

# TM-102 chassis

*Compact network element platform for different access applications*

### Key benefits:

- Compact and flexible making it ideal for access applications and Triple-Play networks
- 1U height requiring small footprint
- Multiple and redundant fan units as well as dual primary power inlets enabling maximum availability and carrier class performance
- Low Power Design for low power consumption

The TM-Series system platform contains a wide range of active and passive plug-in units optimized for cost-effective Layer 1 and Layer 2 transport. These plug-in units can be mounted in any of the three enclosures TM-3000, TM-301 and TM-101/-102. The selection of enclosure is based upon number of required board slots and expected space for upgrades.

A TM-102 chassis can be equipped with either DWDM, CWDM or hybrid C/DWDM plug-in units in either single-fiber or fiber-pair configurations.

### A compact and flexible system platform

The TM-102 chassis has one full-sized slot for one traffic unit (Transponder or Muxponder). Consequently, a Control Unit (CU) is not required to provide an aggregated management view as would be required in a TM-3000/TM-301 network element (NE).

Instead, the unit processor on the traffic unit contains the node manager (ENM) which is accessed the same way as for a NE with CU, i.e. via CLI commands or via an Internet browser providing a graphical user interface (GUI).

Remote login to other NE's is made via embedded management channels that are provided by the traffic units or via a local DCN connection.

Thanks to its compact size the TM-102 is ideal for the small collector nodes often used in Triple-Play networks. See a number of example configurations later in this datasheet.

### Carrier Class

The TM-102 chassis has multiple and redundant fan units as well as primary power modules. All connections are made on the front of the chassis, so no rear access is required.

A passive version of the TM-102 is also provided, where both the full-sized and half-sized slots are for passive units.

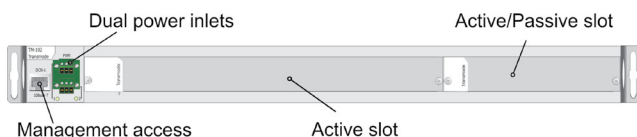


Fig. 1 TM-102 chassis



### Using TM-102 in different network scenarios proving its wide area of use

The following example configurations shows a number of typical scenarios where the TM-102 is the ideal chassis choice. These multiple scenarios again show the flexibility of the TM-102 chassis and its wide range of uses.

#### Example 1: TM-102 with a 4x Multi-Service NE

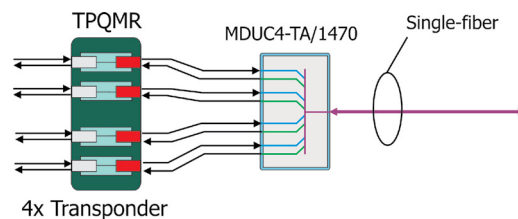


Fig. 2 TM-102 with a 4x Multi-Service NE

The TPQMR (a Quad Multi-Service Layer 1 Transponder) has four independent Transponder functions supporting any traffic format between 100Mb/s and 2.7Gb/s. CWDM SFP's are mounted on the line ports and connected to a 4ch MDU unit providing a single-fiber configuration that is housed in the half-sized slot. Single-fiber configurations are particularly beneficial in access networks as the fiber infrastructure is better utilized. Each single-fiber within a fiber-pair can be used independently and larger networks can be realized since the optical losses from optical filters are distributed between each single-fiber.

#### Example 2: TM-102 with a 2x 10Gb/s NE

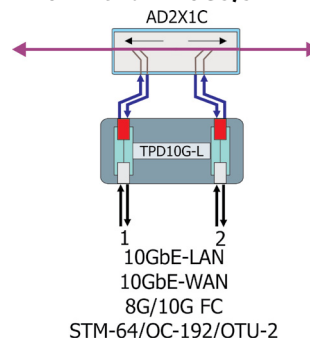


Fig. 3 TM-102 with a 2x 10Gb/s NE

The TPD10G-L unit (a Double 10G Transponder) supports all 10Gb/s formats (Ethernet, SDH/SONET/OTN and SAN) as well as the special 8G Fibre Channel format. The unit has two independent 10G Transponders that can be used for DWDM or CWDM applications by selecting appropriate XFP types. In this example the unit is equipped with CWDM XFPs and connected to a 2ch CWDM filter operating on a single-fiber that is housed in the half-height slot.

**Example 3: TM-102 with a Layer 2 access NE**

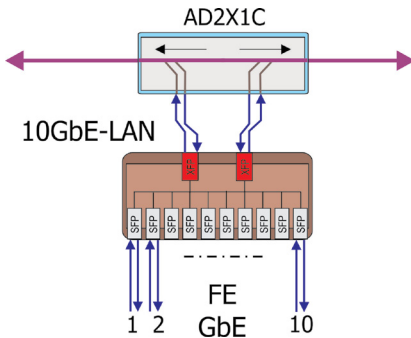


Fig. 4 TM-102 with a Layer 2 access NE

In this example the full-sized slot is equipped with an Ethernet Muxponder (EMXP) unit. The half-sized slot is equipped with a 2ch CWDM AD-filter for single-fiber configuration. This provides an ultra-compact Layer 2 aggregation NE that can be part of a 10GbE-LAN ring network with ring protection.

**Example 4: TM-102 with a Line Amplifier NE**

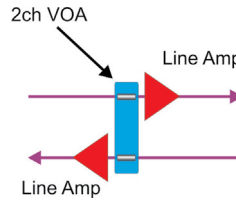


Fig. 5 TM-102 with a Line Amplifier NE

In this example the full-sized slot is equipped with a dual EDFA amplifier unit. The half-sized slot is equipped with an active 2ch VOA (Variable Optical Attenuator). This provides an ultra-compact line amplifier NE where changes in fiber attenuation can be compensated via the VOA unit.

**Low Power Design**

The max power consumption of a TM-102 based NE is 55W, with many typical configurations requiring considerably lower power consumption. As an example, the example configuration no 2 above consumes about 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:**

<b>Dimensions</b>	Height: 1U / 44mm (1.7in) Depth: 249mm (9.8in) excl mounting brackets. 295mm (11.6in) incl mounting brackets Width: 448mm (17.6) excl. mounting brackets
<b>Primary power</b>	DC-inlets. Redundant
<b>Cooling</b>	Fixed fans
<b>Mounting</b>	ETSI, 19"
<b>LAN/Management connections</b>	RJ45
<b>Primary power range, DC</b>	48VDC (40.8 - 57.6VDC), 3A Class III
<b>Max power at DC powering</b>	50W
<b>Max Inrush current @ -48VDC</b>	1,9A / 30ms
<b>Primary power range AC</b>	External AC/DC-converter 100-240VAC, 50/60Hz, 1.1A Class I
<b>Max power at AC powering</b>	55 W
<b>Max power consumption in card cage</b>	~45W
<b>Size AC/DC converter</b>	PS1A-70/DS3 excl connectors. Length: 161mm (6.3in) Width: 78mm (3.0in) Height: 52mm (2.0in)
<b>Weight DC-powering</b>	~3,4kg (74.9lb)
<b>DC cable size</b>	1,5mm <sup>2</sup> (0.002in <sup>2</sup> ) (connector limit). Standard 1,0mm <sup>2</sup> (0.001in <sup>2</sup> )
<b>Operating conditions</b>	ETSI EN 300 019-1-3 class T3.1

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