Optimux-XLE1

Fiber Optic Multiplexer

Optimux

FEATURES

- Integrates multiple E1, Ethernet, Fast Ethernet and high-speed data links
- E3 transmission over coax or fiber optic media
- Built-in 10/100BaseT bridge supporting IEEE 802.3x flow control and backpressure
- Supports multimode fiber, single mode fiber, or single mode over single fiber
- Range of up to 110 km (68 miles)
- Conforms to ITU G.703, G.742, G.751, G.823, G.956
- Optional redundant power supply and second E3 link provide automatic backup
- Optional station clock module for external clock
- Management using ASCII terminal, Telnet host, SNMP management station or ConfiguRAD web-based remote access terminal
- Compact 1U high enclosure

DESCRIPTION

- Optimux-XLE1 provides a simple, flexible and cost-effective solution for transporting multiple E1, Ethernet, Fast Ethernet and high-speed data channels over an E3 link to distances of up to 110 km (68 miles). The E3 link is available with single mode fiber, multimode fiber, single mode over single fiber, or coax interface. The Optimux-XLE1 multiplexer is available in both modular and non-modular versions.
- The non-modular Optimux-XLE1/16 version provides 16 E1 channels, and is designed for applications requiring the full E3 bandwidth for multiple E1 connectivity.
- The modular Optimux-XLE1 version provides a single fixed 10/100BaseT Fast Ethernet port, in addition to three hot-swappable channel modules. This enables a scalable solution, flexible enough to meet the specific requirements of a broad range of applications.
- All critical components can be automatically backed up. This ensures that there is no single point of failure. An optional second link provides backup, using automatic switchover upon link failure. An optional second power supply provides power redundancy for fail-safe operation.
- Available hot-swappable channel modules:
  - Dual E1 channels
  - Quad E1 channels
  - 10BaseT Ethernet
  - 10/100BaseT Fast Ethernet (with VLAN support)
  - Quad V.35/X.21/RS-530 channels (2.048 Mbps each)
  - Single V.35/RS-530 channel (8.448 Mbps)
  - Single HSSI (High Speed Serial Interface) channel (8.448 Mbps)
  - Single V.35/X.21/RS-530 channel (N×64 kbps), with dual E1 ports optional.
- In addition to coax, various optical interfaces are available for both the active and the backup E3 link(s):
  - 850 nm for multimode fiber
  - 1310 nm for multimode fiber
  - 1310 nm and 1550 nm laser diode or long haul laser for extended range over single mode fiber
  - Single fiber (SF1, SF2) using WDM technology, where the laser transmit signal is at a different wavelength than the receive signal (1310 nm and 1550 nm)
  - Single fiber (SF3) using SC/APC technology, with a 1310 nm laser diode for single wavelength operation.

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- Ethernet data is transmitted using a built-in bridging function. The bridge operates at 8.448 Mbps and supports up to 1024 addresses.
- The fixed Fast Ethernet port and Fast Ethernet module provide either 10BaseT (UTP) or 100BaseT (UTP) LAN interfaces. These interfaces can operate in half or full duplex mode, providing auto-negotiation and supporting transparent VLAN forwarding. The fixed port supports IEEE 802.3x flow control and backpressure. True net throughput is 8.448 Mbps.
- Optimux-XLE1 transmits each E1 channel independently so that the clock of each E1 channel is independent.
- The High Speed data module enables communications between DTE units using V.35, X.21 or RS-530 interfaces at data rates of 2.048 or 8.448 Mbps.
- The HSSI data module enables communication between DTE units using HSSI interfaces at data rates of 8.448 Mbps.
- N×64 kbps data module enables communications at data rates of Nx56 or Nx64 kbps, up to 2.048 Mbps, using V.35, X.21 or RS-530 interfaces.
- A station clock module can be ordered to facilitate connection to a master clock.
- To ease system diagnostics, Optimux-XLE1 features LED status indicators, AIS alarm generation, recognition and dry contact closure upon link failure. In addition, the Optimux-XLE1 setup, control and diagnostics can be performed via:
  - An ASCII terminal via the supervisory port
  - A Telnet terminal via the Ethernet management ports
  - An SNMP management station via the Ethernet ports
  - A dedicated separate Ethernet management port.
  - RADview-PC running in a Windows environment
  - RADview-HPOV for Unix platforms
  - ConfiguRAD web-based remote access terminal application.
- Optimux-XLE1 is available as a compact 1U high standalone unit that can be mounted in a 19-inch rack.

SPECIFICATIONS

E3 LINK (MAIN AND BACKUP)

- **Electrical**
  Data rate: 34.368 Mbps
  Line code: HDB-3
  Impedance: 75Ω, unbalanced
  Connectors: BNC
- **Optical**
  Connectors: ST, SC, FC/PC or SC/APC
  Interface Options: see *Table 1*

CHANNEL MODULES

- **Number of Supported Modules (Modular Version Only)**
  Up to three
- **Connector Types for Non-Modular Version**
  - 16 x E1, RJ-45 connectors, 120Ω balanced
  - 16 x E1, BNC connectors, 75Ω unbalanced
- **Module and Connector Types for Modular Version**
  See *Table 2*

STATION CLOCK MODULE

- **Standard**
  ITU-T G.703
- **Data rate**
  2.048 MHz with 10-ppm accuracy
- **Line code**
  - Input – AMI, according to standard square, 2V peak-to-peak amplitude minimum
  - Output – AMI, according to standard
- **Connectors**
  BNC

GENERAL

- **Alarms**
  Dry relay contacts for major and minor alarms through DB-9 connector
- **Control Ports**
  - CONTROL/MNG
    RS-232 control port with a DB-9 connector for management via supervisory terminal
  - MNG-ETH
    A separate 10/100BaseT Fast Ethernet port with an RJ-45 connector for management
- **Power**
  Modular Version:
  - 100–240 VAC; 50/60 Hz; 55 VA
  - -48 VDC (-36 to -75 VDC); 30W
  - 24 VDC (18 to 36 VDC); 30W

  Non-Modular Version:
  - 100–240 VAC; 50/60 Hz; 35 VA
  - -48 VDC (-36 to -75 VDC); 20W
  - 24 VDC (18 to 36 VDC); 20W
- **Physical**

Height:	4.40 cm	/	1.7 in
Width:	43.2 cm	/	17.0 in
Depth:	26.8 cm	/	10.6 in
Weight:	2.0 kg	/	4.4 lb

- **Environment**

Temperature:	0° to 45°C 32° to 113°F
Humidity:	Up to 90% non-condensing

Table 1. Main Link Interface Options

Module Name (Ordering Option)	Transmitter Type and Wavelength [nm]	Connector Type	Fiber Type	Optical Output Power [dBm]	Receiver Sensitivity [dBm]	Typical Range [km]	[miles]
OP-M/CX/34	–	Coax interface	Copper cable	–	–	(According to ITU-T G.703 standard)	
OP-M/MM/SC/85 OP-M/MM/FC/85 OP-M/MM/ST/85	VCSEL, 850	SC, FC, ST	62.5/125 Multimode	-15	-28	2.5	1.55
OP-M/MM/SC/13 OP-M/MM//FC/13 OP-M/MM/ST/13	LED, 1310	SC, FC, ST	62.5/125 Multimode	-18	-31	6.5	4.0
OP-M/SM/SC/13L OP-M/SM//FC/13L OP-M/SM/ST/13L	Laser, 1310	SC, FC, ST	9/125 Single mode	-12	-31	38	23.6
OP-M/SM/SC/15L OP-M/SM//FC/15L OP-M/SM/ST/15L	Laser, 1550	SC, FC, ST	9/125 Single mode	-12	-31	68	42.2
OP-M/SM/SC/13LH OP-M/SM/FC/13LH OP-M/SM/ST/13LH	Long haul laser, 1310	SC, FC, ST	9/125 Single mode	-2	-34	70	43.4
OP-M/SM/SC/15LH OP-M/SM/FC/15LH OP-M/SM/ST/15LH	Long haul laser, 1550	SC, FC, ST	9/125 Single mode	-1	-34	110	68.3
OP-M/SF1/SC	Laser WDM, Transmit: 1310 Receive: 1550	SC	9/125 Single mode (single fiber)	-12	-30	40	24.8
OP-M/SF2/SC	Laser WDM, Transmit: 1550 Receive: 1310	SC	9/125 Single mode (single fiber)	-12	-30	40	24.8
OP-M/SF3/SC	Laser, Transmit and Receive: 1310	SC/APC	9/125 Single mode (single fiber)	-12	-27	20	12.4

Note: Typical ranges are calculated according to attenuation of 0.4 dB/km for 1310 nm, 0.25 dB/km for 1550 nm and 3.5 dB/km for 850 nm multimode modules.

APPLICATIONS

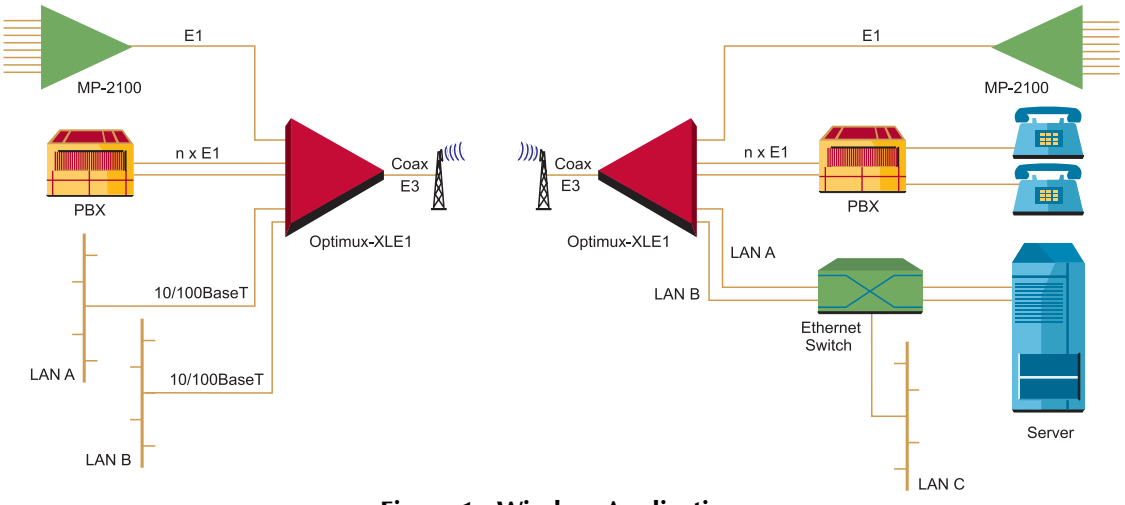

Figure 1. Wireless Application

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ORDERING

OP-XLE1/*/R/#+/D
Modular Multiplexer with built-in Ethernet port

Note: Up to three channel modules should be ordered separately (see below).

OP-XLE1/16/?/*/R/#+/D
Non-Modular Multiplexer with 16 E1 channels

? Specify E1 connectors:
B for balanced (RJ-45)
U for unbalanced (BNC)

***** Specify power supply:
AC for 110 to 240 VAC
48 for -48 VDC
24 for 24 VDC
AD for one AC and one DC backup supply (option **R** is not available when ordering this option)

R Specify **R** for second redundant power supply

Specify main link interface connector type:
CX for electrical, coax connectors
ST for ST type FO connectors
SC for SC type FO connectors
FC for FC/PC type FO connectors

Note: ST and FC options are not available with the single fiber modules.

+ Specify wavelength for the optical link (not relevant for CX option):
85 for 850 nm, multimode VCSEL
13 for 1310 nm, multimode LED
13L for 1310 nm, single mode, laser diode
15L for 1550 nm, single mode, laser diode
13LH for 1310nm, single mode, long haul laser diode
15LH for 1550 nm, single mode, long haul laser diode
SF1 for transmit 1310 nm, receive 1550 nm (WDM)
SF2 for transmit 1550 nm, receive 1310 nm (WDM)
SF3 for 1310 nm single wavelength laser.

***Note*:** For single-fiber applications, a device with the SF-1 interface should always be used opposite the device with the SF-2 interface, and vice versa. The SF-3 interface works opposite another SF-3.

D Specify **D** for second redundant link

Channel Modules

OP-XL-M/*
E1 and Ethernet Modules

***** Specify channel option:
2E1U for 2 × E1 unbalanced
2E1B for 2 × E1 balanced
4E1U for 4 × E1 unbalanced
4E1B for 4 × E1 balanced
ETH for 10BaseT
FETH for 10/100BaseT

OP-XL-M/&/@
Data Modules

& Specify the number and the data rate of the ports:
4/2 for Quad Port, 2 Mbps each
8 for single 8 Mbps port
n64 for single N×64 port
n64/2E1B for single N×64 and two balanced E1 ports
n64/2E1U for single N×64 and two unbalanced E1 ports

@ Specify the data interface type:
V35 for V.35
X21 for X.21 (no 8 Mbps, single port option)
530 for RS-530
HSSI for HSSI (single port, 8 Mbps only)

Station Clock Module

OP-XL-M/SCLOCK
Station clock module

Link Module

Link modules can be ordered separately in order to add a redundant link to an existing unit, or to replace the original link modules. The various available OP-M modules are specified in *Table 1*.

Cable

CBL-MINIBNC-BNC
Mini-BNC to BNC adapter cable

Rack Mount

RM-11/NEW
One rack mount kit is included with each unit shipped.

Table 2. Module and Connector Types for Optimux-XLE1

Link Options	Type of Connector	Data Rate
2 × E1	RJ-45 120Ω balanced or BNC 75Ω unbalanced	2 × 2.048 Mbps
4 × E1	RJ-45 120Ω balanced or Mini-Coax (1.0 × 2.3) 75Ω unbalanced	4 × 2.048 Mbps
4 × V.35/X.21/RS-530	SCSI 26-pin **	4 × 2.048 Mbps
1 × V.35/X.21/RS-530	SCSI 26-pin **	1 × 8.448 Mbps
1 × V.35/ X.21/RS-530*	SCSI 26-pin **	N × 56 or N × 64 kbps, up to 2.048 Mbps
1 × HSSI	SCSI 50-pin	1 × 8.448 Mbps
Ethernet 10BaseT	RJ-45	1 × 8.448 Mbps
Fast Ethernet 100BaseT	RJ-45	1 × 8.448 Mbps

* Available with an optional addition of 2 × E1 ports, balanced (RJ-45) or unbalanced (mini-BNC)
** Interface adapter cable is supplied

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