



## 33-960 Series - Micro OTDRs

- **Short Attenuation and Event Dead Zones** – for accurate location and characterization of events
- **Autotest Function** – provides simple one-button operation
- **Fast Data Acquisition** – important for troubleshooting intermittent problems
- **Interchangeable Fiber Adapters** – easy on-site replacement
- **USB port** – convenient data transfer to PC
- **Certifying OTDR Option** – for tier-2 certification
- **Optional Macro Bend detection** – accurately detects macro bends in singlemode fiber
- **Fiber Inspection Probe ready** – includes port for video inspection probes

### 33-960 Series Micro OTDRs

Designed with installers in mind, 33-960 Series Micro OTDRs offer excellent performance and ease of use in a truly handheld, lightweight and rugged package. Available as either an 850/1300 nm (multimode) or 850/1300/1310/1550 nm (multimode and single mode) OTDR, they are ideally suited for the installation and troubleshooting of LAN, campus and WAN fiber networks. Both models combine high measurement precision with the user friendliness of one-button operation resulting in accurate characterization of connectors and splices in addition to fast and reliable fault location.

With the MB option, these OTDRs provide clear PASS/FAIL indications. Distance, loss and ORL for each event is reported in a trace summary table making full certification of the link possible. Each OTDR is shipped in a kit containing everything you need to get started on the job, including a ruggedised carry case, PC software, rechargeable batteries and wall charger.

### Maximum Flexibility

33-960 Series Micro OTDRs are available in either multimode or quad configuration to meet your individual application requirements.



## 33-960 Series Micro OTDRs - Models and Applications



### Key Features:

- Short attenuation and event dead zones for accurate location and characterization of events. Suitable for even the shortest fiber links.
- Two wavelength "autotest" function with automatic adjustment of test parameters
- Manual mode allows users to define all test parameters.
- Real-time mode for troubleshooting. Useful when trying to identify intermittent problems.
- Clear characterization of events
- Fast data acquisition

### Target Applications:

- **Tier-2 certification** of premise and enterprise networks that require OTDR testing. The feature set of 33-960 Series Micro OTDRs is perfectly matched to this application.
- **Increasing bandwidths in LAN and campus fiber cabling** demands more in-depth testing. The 33-960 Series delivers all necessary test functions in an extremely user-friendly instrument.
- **Troubleshooting** of fiber links requires an accurate, easy-to-use OTDR. The high specification and small form factor of the 33-960 Series makes them perfect for troubleshooting installations.
- **WAN and FTTH cabling** requires an OTDR with a high dynamic range. Offering a dynamic range up to 29 dB, the 33-960 Series is more than capable of the job.

- Interchangeable fiber adapters with a wide variety of available configurations
  - PC Software included. Reports in Bellcore™ format
  - Color display
  - USB connection to thumbdrives or PCs.
  - Optional Certifying OTDR firmware
  - Optional macro bend detection on singlemode fibers
  - Video inspection probe ready
- (For more detailed specifications see page 4.)

### 33-960-10 MM OTDR

Multimode OTDR for 850 nm and 1300 nm. The 33-960-10 MM OTDR provides accurate measurements even on very short multimode links such as backbones. Press Autotest and the instrument automatically selects the optimum test configuration for the link being tested, thereby helping inexperienced users to obtain accurate and meaningful test results. More experienced users will find the manual and real-time modes useful when troubleshooting.

The MB Certifying OTDR firmware option turns 33-960 Series OTDRs into full certifying instruments that provide clear PASS/FAIL indications for each link tested.

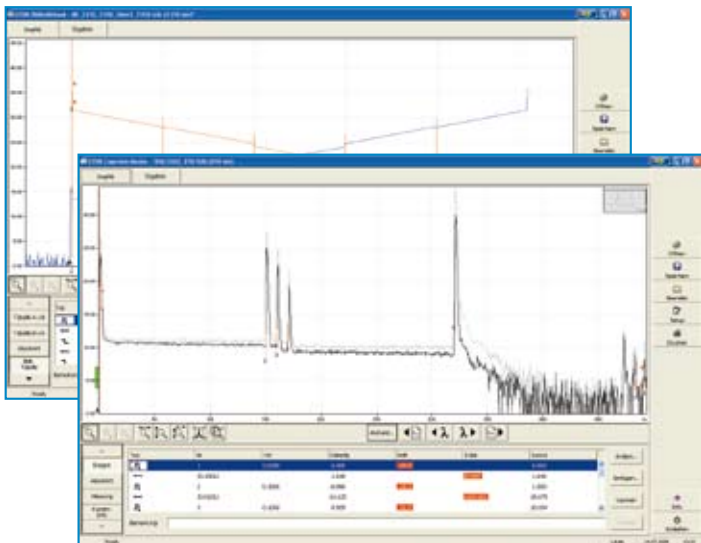
### 33-960-30 Quad OTDR

The 33-960-30 Quad OTDR provides all the same features as the MM version above, however it also incorporates an additional test port for 1310 nm and 1550 nm making this OTDR the all-in-one solution for your multimode and single mode test needs.

The MB Certifying OTDR firmware option also includes a Macro Bend Detector that was developed to help users pinpoint areas along the fiber, where the bend radius is too small.







## Comprehensive PC Software

Multilingual PC software is included as standard in all kits. This software is used to manage OTDR traces and test data. Downloads from the OTDR can be made to a memory stick or directly through the USB interface to a PC.

An AUTO mode makes interpretation of traces straightforward. The EXPERT mode allows more experienced users to evaluate test data using up to four markers for attenuation in dB and dB/km, optical return loss and reflection.

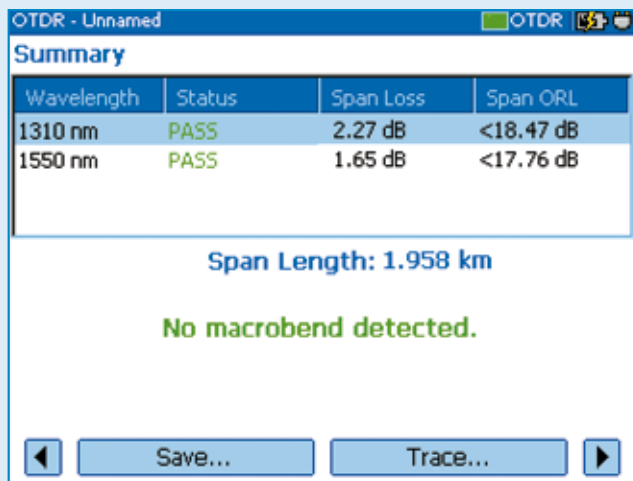
With adjustable PASS/FAIL limits, the software gives a clear indication of the quality of links being tested. The PC software allows export in Bellcore™ format, making test results compatible with world wide OTDR standards. The kit also includes a viewer for bi-directional tests, allowing the user to overlay A => B / B => A plots. Test results can also be printed or stored as PDF files.

## Certifying OTDR and Macro Bend Detector Option

The Certifying OTDR option turns 33-960 Series OTDRs into full certifying instruments with clear PASS/FAIL indication for every link. A single summary screen delivers all key measurement values. Installations that specify "Tier-2" certification will find this option invaluable as it gives instant PASS/FAIL results for every link without having to resort to cumbersome manual evaluation of traces. It also benefits less experienced users by providing clear decision points on whether a link is good or bad.

Order 33-960-10MB for the multimode OTDR with certification firmware or 33-960-30MB for the quad MM/SM OTDR with certification firmware.

*Please note that this option cannot be installed in the field. It is a factory installed option only, so whenever possible should be ordered at the same time as the main OTDR.*



The Macro Bend Detector finds areas along the fiber where minimum bending radii are undercut. Especially at splicing cassettes or patch panels, macro bends can cause excessive attenuation. Without this option macro bends are extremely hard to detect or are often confused with splices.



## 33-960-VP Video Inspection Probe

Poor cleanliness is the number one reason for failures in fiber optic networks. The optional video probe helps users document and troubleshoot fiber optic installations by providing visual inspection of connectors. Unlike optical microscopes, video microscopes offer 100% eyesight protection plus the ability to store connector images on the OTDR for later download and documentation.

Magnifications of 200x and 400x deliver crystal clear images of connectors. In addition, a wide range of probe tips makes the video probe a useful diagnostic tool in many different applications.

The 33-960-VP Video Inspection Probe is compatible with all 33-960 Series OTDRs which incorporate a video probe port as standard - no upgrade is required to drive the probe.

# 33-960 Series Micro OTDRs - Ordering Information and Detailed Specifications

## Specifications

Testing	33-960-10	33-960-30
Wavelength [nm]	850, 1300	850, 1300, 1310, 1550
Dynamic Range [dB]	24 / 25	24 / 25 / 29 / 28
Attenuation dead zone [m]	11 / 11	11 / 11 / 11 / 12
Pulse width [ns]	10, 30, 100, 275, 1000, 2500, 10000	
Event dead zone [m]	2.5 worst case	
Launch Conditions (MM)	Class CPR 1 or 2	
Linearity [dB / dB]	± 0.03	
Loss threshold [dB]	0.05	
Loss resolution [dB]	0.01	
Sampling resolution [m]	0.16 to 5	
Sampling points	Up to 30000	
Typical real time refresh [1/sec]	4	
Distance uncertainty [m]	± (0.75 + 0.0025% x distance + sampling resolution)	
Distance range [km]	0.1 to 40	MM: 0.1 to 40 SM: 0.65 to 160
Stable source output power [dBm]	-1.5	MM: -1.5 SM -6.5
Laser Safety	21 CFR 1040.10 and IEC 60825-1:1993+A2:2001 / Class 1M	
Hardware	All models	
Memory capacity	500 traces	
Data connectivity	USB A and USB B	
Size (HxWxD) [mm]	250 x 125 x 75 (9.8 x 4.9 x 2.9 in.)	
Weight	1 kg (2.2 lbs.)	
Temperature	Operating: -18°C to 50°C , Storage: -40°C to 70°C	
Batteries	2 x Li-Ion	
Power supply (mains)	110 - 230 V AC	
Power supply (unit)	9 - 24 V DC, 12 Watt	
Operating time	8 hours (per Bellcore™ TR-NWT-001138)	
Warranty	1 year	

## Ordering Information

33-960-10 MM OTDR Kit	33-960-30 Quad OTDR Kit
MM OTDR with 850/1300nm	Quad OTDR with 850/1300/1310/1550nm
Ruggedized carrying case	Ruggedized carrying case
PC-Software	PC-Software
CD with manual and Quick Reference Guide	CD with manual and Quick Reference Guide
Wall charger	Wall charger
2 Li-Ion rechargeable batteries	2 Li-Ion rechargeable batteries
SC Adapter	1 SC and 1 FC Adapter
33-960-10MB	OTDR Kit with Tier 2 certification option and macro bend detection
33-960-30MB	

## Optional Accessories

Item	Item
<b>33-960-VP</b> 200x and 400x video probe w/USB port	<b>33-961-10</b> Adapter for FC connectors
	<b>33-961-20</b> Adapter for SC connectors
	<b>33-961-30</b> Adapter for ST connectors
	<b>33-961-40</b> Adapter for E2000 connectors
<b>VFF5</b> - Visual Fault Locator, red light laser source, 5 km reach	<b>33-961-50</b> Adapter for DIN 47256 connectors
	<b>33-961-60</b> Adapter for HMS-10/AG connectors
<b>1912-00-1621</b> Cleaning Kit	
<b>33-960-BP</b> Rechargeable battery	
<b>33-960-KB</b> Foldable USB Keyboard	



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