

TM-GM2 - 2 x GE LambdaDriver transponder



TM - GM2 module

The **TM-GM2 transponder** is part of the LambdaDriver® product line and can be hosted by the LD400, LD800 and LD1600 chassis.

The transponders are single slot modules that interface between the CWDM or DWDM multiplexers and two Gigabit Ethernet SFP ports. TM-GM2 allows for a significant cost reduction and higher fiber utilization when compared to pure optical multiplexing solutions. The TM-GM2 module aggregates 2 Gigabit Ethernet tributaries into one 2.5 Gbps aggregated uplink port, as does another module, the EM2009-GM2, but with one major enhancement – the WDM port is integrated in this module (instead of an SFP port). This feature lowers the total solution cost, but reduces the flexibility of the WDM port.

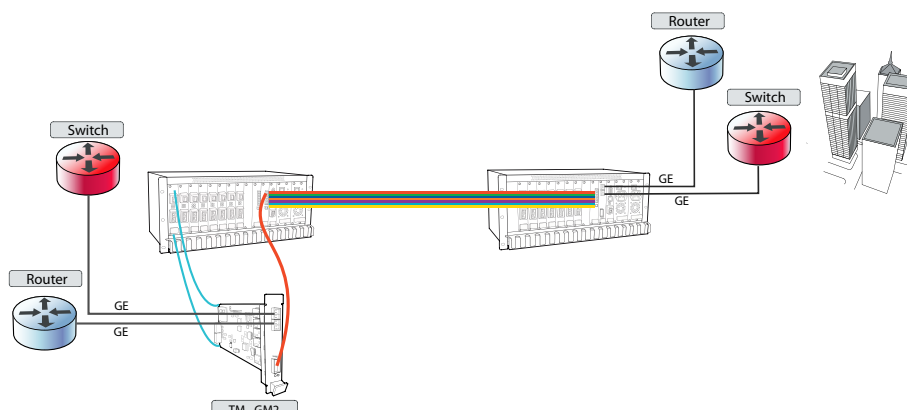
Using a CWDM/DWDM interface on the aggregation side allows direct connection to a CWDM/DWDM OADM or a Mux/DeMux without the need for any additional CWDM/DWDM transponder or SFP. Aggregating 2 GE services over one wavelength also allows for the usage of lower-cost CWDM technology instead of DWDM technology, thanks to a reduced WDM channel count consequential to doubling the capacity of a single wavelength. The simplest application is the transport of 2 x GE data streams to distances of up to 90 km over one or two fibers of a regular

singlemode cable.

Like the EM2009-GM2, TM-GM2 supports a variety of fiber optic SFPs for single mode and multi mode fibers on the GE ports. This makes it an excellent tool for a wide range of applications. For example, it can support 1000BaseTx interfaces by using MRV's 10/100/1000BaseTx SFP.

Larger aggregation of channels can be achieved by using the DWDM or CWDM technologies. Placing 2 GE services over one CWDM/DWDM wavelength will double the capacity of the existing CWDM/DWDM system. Thus, 64 GE applications will be run over one fiber using 32 wavelengths.

Powerful diagnostic tools are available on the GM2 modules. These include two loop-back functions per port (one for each traffic direction). These loop-back functions, together with the Remote Laser Shutdown capability, assist in pinpointing the problem source. In addition to the standard digital diagnostics provided by the SFPs, the GM2 modules count CRC errors on each port to provide per-channel performance monitoring. The LIN feature of the TM-GM2 notifies terminal equipment of a link failure by cutting off the laser power on the access side whenever no power is received from the WDM side, and vice versa.



Features

- Fiber Driver-LD (LambdaDriver®) transponder slot size
- SFP interface on the GE ports
- Trunk port data rate: 2.5 Gbps
- Loop-back on every port
- Placing 2xGE services over one CWDM or DWDM wavelength
- 2 loop-backs per port
- Automatic Laser Shutdown (ALS)
- Link Integrity Notification (LIN)
- SFP digital diagnostics as per SFF-8472

Applications

- GE TDM aggregation for further CWDM/DWDM transport
- Doubling capacity of existing GE links over Multimode or Singlemode fiber

For laser safety requirements, all modules are equipped with the ALS functionality, which reduces the optical power of the transmitters automatically in case of a broken link. The ALS functionality is implemented on both sides of the modules. The WDM side and Terminal equipment side.

The TM-GM2 transponders support the Y-Cable protection protocol, used in cases of full hardware protection of the transport equipment with only one terminal port for every service. In this protection mode each of two adjacent TM-GM2 modules in a LambdaDriver[®] chassis runs proprietary protocols in order to maintain "operational" and "standby" transponder operation.

3 types of TM-GM2 modules are available:

- **TM-GM2C/xx – CWDM laser wavelength**
- **TM-GM2D/xx – DWDM laser wavelength**
- **TM-GM2DL4/xx – Low dispersion DWDM laser wavelength (360 km range)**

The CWDM modules achieve distances of up to 100 km without regeneration with 8-channel Mux/DeMux.

The DWDM transponders achieve distances of up to 110 Km without regeneration with 8-channel Mux/DeMux. .

The low dispersion DWDM transponders achieve distances of up to 400 km (using EDFA Optical Amplifiers) without the need for dispersion compensation

Technical Specifications

Physical dimensions	W: 26.93 mm (1.06 In); H: 130.7 (5.145 In); D: 227.5mm (8.956 In)
Weight	0.55 Kg (1.21 lb)
Optical connector	MiniSC (MU) - WDM port; SFP -GE ports
WDM Data rate	2.5 Gbps
WDM grid	DWDM: ITU-T - G.694.1 CWDM: ITU-T - G.694.2
Minimum laser power	DWDM +3.0 dBm +/- 0,5 dBm CWDM +1.5 dBm
Minimum receiver sensitivity	-28 dBm
Maximum receiver power	-4 dBm +/- 1 dBm
2db Dispersion penalty	TM-GM2C/xx : 1600 ps/nm TM-GM2D/xx : 1800 ps/nm TM-GM2DL4/xx: at 7200 ps/nm

Order Info

TM-GM2DL4/xx	DWDM with low dispersion, 2 x GE ports transponder with SFP receptacles at channel # xx
TM-GM2D/xx*	DWDM 2 x GE ports transponder with SFP receptacles channel # xx
TM-GM2C/xx**	CWDM 2 x GE ports transponder with SFP receptacles channel # xx

*xx = ch#21,22,23,24....59,60

**xx = ch# 31,33,35....61

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