

# Medium-Range Optical Dispersion Measurement (ODM) Module

For T-BERD/MTS-6000A,-8000 Platforms



The VIAVI Solutions T-BERD®/MTS-6000, -6000A, and -8000 Optical Dispersion Measurement (ODM) module offers chromatic dispersion (CD), polarization mode dispersion (PMD), and attenuation profile (AP) test functions in one plug-in module. It is the industry's most compact and integrated dispersion solution dedicated to field testing fiber optic networks. The module includes a patented solution for CD measurement.

Today's fiber networks must meet exacting performance requirements to withstand the demands of widespread broadband access technology deployment. In addition to deploying fiber infrastructures that perform perfectly, network operators must reduce operating expenses while adding new revenue-generating services, all within an ever increasingly complex environment.

Both T-BERD/MTS test platforms provide an ideal, all-in-one solution that meets these challenges. The T-BERD/MTS platforms leverage small, rugged, and highly integrated plug-in modules that are battery operated, completely within drop-tested housing. The weather-resistant design and long battery life make them ideally suited for field use. Their modularity allows for easy field upgrades to technologies and advanced options that support the new and ever changing needs of field technicians.

## KEY FEATURES

- Combined CD, PMD, and AP in one plug-in module
- The most integrated dispersion solution dedicated to field testing
- Patented phase-shift solution for CD measurement
- Complete and accurate fiber characterization over the entire wavelength range (1260-1640 nm) with measurement points

## KEY APPLICATIONS

- Test very high speed networks (40 Gb/s and higher)
- Test DWDM/CWDM systems
- Test amplified links
- Test Metro, long haul, and very long haul fiber optic links



T-BERD/MTS-8000



T-BERD/MTS-6000

## The right testing combination

The ability to measure CD, PMD, and AP is essential during fiber characterization, which is a series of tests performed to identify fiber viability for very high-speed transmission systems. These tests include 10 Gigabit Ethernet (GigE) and 40 G in both the installation and maintenance phases. If not properly managed, CD, PMD, and AP severely degrade transmission quality that must operate optimally to deliver reliable broadband services. The combination of CD, PMD, and AP test functions lets technicians validate the compatibility of the fiber link with high-speed coarse wavelength division multiplexing (CWDM)/dense wavelength division multiplexing (DWDM) system implementation including reconfigurable optical add/drop multiplexer (ROADM) networks. The performance of each function makes the ODM module the right tool for characterizing fiber at transmission speeds of 40 Gb/s and higher.

### Chromatic Dispersion

- Two-ended test using one fiber based on phase-shift method
- 1450-1640 nm wavelength range characterization
- Suitable for any fiber type
- Dynamic range up to 33 dB

### Polarization Mode Dispersion

- Based on the fixed analyzer method using the Fourier transform
- Established in the market
- High dynamic range up to 45 dB

### Attenuation Profile

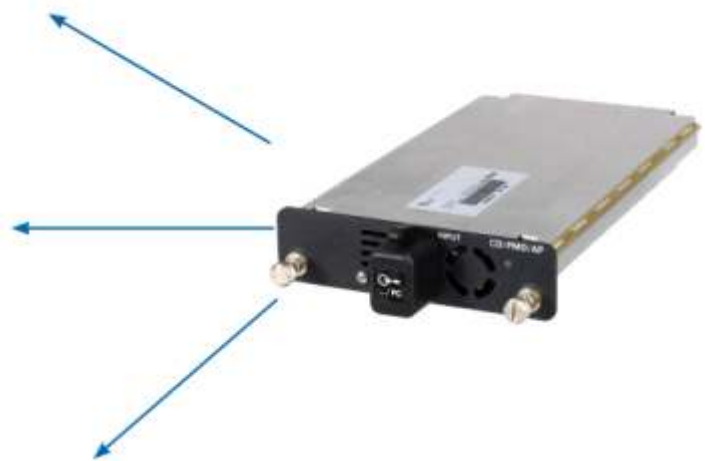
- dB loss/km over the full wavelength range: 1450-1640 nm
- Allow DWDM transmission band characterization

## High-performance solution

In addition to its high level of integration and industry-leading field test performance features, all test methods used in the ODM module are approved and/or referenced by all international standardization bodies.

Its high dynamic range (up to 65 dB), wide wavelength acquisition range, repeatability, and high level of accuracy make it the product of choice for reliable fiber characterization. High-performance features include:

- Test through non-bidirectional components, including erbium doped fiber amplifiers (EDFAs) and filters
- Very fast acquisition time (from 40 to 80 seconds) with minimum 500 acquisition points
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- One input port for any test configuration



## Field-Dedicated Solution

Housed in the T-BERD/MTS platform, the ODM module offers the highest level of integration and ruggedness.

When used in tandem with another T-BERD/MTS or a VIAVI handheld source, the ODM module can adapt to all existing fiber optic field measurement conditions. Its size and weight makes it the ideal solution for outside plant testing and its suite of personal computer interfaces and remote control capability offer the best fit for indoor use.

- Most compact dispersion test solution on the market
- A shock- and vibration-proof instrument with no moving parts (drop tested at 70 cm)
- Internal/online wavelength referencing
- Rugged, handheld, battery-operated light source

## Intuitive and Easy-to-Use Interface

The T-BERD/MTS user interface enables technicians to quickly learn how to use the three primary ODM test functions.

- No specific setup required
- No acquisition points and test time selection
- Customized wavelength range with pre-defined CWDM and DWDM ITU grid
- Pass/fail indication with predefined values according to bit rate

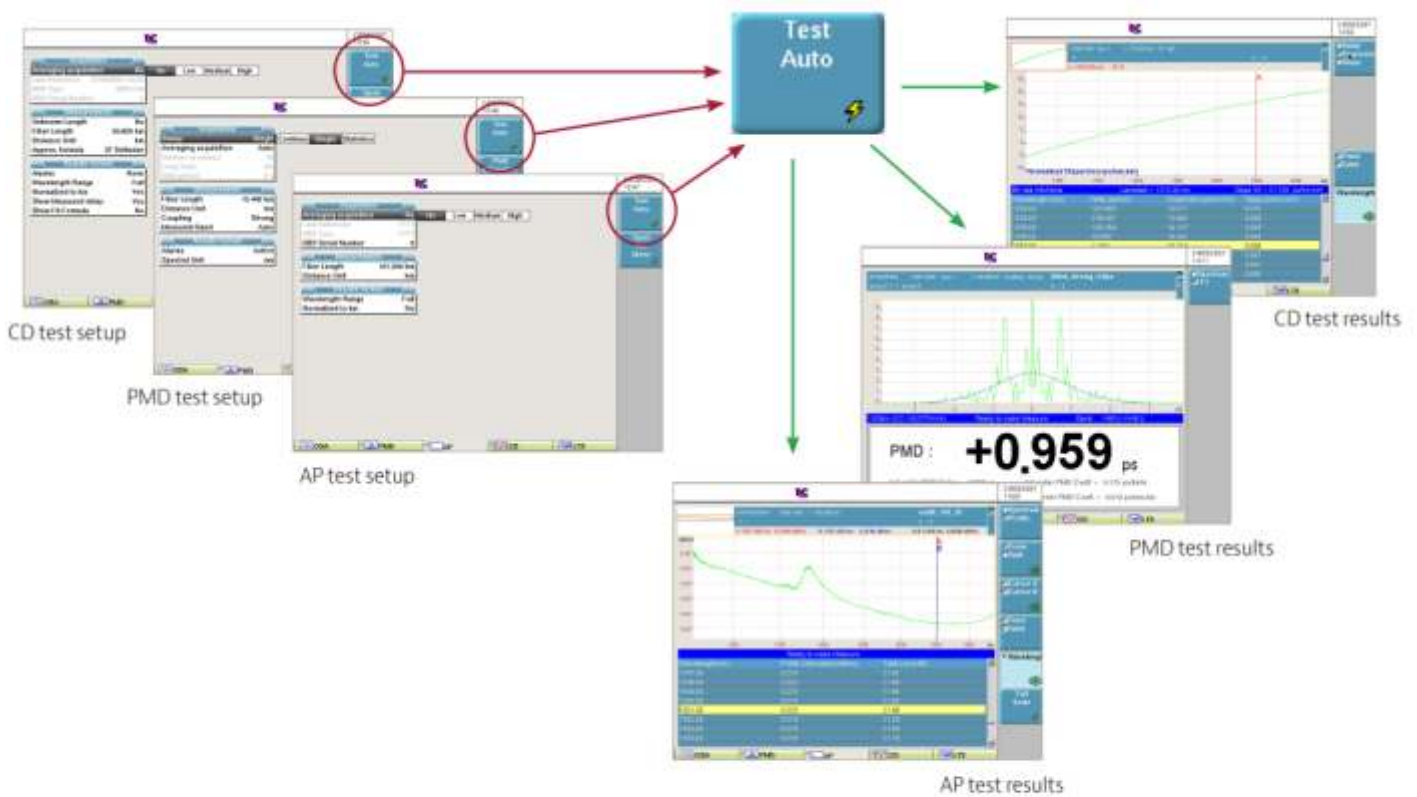


Figure 1 Test results provided at the touch of a button

## Specifications

ODM Module–Typical Specifications <sup>1</sup> at 25°C	
Weight	600 g (1.32 lbs)
Dimensions (W x H x D)	213 x 124 x 32 mm (8.38 x 4.88 x 1.26 in)
Optical Interfaces	
Applicable fiber	SMF 9/125 μm
Interchangeable optical connectors	FC, SC, DIN, LC
Attenuation Profile	
Dynamic range <sup>6</sup>	55 dB 60 dB <sup>2</sup>
Wavelength Uncertainty	±0.1 nm
Measurement uncertainty <sup>11</sup> at 1310 nm at 1550 nm at 1625 nm	0.006 dB/km 0.003 dB/km 0.004 dB/km
Measurement time <sup>10</sup>	6 s
Polarization Mode Dispersion	
Dynamic range <sup>6</sup>	58 dB 65 dB <sup>2</sup>
PMD measurement range <sup>7</sup>	0.08 to 130 ps
PMD absolute uncertainty <sup>8,9</sup>	±0.02ps ±2% PMD
PMD repeatability <sup>8,9</sup>	0.025 ps
Measurement time <sup>10</sup>	16 s, independent of PMD value
Chromatic Dispersion	
Wavelength Range	1260-1640 nm
Wavelength Uncertainty	±0.1 nm
Minimum length	1 km
Dynamic Range (dB)	45 dB 55 dB <sup>2</sup>
	<b>80 km</b> <b>10 km</b> <b>G.652</b> <b>G.655</b>
Zero dispersion wavelength uncertainty (nm)	±1.5    ±1.5
Zero dispersion wavelength repeatability <sup>3</sup> (nm)	0.1    0.1
Dispersion uncertainty <sup>4,5</sup> (ps/nm.km)	±0.05    ±0.1
Dispersion repeatability <sup>3,4</sup> (ps/nm.km)	0.005    0.005
Slope at zero wavelength repeatability <sup>3</sup>	0.5%    0.1%
Measurement time	40 to 80 s

## Ordering Information

ODM Module	
Description	Part Number
Chromatic dispersion test module (1260–1640 nm)	E81CD
Chromatic dispersion + PMD + Attenuation profile test module (1260–1640 nm)	E81DISPAP
PMD Test module	E81PMD
Broadband Source	
Handheld Broadband source for CD/PMD/AP (1460–1640 nm) High dynamic range (1525–1570 nm)	EOBS550
Broadband Source module for CD/PMD/AP (1260–1640 nm)	E81BBS2A

1. With broadband source (BBS) module E81BBS2A unless specified
2. With handheld broadband source OBS550 in high dynamic mode
3. Repeatability refers to the typical one-sigma standard deviation value, obtained for systems cycling over 20 measurements
4. 1530–1570 nm band
5. Excluding reference fiber uncertainties
6. With averaging
7. Up to 60 ps in strong mode coupling
8. Weak mode coupling, between 0.1 ps and 60 ps DGD range
9. Up to 35 dB attenuation and NPL standard traceable
10. Minimum value without averaging
11. Measured with 80 km G.652 fiber