M-1601

Intelligent distance extending multiplexing platform

Certified by:

BROCADE

16/8/4 Gbps
FIBRE CHANNEL
SOLUTIONS

M-SERIES IN SHORT

- Flexible networking — Embedded or transponder-based intelligent DWDM multiplexer. Integrated amplification, dispersion control and system management.
- SmartOS — Fully featured automated management system adjusts all power levels to optimum values. Optical signal monitoring and system management.
- Compact building practice — ETSI300 1U x 19" form factor
- Protocol transparency — Support for any combination of SAN and WAN traffic - 100Mbps to 100Gbps
- Robust — Redundant hot pluggable power supply units (PSUs). Field serviceable network management board without traffic interruption.
- Easy setup — No user required set up of signal inputs LED guide lights for easy deployment including channel recognition
- Channel Density — 16 channels. Can be increased to 32 channels with M-1600

FLEXIBLE NETWORKING
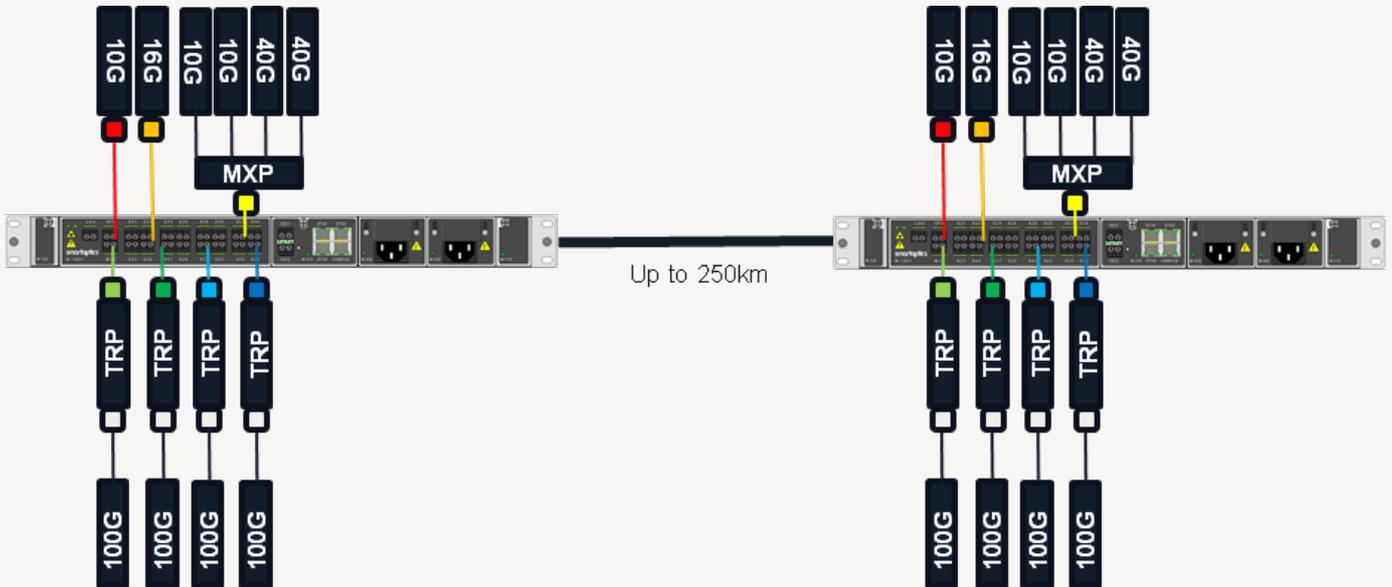
Any combination of embedded and/or transponder and/or Muxponder DWDM input channels can be connected to each of the 16 M-Series ports. 40 and 100G traffic easily handled in a simple straight forward way. Cost and simplicity advantages of a passive multiplexer approach with the monitoring and distance extension features of a traditional DWDM platform. All in a simple to install 1U form factor. Can be configured as an intelligent passive multiplexer ideal for remote traffic backhauling or synchronous replication for example. Actual distance depends on fiber and traffic type and whether FEC is used in the host equipment. Please check with Smartoptics for exact configuration details.

DESCRIPTION

M-Series is an intelligent DWDM multiplexer offering a flexible approach to DWDM networking. It has two key modes of operation. In the first mode, it operates as an intelligent multiplexer in an embedded system, where the DWDM transceiver connects straight from the host equipment to the corresponding port on the M-Series. The embedded approach provides a cost effective plug and play embedded DWDM platform combining the features of a traditional telecom DWDM system with the simplicity and cost advantages of a passive multiplexer, removing many of the limitations on distance and power budget.

In the second mode of operation it can be used as a flexible DWDM multiplexer for any ITU standardized DWDM transponder or muxponder systems. Inputs from such systems as well as embedded DWDM wavelengths can all be used together with the M-Series for optimal networking flexibility. Traditional telecom-based transponder systems used to be the go-to transmission solution because they offer system management and amplification for longer distances. As M-Series has built in channel monitoring, amplification and signal conditioning, these hurdles are removed. So is the need for complicated systems to design, install and maintain. It is also the most compact solution available on the market.

Depending on the type of connectivity required, it can be configured with any combination of EDFAs and DCM modules to handle all protocols up to 100Gbps. Due to this flexibility, each network is configured to its exact requirements. The footprint for the network is drastically reduced as is the required system wiring.

Any combination of data and storage traffic can be connected together on the same system. Distances of up to 500km are easily achieved with standard DWDM ER transceivers but if shorter distances are required, M-Series can be used as an intelligent passive multiplexer. The M-1601 base model is a 16 Channel Mux/Demux which can be expanded to 32 channels by connecting the M1600 module.

The low power consumption (68W) provides a great deal of flexibility when planning the network and makes M-Series the ideal Data Centre connectivity platform. The fully automated SmartOS Management System ensures a truly plug and play experience and provides all the features necessary to handle the challenges in today's fiber network requirements. The system automatically adjusts to the correct power levels and intuitive front panel LEDs guide the user through the installation process.

TECHNICAL SPECIFICATIONS

System	
Topology	Point-to-point, add/drop networks
Transport Network	Metro WDM / dark fibre
Approvals	CE Class B, FCC, RoHS-6
Standardization	Long term storage according to ETSI EN 300 019-1-1 V2.1.4 Class 1.1 "Weather protected, partly temperature controlled storage locations" Transport according to ETSI EN 300 019-1-2 Class 2.3: Public transportation Operation according to ETSI EN 300019-1-3 V2.3.2 Class 3.1: Temperature controlled locations
Operating Temp	0° C to +45° C
Size	ETSI300 450 mm (H) x 440 mm (W) x 250 mm (D)
Weight	8 kg
Channel count	16 DWDM channel (ITU921 to ITU936)
Supported protocols	Fast Ethernet to 100G Ethernet 1/2/4/8/16G Fibre Channel
Eye Safety	Automatic laser shut down
Maximum reach	200km point to point. 500km @10Gbs, 400km @ 16Gbps with inline M-4000 amplifier

Network Management		Power Supply	
Management Ports	3x10/100Base-T RJ-45 2x 100Base-FX SFP 1xconsole port RJ45	Characteristics	90-254 VAC, -48 VDC, <68 Watts
Software upgrade	Traffic hitless - dual image	Redundancy	Single/Dual feeding, Hot Swappable
Protocols	CLI, SNMP		
DCN	LAN/WAN/VPN		
Management Channel	Optical Supervisory Channel (OSC) at 1510nm (standard)		
Visual Indicators	LED status indicators for client ports, line interfaces, power, shelf		

Subject to change without notice.

For more information visit smartoptics.com.

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CONFIGURATIONS

Part number	Description
Base model	
M-1601	16 ch. DWDM intelligent Mux/Demux, 100GHz, D921-D936, DWDM expansion port, OSC
Intelligent 16 / 32 Ch. passive multiplexer networking	
M-1601-xxxyyy-C0000C1	16 ch. DWDM Mux/Demux, 100GHz, IL Link= 5.0dB, DWDM exp port, NMB, OSC
M-1600-xxxyyy-D0000C0	16 ch. UPG unit, Dxxx-Dyyy, compatible with all M-1601 versions
Intelligent 16 ch. active multiplexer networking	
Full part number is based on the specific requirements of each network task and is built up as follows: -	
M1601-xxxyyy-DzzzzC1	z = Line Tx EDFA. 0 = no EDFA; 1 = 24dB gain/22dBm output power
M1601-xxxyyy-DzzzzC1	z = Line Tx DCM. 0 = no DCM; A = 40km; B = 80km; G = 80 + 80km; U = 40km + TDCM, T = Tunable DCM
M1601-xxxyyy-DzzzzC1	z = Line Rx EDFA. 0 = no EDFA, 3 = 26dB gain/16dB output power
M1601-xxxyyy-DzzzzC1	z = Line Rx DCM. 0 = no DCM; A = 40km; B = 80km; G = 80 + 80km; U = 40km + TDCM, T = Tunable DCM
16 Channel expansion module	
M-1600-xxxyyy-D0000C0	16 ch. UPG unit, Dxxx-Dyyy, compatible with all M-1601 versions
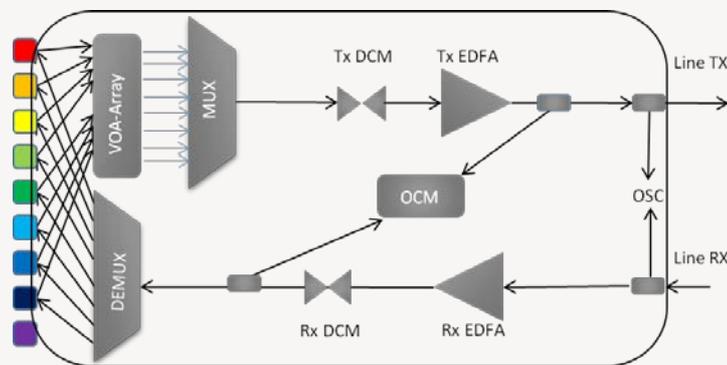
M-Series functional layout

Example configurations	
M-1601-xxxyyy-D1U00C1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 40km+TDCM
M-1601-xxxyyy-D0030C1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Rx: EDFA, 40km DCM
M-1601-xxxyyy-D003AC1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 40km DCM, Line Rx: EDFA, no DCM
M-1601-xxxyyy-D1A30C1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 40km DCM, Line Rx: EDFA, no DCM
M-1601-xxxyyy-D1B30C1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 80km DCM, Line Rx: EDFA, no DCM
M-1601-xxxyyy-D1B3AC1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 80km DCM, Line Rx: EDFA, 40km DCM
M-1601-xxxyyy-D1A3TC1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 40km DCM, Line Tx: EDFA, TDCM
M-1601-xxxyyy-D1B3TC1	16 ch. M-Series, exp port, Dxxx-Dyyy, OSC, Line Tx: EDFA, 80km DCM, Line Tx: EDFA, TDCM

Contact Smartoptics for a full list of configuration options and network design support

SPARES

Spare parts	
M-420	AC power supply, M-Series
M-410	DC power supply, M-Series
M-310	Network Management Board, M-Series
M-110	Fan unit, M-Series

WAVELENGTH PLAN

xxxyyy = 921936; 943958	

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