



# 4-CH WM1

## TWDM-PON Wavelength Multiplexer

The Wavelength Multiplexer (WM1) module multiplexes and demultiplexes up to 4 TWDM-PON wavelengths for downlink and uplink connectivity between Optical Line Terminal (OLT) transceivers and Optical Network Units (ONUs) in an NG-PON2 system. All ports provide bi-directional connectivity for uplink and downlink wavelengths over a single fiber. An optional monitor port is also available for the downlink and uplink signals to/from the Optical Distribution Network (ODN). The WM1 is provided in a compact, half-slot DMS form factor, allowing for up to 8 modules in 1RU rack space.



### Features

- Low insertion loss
- Negligible latency
- High optical power handling
- Completely passive (requires no power)
- Compact DMS form factor
- Bi-directional ports
- Optional monitor ports

### Compliance

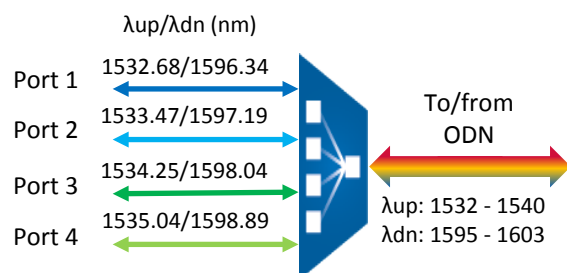
- GR-63-CORE
- ITU-T G.989
- RoHS

### Overview

TWDM-PON is the standardized technology for realizing an NG-PON2 system. Tunable ONUs and the use of multiple wavelengths in the downlink and uplink allow for capacities up to 40 Gb/s using 4 wavelengths today, expandable to 80 Gb/s in the future using 8 wavelengths.

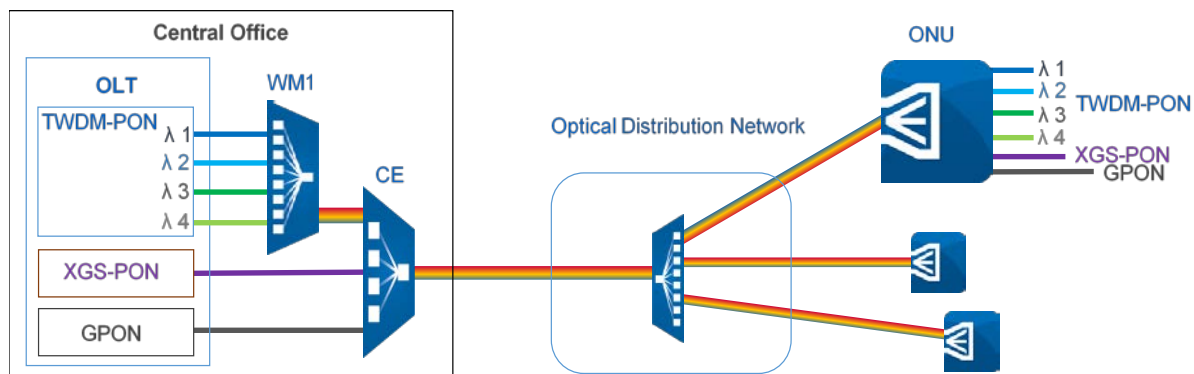
As with GPON, each wavelength uses broadcast TDM in the downlink and Time Division Multiple Access (TDMA) in the uplink to provide communication between each OLT transceiver, connecting to multiple ONUs.

Each OLT transceiver transmits a single L-band wavelength in the downlink at 10 Gb/s, and similarly receives and decodes a single C-band wavelength in the uplink. The downlink wavelengths from different OLT transceivers must be multiplexed before feeding the multi-wavelength signal into a common ODN. Similarly, the multi-wavelength signal received at the OLT must be demultiplexed into individual wavelengths, each then fed to the respective OLT transceiver. The required wavelength multiplexing and demultiplexing is provided by the WM1 module, as shown in the diagram to the left.



## Evolving Passive Optical Networks

Backward compatibility and interoperability with previous generation PONs is provided by NG-PON2. Different wavelengths were chosen than those used in previous generation PONs, allowing NG-PON2 deployments to co-exist with legacy PON technologies, such as GPON and XGS-PON, on the same ODN. In mixed PON deployments, ONUs must be equipped with rejection filters to avoid interference from other PON wavelengths, and a coexistence element (CE) must be present at the ODN headend to combine different PON wavelengths in the downlink, and similarly separate PON wavelengths in the uplink, as shown below. In addition to the WM1 module, Optelian offers a CE module for this application. For details about the CE module, refer to the CE datasheet.



## Specifications

Parameter	Value
<b>Module type</b>	DMS
<b>Size (H x W x D)</b>	1.5 x 10.7 x 16.5 cm (0.6 x 4.2 x 6.5 in.)
<b>Optical connectors</b>	LC/UPC
<b>Optical input power</b>	300 mW maximum
<b>Latency</b>	50 ns maximum
<b>Insertion loss</b>	2.0 dB maximum
<b>Insertion loss uniformity</b>	1.0 dB maximum
<b>Return loss</b>	50 dB minimum
<b>Channel passband</b>	0.22 nm
<b>Passband stability</b>	±0.05 nm

Parameter	Value
<b>Port 1 (up/down)</b>	1532.68/1596.34 nm
<b>Port 2 (up/down)</b>	1533.47/1597.19 nm
<b>Port 3 (up/down)</b>	1534.25/1598.04 nm
<b>Port 4 (up/down)</b>	1535.04/1598.89 nm
<b>Adjacent channel rejection</b>	30 dB minimum
<b>Non-adjacent channel rejection</b>	40 dB minimum
<b>Operating temperature</b>	-5°C to 55°C (23°F to 131°F)
<b>Storage temperature</b>	-40°C to 85°C (-40°F to 185°F)
<b>Compliance</b>	GR-63-CORE ITU G.989, RoHS

## Ordering Information

Model Number	Part Number	Description
WM1	1031-9440	WM1, DWDM 4-CH MUX and DMX, 1/2 WIDE DMS, LC

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