transmode

Data sheet

TM-Series

TM-4000

40G Solution

Key benefits:

- High capacity chassis for 40G Transponder, Regenerator and Muxponder units
- Transparent transport of 40G and 10G clients
- Tunable 40G line interface
- Integrated, tunable chromatic dispersion (CD) compensation

The TM-4000 solution is a powerful part of Transmode's TM-Series platform enabling transport of high capacity 40G wavelength channels.

The solution consists of a TM-4000 chassis that can be equipped with 40G Transponders, Muxponders or Regenerator plug-in units. The TM-4000 is a dedicated 40G solution where the 40G wavelengths are injected into optical multiplexers, amplifiers etc that are located in a TM-3000 chassis.

10G compatible transport

The TM-4000 uses DPSK modulation and in-built dispersion compensation which enables the 40G channels to be carried over same distances as ordinary 10G services. It is therefore possible to upgrade an existing 10G network to 40G without affecting any adjacent 10G channels and without the need to reengineer the amplifier spacing. New 10G/40G networks can be deployed using existing 10G span engineering rules. Furthermore, an external Polarization Mode Dispersion (PMD) compensator can be used to increase PMD tolerance when required to enable 40G transport on fibers with low PMD performance.

40G Muxponder unit

The TM-4000 chassis can be equipped with a 40G Muxponder unit that multiplexes four 10G services onto the 40G line. The 10G services can be any mix of SDH/SONET-, Ethernet- or OTN-based client services. The transport between two 40G Muxponders units is transparent. The client interface is based on pluggable optics (XFP's) enabling uncolored, CWDM or DWDM interfaces towards the client equipment. The 40G DPSK Line Interface contains an integrated Tunable Dispersion Compensation (TDC) module.

40G Transponder unit

The client interface of the 40G Transponder supports OC-768/STM-256/OTU-3 signal formats with an optical interface as defined in the G.691 I-64.1 (GR-253 SR-1) recommendations. The line interface is a 40G DPSK Line Interface with an integrated Tunable Dispersion Compensation (TDC) module.

40G Regenerator unit

The 40G Regenerator supports regeneration of 40G line signals from the 40G Muxponder and 40G Transponder. The line interfaces are therefore a 40G DPSK Line Interface with an integrated Tunable Dispersion Compensation (TDC) module.

PMD compensation unit

The PMD compensation unit is selectively deployed on an as-needed basis to increase PMD Tolerance and adaptively track State of Polarization (SOP) and Differential Group Delay (DGD) changes. This enables 40G channels to be carried over fibers with low PMD tolerance. The PMD compensation unit makes the PMD tolerance equivalent to 10G channels and allows 40G channels to be carried over the existing 10G infrastructure.

TM-4000 chassis

The TM-4000 chassis is NEBS 3 certified and can be equipped with up to 8 Traffic Units (Muxponder, Transponder or Regenerator). The chassis has dual/redundant DC power inlets and a redundant fan solution. The height of the TM-4000 chassis is 15U and it fits into a 23" rack. Fully equipped the max power consumption is 1500W.

Technical specifications:

Item	Data
TM-4000	Height: 15U / 666.75mm (26.25in) Width: 538.48mm (23") Depth: 300mm (11.8in) Max power consumption: 1500W
40G Muxponder	Client signals: OC192/ STM-64, OTU2, 10 GbE WAN/LAN in any mix Client interface: XFP Line interface: DPSK with integrated Tunable Dispersion Compensation (TDC) Max power consumption: 160W
40G Transponder	Client signals: OC-768/STM-256 and OTU3 Client interface: G.691 I-64.1 (GR-253 SR-1) Line interface: DPSK with integrated Tunable Dispersion Compensation (TDC) Max power consumption: 130W
40G Regenerator	Line interface: DPSK with integrated Tunable Dispersion Compensation (TDC) Max power consumption: 114W
Optical Interfaces	LC connectors
PMD compensator	PMD module. 2 units can be mounted via a special mechanical holder in a traffic unit slot. Increases PMD tolerance to > 8ps mean Differential Group Delay (DGD) Adaptively tracks State of Polarization (SOP) and DGD changes in ms timeframe Selectively deployed on a per-channel basis only when needed

Note: The internal TDC on the 40G line interfaces restricts the usage to odd and even 50GHz channels. Consequently each traffic unit is provided in an odd and even 50GHz version, i.e. same principle as for the optical MDU units.