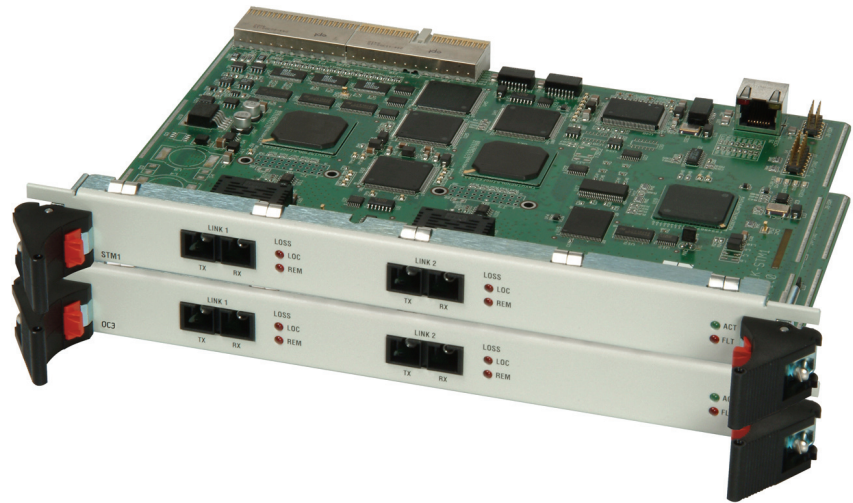


Gmux-2000 Modules

STM1, OC3

Dual-Port STM-1 and OC-3 Interface Modules



Direct access to SDH or SONET networks at the STM-1 or OC-3 levels

- Capacity of two full channelized STM-1 (SDH) or OC-3 (SONET) links
- User-defined mapping of internal VC-12 and VT1.5 streams within the STM-1 and OC-3 streams
- Line redundancy and MSP (Multiplexing Section Protection) between the dual link ports, or module redundancy with two STM1/OC3 modules
- Extended diagnostic mechanism, including self-test and loopbacks on external STM-1 or OC-3 ports

The STM1 and OC3 modules operate as SDH and SONET terminal multiplexers for the Gmux-2000 chassis that terminates the STM-1 or OC-3 link and its overhead.

The modules multiplex up to 63 E1 or 84 T1 streams derived from the Gmux-2000 internal telecom buses into one STM-1 or OC-3 data stream.

Mapping of the traffic flows within the SDH and SONET trunks is configurable as follows:

- SDH – any VC-12 tributary units carried in the STM-1 VC-4 virtual container
- SONET – any VT1.5 tributary units carried in the OC-3 STS-1 virtual container.



data communications

The Access Company

STM1, OC3

Dual-Port STM-1 and OC-3 Interface Modules

Timing can be configured for the following modes:

- SDH/SONET trunk loopback clock
- Internal VC-12/VT1.5 clock
- Nodal (system) reference clock.

The interfaces available for the external STM-1 and OC-3 ports are:

- Fixed electrical interface, for intra office applications, which require direct connection to higher level SDH/SONET multiplexers.
- Fixed fiber optic interfaces for short and long haul applications, complying with ITU T Rec. G.957. There is a wide range of optical interfaces available (see Table 1).
- Various fiber optic SFP transceivers, enabling optimal combination of Capex reduction, ease of network planning and stock flexibility.

REDUNDANCY

The STM1 or OC3 modules support 1+1 line redundancy (APS) mechanism, which automatically activates a standby STM-1 or OC-3 port if an active port or link fails.

The 1+1 APS complies with ITU G.783 and G.707 requirements, switching to a redundant link within 50 ms of an active link failure.

Hardware redundancy is attained by installing two STM1 or OC3 modules in Gmux-2000 chassis. A redundant module is put into service in case the active module fails, ensuring continuous system operation.

DIAGNOSTICS

Comprehensive diagnostic capabilities include:

- Automatic self-test at power-up to monitor the module subsystems
- Real-time alarms to alert user on fault conditions
- Local and remote loopbacks on the external STM-1 or OC-3 ports.

Specifications

STM-1 MODULE

Number of Ports

Two

Payload Capacity

Full STM-1

Payload Routing

Any E1 port to any VC 12 within the STM-1 payload

Electrical Interface

Physical layer: ITU T Rec. G.703, Para. 12

Line code: CMI

Nominal bit rate: 155.520 Mbps

Connectors: two BNC 75Ω, unbalanced

Fixed Fiber Optic Interface

Physical layer: I ITU T Rec. G.957

Nominal bit rate: 155.520 Mbps

Standard: SDH

Framing: ITU T Rec. G.707, G.708, G.709

Characteristics: see *Table 1*

Connectors: SC

STM-1 SFPs

SFP-1: 1310 nm, 2 km (1.2 miles)

SFP-2: 1310 nm, 15 km (9.3 miles)

SFP-3: 1310 nm, 40 km (24.8 miles)

SFP-4: 1550 nm, 80 km (49.7 miles)

SFP-10a: Tx – 1310 nm, Rx – 1550 nm, single fiber, 20 km (12.4 miles)

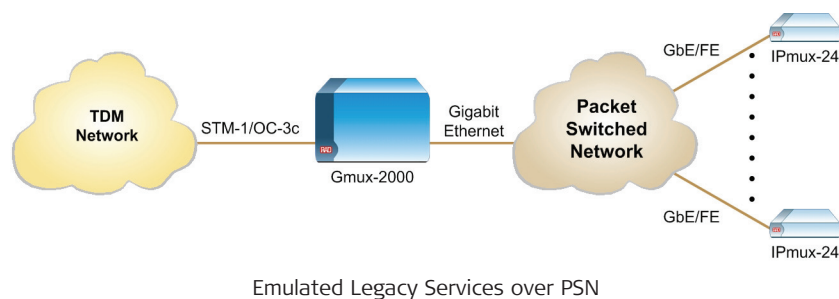
SFP-10b: Tx – 1550 nm, Rx – 1310 nm, single fiber, 20 km (12.4 miles)

SFP-18a: Tx – 1310 nm, Rx – 1550 nm, single fiber, 40 km (24.8 miles)

SFP-18b: Tx – 1550 nm, Rx – 1310 nm, single fiber, 40 km (24.8 miles)

SFP-19a: Tx – 1490 nm Rx – 1570 nm, single fiber, 80 km (49.7 miles)

SFP-19b: Tx – 1570 nm, Rx – 1490 nm, single fiber, 80 km (49.7 miles)



OC-3 MODULE**Number of Ports**

Two

Payload Capacity

Full OC-3

Payload Routing

Any T1 port to any VT1.5 within the OC-3 payload

Electrical Interface

Physical layer: ITU T Rec. G.703, Para. 12

Line code: CMI

Nominal bit rate: 155.520 Mbps

Connectors: two BNC 75Ω, unbalanced

Fixed Fiber Optic Interface

Physical layer: I ITU T Rec. G.957

Nominal bit rate: 155.520 Mbps

Standard: GR-253-CORE

Framing: GR-253-CORE and ANSI T1.105

Characteristics: see *Table 1*

Connectors: SC

OC-3 SFPs

See the STM-1 SFP specifications

GENERAL**Redundancy Type**

1+1 unidirectional as per G.783

Indicators

Fiber optic port:

L LOS (red): Local loss of STM-1 or OC-3 signal

R LOS (red): Remote loss of STM-1 or OC-3 signal

STM1 and OC3 module:

ACT (green): Module activity status

FLT (red): Module fault detected

Physical

Fits a single slot of the Gmux 2000 chassis (slot 7 or 9)

Environment

Operating temperature: 0–55°C (0–131°F)

Storage temperature: -20–50°C (0–150°F)

Humidity: Up to 90%, non-condensing

Table 1. Fixed Fiber Optic Interface Characteristics

Wavelength [nm]	Fiber Type [mm]	Transmitter Type	Power Coupled into Fiber [dBm]		Receiver Sensitivity [dBm]	Typical Optical Budget [dB]	Typical Max. Range	
			Min	Max			[km]	[miles]
1310	9/125, single mode	Laser	-15	-8	-31	16	20	13
	9/125, single mode	Laser, long haul	-5	0	-34	29	40	26
	62.5/125, multimode	LED	-20	-14	-30	10	2	1.3
850	62.5/125, multimode	VCSEL	-20	-14	-30	10	2	1.3

STM1, OC3

Dual-Port STM-1 and OC-3 Interface Modules

Ordering

GMUX-M-STM1/⊗

GMUX-M-OC3/⊗

Legend

⊗	Fixed or SFP interface type:
CX	Unbalanced coax
MM850SC	Multimode fiber 850 nm
MM13SC	Multimode fiber 1310 nm
SM13SC	Single mode fiber 1310 nm
SM13LHSC	Single mode fiber 1310 nm, long haul
SFP-1	SFP-1 transceiver
SFP-2	SFP-2 transceiver
SFP-3	SFP-3 transceiver
SFP-4	SFP-4 transceiver
SFP-10a	SFP-10a transceiver
SFP-10b	SFP-10b transceiver
SFP-18a	SFP-18a transceiver
SFP-18b	SFP-18b transceiver
SFP-19a	SFP-19a transceiver
SFP-19b	SFP-19b transceiver
Null	SFP-ready slots

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