

Optimux-1553

Fiber Multiplexers for 3 E3/T3 over STM-1/OC-3



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

Any Traffic over Fiber



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.



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Power supply and uplink modules in Optimux-1553 can be backed up and are field-serviceable. Uplink 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.

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

The unit provides high availability, and 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, status monitoring, and diagnostics information can be performed using one of the following methods:

- ASCII terminal connected to the DB-9 control port
- Telnet host via the dedicated Ethernet port
- Network management station (NMS) running RADview-EMS, RAD's client-server CORBA-based SNMP network management application. NMS is connected via the dedicated Ethernet port
- RAD's Web-based remote access terminal application, via the dedicated Ethernet port
- TFTP for software update and remote configuration, via the dedicated Ethernet port.



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

Specifications

UPLINK (NETWORK)

Interfaces

Electrical (Coax) – STS-3
Fiber Optic – STM-1/OC-3

Compliance

Bellcore GR-253-CORE,
Bellcore GR-499-CORE, ITU-T G.703,
G.707, G.783, G.841, G.957, RFC 3592

Redundancy

1+1

Line Rate

155.52 Mbps ±20 ppm

Copper Line Attenuation

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

Copper Impedance

75Ω

Connectors

Electrical: BNC
Fiber Optic: ST, SC, FC, SC/APC

Line Code

Electrical: CMI
Fiber Optic: NRZ scrambled

Specifications and Ranges

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

B3ZS

Impedance

75Ω, unbalanced

Jitter

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

Connectors

3 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: 9,6 kbps, 19,2 kbps,
38,4 kbps, 57,6 kbps, 115,2 kbps,
autobaud detect

Ethernet Ports

Interface: 10/100BaseT
Connector: shielded RJ-45
Mode of operation: autonegotiation,
full/half-duplex

ALARM RELAY

Rating

60 VDC max or 30 VAC max, at 0.5A max

Input Alarm

10 VDC min, 48 VDC max, at 0.5A max

Connector

Dry contact, DB-9 female

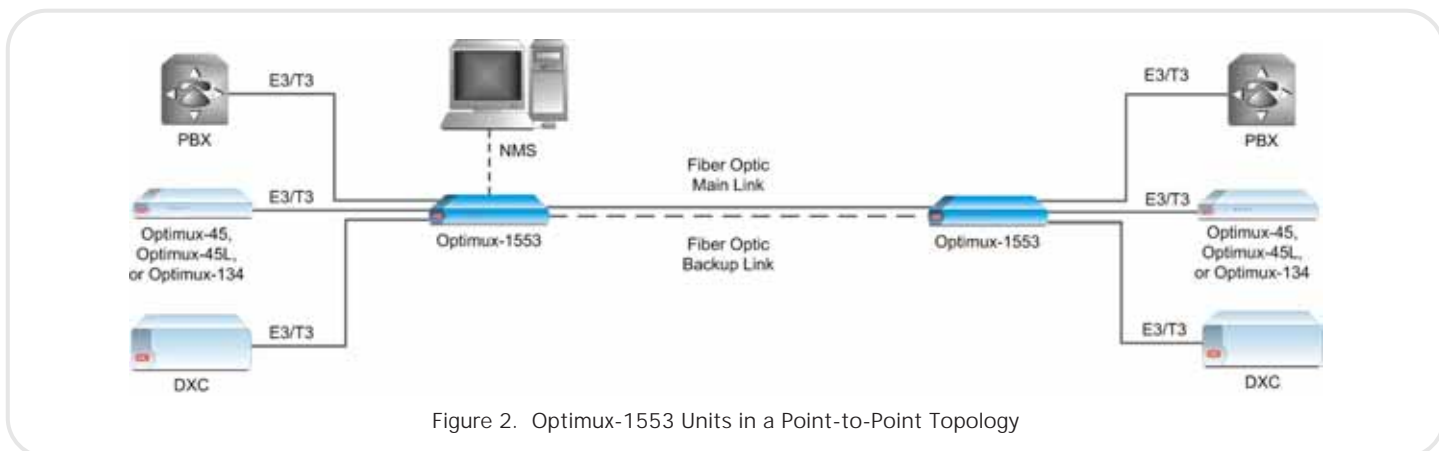


Figure 2. Optimux-1553 Units in a Point-to-Point Topology

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INDICATORS

Power A, B

Green: Power is OK

Red: Power fault

Off: No power

System

TST (yellow):

- On: Unit is in test mode
- Blinking: Downloading new software

FLT (red): Access and control card is in fault condition

ON A/B (green):

- On: The 3E3/3T3 card is active
- Blinking during auto-baud detect process

Alarm

MAJ (red):

- On: Major Alarm
- Blinking: Major Alarm + ACO button pressed

MIN (yellow):

- On: Minor Alarm
- Blinking: Minor Alarm + ACO button pressed

Uplink

Front and Rear Panels:

SYNC A/B LOSS (red): Electrical/optical signal not present or out-of-frame detected on uplink (A/B) respectively

AIS A/B (yellow): AIS signal detected on uplink A/B

Rear Panel only (on uplink module):

SIG (green): Signal detected on the respective uplink card

Ethernet

(Rear Panel only)

100 (green):

- On: operating at 100 Mbps
- Off: operating at 10 Mbps

LINK/ACT:

- Green: Ethernet link integrity
- Yellow: Traffic activity

Station Clock Interface

(Rear Panel only)

OK (green): External valid E1/T1 clock source exists on clock connector

E3/T3 Tributary Channels

(Front Panel only)

SYNC LOSS (red):

Loss of signal detected on the respective non masked channel

AIS (yellow):

- On: AIS signal detected on the respective non masked channel
- Blinking: The channel is masked and the LED status for the masked channels' parameter is set to Blink by the user
- Off: The channel is masked and the LED status for the masked channels' parameter is set to Off by the user OR the channel is not masked and no Loss of Signal or AIS is detected on the respective channel.

Table 1. Uplink Interface Options

Module Name (Ordering Option)	Wavelength	Fiber Type	Transmitter Type	Power Coupled into Fiber	Receiver Sensitivity	Typical Max. Range		Connector Type
	[nm]	[μ m]		[dBm]	[dBm]	[km]	[miles]	
OP-M/CX/155	-	Copper cable	-	-	-	135m	443 ft	Coax interface See <i>Note 1</i>
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

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DIAGNOSTICS

Uplink and Tributary Links

- Local Loopback
- Remote Loopback

GENERAL

Power

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

Power Consumption

- AC: 77 VA max, 0.4A max
- DC: 37W max, 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) max.

Environment

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

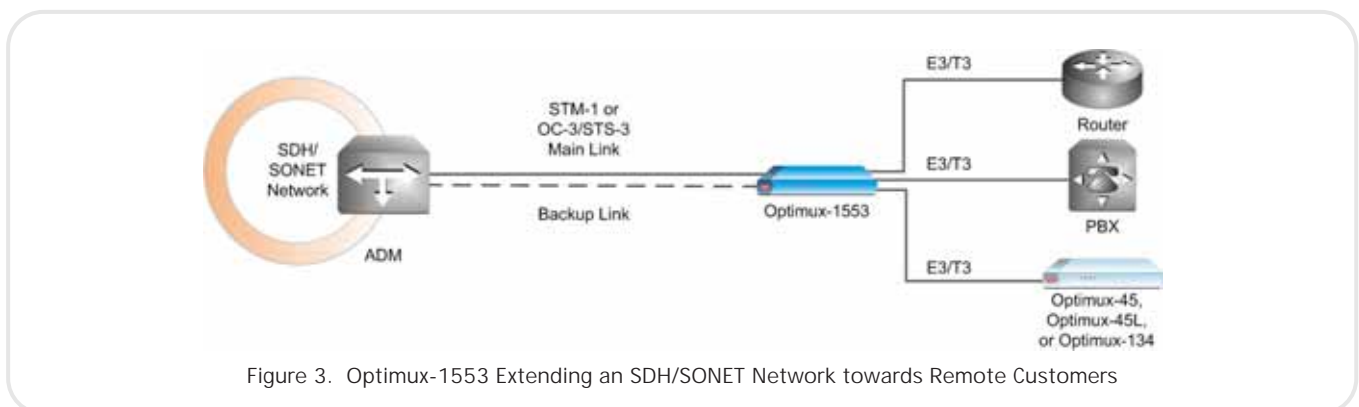


Figure 3. Optimux-1553 Extending an SDH/SONET Network towards Remote Customers

Ordering

STANDARD CONFIGURATIONS

OP-1553/3E3T3/AC/R/SC/13L

OP-1553/3E3T3/AC/SC/13L

OP-1553/3E3T3/48/R/SC/13L

OP-1553/48/R

OP-1553/3E3T3/AC/R/SC/13L/D

OP-1553/AC/R

SPECIAL CONFIGURATIONS

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

OP-1553-M/*/S

Additional tributary module

Note: Each module should be ordered separately.

OP-M/?/+

Uplink interface module only (see *Table 1*)

Note: Uplink modules and tributary modules are ordered separately.

Legend

* Tributary interface module:

3E3T3 Module with 3 E3/T3 links

2X3E3T3 Two 3 E3T3 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 the same type

? Uplink connector:

ST ST fiber

SC SC fiber

FC FC 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.

^ Redundant STM-1 uplink (default = single uplink):

D Redundant uplink for unidirectional 1+1 protection

SUPPLIED ACCESSORIES

AC power cord (when AC power supply is ordered)

DC adapter plug (when DC power supply is ordered)

RM-34

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

OPTIONAL ACCESSORIES

CBL-DB9F-DB9M-STR

Control port cable

Power Supply

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








OP-1553-PS/48: -48 VDC

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Table 2. Optimux Comparison Table

Feature	OP-108L	OP-108/106	OP-134/125	OP-1032/1025	OP-45/45L	OP-1551	OP-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	108/106	34/25 or 134/125	1000 (Proprietary)	45	155	155
Number of trunks	4 E1	4 E1/4 T1	16 E1/16 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	Reduced power consumption cost-effective	Redundant, hot-swappable uplinks	Full bandwidth, Ethernet license activation	3xGbE User interfaces	Ring support (Optimux-45)	Full redundancy	Full redundancy
Card version for LRS-102/MP-4100	Works with OP-108C	✓	Works with OP-34C/OP-25C	-	-	-	-

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