VIAVI T-BERD/MTS
4100-Series OTDR Modules
For T-BERD®/MTS-2000, –4000, –5800 & CellAdvisor 5G Platforms

VIAVI Solutions 4100-Series OTDR modules let field technicians rapidly, reliably, and cost-effectively install, turn up, and troubleshoot any optical network architecture—enterprise, metro, long-haul, and FTTx/access point-to-point or point-to-multipoint passive (PONs).

The OTDR modules' optical performance, combined with the complete suite of T-BERD/MTS and CellAdvisor 5G platform testing features, ensures that testing is done right the first time.

Standard testing features include:

- Automatic macrobend detection

- Summary results table with pass/fail analysis

- Bidirectional OTDR analysis

- Fast-Report — onboard report generation

- Smart Link Mapper (SLM) icon-based map view of the fiber link

- SmartAcq perform a short and long pulse acquisition to improve measurement reliability

- SmartTEST Assistant guides users with an easy step by step process

Benefits

- Up to 45 dB dynamic range and 256,000 acquisition points

- PON-optimized to test through a 1x256 splitter

- Combined single-mode/multimode into one (quad)

- Single/dual/tri-wavelength versions with 1310/1550/1625/1650 nm

- Integrated CW light source and power meter

- Ready for Enterprise-SLM, FTTA-SLM, and FTTH-SLM intelligent optical application software

- Instantly detects traffic when connected to live fiber (except on live/filtered port)

- ITU Fiber type identification (G65x A, B, C and D) with water peak detection at 1383nm

T-BERD/MTS-2000
one-slot handheld modular platform for testing fiber networks

T-BERD/MTS-4000 v2
Two-slot handheld modular platform for testing fiber networks

T-BERD/MTS-5800
Handheld test instrument for testing 10 G Ethernet and fiber networks

CellAdvisor 5G
Cell site test solution

Specifications

General (typical at 25°C)

Weight	0.35 kg (0.77 lb)
Dimensions (w x h x d)	Software can be enhanced and upgraded in the field

Optical Interfaces

Interchangeable optical connectors[1]	FC, SC, LC (PC or APC) and ST (PC)

Technical Characteristics

Laser safety class (21CFR)	Class 1
Distance units	Kilometers, feet, and miles
Group index range	1.30000 to 1.70000 in 0.00001 steps
Number of data points	- Up to 128,000 for MM, QUAD, LA - Up to 256,000 for MA2, MA3, MP2

Distance measurement

Mode	Automatic or dual cursor
Display range	0.1 up to 400 km
Cursor resolution	1 cm
Sampling resolution	4 cm
Accuracy	±.5 m ±sampling resolution $\pm 1.10^{-5}$ x distance (excluding group index uncertainties) for MA2, MA3, MP2 ±1 m ±sampling resolution $\pm 1.10^{-5}$ x distance for LA, MM and QUAD

Attenuation Measurement

Mode	Automatic, manual, 2-point, 5-point, and LSA
Display range	1.25 to 55 dB
Display resolution	0.001 dB
Cursor resolution	0.001 dB
Linearity	±0.03 dB/dB/±0.05 for LA
Threshold	0.01 to 5.99 dB in 0.01 dB steps

Reflectance/ORL Measurements

Reflectance accuracy	±2 dB
Display resolution	0.01 dB
Threshold	−11 to −99 dB in 1 dB steps

Source[2] Power Meter (optional)

CW source output power level	−3.5 dBm
Power level range (MM/SM)[3]	−3 to −30/0 to −55 dBm
Calibrated wavelengths (SM)	1310/1490/1550/1625/1650 nm
Calibrated wavelengths (MM)[4]	850/1300 nm
Measurement accuracy (SM)	±0.5 dB
Measurement accuracy (MM)[5]	±1 dB

OTDR Modules (typical at 25°C)

	Central Wavelength[6]	RMS Dynamic Range[7]	Event Dead Zone[8]	Attenuation Dead Zone[9]	Network Type	Applications
MM	850/1300 ±30 nm	26/24 dB	0.8 m	4 m	Enterprise/FTTA	Multimode network qualification
Quad	850/1300 ±30 nm 1310/1550 ±20 nm	26/24 dB 37/35 dB	0.8 m 0.9 m	4 m	Enterprise/FTTA/access/metro	Multimode and single-mode short- and medium-haul network qualification
LA	1310/1550/1650 ±20 nm	35/33/30 dB	1.5 m	6 m	FTTA/FTTH/access	Short-haul qualification FTTH drop-cable qualification/maintenance
MA2	1310 ±20 nm 1383 ±3 nm 1550 ±20 nm 1625 ±10 nm	40 dB 37 dB 40 dB[10] 38 dB	0.7 m 2 m 0.7 m 0.7 m	3 m 6 m 3 m 3 m	FTTA/access/metro	Short/medium-haul qualification Wireless fronthaul and backhaul Water peak detection at 1383nm
MA3	1310 ±20 nm 1550 ±20 nm 1625 ±10 nm 1650 +10/−5 nm	43 dB 41 dB 41 dB 41 dB	0.7 m	3 m	FTTH/access/metro/long-haul	Short/medium/long-haul qualification FTTH test up to 1x128 splitter
MP2	1310 ±20 nm 1550 ±20 nm 1625 ±10 nm 1650 ±10 nm	46 dB 45 dB 44 dB 42 dB	0.65 m	2.5 m	FTTH/long-haul/very long-haul	Long haul/very long haul qualification FTTH test up to 1x256 splitter

1. ST for QUAD/MM only
2. Sames wavelengths as the OTDR port. Not available on live port.
3. −2 to −50 dBm for Quad
4. Available on MM and Quad modules
5. Using a modal controller
6. Laser at 25°C and measured at 10 μs

7. The one-way difference between the extrapolated backscattering level at the start of the fiber and the RMS noise level, after 3 minutes averaging
8. Measured at ±1.5 dB down from the peak of an unsaturated reflective event
9. Measured at ±0.5 dB from the linear regression using a FC/UPC-type reflectance
10. Measured on optical fiber with Rayleigh parameter K(-82.01dB ± 0.17dB at 1546nm

Ordering Information

Description	Part Number
OTDR Modules	
Multimode 850/1300 OTDR module	E4123MM
Multimode/single-mode 850/1300/1310/1550 nm OTDR module	E4146QUAD
LA 1310/1550 nm OTDR module	E4126LA
MA2 1310/1550 nm OTDR module with straight connector	E4126MA2-PC
MA2 1310/1383/1550 nm OTDR module with straight connector	E4138MA283-PC
MA3 1310/1550 nm OTDR module with angled connector	E4126MA3-APC
MP2 1310/1550/1625 nm OTDR module with straight connector	E4136MP2-PC

Description	Part Number
Universal Optical Connectors (for MM and QUAD)	
Straight	EUNIPCFC, EUNIPCSC, EUNIPCST
8° angled	EUNIAPCFC, EUNIAPCSC
Universal Optical Connectors (for MA2, MA3 and MP2 modules)	
Straight	EUSCADS, EUFCADS, EULCADS
8° angled	EUSCADS-APC, EUFCADS, EULCADS-APC

Additional part numbers are available, please contact your VIAVI sales representative.

For more information on T-BERD/MTS-2000, -4000 V2, -5800 and CellAdvisor 5G test platforms or individual modules, refer to their respective data sheets and brochures.

For more information about our SLM (Smart Link Mapper) OTDR applications, refer to this document:
https://www.viavisolutions.com/en-us/literature/smart-link-mapper-otdr-applications-promo-sheet-en.pdf

VIAVI Solutions

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To reach the VIAVI office nearest you, visit viavisolutions.com/contact.

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VIAVI T-BERD/MTS-2000
Handheld Modular Test Set
Fiber Optic Multitest Tool for Smarter, Faster Field Testing

Costs, workflow, quality, network performance, and customer experience are critical for the success of today's fiber optic networks. Selecting the right test tools has become key toward meeting these needs. The VIAVI Solutions™ T-BERD®/MTS-2000 is a handheld multi-test platform that provides field technicians with a single handheld unit to install, turn-up and maintain these networks to the highest standards.

Its innovative design and hands-free bag ensure that all essential fiber test tools are close at hand, whatever the job or location. A large color screen with graphical user interface drives simple operation and optimal workflow in the field.

Test capabilities include a range of OTDR modules for multimode and single-mode testing, including CWDM & DWDM OTDR, as well as a range of FiberComplete™ modules for automated insertion loss/optical return Loss (IL/ORL), OTDR and fault finding. Both OTDR and FiberComplete modules are passive optical network (PON) optimized. The unit is also ready for connector end face pass/fail analysis to IEC standards with a digital analysis microscope.

The CWDM-OSA and DWDM-OCC modules also enable turn-up and troubleshooting of coarse or dense wavelength division multiplexing (CWDM DWDM or Hybrid) networks.

T-BERD/MTS-2000

Key Benefits

- Ensure the highest-quality connectorizing, splicing, and turn-up of new fiber links
- Improve workflow with hands-free solution, driving best practices to IEC standards
- Smarter and faster field testing with simple setup and instantaneous pass/fail results
- Boost productivity with improved report generation and flexible connectivity
- Decrease OpEx and increase field productivity when combined with StrataSync™ & CerTiFi

Key Features

- High-visibility touch-screen display
- Wide range of field installable OTDR modules including QUAD and PON
- Optional built-in optical power meter, visual fault locator (VFL), and optical talk set
- Flexible connectivity with Ethernet, USB, Bluetooth®, and WiFi capabilities
- Smart Access Anywhere (SAA) for remote control & field tech support
- StrataSync enabled — centralized cloud based asset, configuration, test data and workflow management

Applications

- Fiber optic test, qualification, certification and reporting
- Certify the fiber physical layer on FTTx/ PON, access, metro and enterprise networks
- FiberComplete automated uni & bi-directional IL, ORL, Length, OTDR certification
- Automated fiber inspection and IEC pass/fail analysis

Widest Range of Applications for Maximum Flexibility

The T-BERD/MTS-2000 provides the largest range of test capabilities offered in one handheld unit. The modular design allows service providers the maximum flexibility to scale their investment and evolve with the growth of their network.

The instrument supports the whole range of essential fiber analysis tools including connection inspection, connection check, source, ORL, OTDR, a power meter, and DWDM Optical Channel Checker (DWDM-OCC).

Application modules used with the T-BERD/MTS-2000 can also be used with the T-BERD/MTS-4000 V2 and the two products are interoperable.
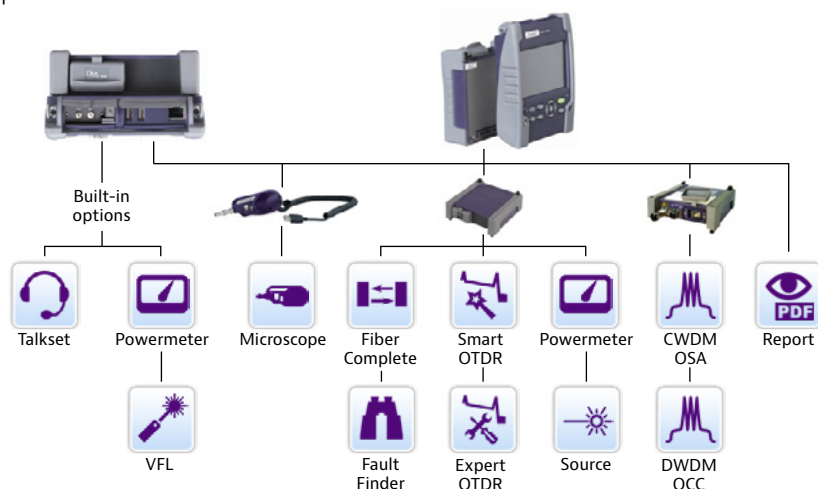
Boosted Productivity with Seamless Data Workflow

The T-BERD/MTS-2000 integrates various communication capabilities allowing remote control, data and setup uploads/downloads, and report transfer. The unit has one high-speed 1G Ethernet port, three USB ports, and optional WiFi and Bluetooth network connections.
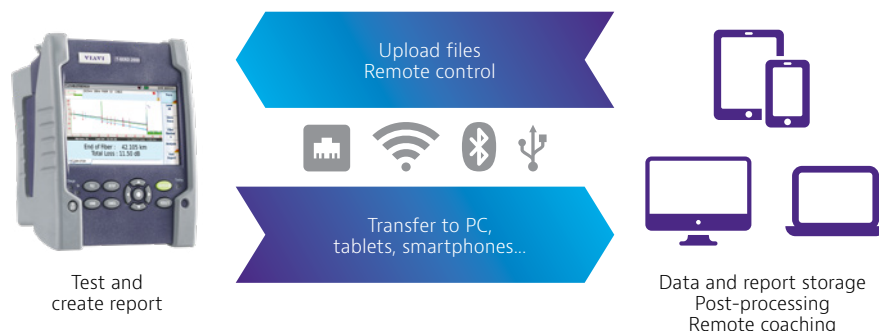
T-BERD/MTS-2000 Design Optimizes Operational Efficiency

1. 5-inch touch screen
2. Charge indicator
3. On indicator
4. File menu
5. Setup menu
6. Start/Stop
7. Testing indicator
8. On/Off
9. Home page
10. Cancel
11. Direction and validation keys
12. Results page
13. Loudspeaker
14. Headset jack
15. AC/DC input
16. Slave mini USB port
17. RJ45 connector
18. Master USB ports (2)
19. Power meter port
20. VFL or talk set port
21. WiFi and Bluetooth options

StrataSync — Empower Your Assets

StrataSync Core capabilities are included when you purchase any StrataSync-enabled instrument from VIAVI, there is nothing to buy to take advantage of these benefits. StrataSync Core includes asset and configuration management, test data management with 35 day limit, and even instrument self-management for techs via the Tech Portal. StrataSync Plus extends test data storage for up to 6 years and provides access to seasoned VIAVI StrataSync experts for assistance with setup, config, usage, reporting – just about anything that you desire.

Specifications

General (typical at 25°C)	
Display	5-inch TFT color touch screen (12.5 cm) Resolution 800 x 480 WVGA
Interfaces	Two USB 2.0 ports One mini-USB 2.0 port RJ45 LAN 10/100/1000 Mbps Built-in Bluetooth (optional) Built-in WiFi 802.11 b/g/n (optional)
Internal memory	8 GB (1 GB for storage)
Battery	Rechargeable lithium-polymer battery 9-hour operation as per Telcordia GR-196-CORE
Power supply	AC/DC adapter, input 100-250 V AC, 50-60 Hz; 2.5 A max, output 12 V DC, 25 W Electrical safety: EN60950-compliant
Size with module (H x W x D)	175 x 138 x 80 mm (6.9 x 5.4 x 3.2 in)
Weight with battery with battery and LM OTDR	0.864 kg (1.89 lb) 1.21 kg (2.67 lb)
Operating temperatures No options/modules With options/modules	−20 to +50°C (−4 to 122°F) 0 to +40°C (32 to 104°F)
Relative humidity	0% to 95% noncondensing

Built-In Power Meter[1]	
Calibrated wavelengths	850/1310/1490/1550/1625/1650
Wavelength range	800 to 1650 nm in 1 nm steps
Accuracy[2]	±0.2 dB
Measurement range[3]	+5 to −50 dBm
Maximum resolution	0.01 dB/0.01 nW

1. At 25°C, after 20 minutes stabilization time and after zero setting.
2. At calibrated wavelength (except 1650 nm)
3. −45 dBm from 800 to 1250 nm

Connector type	Universal push pull (UPP)

Built-In Visual Fault Locator (VFL)	
Wavelength	650 nm
Emission mode	CW, 1 Hz
Laser class	Class 2 per standards EN60825-1 and FDA21 CFR Part 1040.10

Built-In Talk Set	
Dynamic range	32 dB (typical)
Connector types	SC, FC, and UPP (three adapters included)

Ordering Information

Description	Part Number
T-BERD/MTS-2000 Handheld Modular Test Set Includes: touch screen, hands-free soft case, shoulder strap, power supply with 5 adaptable plugs (US, Europe, UK, Australia, Japan), on-line Getting Started manual	ETB2000HVT/ EM2000HVT
Built-in optical power meter and VFL, with 2.5 mm UPP connectors	E20PMVFL
Built-in optical power meter with 2.5 mm UPP connector	E20PM
Built-in visual fault locator (VFL) with 2.5 mm UPP connector	E20VFL
Built-in optical power meter and talk set	E20TSPM
Internal Bluetooth option	E20BLUE
Internal WiFi option	E20WIFI
USB2.0 digital video scope kit (P5000i), including 7 tips and soft case	EDFSCOPE5Ki
Soft carrying case for T-BERD/MTS-2000/4000	E40SCASE1
Hard carrying case for T-BERD/MTS-2000 Modular Test Set	E20HCASE
12 V car adapter for T-BERD/MTS-2000/4000	E40LIGHTER

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VIAVI
SmartOTDR Handheld Fiber Tester
The affordable, easy-to-use handheld tester for techs at any level

The lightweight and compact SmartOTDR speeds and optimizes field testing of metro and access networks— with a tailored OTDR interface and automatic analysis that any technician can understand.

With SmartOTDR, generic or user-defined setup configurations eliminate setup errors and maintain results consistency. One-touch operation and a single results window ensure fast and easy measurements, while robust wireless connectivity options increase productivity anywhere.

Microscope	VFL	Powermeter	SmartTEST OTDR
	Source	PON Powermeter	Expert OTDR
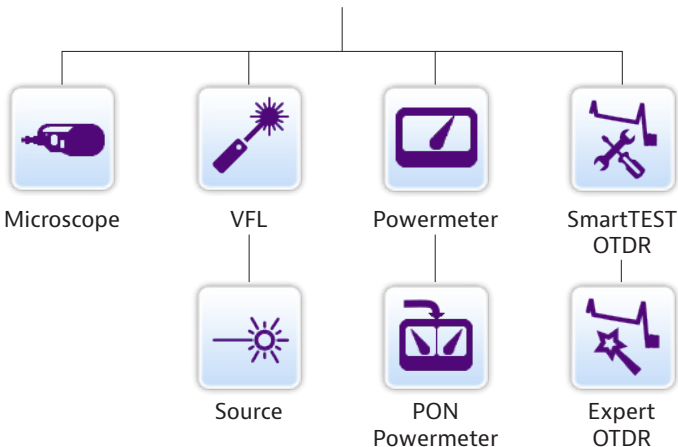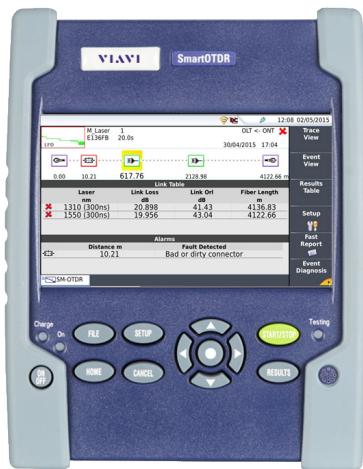
Benefits
- Combines all essential fiber tests in one handheld with visual fault locator (VFL), optical power meter (OPM), and P5000i microscope options
- Simplifies OTDR analysis with Smart Link Mapper (SLM) result view
- Upgrades easily in the field
- Automates testing with objective, pass/fail results
- Enhances productivity anywhere with powerful network connectivity options)
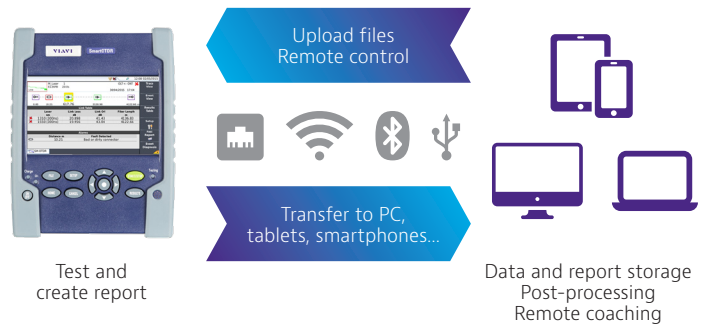
Features
- Single-/dual-/tri-wavelength versions with 1310/1550 nm and in-service 1625 or 1650 nm wavelengths
- Light, compact, hands-free design includes 5" high-visibility outdoor touch screen
- Integrated CW light source
- PON optimized to test through 1x128 splitter ratio with FTTH-SLM
- Built-in PON/XG-PON power meter (1490/1550/1578 nm)
- Automated fiber inspection and macrobend detection with pass/fail analysis software
- 3G/4G connectivity via USB, Bluetooth®/WiFi options
- 3-year warranty
- All-day battery life

Powerful Connectivity

Several connectivity options (3G/4G smartphones via USB and optional Bluetooth/WiFi) enable remote control as well as data and work-order transfers to-and-from tablets, smartphones, and computers. The SmartOTDR quickly resolves field issues in real time, and optional SmartAccess Anywhere (SAA) can open a tunnel in the cloud so a technician can remotely access and operate the instrument. Compatible with a wide range of cloud servers (WebDAV service providers), the SmartOTDR can also instantly share measurement reports using onboard FastReport .pdf report generation.

SmartOTDR includes a one-year trial of cloud-based StrataSync™ for asset, configuration, and test-data management, and to ensure that all instruments have the latest software and options installed.

Upload files
Remote control

Transfer to PC, tablets, smartphones...

Test and create report

Data and report storage
Post-processing
Remote coaching

Connectivity features and options enhance workflows

1. 5-inch high-visibility capacitive touch screen
2. Charge indicator
3. On indicator
4. File menu
5. Setup menu
6. Start/Stop
7. Testing indicator
8. On/Off
9. Home page
10. Cancel (switch off functions)

11. Direction and validation keys
12. Results page
13. Loudspeaker
14. AC/DC input
15. Slave mini USB port
16. Visual fault locator (VFL)
17. Master USB ports
18. OTDR port/continuous light source/power meter
19. OTDR live port (in-service test)/PON/XG-PON power meter
20. WiFi or Bluetooth options

Specifications (typical at 25°C)

General	
Display	5-inch capacitive color touch screen (12.5 cm)
Display resolution	800 x 480 W VGA
Interfaces	2x USB 2.0 ports, 1x mini-USB 2.0 port, built-in Bluetooth and WiFi (optional, dongles also available)
Storage	10,000 OTDR traces typical
Battery	Rechargeable Lithium-polymer battery, up to 20 hours of operation[1]
Power supply	AC/DC adapter, input 100-250 V AC, 50-60 Hz; 2.5 A max, output 12 V DC, 25 W
Electrical safety	EN60950 compliant
Size (HxWxD)	175 x 138 x 57 mm (6.9 x 5.4 x 2.24 in)
Weight (battery included)	Approx. 0.9 kg (1.98 lb)
Operating/storage temperature	Operating: −20 to +50°C; storage: −20 to +60°C
Humidity (noncondensing)	95%

OTDR		
Laser safety class (21 CFR)	Class 1	
Number of data points	Up to 256,000 data points	
Display range	0.1 km to 260 km	
Sampling resolution	4 cm	
Distance accuracy	(±1 m) ± (sampling resolution) ±(1.10^{-5} x distance), excluding group index uncertainties	
Attenuation resolution	0.001 dB	
Attenuation linearity	±0.04 dB/dB	
	SmartOTDR 100A	**SmartOTDR 100B**
Central wavelength[2]	1310/1550/1650 nm ±20 nm	1310/1550/1625/1650 nm ±20 nm
RMS dynamic range[3]	37/35/32 dB	40/40/41/41 dB
Pulse widths	5 ns to 20 µs	3 ns to 20 µs
Event dead zone[4]	1.35 m	0.9 m
Attenuation dead zone[5]	4 m	2.5 m
Splitter attenuation dead zone	Not available	45 m after 15 dB splitter loss

CW Light Source	
Output power level[6]	−3.5 dBm
Stability long term (8 hr)[7]	±0.05 dB

Built-in Power Meter (optional)	
Operating mode	270, 330, 1 kHz, 2 kHz, and TWINTest
Power level range	0 to −55 dBm
Calibrated wavelengths	1310, 1490, 1550, 1625, and 1650 nm
Measurement accuracy[8]	±0.5 dB

Built-in Visual Fault Locator (optional)	
Wavelength	650 nm
Emission mode	CW, 1 Hz
Laser class	Class 2 per EN60825-1 and FDA21 CFR Part 1040.10 standards

Built-in PON/XG-PON Power Meter (E118FA65PPM version)	
Wavelengths	1490/1550 nm; 1490/1578 nm
Measurement ranges	1490 nm: −35 to +5 dBm; 1550/1578 nm: −35 to +23 dBm
Measurement accuracy	±0.5 dB

1. Per Telcordia GR-196-CORE.

2. Laser at 25°C and measured at 10 µs.

3. The one-way difference between the extrapolated backscattering level at the start of the fiber and the RMS (SNR=1) noise level, after 3 minutes of averaging using the largest pulsewidth.

4. Measured at ±1.5 dB below the peak of an unsaturated reflective event using the shortest pulse width.

5. Measured at ±0.5 dB from the linear regression using a FC/UPC-type reflectance and the shortest pulse width.

6. ±1 dB.

7. After light source stabilization, warm-up time of 20 min.

8. At calibrated wavelengths and at −30 dBm.

Ordering Information

SmartOTDR Configurations	Part Number
All configurations include a hands-free soft case with neck strap, a stylus for capacitive touch screen, a Lithium-Polymer batteryand SC/PC or SC/APC connector(s).	
SmartOTDR 1550nm A-range handheld tester	E100A-PC/-APC
SmartOTDR filtered 1650 nm A-range handheld tester	E118FA65-APC
SmartOTDR filtered 1650 nm A-range handheld tester with broadband and PON-XGPON (1490/1550/1578 nm) power meters	E118FA65PPM-APC
SmartOTDR 1310/1550 nm A-range handheld tester	E126A-PC/-APC
SmartOTDR 1310/1550/filtered 1650 nm A-range handheld tester	E138FA65-PC/-APC
SmartOTDR 1310/1550 nm B-range handheld tester	E126B-PC/-APC
SmartOTDR 1310/1550/filtered 1625nm B-range handheld tester	E136FB-PC/-APC
SmartOTDR 1310/1550/filtered 1650 nm B-range handheld tester	E138FB65-APC
Additional OTDR Connector Adapters	
SC universal adapter	EUSCADS
FC universal adapter	EUFCADS
LC universal adapter	EULCADS
Accessories	
Additional Lithium Polymer battery	E10LIPO
Additional hands-free soft case with neck strap	E10GLOVE
Additional stylus for capacitive touch screen	EHVT-STYLUS
Large soft carrying case (optional)	E40SCASE1
12 V car lighter adapter (optional)	E40LIGHTER
EU/US-to-India type D power adapter (optional)	EINDIADPLUG
USB GPS receiver	EUSBGPSRECEIVER
Optional Tools	
VFL with 2.5 mm UPP adapter	E10VFL
Optical power meter option (same port as OTDR)	E10PM
MP-60 USB optical power meter with 2.5 and 1.25 mm UPP adapters	MP-60A
MP-80 USB high-power optical power meter with 2.5 and 1.25 mm UPP adapters	MP-80A
P5000i digital microscope kit with 7 tips	ESDFSCOPE5KI
Built-in WiFi / Built-in Bluetooth	E10WIFI / E10BLUE
External WiFi USB dongle / External Blutooth USB dongle	E60EWIFI / E60EBLUE
Software Options	
FTTH-SLM Base - Tailored OTDR App. for FTTH Networks (Basic PON Architectures)	ESMARTFTTH-100-BASE
FTTH-SLM Premium - Tailored OTDR App. for FTTH Networks (Advanced PON Architectures, including Unbalanced/tapered Splitters)	ESMARTFTTH-100
FTTH-SLM Assistant - Simplified Set-up Mode for FTTH-SLM Base or FTTH-SLM Premium Apps	EFTTHSLM-ASSIST-100
FTTA-SLM - Tailored OTDR App. for FTTA Networks	ESMARTFTTA-100
Enterprise-SLM - Tailored OTDR App. for Enterprise & Datacenter Networks	ENTERPRISE-100
CABLE-SLM - Management & Automation of High Count Fiber Cables OTDR Measurements	ESMARTCABL-100
SMARTACQ - Automatic Multi-Pulses OTDR Measurements	ESMARTACQ-100
SmartAccess Anywhere - Remote Access & Control from Anywhere	SAA-100-L2
GPS - Embedded GPS Coordinates into Test Files and Reports	EGPS

VIAVI Care Support Plans

Increase your productivity for up to 5 years with optional VIAVI Care Support Plans:

- Maximize your time with on-demand training, priority technical application support and rapid service.
- Maintain your equipment for peak performance at a low, predictable cost.

For more Information: go to viavisolutions.com/viavicareplan

Features

*5-year plans only

Plan	Objective	Technical Assistance	Factory Repair	Priority Service	Self-paced Training	5 Year Battery and Bag Coverage	Factory Calibration	Accessory Coverage	Express Loaner
BronzeCare	Technician Efficiency	Premium	✓	✓	✓				
SilverCare	Maintenance & Measurement Accuracy	Premium	✓	✓	✓	✓*	✓		
MaxCare	High Availability	Premium	✓	✓	✓	✓*	✓	✓	✓

MaxCare not available for SmartOTDR E100AS models