

## M210e Hand-held OTDR

### Test, Troubleshoot and Document Single-mode and Multimode Fiber Networks



#### Features

- Industry leading TruEvent™ analysis
- Short dead zones provide precise testing of closely spaced events
- 34 dB dynamic range single-mode
- Crisp bright display for indoor/outdoor viewing
- Integrated Power Meter and VFL (visual fault locator)
- Inspection ready with DFS1 Digital FiberScope
- 16 hours battery life
- Rugged, lightweight (<1 kg)
- Multiple languages supported

#### Applications

- Enterprise network
- LAN/WAN
- Campus and military fiber networks and more

The M210e is the inspection ready OTDR that combines OTDR, OPM and VFL capability with a proven, easy to operate and understand interface. The M210e offers the intuitive Touch and Test™ user interface in a rugged, lightweight, easy-to-hold package ready for field use. Touch and Test simplifies the M210e user experience, minimizes human errors and reduces training time by providing one-touch access to the all major functions of the OTDR. The M210e allows setting Pass/Fail thresholds to industry standard TIA/ISO or user-values and automatically alerts users of failing fibers, enabling both experts and novice technicians to complete jobs more accurately and in less time.

Available as a single-mode, multimode, or single-mode/multimode model, the M210e comes in either a soft or hard case, also as part of kit for testing, inspection, and certification.

The M210e is ideal for testing, analyzing and troubleshooting enterprise, LAN/WAN campus and military facilities.

Thousands of test results may be stored internally or on the supplied USB drive. Test results are transferable, via USB cable or USB drive, to a computer for viewing, printing, and analyzing with the supplied Windows® compatible TRM® 2.0 Basic Analysis and Documentation Software (Test Results Manager). The supplied TRM 2.0 Basic is licensed for installation on up to 5 PCs.

## M210e Hand-held OTDR

### Specifications <sup>a</sup>

| OTDR                                       | MULTIMODE   | SINGLE-MODE  |
|--|---|--|
| Emitter Type                               | Laser   | Laser  |
| Safety Class                               | Class I FDA 21 CFR 1040.10 and 1040.11; IEC 60825-1:2007-03         | Class I FDA 21 CFR 1040.10 and 1040.11; IEC 60825-1:2007-03        |
| Center Wavelengths                         | 850/1300 nm   | 1310/1550 nm   |
| Wavelength Tolerance                       | ±20/±30 nm  | ±20/±30 nm   |
| Launch Condition <sup>n</sup>              | Controlled Launch at 850 nm <sup>n</sup>                            | N/A  |
| Live Fiber Detection <sup>m</sup>          | Yes   | Yes  |
| Dynamic Range (SNR = 1) <sup>b</sup>       | 28/28 dB  | 34/33 dB   |
| Event Dead Zone <sup>c</sup>               | 1.0 m   | 1.0 m  |
| Attenuation Dead Zone <sup>d</sup>         | 4.0 m   | 4.0 m  |
| Pulse Widths                               | 5, 10, 30, 100, 300 ns, 1 µs,                                       | 5, 10, 30, 100, 300 ns, 1, 3, 10 µs, 20 µs                         |
| Range Settings                             | 250 m to 30 km  | 250 m to 240 km  |
| Sampling Points                            | Up to 120,000   | Up to 120,000  |
| Minimum Data Point Spacing <sup>e</sup>    | 3 cm  | 3 cm   |
| Group Index of Refraction (GIR)            | 1.4000 to 1.6000  | 1.4000 to 1.6000   |
| Distance Uncertainty/Accuracy <sup>f</sup> | ±(1 +0.005 % x distance + data point spacing)                       | ±(1 +0.005 % x distance + data point spacing)                      |
| Linearity <sup>g</sup>                     | ±0.05 dB/dB   | ±0.05 dB/dB  |
| Loss Threshold                             | 0.02 dB   | 0.02 dB  |
| Loss Resolution                            | 0.01 dB   | 0.01 dB  |
| Reflectance Range <sup>h</sup>             | 850 nm: -14 to -58 dB (typical)<br>1300 nm: -14 to -63 dB (typical) | 1310 nm -14 to -65 dB (typical)<br>1550 nm -14 to -65 dB (typical) |
| Reflectance Resolution                     | 0.01 dB   | 0.01 dB  |
| Reflectance Accuracy <sup>h</sup>          | ±2 dB   | ±2 dB  |
| Real Time Refresh Rate <sup>j</sup>        | >2 Hz   | >2 Hz  |
| Units                                      | m, km, ft, kft, mi  |  |
| OTDR Modes                                 | Full Auto, Expert, Real-Time  |  |
| Trace File Format                          | Bellcore GR-196 Version 1.1, Telcordia SR -4731 Issue 2             |  |
| Trace File Storage Medium                  | Internal and USB  |  |
| Trace File Storage Capacity                | >1000 internal, 1000s on USB  |  |
| Trace File Transfer to PC                  | USB   |  |

#### Notes:

- a. All specifications valid at 23°C ±2°C (73.4°F ±3.6°F) unless otherwise specified.
- b. Longest Range and Pulse Width, 3 minutes Averaging Time, normal resolution.
- c. Typical distance between the two points 1.5 dB down each side of a reflective spike caused by a -40 dB (multimode) or -45 dB (single-mode) event using 10 ns pulse width.
- d. Typical distance from event location to point where trace is within 0.5 dB of backscatter.
- e. Range <8 km.
- f. Does not include GIR uncertainty. Is based on the trace and user positioned cursors.
- g. Typical.
- h. For a non-saturated event.
- j. 2 km Range, 100 ns.
- m. Signals greater than -20 dBm MMF and -30 dBm SMF will trigger the Live Fiber Indication warning.
- n. Comparable to Encircled Flux loss measurement on OM4 fiber networks.
- p. For OM1 fiber typical Backscatter Coefficient @850 nm -68 dB, @1300 nm -76 dB and attenuation coefficient @850 nm 2.77 dB, @1300 nm 0.52 dB.  
For OS1-OS2 fiber typical Backscatter Coefficient @1310 nm -79.6 dB, 1550 nm -82 dB and attenuation coefficient @1300 nm 0.31 dB, @1550 nm 0.18 dB.

## M210e Hand-held OTDR

### Specifications <sup>a</sup>

|  |   |
|--|---|
| <b>OPM (STANDARD)</b>                  |   |
| Calibrated Wavelengths                 | 850, 1300, 1310, 1490, 1550, 1625, 1650 nm (displays up to 3 simultaneously)  |
| Detector Type                          | InGaAs 2mm  |
| Display Range <sup>b</sup>             | +6 to -70 dBm   |
| Accuracy @ -10 dBm                     | ±0.25 dB  |
| Resolution                             | 0.01 dB   |
| Measurement Units                      | dB, dBm, mW   |
| Wavelength ID <sup>c</sup>             | Yes   |
| Set Reference                          | Yes   |
| Data Storage                           | Yes   |
| Tone Detection <sup>d</sup>            | 270 Hz, 330 Hz, 1 kHz, 2 kHz  |
| <b>VFL (STANDARD)</b>                  |   |
| Emitter Type                           | Laser   |
| Safety Class                           | Class II FDA 21 CFR 1040.10 and 1040.11; IEC 825-1:1993, 60825-1:2007-03  |
| Wavelength                             | 635 nm ±20 nm   |
| Output Power (nominal)                 | 0.8 mW  |
| <b>GENERAL</b>                         |   |
| Display Type                           | 3.5-inch transfective color, high contrast, high reflectivity (20%) for optimum indoor/outdoor viewing , QVGA with touchscreen                                    |
| Size (in boot)                         | 23 x 11 x 7 cm (8.8 x 4.3 x 2.8 in)   |
| Weight                                 | <1.4 kg (3 lb)  |
| Power                                  | Removable Li-ion or AC/DC power adapter (input 100-240 V, ~1.5 A 47-63 Hz) output 18 V DC/3.6 A (can test while charging, can operate on AC with battery removed) |
| Battery Life <sup>e</sup>              | 16 hours  |
| Recharge Time <sup>f</sup>             | 4 hours   |
| Auto Shut Off                          | 0-60 minutes  |
| Connectivity                           | USB host/full speed 1.1   |
| Operating Temperature                  | -10°C to +50°C  |
| Storage Temperature                    | -20°C to +60°C  |
| Relative Humidity                      | 0 to 95 % RH (non-condensing)   |
| <b>DFS1 DIGITAL FIBERSCOPE SUPPORT</b> |   |
| Field of View                          | 400 x 300 µm  |
| Optical Resolution                     | 4 µm  |
| Detection Capability                   | 2 µm  |

#### Notes:

- a. All specifications valid at 23°C ±2°C (73.4°F ±3.6°F) unless otherwise specified.
- b. Measurement Range:  
+3 to -65 dBm for 1300 to 1625 nm, and +3 to -60 dBm for 850 nm
- c. Wavelength ID Range:  
+3 to -50 dBm for 1300 to 1625 nm, and +3 to -40 dBm for 850 nm
- d. Tone Detect Range:  
+3 to -50 dBm 1300 to 1625 nm, and +3 to -40 dBm for 850 nm
- e. Typical with new battery, per GR-196-Core Issue 2.
- f. Typical, from fully discharged to fully charged state, unit may be operating.

## M210e Hand-held OTDR

### M210e Models and Included Adapters

| WAVELENGTHS (nm) |      |      |      | DYNAMIC RANGE (dB) | OTDR PORT ADAPTERS | OPM PORT ADAPTERS    | AFL BASE MODEL NO. |
|------------------|------|------|------|--------------------|--------------------|----------------------|--------------------|
| 850              | 1300 | 1310 | 1550 |                    |                    |                      |                    |
|                  |      | ◆    | ◆    | 34/33              | SC, FC             | SC, 2.5 mm Universal | M210e-20           |
| ◆                | ◆    |      |      | 28/28              | SC, ST             | SC, 2.5 mm Universal | M210e-22           |
| ◆                | ◆    | ◆    | ◆    | 28/28/34/33        | SC, FC, ST         | SC, 2.5 mm Universal | M210e-25           |

All M210e OTDRs include a USB flash drive, an AC adapter, UCI switchable adapters for OTDR and OPM ports, trace analysis and documentation software and a quick reference guide.

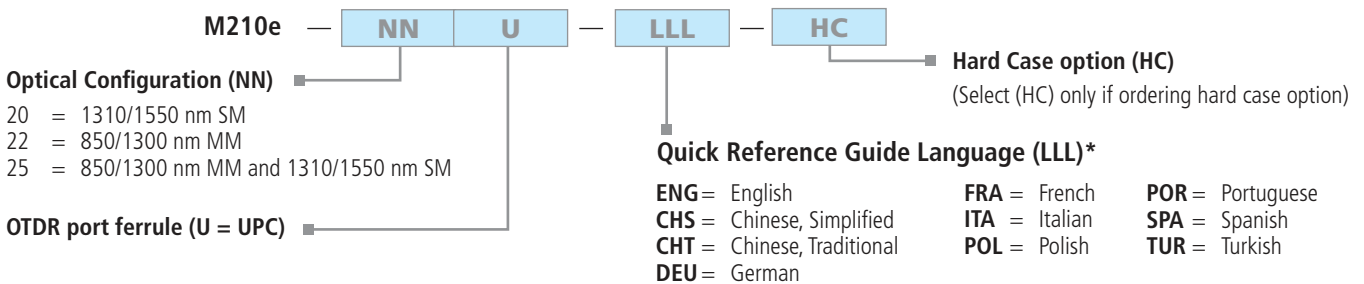
### Ordering Information

| DESCRIPTION   | AFL NO.          |
|---|------------------|
| M210e QUAD Certification Kit (Tier 1 and 2): M210e QUAD, OLS4, DFS1* in hard case | M210e-25K-01-HC2 |
| M210e QUAD Test and Inspection Kit (Tier 2): M210e QUAD, DFS1* in hard case       | M210e-25K-01-HC1 |
| M210e OTDR, SM (1310/1550), OPM, VFL in hard case                                 | M210e-20U-01-HC  |
| M210e OTDR, MM (850/1300) OPM, VFL in hard case                                   | M210e-22U-01-HC  |
| M210e OTDR, QUAD (850/1300/1310/1550), OPM, VFL in hard case                      | M210e-25U-01-HC  |
| M210e OTDR, SM (1310/1550) OPM, VFL in soft case                                  | M210e-20U-01     |
| M210e OTDR, MM (850/1300) OPM, VFL in soft case                                   | M210e-22U-01     |
| M210e OTDR, QUAD (850/1300/1310/1550), OPM, VFL in soft case                      | M210e-25U-01     |

When ordering, select options as follows: Optical Configuration (NN), (U) for UPC connection and Language (LL). Add (HC) only if ordering the hard case option.

Example: M210e-25U-01-HC -> This model number indicates M210e QUAD with the English/European language pack in the optional hard case.

\* When ordering, specify DFS1 model (See Accessories Table below).



### Accessories

| DESCRIPTION   | AFL NO.                       |
|---|-------------------------------|
| DFS1 Digital FiberScope PC/UPC inspection kit       | DFS1-00-04XU                  |
| DFS1 Digital FiberScope APC inspection kit          | DFS1-00-04XA                  |
| DFS1 Digital FiberScope kit without adapters        | DFS1-00-04XN                  |
| Fiber Ring, 50/125 μm multimode, 150 m              | FR1-M5-150-x1-x2 <sup>a</sup> |
| Fiber Ring, Laser Optimized, 50 μm multimode, 150 m | FR1-L5-150-x1-x2 <sup>a</sup> |
| Fiber Ring, 62.5/125 mm multimode, 150 m            | FR1-M6-150-x1-x2 <sup>a</sup> |
| Fiber Ring, single-mode, 150 m                      | FR1-SM-150-y1-y2 <sup>a</sup> |
| Wet Cleaning kit for SC/FC/ST/LC connectors         | 8500-20-0900                  |
| Dry Cleaning kit                                    | 8500-20-0901                  |

|  |                |
|--|----------------|
| Basic Cleaning kit with carry case                         | FCP2-00-0900   |
| Basic Cleaning kit with MPO Cleaners and carry case        | FCP2-00-0901   |
| One-Click Cleaner SC, ST, FC (500+ cleans)                 | 8500-05-0001MZ |
| One-Click Cleaner LC/MU (500+ cleans)                      | 8500-05-0002MZ |
| One-Click Mini-100 SC, ST, FC (100+ cleans)                | 8500-05-0005MZ |
| One-Click Mini-100 LC/MU (100+ cleans)                     | 8500-05-0006MZ |
| One-Click Cleaner Ultra 2.5 SC, ST, FC (enlarged cleaning) | 8500-05-0007MZ |
| One-Click Ultra Cleaner D-LC (Duplex LC, 500 cleans x 2)   | 8500-05-0008MZ |

**Note:**

a. When ordering Fiber Rings, specify connector types (x1, x2, y1, y2).



### International Sales and Service Contact Information

Available at [www.AFLglobal.com/Test/Contacts](http://www.AFLglobal.com/Test/Contacts)