

# 10G Multi-Service Extended Reach Muxponder

## *Effective aggregation of multiple traffic formats*

### Key benefits:

- Compact and cost-effective aggregation of up to 10 client signals to a 10Gb/s line signal
- Fully transparent transport of SDH/SONET, Ethernet and Fibre Channel signals
- Singular line interface with tunable C-band laser
- Technology agnostic. Pluggable transceivers on client ports enable usage in CWDM as well as DWDM networks
- Tunable optics for full flexibility and cost efficient spare management
- Inbuilt Enhanced Forward Error Correction (EFEC) enables usage in 1000km long-haul networks
- High flexibility and Layer-2 awareness via Transmode's Intelligent WDM (iWDM™) concept
- Low Power Design for low total cost of ownership

The 10G Multi-Service Extended Reach Muxponder (MS-MXP10G/TC-ER) is a part of the Multi-Service concept within Transmode's TM-Series platform, enabling a traffic unit to be configured and used in multiple applications. Instead of having traffic units that are dedicated for a certain service and application, the same unit can be reconfigured to support different traffic formats as well as being configured to provide a different functional behavior, such as Muxponder, Transponder and Regenerator.

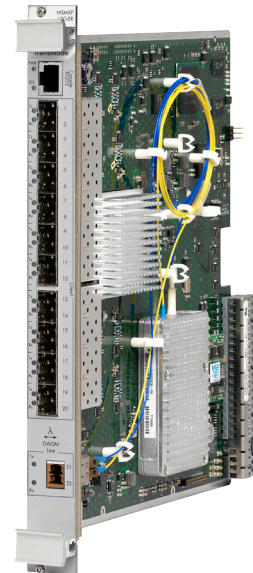
The 10G Multi-Service Extended Reach Muxponder uses a combination of pluggable transceivers on the client side with a fixed/tunable line interface giving the lowest Total Cost of Ownership (TCO).

### Optimized for Ethernet backhaul applications

The 10G Multi-Service Extended Reach Muxponder is a generic traffic unit for use in regional networks for backhaul of traffic such as Ethernet and SDH/SONET. For wholesale operators it is important to be able to transport both SDH/SONET and Ethernet signals data as well as synchronization transparently. The latter is of imperative importance for mobile backhauling of Synchronous Ethernet signals.

The 10G Multi-Service Extended Reach Muxponder is a single-slot device for aggregation of up to 10 client signals onto a 10G line signal.

All client interfaces use pluggable transceivers (SFPs) enabling each client connection to be adapted to type of interface (SM, MM etc) and distance to the client equipment. The line interface is equipped with a high performance optical receiver with 1000km optical distance capabilities and a tunable laser that enables the unit to be used in 80ch DWDM configurations.



### Simplified management via iWDM

The 10G Multi-Service Extended Reach Muxponder is based on Transmode's Intelligent WDM (iWDM) concept where the client signals are wrapped into a digital frame with overhead bytes that are used to carry the management channels as well as providing quality control of the transmission via performance data. The embedded management channel simplifies the management of a Transmode network since management access is provided wherever there is a traffic connection.

### iWDM Layer-2 awareness

Even though the 10G Multi-Service Extended Reach Muxponder is a Layer-1 device it has inbuilt Layer-2 functions, such as the ability to measure to what extent each GbE-pipe is utilized. This information gives the operator the ability to insert Layer-2 concentration to better utilize each GbE-pipe and thus avoid adding unnecessary wavelengths in the transport network.

Another powerful Layer-2 feature is the ability to inject and extract VLAN management channels on the GbE-ports. This enables easy remote management of Transmode Layer-2 units via the native GbE signal.

Remote access to an Ethernet Muxponder (EMXP) or Ethernet Demarcation Unit (EDU) is easily provided via the management VLANs and thus providing an integrated solution for management of both Layer-1 and Layer-2 devices in the network.

### Tailored Network Element options

The 10G Multi-Service Extended Reach Muxponder can be mounted in any of the TM-Series chassis options;

- As a self-managed Network Element in a 1U TM-101/102 chassis
- As one of many traffic units in a TM-3000 (10U) or TM-301 (3U) chassis

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

In the TM-101/102 option, the 10G Multi-Service Extended Reach Muxponder initiates the complete Embedded Node Management (ENM) on the on-board 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 thus no need to provide access to the customer DCN network if the Muxponder is placed at a customer site.

### Low Power Design

A fully equipped 10G Multi-Service Extended Reach Muxponder consumes typically 35W. 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.

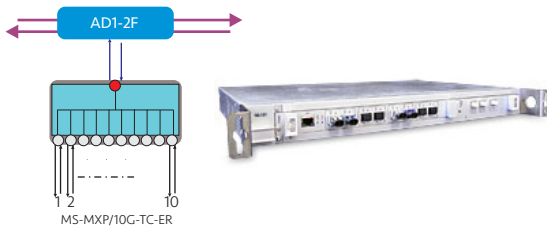


Fig. 1 1U collector node in TM-101 chassis

### Technical specifications:

|                                       |   |
|---------------------------------------|---|
| <b>Supported traffic formats</b>      | STM-4/OC-12, STM-16/OC-48<br>Gigabit Ethernet<br>1G/2G/4G Fibre Channel<br>Line signal from TPDDGBE, MS-MXP<br>Actual supported formats given by traffic images. Contact Transmode for details.   |
| <b>Layer-1 performance monitoring</b> | SDH/SONET: Based on B1 calculations<br>Gigabit Ethernet: Based on CRC and coding errors<br>SAN formats: Based on CRC and coding errors<br>Line signal: Based on CRC<br>Collected every 15min/24h and presented according to G.826 using ES, SES etc |
| <b>Protection</b>                     | Client/Equipment protection. Non-revertive switching typically <20ms  |
| <b>Power consumption</b>              | Typically 35W including optics  |
| <b>Misc line interface features</b>   | Embedded management channels on line signals<br>Trail Trace insertion to validate connection  |
| <b>Interfaces</b>                     | Client interfaces: SFP-based. Supporting MM, SM @ 1310nm/1550nm<br>Line interfaces: Fixed/tunable DWDM 80ch @ 50GHz spacing   |
| <b>Layer-2 features</b>               | GbE utilization PM (in %) per GbE port<br>Inject and extract of mgmt-VLAN on all GbE ports  |

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