

XTM SERIES

4G MULTI-SERVICE MUXPONDER

A TDM Multiplexer for Multiple Services

The **4G Multi-Service Muxponder (MS-MXP)** is a powerful part of the Infinera XTM Series, which enables optimized and cost-efficient capacity networks based on CWDM and DWDM technology.

Optimized for Metro/Access Applications

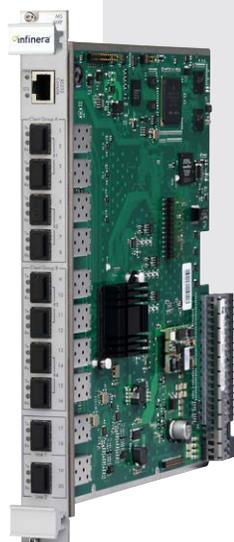
The 4G Multi-Service Muxponder is ideally suited for metro/access applications where multi-service support, compact design and low power consumption are critical components. The MS-MXP can be optimized for its purpose by initiating tailored traffic images. Different traffic combinations can be addressed while still maintaining low power consumption, and the 4 Gb/s line rate provides high utilization of the wavelength capacity. For example, the MS-MXP can be configured to carry three Gigabit Ethernet signals plus four STM-1/OC-3 signals, far better than traditional SDH/SONET solutions that would require multiple plug-in units to support such capacity.

The combination of STM-1/OC-3 and Gigabit Ethernet (GbE) is a perfect solution for mobile transmission networks where a combination of circuit-switched and packet-based connections is required to/from the base station clusters. The MS-MXP can support these networks and also provides a seamless transition to an all-Ethernet solution. This traffic combination is also a powerful option for broadband networks with a mix of ATM/STM-1/OC-3 and GbE signals.

The MS-MXP can also address large enterprise customers where a combination of storage area networks (SAN) with GbE connectivity can be seen. The MS-MXP can support 1G as well as 2G Fibre Channel signals in combination with Gigabit Ethernet.

True Transparency Multiplexing of SDH/SONET

The 4G Multi-Service Muxponder is based on the iWDM concept, enabling true transparent transport of SDH/SONET signals as compared to SDH/OTN multiplexers where the section overhead



Key benefits:

- Sync- and data-transparent transport of SDH/SONET, Gigabit Ethernet and SAN formats
- High wavelength utilization via the Infinera Intelligent WDM (iWDM®) concept using 4 Gb/s or 2.5 Gb/s line rate
- Multi-functional plug-in unit. Same hardware can be used as muxponder, transponder, and regenerator
- Technology-agnostic. Pluggable transceivers enable use in CWDM as well as DWDM networks
- Dual line ports enabling sub-50 ms 1+1 line protection
- Low power design ensures low total cost of ownership

(SOH) is terminated and thus prevents the usage of the inherent data communications channels (DCC) of the SDH/SONET frames.

Multiple Operating Modes

The MS-MXP can be configured into a 4G muxponder, a 2.5G transponder or a 2.5/4G regenerator - see figure 1.

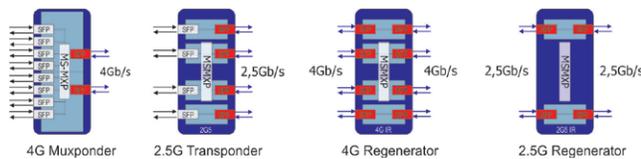


Fig 1. The Main Operating Modes of the MS-MXP.

This reduces the operational expenditure (OpEx) since the same plug-in unit can be used for both the muxponder and transponder functions, as well as the regenerator function should the line signal require extension to the bridgeable distance. The regenerator mode can also be used to convert from a CWDM to a DWDM network by using corresponding transceivers (SFPs) on the interfaces - see Figure 2. Another application is to use the regenerator mode to convert from one DWDM wavelength to another.

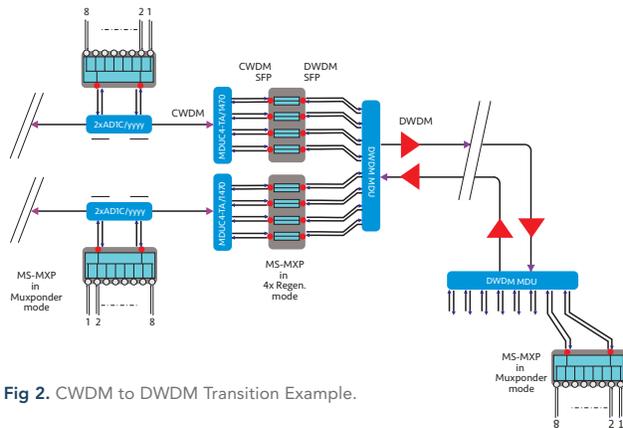


Fig 2. CWDM to DWDM Transition Example.

Tailored Network Element Options

The MS-MXP can be mounted in any of the XTM Series chassis options:

- As a self-managed network element in a TM-102 (1U) chassis
- As one of many traffic units in a TM-3000/TM-3000/II (11U) or TM-301 (3U) chassis

This enables a tailored setup depending on the current and future capacity needs of the site.

In the TM-102 option, the MS-MXP initiates the complete Embedded Node Manager (ENM) on the onboard micro processor. This enables local management simply by connecting any PC or work station and launching a standard Internet browser. The embedded management channels enable easy remote management via the line signal. There is no need to provide access to the customer data communications network (DCN) if the MS-MXP is placed at a customer site.

Low Power Design

A fully equipped MS-MXP consumes less than 20 watts (W). Low power consumption in combination with a small footprint reduces site costs and enables more capacity to be handled at sites with restrictions on power consumption, cooling and space.

Specifications

Supported Traffic Formats	STM-1/OC-3, STM-4/OC-12, STM-16/OC-48 Gigabit Ethernet (optical/electrical), Fast Ethernet (electrical) 1 Gb/s / 2 Gb/s Fibre Channel
Layer 1 Performance Monitoring	SDH/SONET: Based on B1 calculations Gigabit Ethernet: Based on CRC errors SAN formats: Based on CRC errors Line signal: Based on CRC Collected every 15min/24h and presented according to G.826 using ES, SES, etc.
Layer 2 Performance Monitoring	Channel utilization (%) on GbE clients
Protection	1+1 line protection on muxponder images. Non-revertive/revertive switching <50 ms. Client/equipment protection on 2.5G transponder images. Non-reverting switching <50 ms
Power Consumption	Max 20 W worst case (with all client ports active and using DWDM SFPs) 12 W w/o SFPs
Misc Line Interface Features	Embedded management channels on line signals Trail Trace insertion to validate connection
Operational Modes	Muxponder mode (8 client ports + 2 line ports) with 4 Gb/s line interface Transponder mode with 2.5 Gb/s line interface 4x regenerator mode for 4 Gb/s line signals (with embedded management channels on all 8 line ports) 2x regenerator mode for 2.5 Gb/s line signals (with emb mgmt channels on all 4 ports)
Released Traffic Combinations	4G muxponder images: 3x GbE + 3x STM-1/OC-3 + 1x STM-1/OC-3 or STM-4/OC-12 on 4 Gb/s line with 1+1 protection 1x STM-16/OC-48/TPDDGBE + 1x GbE + 3x STM-1/OC-3 on 4 Gb/s line with 1+1 protection 2x (4x GbE) on 4 Gb/s line w/o 1+1 line protection or 4x GbE on 4 Gb/s line with 1+1 line protection Dual 2x GbE + 1x 2 Gb/s FC (or 2x 1 Gb/s FC) w/o line protection or single 2x GbE + 2x 1 Gb/s FC (or 2x 1 Gb/s FC) with 1+1 line protection 3x GbE (Sync-E) + 1x STM-1/-4 muxponder with 1+1 protection on 4 Gb/s line Transponder images: 4x 2.5 Gb/s transponder STM-16/OC-48, GbE 2x 2.5 Gb/s transponder STM-16/OC-48, GbE + 2x 2.5 Gb/s transponder STM-1/OC-3 or STM-4/OC-12 Regenerator images: 4x regenerator function for 4 Gb/s line signals 2x regenerator function for 2.5 Gb/s line signals Note: GbE-ports can be optical/electrical and also support electrical Fast Ethernet Note: Sync-E is always optical GbE
Interfaces	Client interfaces: SFP MM, SM @ 1310 nm/1550 nm versions covering ranges from 100 m up to 15 km. Multi-rate 100 Mb/s – 2.125 Gb/s. Dedicated STM-1/OC-3 (S-1.1). Electrical SFP for Gigabit Ethernet and Fast Ethernet. Line interfaces: SFP 4 Gb/s 40 km/70 km CWDM (up to 8 channels) or DWDM (up to 40 channels)

Specifications and Features Are Subject to Change

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