt2-s1-s2-s3-s4-s7-pp1-pp2-G</td>
<td>1U height ETSI unit (fully front access) unit. Operating range: 0~50°C</td>
<td>• For allowed pp1, pp2 combinations, refer to NOTE 1</td>
</tr>
</tbody>
</table>

**Hot Pluggable Modules**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop-O9330-S-opt-G</td>
<td>Optical module type card</td>
<td>• Used to Slots 5 and 6.</td>
</tr>
<tr>
<td>Loop-O9330-S-EUR-G</td>
<td>Quad E1, unframed RJ48C</td>
<td>• Module type is defined in the table below.</td>
</tr>
<tr>
<td>Loop-O9330-S-EUM-G</td>
<td>Quad E1, unframed with 1.0/2.3 RF connector (75ohm impedance)</td>
<td>• For SFPC option, order SFP modules separately from SFP table below.</td>
</tr>
<tr>
<td>Loop-O9330-S-EUD-G</td>
<td>Quad E1, unframed DB25 (75ohm)</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>Loop-O9330-S-EUD120-G</td>
<td>Quad E1, unframed DB25 (120ohm)</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>Loop-O9330-S-TUR-G</td>
<td>Quad T1, unframed RJ48</td>
<td></td>
</tr>
<tr>
<td>Loop-O9330-S-VS-G</td>
<td>Dual V.35, SCSI68</td>
<td></td>
</tr>
<tr>
<td>Loop-O9330-S-BR-G</td>
<td>Quad 10/100M Ethernet with bridge</td>
<td></td>
</tr>
</tbody>
</table>

**Accessories**

**SFP Optical Modules**

Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.

**Power Cord**  
**Note:** Order a power cord if you select the SA (100 to 240 Vac) power option.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop-ACC-PC-USA</td>
<td>AC power cord for Taiwan/America</td>
</tr>
<tr>
<td>Loop-ACC-PC-EU</td>
<td>AC power cord for Europe</td>
</tr>
<tr>
<td>Loop-ACC-PC-UK</td>
<td>AC power cord for UK</td>
</tr>
<tr>
<td>Loop-ACC-PC-AUS</td>
<td>AC power cord for Australia</td>
</tr>
<tr>
<td>Loop-ACC-PC-CH</td>
<td>AC power cord for China</td>
</tr>
</tbody>
</table>

**Cables**  
(All Cables are RoHS compliant.)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop-ACC-CAB-DB25M-100-8BNCM</td>
<td>DB25/Male to eight BNC/Male Cable Length : 100 cm</td>
</tr>
<tr>
<td>Loop-ACC-CAB-DB25M-300-8BNCM</td>
<td>DB25/Male to eight BNC/Male Cable Length : 300 cm</td>
</tr>
<tr>
<td>Loop-ACC-CAB-DB25M-300-8BNCF-GND</td>
<td>DB25/Male to eight BNC/Female Cable with grounding function Length : 300 cm</td>
</tr>
<tr>
<td>Loop-ACC-CAB-SCSIM-100-2M34M</td>
<td>SCSI 68pin Male to two M34 Male Extension Cable Length : 100 cm</td>
</tr>
</tbody>
</table>

**User’s Manual**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
</table>

**Ear Mounts**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>19”/23” ear mounts</td>
<td>A pair of 19”/23” ear mounts is supplied as part of standard package. <strong>Note:</strong> For other sizes, please contact your nearest Loop sales representative.</td>
<td></td>
</tr>
</tbody>
</table>

<p>| opt1 and opt 2 are used to select optical module types for Slots 5 and 6. <strong>Note:</strong> If only one is needed, skip opt2 in the ordering code. |
| opt =                  | Description | Note |
| SAA                   | Single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km | • Use 2 fibers |
| SBB                   | Single optical module with dual uni-directional fiber, 1310 nm, | |</p>
<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCC</td>
<td>Single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 50 km</td>
<td></td>
</tr>
<tr>
<td>SDD</td>
<td>Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 30 km</td>
<td></td>
</tr>
<tr>
<td>SEE</td>
<td>Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km</td>
<td></td>
</tr>
</tbody>
</table>
| SSM | Single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km | • 1310 nm from master to slave  
• Order SSM to use with SSS  
• Use 1 fiber |
| SSS | Single optical module with single bi-directional fiber (slave), 1310 nm receive and 1550 transmit, SC optical connector, 30 km | • 1550 nm from slave to master  
• Order SSS to use with SSM  
• Use 1 fiber |
| SFPC | SFP (mini-GBIC) optical housing plug-in card without SFP optical module | • Order SFP modules separately from SFP table below. |

**SFP (mini-GBIC) Optical Module Plug-in Tables**

Please refer to the separate SFP Optical Module Brochure for details.

Where s1, s2, s3, s4 are used to select plug-in modules for Slots 1-4:

**Note:** If none are needed, skip s1-4 in the ordering code and proceed to s7.

<table>
<thead>
<tr>
<th>s=</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR</td>
<td>Quad E1, unframed RJ48C</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>EUM</td>
<td>Quad E1, unframed with 1.0/2.3 RF connector (75ohm impedance)</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>EUD</td>
<td>Quad E1, unframed DB25 (75ohm)</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>EUD120</td>
<td>Quad E1 unframed DB25 (120ohm)</td>
<td></td>
</tr>
<tr>
<td>TUR</td>
<td>Quad T1, unframed RJ48C</td>
<td>Conversion cable is not included, order conversion cable separately from accessory</td>
</tr>
<tr>
<td>VS</td>
<td>Dual V.35, SCSI/68</td>
<td></td>
</tr>
</tbody>
</table>

Where s7 is used to select a plug-in module for Slot 7:

**Note:** If none is needed, skip s7 in the ordering code and proceed to pp1.

<table>
<thead>
<tr>
<th>s=</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR</td>
<td>Quad Ethernet with bridge. (10/100M bridge)</td>
<td></td>
</tr>
</tbody>
</table>

Where pp1 is used to select the 1st power supply:

<table>
<thead>
<tr>
<th>pp1 =</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
</table>
| SA | Single AC power supply (100 to 240 Vac) | • For redundancy purposes, ordering a second plug-in module will provide dual power.  
• All plug-in power 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.  
• For AC, choose an appropriate power cord  
• NOTE 1 |
| SD48 | Single -48 Vdc DC power supply (-36 to -75 Vdc) |  |

Where pp2 is used to select the 2nd power supply.

<table>
<thead>
<tr>
<th>pp2 =</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
</table>
| SA | Single AC power supply (100 to 240 Vac) for ANSI only | • For AC, choose an appropriate power cord.  
• NOTE 1 |
| SD48 | Single -48 Vdc DC power supply (-36 to -75 Vdc) |  |

**NOTE 1:** The combinations of pp1 and pp2 power modules:

For ANSI unit:
- pp1=SA (Single AC power plug-in in front or at rear)  
- pp1=SD48 (Single DC power plug-in at rear)  
- pp1=SD48, pp2=SD48 (Dual hot-swappable DC, both rear plug-in)  
- pp1=SA, pp2=SA (Dual hot-swappable AC, one front and one rear plug-in)
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- pp1=SA, pp2=SD48 (Hot-swappable AC front and DC rear plug-in)

**Note:** For ANSI unit, DC power is available in rear panel only

For ETSI unit (all power modules in front):
- pp1=SA (Single AC power plug-in)
- pp1=SD48 (Single DC power plug-in)
- pp1=SD48, pp2=SD48 (Dual hot-swappable DC power plug-in)

Where add is used to select LCD option.

<table>
<thead>
<tr>
<th>add</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD</td>
<td>LCD display</td>
<td>LCD is supported for ANSI unit only</td>
</tr>
</tbody>
</table>

Loop-O9330 Fiber Optical Mux Product Specifications

**Optical Fiber Interface**

- **Source** MLM Laser
- **Wavelength** 1310 ± 50 nm, 1550 ± 40 nm
- **Power** -26 or -8 dBm
- **Receiver Sensitivity** -38 dBm at BER < 10^-10
- **Optical Line Rate** 155.52M bps
- **50 Km reach**

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

**Optical Fiber Interface Characteristics**

<table>
<thead>
<tr>
<th>Optical Module</th>
<th>Fiber Direction</th>
<th>Wavelength (nm)</th>
<th>Connector</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAA</td>
<td>Dual uni-directional</td>
<td>1310</td>
<td>SC (Subscriber Connector)</td>
<td>30</td>
</tr>
<tr>
<td>SBB</td>
<td>Dual uni-directional</td>
<td>1310</td>
<td>SC (Subscriber Connector)</td>
<td>50</td>
</tr>
<tr>
<td>SCC</td>
<td>Dual uni-directional</td>
<td>1310</td>
<td>FC (Fiber Connector)</td>
<td>30</td>
</tr>
<tr>
<td>SDD</td>
<td>Dual uni-directional</td>
<td>1550</td>
<td>SC (Subscriber Connector)</td>
<td>20</td>
</tr>
<tr>
<td>SEE</td>
<td>Dual uni-directional</td>
<td>1550</td>
<td>SC (Subscriber Connector)</td>
<td>100</td>
</tr>
<tr>
<td>SSM</td>
<td>Single bi-directional (master)</td>
<td>1310/1550</td>
<td>SC (Subscriber Connector)</td>
<td>30</td>
</tr>
<tr>
<td>SSS</td>
<td>Single bi-directional (slave)</td>
<td>1550/1310</td>
<td>SC (Subscriber Connector)</td>
<td>30</td>
</tr>
</tbody>
</table>

**SFP (mini-GBIC) Optical Fiber Interface Characteristics**

Please refer to the separate SFP Optical Module Brochure for details.

**E1 Line Interface**

- **Number of E1 lines** Up to 16
- **Line Rate** 2.048M bps ± 50 ppm
- **Line Code** HDB3
- **Line Impedance** 120Ω twisted pair, 75Ω for mini-BNC
- **Output Signal** ITU G.703
- **Clock** Transparent
- **Connector** 120Ω RJ48C, 75Ω DB25, 120Ω DB25, 75Ω MiniBNC

**T1 Line Interface**

- **Line Rate** 1.544M bps ± 50 bps
- **Line Code** AMI or B8ZS
- **Input Signal** ABAM cable length up to 655 feet
- **Output Signal** DSX1
- **Clock** Transparent
- **Connector** RJ48C
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**V.35 Interface**
- **Data Port**: 2 ports per card, DCE
- **Data Rate**: \( n \times 64K \text{ bps, } n = 1 \text{ to } 32 \)
- **Clock Mode**: External, Internal, Received (Selectable)
- **Connector**: SCSI 68, optional SCSI 68 Male to M34 Male (DCE) Conversion Cable

**Ethernet Bridge**
- **Number of Ports**: 4 Ethernet ports with Switching Function
- **Function**: 10/ 100 Mbps half/ full duplex Ethernet Switching 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

**SNMP Port**
- **Protocol**: Telnet
- **Connector**: RJ45

**Console**
- **Electrical**: RS232 interface
- **Protocol**: Menu driven VT-100 terminal
- **Baud Rate**: 9600, 19200, 38400, 57600, 115200 bps asynchronous
- **Connector**: DB9, female, DCE

**Switches and Contacts**
- **Power, Alarm Cut-Off, and ENTER for command execute.**
- **Alarm Relay**: 3 pin terminal block

**Diagnostics Test**
- **Optical Fiber**: Local and remote loopbacks
- **E1/T1 Lines**: Local and remote loopbacks

**Power**
- **AC Power**: 100-240 Vac, 50/ 60 Hz
- **DC Power**: -48 Vdc; -36 to -75 Vdc
- **Power Consumption**: < 20 Watts

**Physical and Environment**
- **Dimensions for 1U**: 432 x 44 x 226 mm (W x H x D)
- **Mounting**: Stand-alone, 19 or 23 inch rack mount, wall mount
- **Temperature Range**: 0°C to 55°C
- **Humidity**: 5% - 90% RH (non-condensing)

**Compliance**
- **EMI/EMC**: EN55022, EN55024, FCC15
- **ITU**: G.703, G.706, G.732, G.823
- **Safety**: IEC60950
ANSI Unit Rear Panel / ETSI Unit Front Panel View

O9330 with AC Power

O9330 with DC Power

Application Illustration

Tributary ports

WAN ports

Protection Pair

Optical Link

Loop-O9330

Loop-O8330

4 10/100BaseT Ethernet Bridge

4E1, 4T1 or 2V.35 per slot

4E1, 4T1 or 2V.35 per slot

4 +1/-1 slot

SNMP

SNMP

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