

MTTplus-410+ OTDR Module



MTTplus Modular Test Platform

The MTTplus-410+ fiber optics test module for the VeEX® MTTplus platform now has 3 cm resolution with up to 500,000 sampling points. The module supports a full range of test functions including OTDR, OPM, light source and VFL. Geo tagging of optical test data and picture capture allows technicians to fully document any test location.



Module Highlights

Optical Time Domain Reflectometer (OTDR)

- Singlemode wavelength options - 1310, 1550, 1625, and 1650 nm
- Filtered 1625 or 1650 nm port for in-service measurements
- 3 cm resolution with up to 500,000 sampling points
- Live fiber detection to avoid service disruption
- Dynamic range up to 50 dB
- Event dead zone 0.85 m, attenuation dead zone 3.5 m typical
- Link Map with optional V-Scout multi-pulse test profile
- Optional built-in launch fiber
- Fixed or universal optical connectors with (UPC or APC polish)

Optical Power Meter (OPM)

- Multiple calibrated wavelengths
- InGaAs detector for standard and high power levels
- Absolute (dBm, Watts) and relative (dB) power measurements
- WaveID detection of incoming wavelength from compatible VeEX light source
- Industry standard optical adaptors available

Optical Light Source (OLS)

- Optional OLS function based on OTDR laser fitted
- Stabilized output for insertion loss testing
- Wave ID/Loop mode to support multi-wavelength testing
- CW or modulation modes for use with fiber identifiers
- Auto-off feature to conserve battery power

Visual Fault Locator (VFL)

- Visible laser for patch-panel troubleshooting or localized fault finding
- CW and 1 Hz operating modes



Optical Time Domain Reflectometer (OTDR)

Intuitive Test Setup

An intuitive menu structure offers simple test setup for novice, expert, and skilled technicians alike. Test parameters can be configured manually by the user or set automatically by the unit.

Several wavelength combinations covering both multimode and singlemode applications are available, including short haul FTTX, Metro, long and very long haul networks.

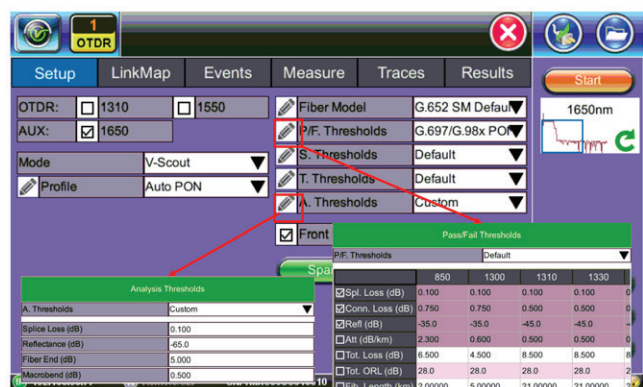


Live Fiber Check

The OTDR checks for the presence of light when connected to a fiber. This safety mechanism prevents receiver damage. If light is detected, a warning is issued and if power exceeds a pre-determined threshold, the OTDR laser is even disabled to prevent service disruption, measurement interference or damage to OTDR.

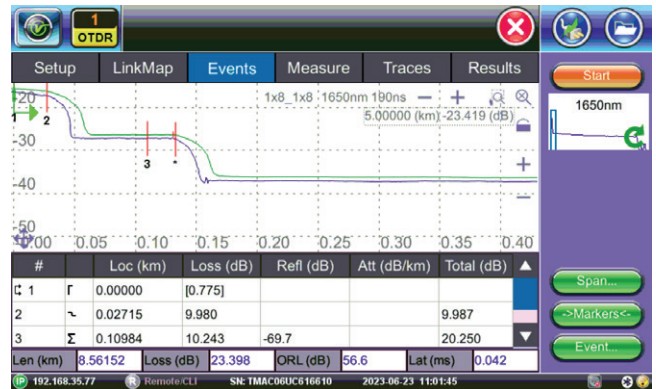
Analysis Thresholds

User can create custom analysis and pass/fail profiles which include: splice loss, connector loss, fiber lengths and reflectance. These profiles can be used to apply industry standards or unique customer requirements. Color coding used in the event table will display events exceeding Pass/Fail thresholds and alert technicians of a potential problem.



Accurate Event Analysis

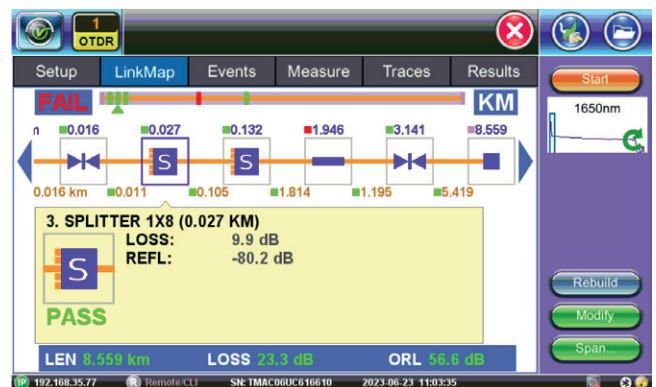
Reliable event detection and accurate analysis are crucial to document fiber links properly at the time of installation. These baseline records are essential to troubleshooting faulty fiber networks and reducing system downtime afterwards.



These fiber properties allow operators especially those providing co-location services to the financial sector, and skilled datacenter technicians, to “calibrate” and optimize optical links to ensure uniform latency among all customers and view bi-directional traces using X-view.

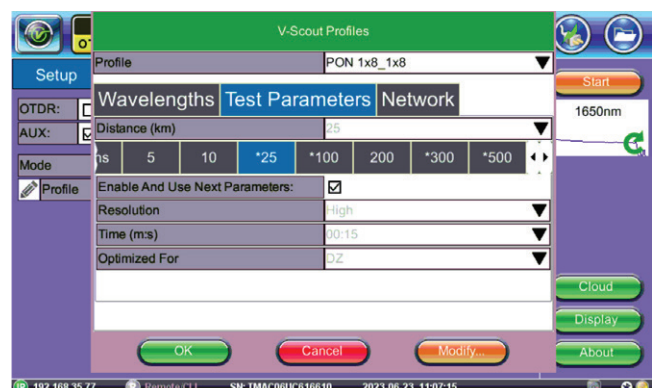
V-Scout and Smart Link Mapping

Advanced algorithms evaluate separate acquisitions and characterize the fiber span using intuitive symbols. Each individual acquisition can be customized and user defined as a test profile depending on network type or application. The LinkMap view eliminates event interpretation and provides greater analysis confidence to the technician, regardless of OTDR skill set.



V-Scout Profiles

V-Scout Custom Profiles puts experienced technicians into the driver seat. Users can now build their own custom V-Scout Test Plan and optimize it for their specific project using the automated V-Scout Profiles test mode. Select a maximum test range and V-Scout Profiles will list available pulse widths.

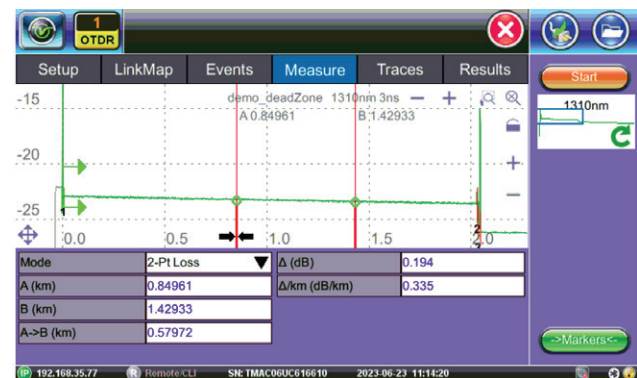


The MTTplus-410+ OTDR employs specialized techniques developed from decades of experience to locate and measure connectors, splices, optical splitters, and macro-bends.



Internal Launch Fiber Option

Near end fiber analysis is greatly improved thanks to the optional built-in G.657A2 launch fiber. Excellent dead zone performance and 3 cm sampling resolution allows the OTDR to evaluate loss and reflectance of the first connection and short fiber spans common in FTTA applications.



Optical Power Meter (OPM)

An optional Optical Power Meter (OPM) 800 to 1700 nm range can be fitted to measure absolute or relative optical power levels. The OPM incorporates a highly sensitive and stable InGaAs detector with six calibrated wavelengths providing accurate level measurements from +10 to -65 dBm. A high power version is available for DWDM or CATV applications for levels ranging from +26 to -50 dBm.

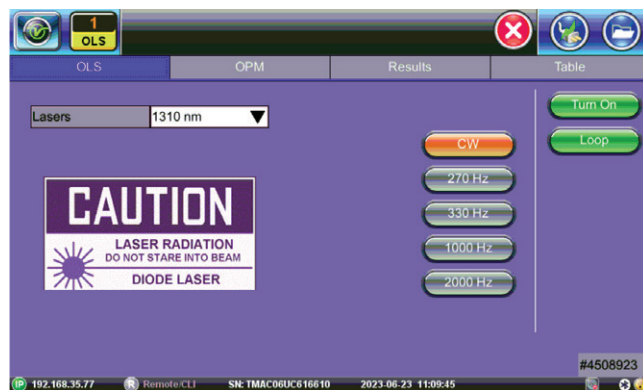
WaveID

The OPM employs WaveID, a unique wavelength detection system common to most VeEX optical test products. The OPM automatically recognizes a single or multi-wavelength signal transmitted by another VeEX optical tester connected to the far end of the link under test. The OPM measures the level at the corresponding wavelength automatically, eliminating setup errors and saving test time.

Switchable Adapters

The OTDR and OPM interfaces accept VeEX thread-on adapters, which can be swapped out in a matter of seconds. The OPM UCI (Universal Connector Interface) and removable adapters provide a contact-less meter interface with a variety of industry standard connector styles fitted with either angled or non-angled connector versions.

A protective dust cap to protect the adapter from dirt and other contaminants is also included.



Visual Fault Locator (VFL)

The optional Visual Fault Locator is a useful tool to identify poor connections, bad fusion splices and macrobends in fiber management closures. Operating at 650 nm, this visible source offers up to 5 km (3 miles) of range.

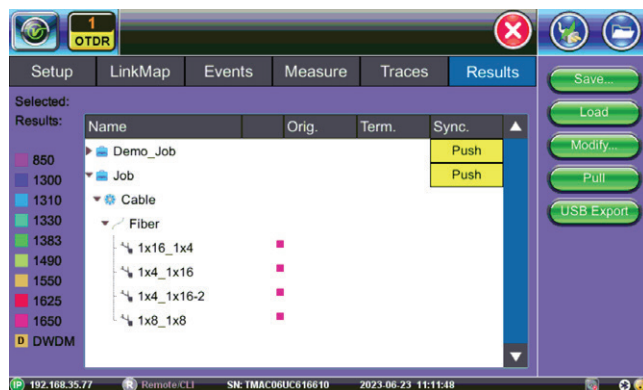
Optical Light Source (OLS)

The OTDR port can operate as an optional stable light source for loss testing. The output supports WaveID which automatically sets the wavelength when paired with compatible VeEX optical power meters. The source output can also be modulated for use with industry standard fiber identifiers.

Test Results (OTDR, OPM, FiberScope)

OTDR traces in the Telcordia SR-4731 sor format are saved in a logical hierarchy for easy sorting and archiving. Loss Test/OPM results are saved in oxlts format and connector inspection results are saved in JPG and PDF reports formats.

All test result files can be pushed directly to Fiberizer Cloud or VeSion® R-Server from the tester using an Internet connection, so that work supervisors have immediate access to test data being measured on site. Reference trace files can also be “pulled” from Fiberizer Cloud server for troubleshooting and restoration purposes. In addition, test results can be exported to USB so a PC can be used to generate a Cable Qualification Report using Fiberizer Desktop+ or Cloud software.



Multi-Fiber Testing

Overview

Multi-fiber cables fitted with MPO/MTP connectors are now commonplace in telecom, mobile and fiber deep applications. Previously, MPO/MTP cables were mostly used for data center interconnects, however fiber access applications such as FTTH/PON, FTTA/C-RAN and RPD/Fiber deep are also leveraging the high data rate, high-density benefits of multi-fiber cable infrastructure.

An MPO switch is the best way to test and quickly characterize individual fibers within a multi-fiber cable using an OTDR. Ribbon cables including multi-fiber cables terminated with MPO/MTP®, SC or LC connectors can be tested by using different patchcord assemblies.

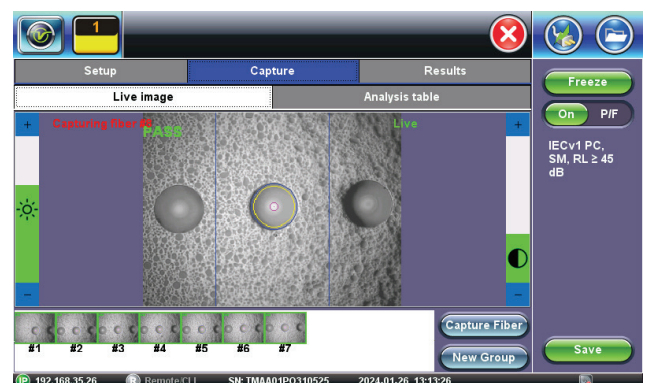
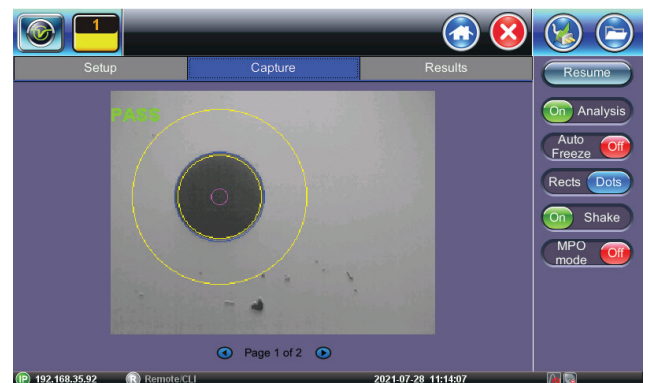
Fiber Inspection

DI-1000 and DI-3000 series Fiberscopes

VeEX offers cost effective fiberscopes for checking contamination on single and multi-fiber (MPO/MTP®) optical connectors. The MTTplus's large color display and advanced software automatically captures and freezes the focused image allowing connector end faces to be viewed in detail before end-face analysis is performed. Graphic and Tabular Pass/Fail results per the latest IEC 61300-3-35 standard are included.

Connectivity

Depending on the fiberscope, connection with the MTTplus platform is either via the unit's USB port or WiFi adaptor. The USB interface provides power and wired communication/operation with the manual focus DI-1000 series while the WiFi interface supports wireless operation with the new DI-3000 auto-focus series.



OTDR Trace Analysis and Documentation

Fiberizer® Desktop+

Fiberizer Desktop+ is a standalone PC software application to analyze traces acquired by the MTTplus OTDR. Users can edit traces manually, create event tables, generate reports using built-in templates and much more. This viewer displays trace files conforming to Telcordia (Bellcore) GR-196 & SR-4731 *.sor formats, and offers both 2-point and 5-point loss measurement modes. It also supports batch processing, a very useful feature for analyzing multiple fibers in a single cable. The software does not require Internet access to operate, but it can be interfaced with Fiberizer Cloud OTDR trace viewer at any time.

Work from Anywhere, Anytime

Fiberizer® Cloud

Fiberizer Cloud, powered by Optixsoft, not only empowers the OTDR, but also the workforce. Going way beyond traditional OTDR reporting methods or concepts, this cloud-based solution provides superior centralized test data management capabilities including powerful web based trace analyses. You can work from almost anywhere, at anytime because Fiberizer Cloud is a full online web service.

Streamlining Onsite Data Reporting

Fiber technicians and contractors tasked to validate new fiber installations or restoring cable routes after an outage are generally obliged to submit measured data (.sor files) and related documentation to the network operator as proof of delivery before being paid. Valuable time however is often wasted after the onsite work is completed, because critical test files are usually first stored to some local storage media before being transferred to a colleague via email for verification and further reporting.

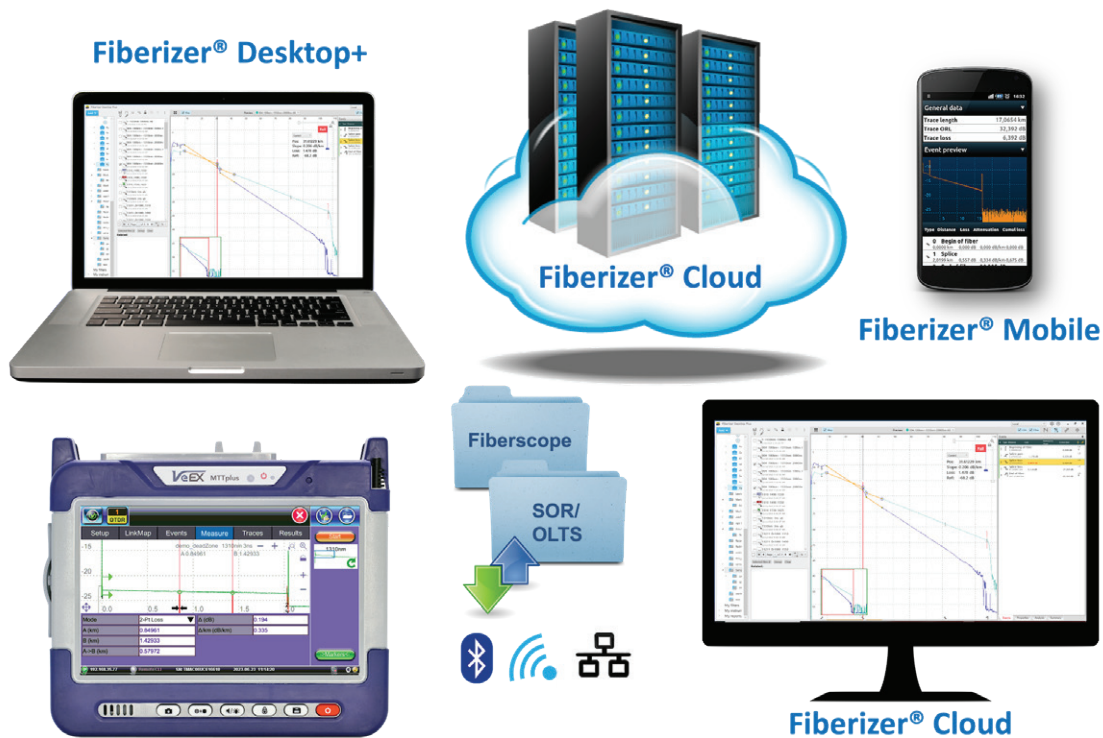
Fiberizer Cloud streamlines this information exchange, eliminating costly paper, e-mail or other time consuming communication methods - instead, time wastage can be avoided by transferring traces of jobs completed directly from the OTDR to Fiberizer Cloud. Professional PDF or MS Excel reporting functionality is also available, and users can create their own templates for reports. Bi-directional analysis of OTDR traces, tested from both ends of the optical fiber, can also be performed.



Value added data post processing

Fiberizer Cloud

cloud.fiberizer.com



Fiberizer Cloud Connectivity

Pair the MTTplus OTDR Multiservice tester via Bluetooth to a mobile smartphone, laptop or tablet PC and efficiently upload OTDR test data directly to the cloud server using any available wireless technology (3G, WiFi).

Total Compatibility

Fiberizer Cloud is compatible with both Windows and MacOS browsers, not limiting users to PC platforms only. OTDR trace files in Telcordia (Bellcore) GR-196 & SR-4731 *.sor formats are securely transferred via HTTPS connection, a fast reliable communication protocol commonly used in today's Internet applications.

Optical Connector Protector (Hardware Option)



Optical Connector Protector



Replaceable Ferrule



Optical Protector Cover
(optional)

1 Patent pending
2 Spare ferrules available in
pack of 4 for APC or UPC

The innovative, patent pending field-replaceable optical ferrule system¹ adds an extra layer of protection to the internal end-face of calibrated optical test ports, preventing contamination and accidental damage.

Users can quickly replace the ferrule² without the need for any tool while maintaining the integrity of the instrument's factory calibration. This novel approach eliminates the downtime, logistical hurdles and high cost associated with sending test sets to a service center for repair and recalibration.

All components in the system are reusable, with the exception of the small replaceable ferrule, helping to reduce environmental waste.

Field-Replaceable Optical Ferrule System

Universal Adapter

The universal connector adapter allows users to change the optical connector type conveniently whenever needed. Available in FC, SC, ST and LC.

Locking Ring

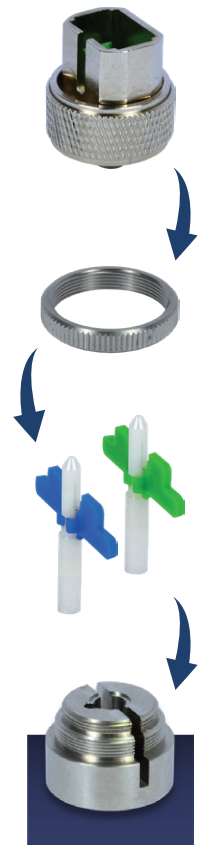
To secure the replaceable ferrule at its optimum location for the best performance.

Replaceable Ferrule with APC or UPC End-face

The self-aligned field-replaceable ferrule can be changed out in seconds. Users can select between APC or UPC end-face, ensuring compatibility with any test application requirement.

Optical Connector Protector Base

The panel mount protector base is made from high-grade stainless steel using a precision CNC process. This achieves proper alignment of the replaceable ferrule, minimizing insertion loss.



Optical Test Functions¹

OTDR	Singlemode	
Wavelength	1310/1550//1625//1650 ²	
Filter passband (nm)	1625: 1610-1680/1650: 1650 ± 10	
Filter isolation (dB) ³	>50 dB (1625: 1260-1590/1650: 1260 to 1620)	
Laser safety class	Class 1, 21 CFR 1040.10	
Display Range (dB)	0.1 to 54.165	
Dynamic Range (dB) ⁴	Refer to ordering guide	
Event dead zone (m) ⁵	Refer to ordering guide	
Attenuation dead zone (m) ⁶	Refer to ordering guide	
Reflectance accuracy (dB)	±2.0	
Pulse width (ns)	3, 10, 25, 30, 100, 300, 500, 1000, 3000, 10000, 20000 (where applicable)	
Distance range (km)	0.1 to 400	
Distance units	Kilometer, Meter, Mile, Kilofeet, or Feet	
Readout resolution (m)	0.01	
Sampling resolution (m)	Auto, High or Low (0.03 to 16 depending on module and distance range)	
Sampling points	Up to 500,000	
Distance uncertainty (m) ⁷	±(0.5 + resolution + 3x10 ⁻⁵ x L)	
Group index range	1.2000 to 1.8000 in 0.0001 steps	
Linearity (dB/dB)	0.03	
Loss threshold (dB)	0.001 to 100.000 in 0.001 step	
Loss resolution (dB)	0.001	
Measurement time	Realtime, auto or user defined presets (5s, 15s, 30s, 1 min, 2 min, 3 min, 10 min)	
Measurement modes	Loss (2-PT or LSA, dB/km), Reflectance, ORL, Latency	
Reflectance threshold (dB)	-0.10 to -99.9 dB in 0.1 dB step	
Typical real-time refresh (sec)	0.2	
Optical interface	Fixed connector or optional universal interface with interchangeable adapters	
Optical Test Options	Single Mode	Multimode
Visual Fault Locator (VFL)	Optional	
-Wavelength (nm)	650 ± 10 nm	
-Output (mW)	+1	
-Laser safety	IEC 60825-1, Class II	
-Optical connector	Universal 2.5 mm interface; Optional 2.5 mm to 1.25 mm converter	
Optical light source⁸	Optional	
-Wavelengths (nm)	Uses same lasers as OTDR	
-Output power (dBm)	>-2.5	
Level stability	±0.10 (15 min)	
-Source mode	CW or 270, 330, 2000 Hz modulation/tone	
-WaveID	Standard feature; Auto detection of VeEX OLS wavelength	
Optical Power Meter (OPM)	850, 1300	1310, 1490, 1550, 1625, 1650
-Calibrated wavelengths (nm)	850, 1300	1310, 1490, 1550, 1625, 1650
-CWDM Calibrated wavelengths option (nm)	1270, 1290, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1510, 1530, 1570, 1590, 1610	
-Power level range (dBm) - PM1, PM2	-65 to +10 (PM1)/-50 to +26 (PM2)	
-Tone Detection	270, 330, 1000, or 2000 Hz	
-Accuracy, % (dB) ⁹	±5 (0.2 dB)	
-Linearity, % (dB)	±2.5 (0.11 dB)	
Optical connectors adaptor	Universal FC/SC/ST/LC - non-contacting, polish independent	

Optical Modules

OTDR Configurations			Deadzone (m)		Applications
Order #	Wavelength (nm)	Dynamic Range (dB)	Event	Attenuation ⁶	
Point-to-Point Singlemode - 1 Wavelength					
Z07-22-229P	1550 ± 20 nm	50 ¹⁰	0.8 typ.	4 typ.	Short/ultra long haul fault locator
Point-to-Point Singlemode - 2 Wavelengths					
Z07-22-230P	1310/1550 ± 20 nm	38/36	0.85 typ.	3.5 typ.	Short/medium haul, wireless fronthaul and backhaul
Z07-22-231P	1310/1550 ± 20 nm	40/38	0.85 typ.	3.5 typ.	Short/medium haul
Z07-22-232P	1310/1550 ± 20 nm	43/41	0.7 typ.	3.5 typ.	Short/very long haul
Z07-22-233P	1310/1550 ± 20 nm	46/44	0.7 typ.	3.5 typ.	Short/very long haul
Point-to-Point Singlemode - In-Service Testing*					
Z07-22-234P	1310/1550//1625 (F)	38/36//38	0.85 typ.	3.5 typ.	Short to medium networks
Z07-22-235P	1310/1550//1625 (F)	40/38//40	0.85 typ.	3.5 typ.	Short/long haul networks
Z07-22-236P	1310/1550//1625 (F)	43/41//41	0.85 typ.	3.5 typ.	Short/medium networks
Z07-22-237P	1310/1550/1625 (F)	46/44//44	0.85 typ.	3.5 typ.	Short/long networks
Z07-22-238P	1310/1550//1650 (F)	40/38//39	0.85 typ.	3.5 typ.	Short/long haul networks
Z07-22-239P	1310/1550//1650 (F)	43/41//39	0.85 typ.	3.5 typ.	Short/very long haul networks

*Can be used to test a single splitter with up to 32 split using Manual PON.

Notes

1. Unless noted, all specifications are valid at 23°C ± 2°C (73.4°F ± 3.6°F) using SC-APC connectors
2. Center wavelength for 850, 1300, and 1550nm is ±20; for 1490, 1625, 1650 ≤ 10 depending on configuration
3. 1625/1650 nm SM live-port built-in filter isolation >50 dB
4. Typical dynamic range with longest pulse and three-minute averaging is the difference between extrapolated backscatter level at the start of test fiber to SNR=1
5. Typical SM 1310nm using shortest pulse measured 1.5 dB down from either side of the unsaturated reflective peak
6. Typical SM 1310nm @ Refl = -55dB, for 1550/16XXnm @ Refl = -55dB = 4m; Refl = -45dB add 1m to value
7. Does not include uncertainty due to fiber index; ±(0.5 + resolution + 3x10⁻⁵ x L) over full operating temperature
8. OLS shares the same test port as the OTDR
9. Between 5 to -50 dBm for standard OPM. Between 17 to -35 dBm for high power
10. 50 dB using 20 μs pulse width 16 meter res 10 min. on G.655; the difference between extrapolated backscatter level at the start of test fiber to SNR = 1

Additional Options & Accessories	Description
499-05-638	V-Scout Multi-pulse test option
Z66-00-258P	Standard OPM +10 to -65 dBm option
Z66-00-263P	High Power OPM +25 to -50 dBm option
Z66-00-264P	Visual Fault Locator option
F99-00-158G	FC-U1.25mm Conversion Adapter
Z66-00-352P	SM Lightsource option
Z66-00-108P	Internal Launch Cable, Singlemode
Z06-00-008P	DI-1000 wired FiberScope
Z06-00-040P	DI-1000MPO wired FiberScope with built-in XY control
Z06-00-043P	DI-3000 WiFi FiberScope with AutoFocus
Consult factory	Fiber launch reel, typically 1 km length (consult factory for other length)

MTTplus General Specifications

Size	188 x 168 x 80 mm, 7.4 x 6.61 x 3.15 in (W x H x D)
Weight (module only)	0.466kg (<1.03 lb)
Battery	Li-ion smart battery, 5800 mAh 10.8 VDC
Power Supply (AC Adaptor)	Input: 100-240 VAC, 50-60 Hz, Output: 15 VDC, 5.33 A
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	5% to 95% non-condensing
Display	TFT 7" full color touch-screen display
Ruggedness	Survives 1m drop to concrete on all sides
Altitude	3000 meter
Management Interfaces	4 x USB Ports (3x USB A and 1x micro-USB B) 1 x 10/100 Base-T Ethernet (RJ45) Bluetooth (optional) Cellular Data Card (optional) WiFi 802.11a, b, g, n and/or ac (optional) Data Card/GPS (optional), WiFi (optional)
Languages	Multiple languages can be supported
System Memory	Dedicated 8 GB USB flash storage