

Quad Multi-Protocol Transponder

Multi-Service Layer 1 transport

Key benefits:

- Transparent transport of any service between 100Mb/s and 4.25Gb/s
- 4 individual Transponders, which can be configured to provide 1+1 protection with sub 50 ms switching
- Technology agnostic. Pluggable transceivers enable usage in CWDM as well as DWDM networks
- Multi-functional plug-in unit. Each Transponder can also be used in a regenerator function or to translate between CWDM and DWDM networks
- Low Power Design for low Total Cost of Ownership

The Quad Multi-Protocol Transponder (TPQMP) is a powerful part of Transmode's TM-Series platform and a versatile, multipurpose device with four individual Transponders on the same board. Each Transponder is bit rate and protocol transparent from 100Mb/s to 4.25Gb/s. With its wide span of supported traffic formats, the TPQMP is ideal in access and metro networks.

Both client and line interfaces are SFP-based, enabling each interface to use uncolored, CWDM or DWDM plug-in units in any combination.

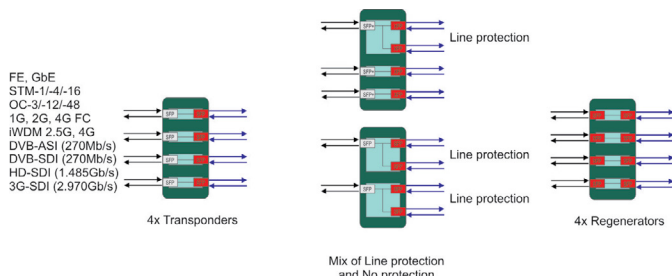
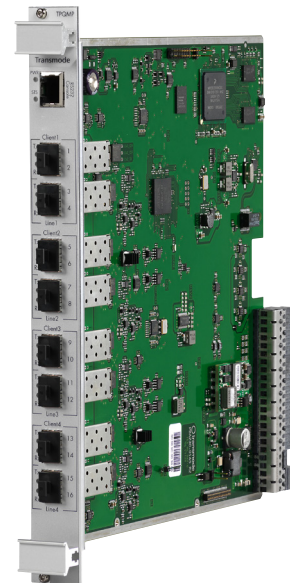


Fig 1: Four operational modes of the TPQMP proving its multi-functional capabilities

Figure 1 shows the different operational modes of the TPQMP. These can be setup independently since each Transponder function is individual. 1+1 Line protection is provided via a SW configuration where two Transponder functions are collapsed into a single Transponder with two line ports.



Tailored Network Element options

The TPQMP 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 requirements of the site.

In the TM-101/102 option, the TPQMP 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.

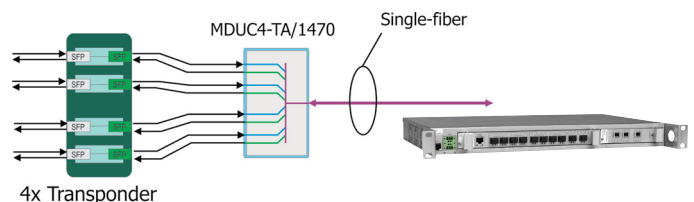


Fig 2: A common TPQMP configuration: 1U Multi-Service NE

Figure 2 shows a 4ch CWDM collector node in a TM-102 chassis, which is a typical TPQMP configuration. The four Transponder functions of the TPQMP match perfectly the 4ch CWDM MDU. These CWDM MDU's are available in both single-fiber and fiber-pair configurations.

Metro to regional network translation

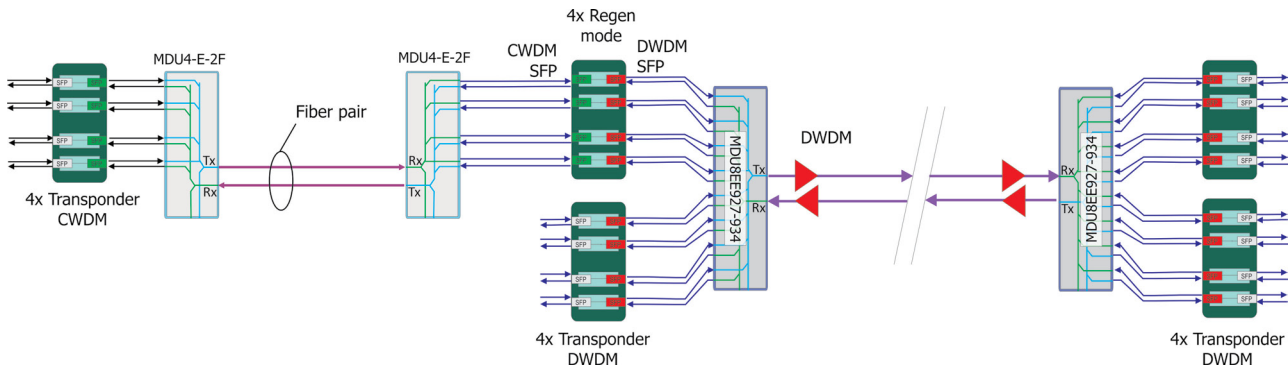


Fig 3: TPQMP used in a CWDM and DWDM network

Figure 3 shows another typical example of how the TPQMP can be used. Here, it is used as a CWDM collector node in an access network. A second TPQMP in the hub node translates from CWDM to an amplified DWDM network by using CWDM SFPs and DWDM SFPs.

Low Power Design

A fully equipped TPQMP consumes less than 25W. 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

Supported traffic formats	STM-1/-4/-16, OC-3/-12/-48 1G FC, 2G FC, 4G FC FE, GbE, Sync-E (G.8262/Y.1362 option 1) DVB-ASI (270Mb/s) DVB-SDI (270Mb/s) SMPTE 259M HD-SDI (1.485Gb/s) SMPTE 292M 3G-SDI (2.970Gb/s) SMPTE 424M (later release)
Layer 1 Performance Monitoring	Simplified, based on LOS, LOF Collected every 15min/24h and presented according to G.826 using ES, SES etc
Protection	1+1 Line protection. Non-revertive switching in normal mode , typically <20ms Equipment/Client protection (later release)
Power consumption	Max 25W worst case (with all client ports active and using DWDM SPFs)
Misc line interface features	Loop-back
Interfaces	Client interfaces: SFP-based. Supporting MM, SM @ 1310nm/1550nm, electrical SFPs etc Line interfaces: SFP-based. 40ch DWDM, 16ch CWDM
Latency	<10ns between two Transponder functions
Timing	3R, through-timing

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