

# 9xGbE/10G Muxponder

## Effective aggregation of Gigabit Ethernet signals

### Key benefits:

- Compact and cost-effective TDM aggregation of up to 9 GbE signals to a 10Gb/s line signal
- Transparent transport
- Technology agnostic. Pluggable transceivers enable usage in CWDM as well as DWDM networks.
- Tunable optics for full flexibility and cost efficient spare management
- High flexibility and Layer-2 awareness via Transmode’s iWDM™ (Intelligent WDM) concept
- Low Power Design for low Total Cost of Ownership

The 9xGbE/10Gb Muxponder (GBE9-MXP10G) is a powerful part of Transmode’s TM-Series platform enabling optimized and cost efficient transport networks based on CWDM/DWDM technology.

The high density capabilities in combination with pluggable optics gives the lowest Total Cost of Ownership (TCO), in particular when using XFP’s with tunable lasers.

### Optimized for Ethernet backhaul applications

The typical application of this GbE Muxponder is for IP-DSLAM Backhauling, IPTV distribution or Business Ethernet Backhaul networks.

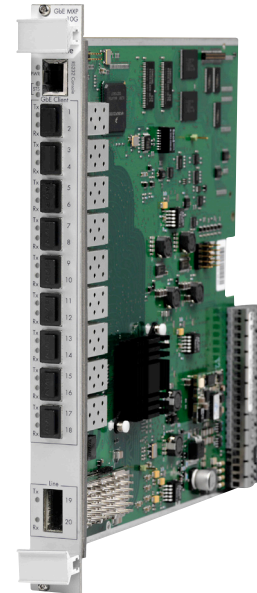
The GbE Muxponder is a single-slot device for the aggregation of up to 9 GbE signals onto a 10G line signal.

All client interfaces use pluggable transceivers (SFPs) enabling each client connection to be adapted to type of interface (SM, MM, electrical) and distance to the client equipment. The line interface is equipped with a 10Gb/s capable pluggable transceiver (XFP). The usage of pluggable transceivers provides a high level of flexibility since the Muxponder can be used in both CWDM and DWDM networks by selecting appropriate type of XFPs.

The support for DWDM XFP’s with tunable lasers further enhances the flexibility and cost efficiency and also enables the unit to be used in 80ch applications.

### Simplified management via iWDM

The 9xGbE/10Gb Muxponder is based on Transmode’s “Intelligent WDM” (iWDM) concept where the client signals are wrapped into a digital frame having 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 9xGbE/10Gb 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 detect low utilization and insert Layer-2 concentration to better utilize each GbE-pipe and thus avoid adding unnecessary wavelengths in the transport network.

### Metro networking

The line signal from the 9xGbE/10Gb MuxPonder is designed for metro applications where Forward Error Correction is not required. If needed, the line signal can be connected to the TPD10GBE-BU Transponder to provide addition of Forward Error Correction and the ability to establish connections with 1+1 line protection. As an alternative, another 9x GbE Muxponder within the TM-Series portfolio could also be used, which has FEC coding and 1+1 line protection (GBE9/MXP10GFEC). See separate Data Sheet

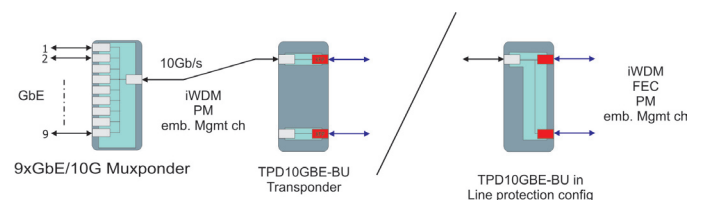


Fig 1: Example configurations with TPD10GBE-BU

### Management connectivity

An embedded management channel connection can be established between the 9xGbE/10Gb Muxponder and the TPD10GBE Transponder. Remote management access towards a 9xGbE/10Gb Muxponder can therefore be provided if the unit is placed at another site. There is thus no need to provide access to the customer DCN network if the GbE Muxponder is placed at a customer site.

### Tailored Network Element options

The 9xGbE/10Gb 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 9xGbE/10Gb 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. There is thus no need for a separate Control Unit (CU) to manage a TM-102/102 Network Element

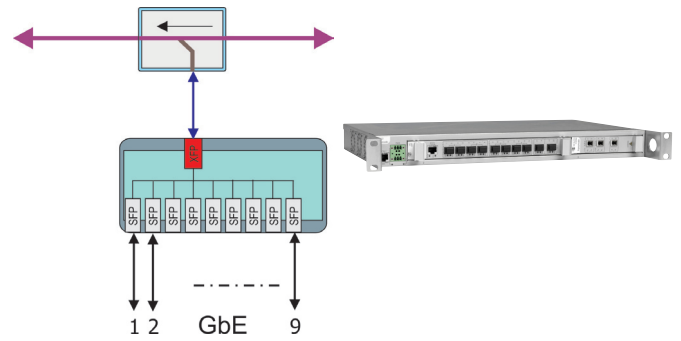


Fig. 2 1U collector node with Muxponder and AD-filter

### Low Power Design

A fully equipped 9xGbE/10Gb Muxponder consumes less than 33W. 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

### Technical specifications

Software release 13.0 or later

<b>Supported traffic formats</b>	Gigabit Ethernet, optical and electrical. Fast Ethernet, electrical
<b>Layer 1 Performance Monitoring</b>	Gigabit Ethernet: Based on CRC and 8B10B coding errors Collected every 15min/24h and presented according to G.826 using ES, SES etc
<b>Power consumption</b>	Max 33W worst case (with all client ports active and using DWDM SPFs) ~25W w/o SPFs
<b>Misc Line interface features</b>	Embedded management channels on line signals Trail Trace insertion to validate connection
<b>Interfaces</b>	Client interfaces: SFP-based. Supporting MM, SM @ 1310nm/1550nm, electrical SPFs etc Line interfaces: XFP 10Gb/s 40km/70km CWDM (up to 8 channels) or 40/80km DWDM, up to 40 channels using standard XFP's. 80channels when using tunable XFP
<b>Layer-2 features</b>	GbE utilization PM (in %) per GbE port

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