

# Optimux-1553

STM-1/OC-3 Terminal Multiplexer



## Any Traffic Over Fiber

- STM-1/OC-3 terminal multiplexer for grooming high order legacy traffic (TDM) over SDH/SONET networks
- Multiplexes up to three E3 or T3 data channels using a single hot swappable card
- Optional 1+1 redundant network interface (single-ended MSP/APS), as well as 1+1 protection of E3/T3 tributaries and power supply for complete carrier class hardware redundancy and serviceability
- Plug and play operability



Optimux-1553 is a unique STM-1/OC-3 terminal multiplexer for transport of high-order legacy PDH traffic over SDH/SONET. Three E3 or T3 tributary channels are mapped into a standard channelized STM-1/OC-3 uplink, extending the local loop up to 80 km (50 miles), while creating a transmission layer fully compatible with regional and national SDH/SONET networks.

Power supply and uplink modules in Optimux-1553 can be backed up and are field-serviceable. Main link 1+1 single-ended MPS/APS redundancy is supported in compliance with the G.841 and GR-253-CORE standards. Power supplies are also backed up and are hot-swappable. These features ensure that Optimux-1553 has no single point of failure, and is fully compatible with carrier class requirements.



**data communications**

Innovative Access Solutions

# Optimux-1553

## STM-1/OC-3 Terminal Multiplexer

Optimux-1553 is available with either coaxial or with fiber optic short/long haul main link interfaces.

The unit provides high availability, high-quality performance monitoring of the traffic path, from the SDH/SONET network to the customer premises.

The simplicity, compact size and low power consumption of Optimux-1553 allow easy rack installation on both customer premises and telecommunication facilities.

Setup, control and monitoring of status and diagnostics information can be performed using one of the following means:

- ASCII terminal connected to the DB-9 control port
- Telnet host via a dedicated Ethernet port

- Network Management Station (NMS) running RADview-EMS, RAD's Client-Server CORBA-based SNMP network management application
- TFTP for software download and update
- ConfiguRAD – RAD's web-based remote access terminal application.



Figure 1. Optimux-1553 Back Panel Showing the Interface Ports

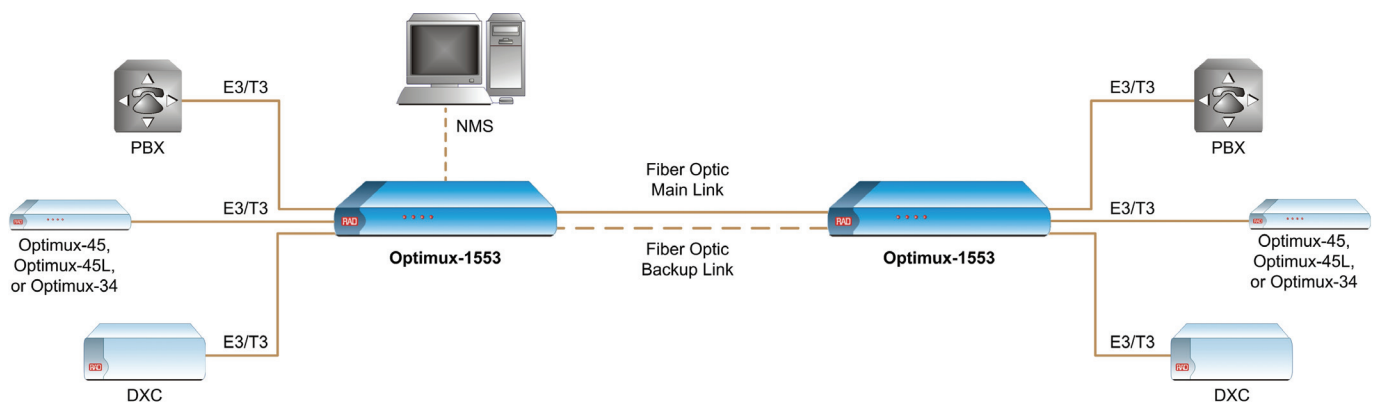


Figure 2. Optimux-1553 Units in a Point-to-Point Topology

Table 1. Main Link Interface Options

Module Name (Ordering Option)	Wavelength [nm]	Fiber Type [μm]	Transmitter Type	Power Coupled into Fiber [dBm]	Receiver Sensitivity [dBm]	Typical Max. Range		Connector Type
						[km]	[miles]	
OP-M/CX/155	-	Copper cable	-	-	-	135m	443 ft	Coax interface
OP-M/SC/85L OP-M/FC/85L OP-M/ST/85L	850	62.5/125 multimode	Laser (VCSEL)	-14 to -20	-26	2.0	1.2	SC, FC, ST
OP-M/SC/13M OP-M/ST/13M	1310	62.5/125 multimode	LED	-14 to -20	-31	2.0	1.2	SC, ST
OP-M/SC/13L OP-M/FC/13L OP-M/ST/13L	1310	9/125 single mode	Laser	-8 to -15	-31	20	12.4	SC, FC, ST
OP-M/SC/15L OP-M/FC/15L OP-M/ST/15L	1550	9/125 single mode	Laser	-8 to -15	-31	20	12.4	SC, FC, ST
OP-M/SC/13LH OP-M/FC/13LH OP-M/ST/13LH	1310	9/125 single mode	Laser (long haul)	0 to -5	-34	40	24.8	SC, FC, ST
OP-M/SC/15LH OP-M/FC/15LH OP-M/ST/15LH	1550	9/125 single mode	Laser (long haul)	0 to -5	-34	80	49.7	SC, FC, ST
OP-M/SC/SF1	Tx: 1310 Rx: 1550	9/125 single mode (single fiber)	Laser WDM	-8 to -15	-29	20	12.4	SC
OP-M/SC/SF2	Tx: 1550 Rx: 1310	9/125 single mode (single fiber)	Laser WDM	-8 to -15	-29	20	12.4	SC
OP-M/SC/SF3	Tx/Rx: 1310	9/125 single mode (single fiber)	Laser (SF3)	-8 to -15	-27	20	12.4	SC/APC

**Notes:** 1. For copper cables (coax interface), a range of 135m is attainable when using RG-59 B/U (at 78 MHz, in accordance with the square root frequency law).

2. The ranges specified above were calculated according to the following typical attenuation rates (with a 3 dB margin):

- 3.5 dB/km for 850 nm multimode
- 0.4 dB/km for 1310 nm single mode
- 0.25 dB/km for 1550 nm single mode

## Specifications

### STM-1/OC-3/STS-3 LINK (NETWORK)

#### Compliance

Bellcore GR-253-CORE,  
Bellcore GR-499-CORE,  
ITU-T G.783, ITU-T G.823,  
RFC 2558

#### Redundancy

1+1

#### Line Rate

155.52 Mbps  $\pm$ 20 ppm

### ELECTRICAL (COAX) INTERFACE

#### Line Code

CMI

#### Interface Connectors

BNC coax

#### Line Attenuation

Typically 12.7 dB at 78 MHz using  
RG-59-B/U cable

#### Impedance

75 $\Omega$

### FIBER OPTIC INTERFACE

#### Line Code

NRZ scrambled

#### Interfaces

ST, SC, FC/PC or SC/APC

#### Range

See *Table 1*

### E3/T3 INTERFACE

#### Compliance

Bellcore GR-253-CORE,  
Bellcore GR-499-CORE,  
ITU-T G.783, ITU-T G.823,  
RFC2496

#### Data Rate

T3: 44.736 Mbps  
E3: 34.368 Mbps

#### Line Code

B3Z5

#### Impedance

75 $\Omega$ , unbalanced

#### Jitter

According to Bellcore GR-499-CORE and  
ITU-T G.823

#### Connectors

Three pairs of unbalanced BNC connectors  
(one Tx and one Rx for each E3/T3  
tributary channel)

### SUPERVISORY & MANAGEMENT PORTS

#### Control Port

Interface: V.24/RS-232  
Connector: DB-9, female  
Format: asynchronous  
Baud rate: 9600 - 115,200 bps, Autobaud  
Character: 8 bit no parity, 7 bit odd or  
even parity

### Ethernet Ports

Interface: 10/100BaseT  
Connector: RJ-45 shielded  
Mode of operation: Autonegotiation,  
Full Duplex, Half Duplex

### Alarm Relay Port

Dry contact via DB-9 female connector.  
Operates as Normally Open and Normally  
Closed, using different pins

### GENERAL

#### Power

AC: 100 - 240 VAC ( $\pm$ 10%), 50 to 60 Hz  
DC: -48 VDC (-40 to -60 VDC)

#### Power Consumption

AC: 48 VA max.  
Heat dissipation: 31W  
Recommended fuse: 1A SB  
Current: 0.4A (max)  
DC: 23W max.  
Heat dissipation: 23W  
Recommended fuse: 3A SB  
Current: 1A (max)

#### Physical

Height: 4.4 cm (1.75 in)  
Width: 44.0 cm (17.3 in)  
Depth: 30.0 cm (11.8 in)  
Weight: 5.0 kg (11.0 lb)

#### Environment

Temperature: 0°–55°C (32°–131°F)  
Humidity: Up to 90%, non-condensing

# Optimux-1553

## STM-1/OC-3 Terminal Multiplexer

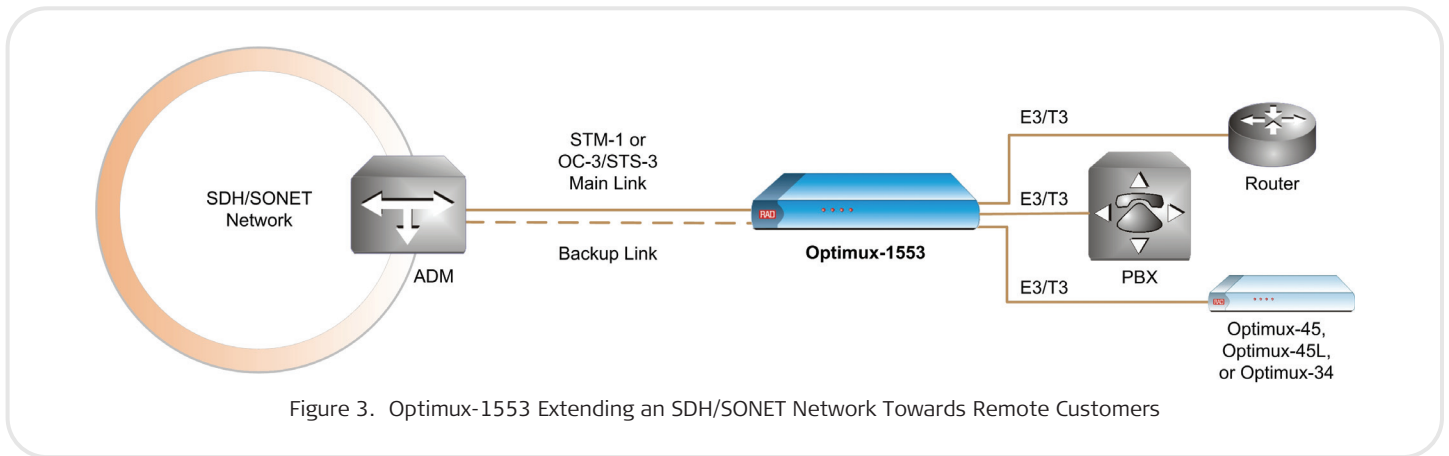


Figure 3. Optimux-1553 Extending an SDH/SONET Network Towards Remote Customers

Table 2. Optimux Comparison Chart

Feature	Optimux-4E1/4T1	Optimux-34	Optimux-XLT1	Optimux-45/45L	Optimux-1551	Optimux-1553
Uplink	Fiber Optic	E3, Fiber Optic	Fiber Optic	T3, Fiber Optic	Copper, STM-1/OC-3	Copper, STM-1/OC-3
Bandwidth (Mbps)	108/106	34	25	45	155	155
Number of trunks	4 E1 4 T1	16 E1	16 T1	21 E1 28 T1	21/42/63 E1 28/56/84 T1	3 E3 3 T3
Ethernet support	✓	✓	✓	-	-	-
Special features	Redundant, hot-swappable uplinks	SFP-based uplinks	Modular	Ring support (Optimux-45)	Full redundancy	Full redundancy

## Optimux-1553

## STM-1/OC-3 Terminal Multiplexer

## Ordering

Main link modules and tributary modules are ordered separately.

**OP-1553\*/\$/#/!/~/+^**

## Legend

\* Tributary interface module:

**3E3T3** Module with three E3/T3 links

**2X3E3T3** Two 3E3T3 modules

\$ Station clock:

**STC** Optional station clock

**Note:** For tributary module redundancy, order two modules. Each tributary module may be defined either as E1 or T1 channels.

# Power supply:

**AC** 100 to 240 VAC

**48** -48 VDC

**AD** 100 to 240 VAC power supply plus redundant -48 VDC power supply

! Redundant power supply:

**R** Redundant power supply of same type

? Main link connector type:

**ST** ST type fiber

**SC** SC type fiber

**FC** 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.

- + Optical wavelength and transmitter type (not relevant with CX option):
- CX** Electrical interface with coaxial BNC connectors
- 13** 1310 nm, multimode LED
- 13L** 1310 nm, single mode, laser diode
- 15L** 1550 nm, single mode, laser diode
- 13LH** 1310 nm, single mode, long haul laser diode
- 15LH** 1550 nm, single mode, long haul laser diode
- 85L** 850 nm, multimode VCSEL
- SF1** Transmit 1310 nm, receive 1550 nm
- SF2** Transmit 1550 nm, receive 1310 nm
- SF3** 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.

^ Second main link:

**D** Optional second main link

## SUPPLIED ACCESSORIES

AC power cord (with AC power supply only)

DC adapter plug (with DC power supply only)

**CBL-DB9F-DB9M-STR**

Control port cable

**RM-34**

Hardware kit for mounting one Optimux-1553 unit into a 19-inch rack

## OPTIONAL ACCESSORIES

**OP-1553-M/\*/S**

Additional tributary module

**Note:** Each module should be ordered separately.

**OP-M/?/+**

Main link interface module (see Table 1)

**Power Supply**

**OP-1553-PS/AC:** 100 to 240 VAC

**OP-1553-PS/48:** -48 VDC

**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](http://www.rad.com)



**data communications**

Innovative Access Solutions