

Optimux-T3

Fiber Optic Multiplexer



FEATURES

- Multiplexes up to 28 T1 or 21 E1 channels into a single 45 Mbps data stream
- Supports a combination of T1 and E1 channels
- Supports ring and chain configurations
- Transmission over coax or fiber optic cable
- Supports single mode fiber, multimode fiber and single fiber (WDM) interface
- Laser diode option
- Range up to 110 km/68 miles
- Optional second power supply provides redundancy
- Optional second main link for automatic backup
- SNMP agent is managed via ASCII terminal, Telnet host, ConfigRAD Web-based remote access terminal or RADview network management system
- Compact 1U high enclosure

DESCRIPTION

- Optimux-T3 provides a simple, flexible and cost-effective solution for transporting multiple T1 and E1 signals at distances of up to 110 km (68 miles).
- Optimux-T3 integrates up to 28 T1, 21 E1, or combinations of T1 and E1 channels, over a single 45 Mbps data stream. This provides an easily configurable solution, flexible enough to meet the specific requirements of a broad range of applications.
- Optimux-T3 conforms to ITU G.703, G.747, G.823, G.824, ANSI T1.107, T1.404, RFC2495, RFC2496 standards.
- Optimux-T3 supports chain, as well as ring configurations, facilitating several E1 or T1 services at each node. In ring topology (see Figure 3), Optimux-T3 provides a full path protection mechanism that enables the nodes to maintain all communication services, even in the event of a link failure.
- Special partially equipped versions are available for ring and chain applications with different number of tributary channels (see Table 1 for details).
- Ring or chain configuration is performed using RADview network management system.
- Two Optimux-T3 units can be connected using WDM (Wavelength Division Multiplexing) or bidirectional technology over a single fiber (SF) link, thus reducing fiber cable costs by 50%.
- Various optical interfaces are available for the fiber main link:
 - 850 nm VCSEL for multimode fiber
 - 1310 nm LED for multimode fiber
 - 1310 and 1550 nm laser for extended range over single mode fiber
 - 1310 and 1550 nm laser for single fiber WDM operation
 - 1310 nm laser for single fiber/single wavelength operation
- When required, critical hardware components can be backed up. This ensures that any single point of failure will not disrupt the entire system. An optional hot-swappable second main link provides backup, using automatic switchover upon link failure. An optional second power supply provides power redundancy for fail-safe operation.

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Table 1. Tributary Channel Options

Ordering Option	Number of T1 Channels	Number of E1 Channels
4X	4	3
8X	8	6
12X	12	9
21X	-	21
28X	28	21

APPLICATIONS

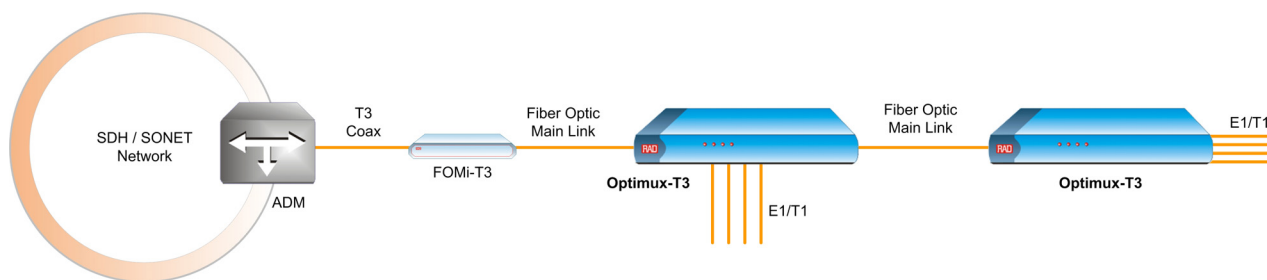


Figure 1. Daisy Chain Application

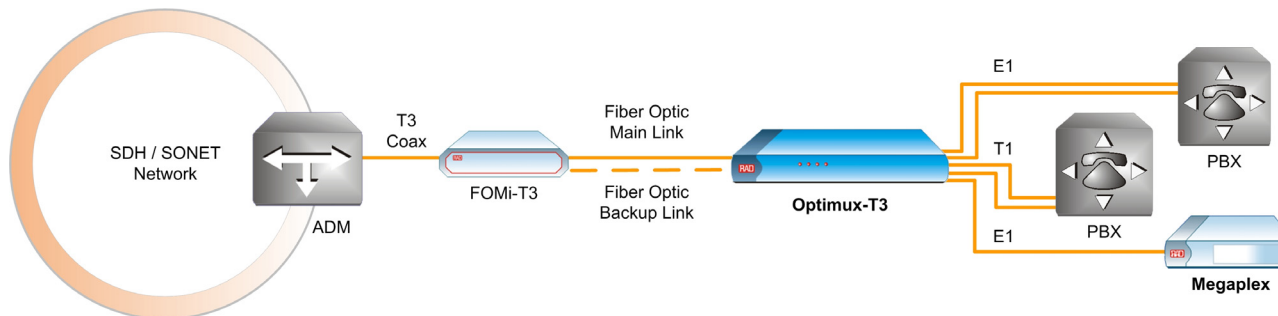


Figure 2. Optimux-T3 Operating Opposite FOMi-T3

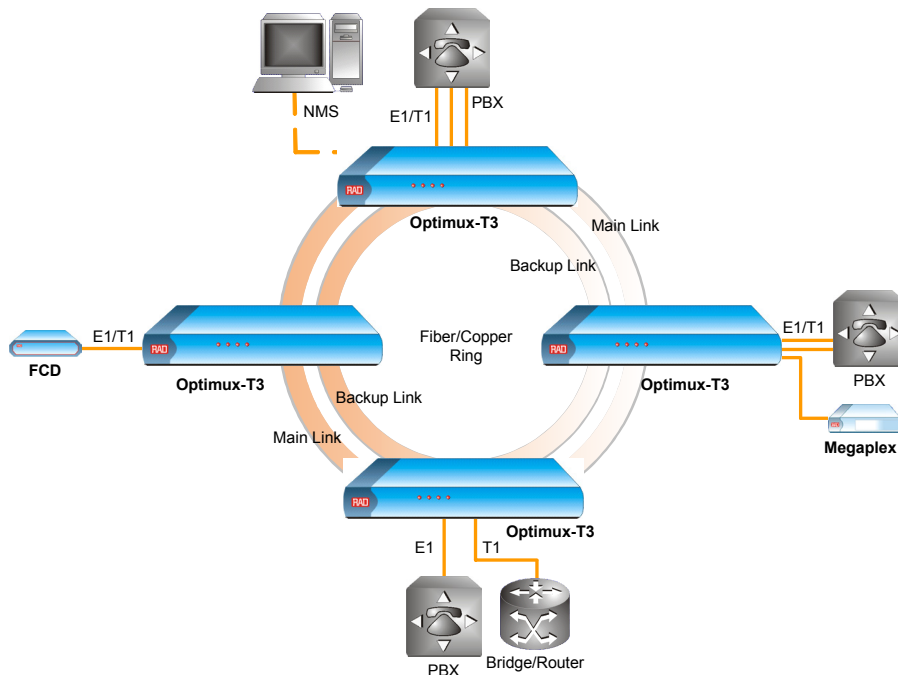


Figure 3. Ring Application

- Optimux-T3 is available with either balanced or unbalanced tributary ports:
 - Balanced ports with 4, 8, 12 or 28 RJ-45 connectors
 - Unbalanced ports with 21 mini-BNC connectors.
- Optimux-T3 transmits each of the E1/T1 channels independently, so that each E1/T1 channel can use a different clock.
- Setup, control and diagnostics can be performed via an ASCII terminal connected to the DB-9 control port. Alternatively, these functions can be performed via the dedicated Ethernet management port, using either a Telnet application, a RADview application (RAD's network element management software) or ConfiguRAD (RAD's web-based remote access terminal application).
- To facilitate system diagnostics, Optimux-T3 features LED status indicators, AIS alarm generation, alarm dry contacts interface, and diagnostic loopbacks on the E1/T1 and T3 links.
- Optimux-T3 is available as a compact 1U high unit that can be mounted in a 19" (ANSI) or ETSI rack.

SPECIFICATIONS

MAIN AND BACKUP LINKS

- **Data Rate (T3)**
44.736 Mbps
- **Redundancy**
Optional second link

OPTICAL INTERFACE

- **Interface Characteristics**
See Table 2

ELECTRICAL INTERFACE

- **Standards**
G.703, G.824
- **Line Code**
B3ZS
- **Impedance**
75Ω, unbalanced
- **Range**
According to ITU-T Rec. G.703
- **Connectors**
Two shielded BNC connectors

TRIBUTARY CHANNELS

- **Interface Type**
Balanced or unbalanced (according to order)
- **Number of Channels**
E1: 3, 6, 9 or 21
T1: 4, 8, 12 or 28
- **Standards**
G.703, G.823, G.824

- **Data Rate**
E1: 2.048 Mbps
T1: 1.544 Mbps
- **Line Code**
E1: HDB3 or AMI
T1: B8ZS or AMI
- **Impedance**
E1: 120Ω, balanced
75Ω, unbalanced
T1: 100Ω, unbalanced
- **Range**
According to ITU-T Rec. G.703
- **Jitter**
E1: According to ITU-T G.823
T1: According to ITU-T Rec. G.703
- **Connectors**
Balanced: Shielded RJ-45
Unbalanced: Two shielded mini-BNC

SUPERVISORY AND MANAGEMENT PORTS

- **Control Port**
Interface: RS-232
Connector: DB-9
- **Ethernet Port**
Interface: 10BaseT
Connector: RJ-45

Table 2. Optical Interface Characteristics

Wavelength [nm]	Fiber Type [μm]	Transmitter Type	Typical Output Power [dBm]	Receiver Sensitivity [dBm]	Typical Max Range		Connector Type
					[km]	[miles]	
850	62.5/125, multimode	VCSEL	-18	-26	2.0	1.2	SC, FC, ST
1310	62.5/125, multimode	LED	-18	-31	5.5	3.4	SC, ST
1310	9/125, single mode	Laser	-12	-31	38	23.6	SC, FC, ST
1550	9/125, single mode	Laser	-12	-31	25	15.5	SC, FC, ST
1310	9/125, single mode	Laser (Long haul)	-2	-34	60	37.2	SC, FC, ST
1550	9/125, single mode	Laser (Long haul)	-2	-34	110	68.4	SC, FC, ST
1310/1550	9/125, single mode	Laser WDM (SF1, SF2)	-12	-29	40	24.8	SC
1310	9/125, single mode	Laser (SF3)	-12	-27	20	12.4	SC/APC

Note: The ranges above were calculated according to the typical attenuation rates:

- 3.5 dB/km for 850 nm multimode
- 0.4 dB/km for 1300 nm single mode
- 0.25 dB/km for 1550 nm single mode

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GENERAL

- **Alarm Relay**
DB-9 connector with dry relay contacts, for major and minor alarms
- **Station Clock**
Optional external station clock input, using RJ-45 connector via optional station clock module
- **Monitoring**
Built-in monitoring capabilities of each one of the tributary input channels
- **Diagnostics**
 - LLB – Local Loopback on the E1/T1 layer and DS3 Layer (LLB on DS3 layer not supported in daisy chain and ring applications)
 - RLB – Remote Loopback on the E1/T1 layer and DS3 Layer
- **Indicators**
 - PWR (green/red) – power is ON (green), power is faulty (red), power is OFF (no light)
 - Main Link Sync Loss (red) – DS3 signal is not detected or out of frame in Link A/B
 - Main Link AIS (yellow) – AIS signal is detected in Link A/B
 - Major (red) – major alarm
 - Minor (yellow) – minor alarm
 - Test (yellow) – unit is in test mode (Loopback)
 - FLT (red) – reserved for future use
- **Physical**
Height: 4.4 cm / 1.7 in
Width: 42.7 cm / 17 in
Depth: 25.8 cm / 10.1 in
Weight: 4.5 kg / 11.3 lb
- **Power**
 - Number of power supplies: one or two (power sharing and redundancy)
 - AC Power Module
100 to 240 VAC;
50/60 Hz; 70W
 - DC Power Module:
-48 VDC (-36 to -72 VDC);
1.2A; 45W
24 VDC (±10%); 2.2A; 45W
- **Maximum Power Consumption**
30W
- **Environment**
Temperature:
 - AC-powered units:
0–50°C/32–122°F
 - DC-powered units:
0–45°C/32–113°FHumidity: Up to 90%, non-condensing

ORDERING

OP-T3B*/@/#+/\$

28 T1 or 21 balanced E1 to T3 multiplexer

OP-T3U*/@/#+/\$

21 unbalanced E1 to T3 multiplexer

OP-T3/&/^*/@/#+/\$

Multiple E1 or T1 to T3 multiplexer, RING support

Note: The station clock and the adapter cable are ordered separately (see below).

& Specify channel interface:

U for unbalanced, mini-BNC,
(for 21X only)

B for balanced, RJ-45

^ Specify the number of user interfaces:

4X 4T1/3E1 balanced user interfaces, ring option

8X 8T1/6E1 balanced user interfaces, ring option

12X 12T1/9E1 balanced user interfaces, ring option

21X 21E1 unbalanced user interfaces, ring option

28X 28T1/21E1 balanced user interfaces, ring option

Note: Ring solutions require RADview-PC/TDM or RADview-HPOV/TDM element management software.

***** Specify power supply:

AC for 100 to 240 VAC

48 for -48 VDC

24 for 24 VDC

AD for 100 to 240 VAC plus
redundant -48 VDC

@ Specify **R** for a second (redundant) power supply (identical to the first power supply).

Specify main link connector type:
CX for electrical interface with
coaxial BNC connectors

ST for ST type fiber

SC for SC type fiber

FC for FC type fiber

Note: For single fiber connection, only SC type connectors are available. For 1310 nm multimode LED option, only SC and ST type connectors are available.

+ Specify optical wavelength and transmitter type (not relevant with 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 1310 nm, single mode, long haul laser diode

15LH for 1550 nm, single mode, long haul laser diode

SF1 for transmit 1310 nm, receive 1550 nm

SF2 for transmit 1550 nm, receive 1310 nm

SF3 for 1310 nm single wavelength laser.

Note: For single-fiber applications, a device with the SF-1 connector should always be used opposite the device with the SF-2 connector, and vice versa. The SF-3 connector can be used on both sides of the link.

\$ Specify **D** for optional second main link

Note: Optional second main link must be ordered for ring products.

OP-T3/STC

Station clock module for external station clock input

CBL-MINIBNC-BNC

Mini-BNC to BNC adapter cable

RM-OPTIMUX-T3

Hardware for mounting a single Optimux-T3 in a 19" rack

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data communications

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