Data Sheet

# Optimux-25

## 16 T1, Ethernet or Data Fiber Multiplexer


## Multiple T1, Ethernet, or High-speed Data over Fiber, up to 110 km (68 miles)

- Up to 16 T1 links, high-speed data, and Ethernet traffic multiplexed into fiber optic link
- Interfaces available: single-mode, multimode, single-mode over single fiber
- Range of up to 110 km (68 miles)
- ITU G.703, G.824, G.955, and IEEE 802.3 compliance
- Redundancy provided by optional second modular, hot-swappable power supply and second fiber link

Optimux

Optimux-25 provides a simple, flexible, and cost-effective solution for transporting multiple T1 links, high-speed data or Ethernet over a fiber link to distances of up to 110 km (68 miles). The fiber optic link is available with single-mode, multimode, and single-mode over single fiber interfaces.

The unit provides up to 16 T1 links, some of which can be replaced by high-speed data and/or 10/100BaseT user Ethernet traffic, selectable by the user (see *Table 1*).

An optional second link provides link backup, using automatic switchover upon link failure. An optional second power supply provides power redundancy for fail-safe operation.

RAD
data communications
The Access Company

# Optimux-25

## 16 T1, Ethernet or Data Fiber Multiplexer

Optimux-25 transmits each T1 channel separately so that the clock of each T1 channel is independent.

The unit is supplied with a 10/100BaseT Ethernet user port interface that can be activated at any time via a software key purchased from RAD.

Various fiber optic interfaces (based on SFP transceivers) are available for both the active and the backup fiber links:

- 1310 nm short or long-haul laser and 1550 nm long-haul laser interfaces for extended range over single-mode fiber
- Single fiber interface using WDM technology, where the laser transmit signal is at a different wavelength from the receive signal (1310 nm and 1550 nm)
- Single fiber single wavelength interface using SC/APC connector, with a 1310 nm laser diode for single wavelength operation.

It is strongly recommended to order this device with **original** RAD SFPs **installed**. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs.

The unit can be supplied with one V.35 (1.544 MB/sec) channel that replaces channel 16 by user activation.

An optional alarm port is available with dry relay contacts for major and minor alarms.

To ease system diagnostics, Optimux-25 features LED status indicators, AIS alarm generation, recognition, and dry contact closure upon link failure.

Management and diagnostics can be performed via:

- ASCII terminal
- Telnet
- RAD's Web-based element management application
- RADview, RAD's SNMP-based management application.

Optimux-25 is a compact, 1U-high unit which can be mounted in a 19-inch rack.

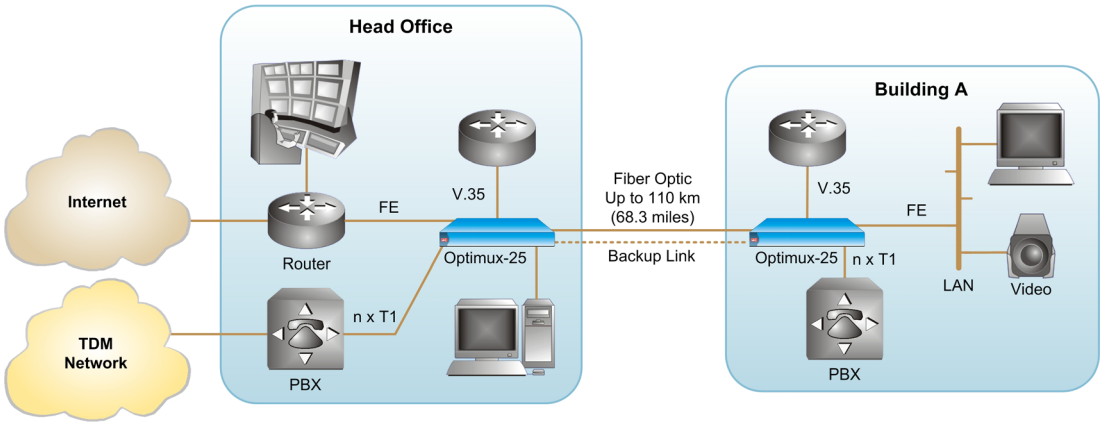


Figure 1. Ethernet, Voice, Data and Video-based Services over Fiber Optic Link

# Specifications

### T1 INTERFACE

**Number of Channels**
16

**Line Interface**
100Ω, balanced

**Connectors**
RJ-45

### FIBER OPTIC INTERFACE (MAIN and BACKUP)

**Interface Options**
see *Table 2*

**Connectors**
SFP interfaces with LC connectors or SC/APC for single wavelength single fiber

**Standards**
ITU G.703, G.824, G.955, IEEE 802.3

### HIGH-SPEED INTERFACE

**Type**
V.35

**Connector**
DB-25 (ISO-2110 or Telebras pinout)

### USER-ETH and MNG-ETH INTERFACE

**Type**
10/100BaseT

**Connector**
RJ-45

### CONTROL PORT

**Type**
RS-232 DCE asynchronous

**Connector**
9-pin D-type female

### ALARM PORT

**Type**
Dry relay contacts for major and minor alarms

**Connector**
9-pin D-type female

Table 1. Available T1 and Ethernet Combinations

| T1 Channels | Ethernet Capacity [Mbps] |
|---|---|
| 16 | 0 |
| 12 | 6 |
| 8 | 12 |
| 4 | 18 |
| 0 | 24 |

## INDICATORS

**Power**
OFF – Not powered
ON (green) – Normal operation
ON (red) – Power malfunction

**System**
TST (yellow) – Self-test or loop
FLT (red) – System fault

**Main link SFP (per port)**
SYNC LOSS (red) – Signal loss or frame loss detected on uplink
AIS (yellow) – AIS detected on uplink

**User Ethernet Port**
LINK/ACT (lights yellow) – LAN up
LINK/ACT (flashes yellow) – LAN traffic transfer
100 (green) – On: 100 Mbps operation
100 (green) – Off: 10 Mbps operation

**T1 Interfaces (per port)**
SYNC LOSS (red) – Signal loss detected on T1 link
AIS (yellow) – AIS detected on T1 link

**Management Port**
LINK/ACT (lights yellow) – LAN up status
LINK/ACT (flashes yellow) – LAN traffic transfer
100 (green) – On: 100 Mbps operation
100 (green) – Off: 10 Mbps operation

## GENERAL

**Power**
100–240 VAC, 50/60 Hz
-48 VDC (-40 to -72 VDC)

**Power Consumption**
AC: 32 VA max
DC: 13W max

**Physical**
Height: 4.4 cm (1.8 in)
Width: 44.0 cm (17.0 in)
Depth: 24.0 cm (9.0 in)
Weight: 3.5 kg (8.0 lb)

**Environment**
Temperature: 0° to 50°C (32° to 122°F)
Humidity: Up to 90%, non-condensing

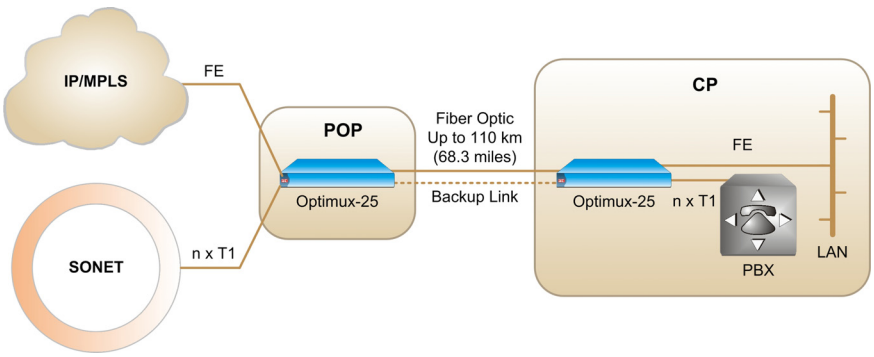


Figure 2. Ethernet and T1 Range Extension

Table 2. Main Link Interface Options

| Module Name | Transmitter Type and Wavelength | Connector Type | Fiber Type | Typical Output Power | Receiver Sensitivity | Typical Range | |
|---|---|---|---|---|---|---|---|
| (Ordering Option) | [nm] | | | [dBm] | [dBm] | [km] | [miles] |
| SFP-1 | LED, 1310 | LC | 62.5/125 Multimode | -18 | -31 | 6.5 | 4.0 |
| SFP-2 | Laser, 1310 | LC | 9/125 Single mode | -12 | -31 | 38 | 23.6 |
| SFP-3 | Long haul laser, 1310 | LC | 9/125 Single mode | -2 | -34 | 70 | 43.4 |
| SFP-4 | Long haul laser, 1550 | LC | 9/125 Single mode | -2 | -34 | 110 | 68.3 |
| SFP-10a | Laser WDM, Transmit: 1310, Receive: 1550 | LC | 9/125 Single mode (single fiber) | -12 | -30 | 40 | 24.8 |
| SFP-10b | Laser WDM, Transmit: 1550, Receive: 1310 | LC | 9/125 Single mode (single fiber) | -12 | -30 | 40 | 24.8 |

***Note**: Typical ranges are calculated according to attenuation of 0.4 dB/km for 1310 nm, 0.25 dB/km for 1550 nm for single mode fiber.*

Table 3. Optimux Comparison Chart

| Feature | Optimux-108 | Optimux-106 | Optimux-34 | Optimux-25 | Optimux-45/45L | Optimux-1551 | Optimux-1553 |
|---|---|---|---|---|---|---|---|
| Uplink | Fiber Optic | Fiber Optic | E3, Fiber Optic | Fiber Optic | T3, Fiber Optic | Copper, STM-1/OC-3 | Copper, STM-1/OC-3 |
| Bandwidth (Mbps) | 108 | 81 | 34 | 25 | 45 | 155 | 155 |
| Number of trunks | 4 E1 | 4 T1 | 16 E1 | 16 T1 | 21 E1<br>28 T1 | 21/42/63 E1<br>28/56/84 T1 | 3 E3<br>3 T3 |
| Ethernet support | ✓ | ✓ | ✓ | ✓ | – | – | – |
| Special features | Redundant, hot-swappable uplinks<br>Card version for LRS-102* | Redundant, hot-swappable uplinks<br>Card version for LRS-102* | SFP-based uplinks | SFP-based uplinks | Ring support (Optimux-45) | Full redundancy | Full redundancy |

***Note**: A central site solution is available (LRS-102 transparent modem rack)*

# Optimux-25

16 T1, Ethernet or Data Fiber Multiplexer

## Ordering

**OP-25/+/*/%/$/#/&**

*Legend*

**+** Alarm port (Default=no Alarm port):
- **A** Alarm port

***** Redundant power supply (Default=one power supply):
- **R** Redundant power supply

**%** V.35 user port (Default=no V.35 user port):
- **V35** DB-25 connector with ISO-2110 pinout
- **V35T** DB-25 connector with Telebras pinout

**$** Activation key (Default=no activation key):
- **PACK1** Software key for activating the 10/100BaseT Ethernet port

***Note**: It is strongly recommended to order this device with **original** RAD SFPs **installed**. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs.*

**#** Main link interface:
- **SFP-1** 1310 nm, multimode, LED, LC connector
- **SFP-2** 1310 nm, single mode, laser diode, LC connector
- **SFP-3** 1310nm, single mode, long-haul laser diode, LC connector
- **SFP-4** 1550 nm, single mode, long-haul laser diode, LC connector
- **SFP-10a** Transmit 1310 nm, receive 1550 nm (WDM), LC connector
- **SFP-10b** Transmit 1550 nm, receive 1310 nm (WDM), LC connector

***Note:** For single-fiber applications, a device with the SFP-10a interface should always be used opposite a device with the SFP-10b interface, and vice versa.*

**&** Redundant main link (Default=one main link):
- **D** Redundant main link

**OP-25-PACK1**
Software key for activating the 10/100BaseT Ethernet port

**OP-25-PACK1-DEMO**
Evaluation software key for activating the 10/100BaseT Ethernet port (expires after 30 days)

**OP-25-PS**
Wide range 100–240 VAC/–48 VDC power supply module for adding a redundant power supply to an existing unit or replacing the original power supply module

### SUPPLIED ACCESSORIES

AC/DC power cord

**RM-34**
Kit for mounting one unit in a 19-inch rack

**CBL-DB9F-DB9M-STR**
Control port cable

### OPTIONAL ACCESSORIES

**OP-25-PS-BP**
Blank panel for power supply module



**International Headquarters**
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

**North America Headquarters**
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@radusa.com

**www.rad.com**

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