

**NOYES®
M310 Enterprise OTDR**

Designed for Enterprise Network Testing, Troubleshooting and Documentation



M310 OTDR with DFS1 Digital FiberScope

Features

- Integrated Optical Power Meter and Visual Fault Locator
- Short dead zones provide testing of closely spaced events
- Industry Lead Auto Event analysis insures no missed and false events
- Front Panel and First Connector Check
- Live fiber detection prevents damage to network equipmen
- Inspection capable with DFS1 Digital FiberScope
- 16-hour battery life
- Multiple languages supported ([see page 6](#))

Test Modes

- Full Auto OTDR – Auto set-up for quick and easy fiber cabl construction testing and fault location
- Expert OTDR – Full function OTDR for precision test set-ups includes Auto and Auto-Once setup options
- Real-Time OTDR – Fast fault location and splice verificatio
- Optical Power Meter – Measure optical power or fiber los
- Visual Fault Locator – Red laser for fiber bend an break location

Enterprise networks have evolved in ways that create more demanding testing of optical cables. This requires an OTDR that can accurately locate and measure closely spaced events on high speed networks. The M310 has the short dead zones required to test these networks. The large number of cable runs in modern enterprise networks and data centers, requires automated detection and measurement of all events in each cable. The M310 provides accurate and reliable event analysis for these critical networks. The M310’s Enhanced Event Analysis software is a product of extensive research into the properties of fiber optic cable events an provides a new level of accuracy and reliability in field test equipment

The M310 OTDR is available in single-mode, multimode or QUAD models and are optimized for testing, analyzing and troubleshooting enterprise, data center, LAN/WAN, campus and military fiber network .

Rugged, lightweight and easy to hold, the M310 has a Touch and Test user interface that makes it easy for experts and novices to test and document fiber networks accu ately and quickly. With an integrated Optical Power Meter and Visual Fault Locator the M310 provides complete Tier 1 insertion loss and Tier 2 OTDR testing. Using pre-set Industry ISO/TIA standards or user set Pass/Fail thresholds, technicians are alerted to installation problems and failures. The M310 single-mode and QUAD models can be ordered with an Advanced Analysis software option that includes Macro/Microbend detection and Bi-directional trace analysis.

All models support end-face visual inspection using an AFL DFS1 Digital FiberScope. OTDR traces , OPM measurements and fiber end face images can be saved together in a job and downloaded to a computer for analyzing and editing using the included Test Results Manager, TRM® 2.0 application software.



NOYES® M310 Enterprise OTDR

M310 OTDR Soft and Hard Case Options



M310 QUAD Certification Kit (Tier 1 and Tier 2)



M310 QUAD Test and Inspection Kit (Tier 2)



M310 OTDR in Hard Transit Case



M310 OTDR in Soft Case

M310 QUAD Certification Kit in Hard Transit Case

This kit is designed for integrated single mode and multimode Tier 1 and Tier 2 testing with fiber end-face image capture. The M310 stores OTDR traces, loss readings and end-face images in a logical Job Structure for each fiber. Review results on the M310 and easily transfer data to a PC for analysis and to produce acceptance reports using companion TRM 2.0 software (included). In TRM 2.0 Basic, apply standards to loss readings to assure fibers meet the low loss needs of high capacity fiber network. This kit includes the QUAD M310, OLS4 LED Laser Source, DFS1 Digital FiberScope and cleaning accessories, in a compact, hard carry case. The hard case is injection molded ABS with a full length hinge, padlock loops, secure latches and O-ring seal to protect the contents from dust and moisture. The case is large enough to hold test, inspection and cleaning accessories and small enough to carry on an airplane.

See [page 3](#) for available accessories.

M310 QUAD Test and Inspection Kit in Hard Transit Case

This kit is designed for performing Tier 2 OTDR testing and troubleshooting as well as end-face inspection. This kit includes the QUAD M310, DFS1 Digital FiberScope and cleaning accessories in a compact rugged hard case.

See [page 3](#) for available accessories.

M310 OTDR in Hard Transit Case

Available for SM, MM or QUAD OTDR models. The hard transit case is large enough for optional test, inspection and cleaning accessories. See [page 3](#) for available accessories.

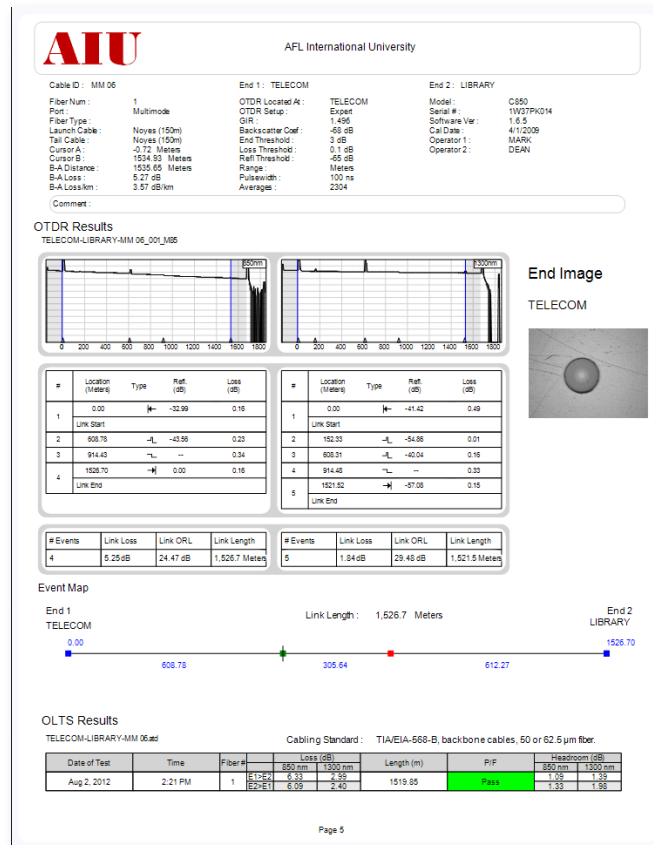
M310 OTDR in Soft Case

Available for SM, MM or QUAD OTDR models. The soft case has a shoulder strap and a large pocket to simplify carrying equipment in the field. The pocket is large enough to accommodate cleaning and test accessories. See [page 3](#) for available accessories.

NOYES® M310 Enterprise OTDR

TRM® 2.0 Basic Software

Using TRM 2.0 Basic (Test Results Manager), the companion PC software included with all M310 OTDRs, users can create acceptance reports conforming to industry guidelines. TRM allows users to create customized cover pages with their company logos and generate results pages showing dual wavelength traces and event tables, end-face image, Event Map and loss data for each fiber.



TRM 2.0 (Test Results Manager) OTDR Certification report page

TRM® 2.0 Advanced Software

TRM 2.0 Advanced Software includes Bi-directional and Macro/Microbend advanced features for analyzing OTDR events better in case of change in fiber type and ruled out events that would be requested to fix and identify excessive bends or stress.

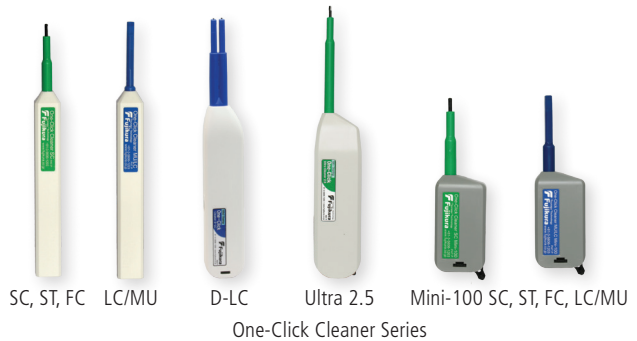
Test, Inspection and Cleaning Accessories



DFS1 FiberScope Inspection Kit



FCP2-00-0900 Basic Cleaning Kit



Accessories Ordering Information

DESCRIPTION	AFL NO.
DFS1 Digital FiberScope PC/UPC inspection kit	DFS-00-04XU
DFS1 Digital FiberScope APC inspection kit	DFS-00-04XA
DFS1 Digital FiberScope kit without adapters	DFS-00-04XN
Fiber Ring, 50/125 µm multimode, 150 m	FR1-M5-150-x1-x2 ^a
Fiber Ring, Laser Optimized, 50 µm multimode, 150 m	FR1-L5-150-x1-x2 ^a
Fiber Ring, 62.5/125 mm multimode, 150 m	FR1-M6-150-x1-x2 ^a
Fiber Ring, single-mode, 150 m	FR1-SM-150-y1-y2 ^a
Wet Cleaning kit for SC/FC/ST/LC connectors	8500-20-0900
Dry Cleaning kit	8500-20-0901
Basic Cleaning kit with carry case (includes One-Clicks, FCC2 cleaning fluid, FiberWipes, Cletop SB)	FCP2-00-0900
Basic Cleaning kit with MPO Cleaners and carry case (includes One-Clicks, FCC2 cleaning fluid, FiberWipes, Cletop SB, MPO/MTP Cleaner)	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
MPO/MTP® Cleaner (MPO-CLK-B)	CS000710

Note:

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

NOYES® M310 Enterprise OTDR

Specifications ^a

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 ⁿ	Controlled Launch at 850 nm ⁿ	N/A
Live Fiber Detection ^m	Yes	Yes
Dynamic Range (SNR = 1) ^b	30/30 dB	38/37 dB
Event Dead Zone ^c	0.8 m	0.8 m
Attenuation Dead Zone ^d	2.5/2.7 m	3.0 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 ^e	3 cm	3 cm
Group Index of Refraction (GIR)	1.4000 to 1.6000	1.4000 to 1.6000
Distance Uncertainty/Accuracy ^f	±(1 +0.005 % x distance + data point spacing)	±(1 +0.005 % x distance + data point spacing)
Linearity ^g	±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 ^h	850 nm: -14 to -58 dB (typical) 1300 nm: -14 to -63 dB (typical)	1310 nm -14 to -65 dB (typical) 1550 nm -14 to -65 dB (typical)
Reflectance Resolutio	0.01 dB	0.01 dB
Reflectance Accuracy ^h	±2 dB	±2 dB
Real Time Refresh Rate ^j	>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 splice 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 network .
- p. For OM1 fiber typical Backscatter Coefficient @ 850 nm -68 dB , @ 1300 nm -76 dB and attenuation coefficient @850 nm 2.77 d , @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 d , @1550 nm 0.18 dB.

NOYES® M310 Enterprise OTDR

Specifications ^a

OPM (STANDARD)	
Calibrated Wavelengths	850, 1300, 1310, 1490, 1550, 1625, 1650 nm (displays up to 3 simultaneously)
Detector Type	InGaAs 2 mm
Display Range ^b	+6 to -70 dBm
Accuracy @ -10 dBm	±0.25 dB
Resolution	0.01 dB
Measurement Units	dB, dBm, mW
Wavelength ID ^c	Wave ID™
Set Reference	Yes
Data Storage	Yes
Tone Detection ^d	270 Hz, 330 Hz, 1 kHz, 2 kHz
VFL (STANDARD)	
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 ^g	0 dBm (1 mW)
GENERAL	
Display Type	3.5-inch transfective color, high contrast, high reflectivity (20%) for optimum indoor/outdoor viewing with touchscreen
Display Resolution	QVGA 240 x 320
Size (in boot)	23 x 11 x 7 cm (8.8 x 4.3 x 2.8 in)
Weight	<1.0 kg (< 2.0 lb)
Drop Test	GR-196-CORE
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 ^e	16 hours
Recharge Time ^f	4 hours
Auto Shut Off	0-60 minutes
Connectivity	USB host/full speed 1.1
Operating Temperature	-18°C to +50°C
Storage Temperature	-30°C to +60°C
Relative Humidity	0 to 95 % RH (non-condensing)
DFS1 DIGITAL FIBERSCOPE SUPPORT	
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.
- g. Typical output power.

NOYES® M310 Enterprise OTDR

M310 Models and Included Adapters

WAVELENGTHS (nm)				DYNAMIC RANGE (dB)	OTDR PORT ADAPTERS	OPM PORT ADAPTERS	AFL BASE MODEL NO.
850	1300	1310	1550				
◆	◆	◆	◆	30/30/38/37	SC, FC, ST	SC, 2.5 mm Universal	M310-25
◆	◆			30/30	SC, ST	SC, 2.5 mm Universal	M310-22
		◆	◆	38/37	SC, FC	SC, 2.5 mm Universal	M310-20

All M310 OTDRs include a USB flas drive, AC adapter, UCI switchable test port adapters, TRM® 2.0 (Basic License) and quick reference guide.

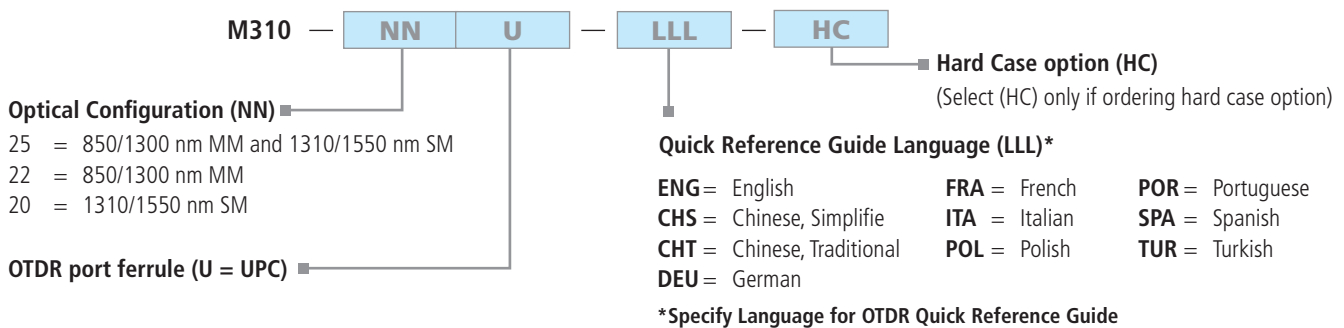
Ordering Information

DESCRIPTION	AFL NO.
M310 Certification Kits (Tier 1 and 2) Options	
QUAD Kit: QUAD OTDR, 850/1300/1310/1550 nm, OPM, VFL, OLS4, DFS1, hard case	M310-25K-01-HC2*
MM Kit: MM OTDR, 850/1300 nm, OPM, VFL, OLS1-DUAL, DFS1, hard case	M310-22K-01-HC2*
SM Kit: SM OTDR, 1310/1550 nm, OPM, VFL, OLS2-DUAL, DFS1, hard case	M310-20K-01-HC2*
M310 Test and Inspection Kits (Tier 2) Options	
QUAD Kit: QUAD OTDR, 850/1300/1310/1550 nm, OPM, VFL, DFS1, hard case	M310-25K-01-HC1*
MM Kit: MM OTDR, 850/1300 nm, OPM, VFL, DFS1, hard case	M310-22K-01-HC1*
SM Kit: SM OTDR, 1310/1550 nm, OPM, VFL, DFS1, hard case	M310-20K-01-HC1*
M310 Hard Case Kits Options	
QUAD OTDR, 850/1300/1310/1550 nm, OPM, VFL, hard case	M310-25U-01-HC
MM OTDR, 850/1300 nm, OPM, VFL, hard case	M310-22U-01-HC
SM OTDR, 1310/1550 nm, OPM, VFL, hard case	M310-20U-01-HC
M310 Soft Case Kits Options	
QUAD OTDR, 850/1300/1310/1550 nm, OPM, VFL, hard case	M310-25U-01
MM OTDR, 850/1300 nm, OPM, VFL, hard case	M310-22U-01
SM OTDR, 1310/1550 nm, OPM, VFL, hard case	M310-20U-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: M310-25U-01-HC -> This model number indicates M310 QUAD with the English/European language pack in the optional hard case.

*** When ordering, specify DFS1 model. The DFS1 Digital FiberScope kit is available as either PC/UPC inspection kit (DFS1-00-04XU model) or APC inspection kit (DFS1-004XA model).**



Calibration Plans

MODEL	2 YR CAL PLAN	2 YR CAL PLUS PLAN
	AFL NO.	AFL NO.
M310-25K-HC2	CAL2-00-M310-25K-HC2	CAL2-01-M310-25K-HC2
M310-22K-HC2	CAL2-00-M310-22K-HC2	CAL2-01-M310-22K-HC2
M310-20K-HC2	CAL2-00-M310-20K-HC2	CAL2-01-M310-20K-HC2
M310-25U-01, -HC, -HC1	CAL2-00-M310-25	CAL2-01-M310-25
M310-22U-01, -HC, -HC1	CAL2-00-M310-22	CAL2-01-M310-22
M310-20U-01, -HC, -HC1	CAL2-00-M310-20	CAL2-01-M310-20

Prepaid Cal plans offer two annual calibrations at a discounted price, calibration expiration email service and express calibration. Cal Plus plans offer the same services as the Cal plans with the addition of a two year extended warranty (three years total coverage).

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M310 Enterprise OTDR with Advanced Analysis

Advanced Analysis includes Macro/Microbend detection and Bi-directional trace analysis, which can be performed in the M310 or using TRM 2.0 Advanced Analysis. Macro/Microbend detection helps technicians find installation problems. Excessive bends or stress on fiber will show up as excessive attenuation at higher wavelengths. These bends or stresses are indicated on the event table with a special icon. Bi-directional trace analysis, used to resolve errors due to mis-matched single-mode fiber, measures the loss of events in the End 1 to End 2 and End 2 to End 1 directions, then calculates a two-way average of the OTDR's loss measurements, which is the true loss of the event. For accessories ordering information see [page 3](#), for calibration plans see [page 6](#).

Ordering Information

DESCRIPTION	AFL NO.
M310 Certification Kits (Tier 1 and 2) Options	
QUAD OTDR with Advanced Analysis Software, OPM, VFL, OLS4, DFS1, hard case	M310-25K-01-HC2-AA*
SM OTDR with Advanced Analysis Software, OPM, VFL, OLS2-DUAL, DFS1, hard case	M310-20K-01-HC2-AA*
M310 Test and Inspection Kits (Tier 2) Options	
QUAD OTDR with Advanced Analysis Software, OPM, VFL, DFS1, hard case	M310-25K-01-HC1-AA*
SM OTDR with Advanced Analysis Software, OPM, VFL, DFS1, hard case	M310-20K-01-HC1-AA*
M310 Hard Case Kits Options	
QUAD OTDR with Advanced Analysis Software, OPM, VFL, hard case	M310-25U-01-HC-AA
SM OTDR with Advanced Analysis Software, 1310/1550, OPM, VFL, hard case	M310-20U-01-HC-AA
M310 Soft Case Kits Options	
QUAD OTDR with Advanced Analysis Software, OPM, VFL, soft case	M310-25U-01-AA
SM OTDR with Advanced Analysis Software, 1310/1550, OPM, VFL, soft case	M310-20U-01-AA
OTDR Advanced Analysis Software	SOFT-00-AAS
OTDR and TRM Advanced Analysis Software	SOFT-00-AAPK

* When ordering, specify DFS1 model. The DFS1 Digital FiberScope kit is available as either PC/UPC inspection kit (DFS1-00-04XU model) or APC inspection kit (DFS1-004XA model).

When ordering, specify Language Preference for OTDR Quick Reference Guide.

TRM 2.0 Basic and Advanced Analysis and Documentation Software

TRM 2.0 Basic Software will enable customers to easily analyze OTDR, OLTS and OPM results, create certification and professional acceptance reports. TRM 2.0 Advanced Software includes Bi-directional and Macro/Microbend advanced features for analyzing OTDR events better in case of change in fiber type and ruled out events that would be requested to fix and identify excessive bends stress. It includes comprehensive reports with details on Bi-directional and Macro/Microbend events. TRM 2.0 Basic Software is bundled with M310 OTDR (one seat included at no additional charge).

Ordering Information

When ordering, select options as follows:

DESCRIPTION	AFL NO.
TRM 2.0 Basic Software (OTDR Trace/OLTS Viewer, Batch Editor & Reports)	TRM-00-0900PR
TRM 2.0 Advanced Software (Basic TRM plus Advanced Features & Reports)	TRM-00-0910PR
TRM 2.0 upgrade from Basic to Advanced Software	TRM-00-0920PR



NOYES International Sales and Service Contact Information

Available at www.AFLglobal.com/NOYES/Contacts