VIAVI

T-BERD®/MTS-8000 DTSS

**Distributed Fiber Optic solution for measuring
Temperature and Strain using single ended Brillouin OTDR**

With over 30 years of experience in fiber optic test equipment for field measurements and monitoring systems, Viavi migrates its knowledge and technology to Distributed Fiber Sensing Applications.

Based on Brillouin scattering technology, Viavi BOTDR module measures the temperature and strain along an optical fiber cable. The BOTDR module can be set up in portable platform (T-BERD/MTS-8000) for cable commissioning and routine auditing or in rackable platform (OTU-8000) for permanent monitoring through the most widely deployed fiber monitoring system, the ONMSi.

Key Benefits

- Simultaneaous temperature and strain measurement
- Single-ended solution requiring only one fiber
- Portable and Rackable form factors
- Portable: Compact, modular and lightweight
- Rackable: Fully compatible with Viavi Fiber Monitoring solution (ONMSi)

Key Features

- BOTDR solution (Brillouin OTDR)
- Temperature & strain threshold monitoring
- Decorrelation of temperature & strain
- Multi-port measurements
- Low power consumption – rackable version
- Battery operated – portable version
- Remote connectivity

Applications

- Pipeline Monitoring
- Telecommunication
- Power cable monitoring
- Structural Health Monitoring (SHM)

Data Sheet

Applications

Pipeline monitoring

- Leak detection

- Ground movement monitoring

- Fatigue detection

Power Cable Monitoring

- Hot spot detection and localization

Telecommunication

- Buried fiber optic cables monitoring

- Aerial cable monitoring

Structural Health Monitoring

- Crack detection

- Infrastructure management & design

- Dam, Dike, Tunnel, Bridge monitoring

LASER COMPONENTS

Technical Specifications for DTSS (Brillouin Single-end, Portable & rackable version)

General Description (base unit with DTSS module)

Base Unit	Portable	Rackable
Height	267mm	2U
Width	326mm	19", 21" (ETSI), 23"
Depth	93mm	260mm (ETSI) / 280 mm (19" & 23")
Weight	Less than 10kg	Less than 15kg
Power Supply	AC 110/220 V; Battery offering 3 hours min	-48 VDC; Dual inputs
Consumption	< 50W	< 50W
Operating Temperature	-10°C to +45°C	+5°C to +45°C
Storage Temperature	-20°C to +60°C	-20°C to +60°C
Humidity	95% without condensing	95% without condensing
EMI/ESD	CE Compliant	CE Compliant
ROHS	Compliant	Compliant
Interface	1xRJ45 Ethernet 10/100/1000baseT port	2xRJ45 Ethernet 10/100/1000baseT ports
Media	SATA hard disk 250GB	Solid State Disk 4GB (32GB option)
Screen	Yes (10.4" TFT color touch screen)	No

Temperature Sensor

Input	One on front panel	One on front panel
PT100	Yes (4 wires Platinum, 5 meters long)	Yes (4 wires Platinum, 5 meters long)

Optical Switch

Internal Optical Switch	4 ports	8 ports
Connector Type	E2000/APC with cord & caps	SC/APC
Lifetime	1E09 switches	1E09 switches
Internal 2 by 1 switch	No	Option (SC/APC connector)

DTSS Specifications (Typical at 25°C unless specified)

Technology	Brillouin Single End DTSS
Laser Safety	Class 1
Distance Range	100 m to 200 km
Measurement time[1]	From 1min to several hours
Spatial Resolution (IEC 61757)	1m (up to 10km); 5m (up to 40km)
Spatial Step (sampling resolution)	8 cm min
Temperature Range	-200°C to +700°C[2]; (relative to frequency range 9-13GHz)
Temperature Repeatability (IEC 61757)	1°C[3]
Strain Range	– 30 000 µε to +40 000 µε; (relative to frequency range 9-13GHz)
Strain Repeatability (IEC 61757)[4]	20µ[3]
Combo Temperature & Strain repeatability (IEC 61757)[4]	2°C AND 50µ[5]
Measurement Variables	Strain, Temperature, Brillouin spectrum & shift, OTDR (loss), Monitoring (for rack-able unit only)

1. Measurement time depends on multiple parameters as mode, range, resolution, average, frequency scan.
2. Depending on Optical Fiber Type.
3. Strain or Temperature repeatability measurement conditions:
   - At 2σ; Distance sampling resolution: 0.25 m; Pulse width: 10 ns; Distance range: 13km; Measurement time: 5 mn
4. Similar method as temperature in strain mode.
5. Strain or Temperature repeatability measurement conditions:
   - At 2σ; Distance sampling resolution: 1m; Pulse width: 50 ns; Distance range: 13km; Measurement time: 7mn30

Ordering Information

Portable solution:

Part Number	Description
Hardware package	
PACK-DTSS4-MTS	Fiber Sensing complete package including MTS/TB 8000 platform and BOTDR with 4 ports E2000APC Switch
EM8000E	MTS-8000 V2 Tester for Standard Power
E80HCASE1	Hard Carrying Case for Multiple Module Configuration
E80EWIFIBLUE	WiFi and Bluetooth Option for 8000E Platform
EDFOS-MTS-TS4	OTDR Module 4 ports (MTS)
EDFOS-MTS-PT100	PT1000 Temperature sensor 5 meters long (MTS)
Base unit Software options	
EDFOS-MTS-DECSW	Decorrelation of temperature and strain
Services options	
EDFOS-Wk-Rate	Renting DTSS pack during one week
EDFOS-Mo-Rate	Renting DTSS pack during one month
E9STRAINING	One day of training
E9SSUPPORT	One day of support

Rackable solution:

Part Number	Description
Base unit	
E98OTU-FP-RF	OTU8000 BASE UNIT 48VDC - 2U – Front power input - FAN
EDFOS-OTU-SW	OTU software license for ONMSI&Fiber Sensing
Base unit options	
E98KIT19	19 inches rack-mounting kit for OTU-8000
E98KIT21	21 inches rack-mounting kit for OTU-8000
E98KIT23	23 inches rack-mounting kit for OTU-8000
E98RELAYS	Relay for external alarm reporting device
E98SSD32GB	32GB SSD for OTU8000 (Fiber Sensing)
E98LEFTFAN	Left Fan
E98ACDC	AC/DC converter (external unit)
Base unit Software options	
EDFOS-OTU-DECSW	Decorrelation of temperature and strain
BOTDR module	
EDFOS-OTU-TS8	BOTDR Module 8 ports switch (DTSS/OTU)
EDFOS-OTU-PT100	PT100 Temperature sensor 5 meters long (OTU)
EDFOS-OTU-TS8A	BOTDR Module 2 by 8 ports switch (DTSS/OTU)
ONMSi Software options	
EDFOS-ONMSI-SW	Temperature and strain monitoring under ONMSi