Agilent E6020B FTTx OTDR

Fast and Cost-effective Fiber Installation for Access Networks

Technical Data Sheet

Introducing the New FTTx OTDR

Agilent's new E6020B FTTx OTDR is a cost-effective, easy to use solution for the installation and maintenance of access fiber networks, ideally suited to serve the needs of technicians who deploy fiber-to-the-home or short distance links such as enterprise networks or links to wireless base stations.

Features and Benefits

- **One button break and reflectance fault location**
- **Lightweight and easily viewable in sunlight**
- **Single-mode and multimode options**
- **Visual Fault Finder included for close up troubleshooting.**

A Broad Range of Tools for Technicians

Agilent's portfolio of handheld instruments for network installation and maintenance also includes

- WireScope™ 350, a LAN cable tester with copper and optional fiber probes,
- FrameScope™ 350 for 10/100 Mbit/s Ethernet performance analysis, trouble-shooting and LAN cable testing,
- FrameScope™ Pro for Gigabit Ethernet performance analysis, triple play service deployment and troubleshooting, equipped with an RJ45 electrical port and an SFP interface to optical networks.

Please visit www.framescope.com and www.wirescope.com for further details.

ISO 9001

The Agilent Technologies E6020B FTTx OTDR is produced to the ISO 9001 international quality system standard as part of Agilent's commitment to continually increasing customer satisfaction through improved quality control.

Agilent Technologies

Characteristics[1]

Horizontal Parameters

- Start-km: 0 km to 200 km
- Span: 0.1 km to 400 km
- Readout resolution: 0.1 m
- Minimum sample spacing: 4 cm (automatic)
- Refractive index: 1.00000 to 2.00000
- Length unit: km, ft, or miles
- Measurement points: 64000

Vertical Parameters

- Vertical scale: 0.1 to 5 dB/Div
- Read-out resolution: 0.001 dB
- Reflectance range: –14 dB to –60 dB

Other Parameters

- Pulsewidth: selectable from 5 ns (options E6020B-013, E6020B-014 only), 10 ns, 30 ns, 100 ns, 300 ns, 1 µs, 3 µs, and 10 µs
- Threshold for fiber breaks: 0.1 to 10 dB, selectable in 0.1 dB steps
- Backscatter coefficient: 48.5 dB (1310 nm), 51.5 dB (1550 nm)

Output Connector

Optical FC/PC, DIN 47256, ST, SC, E2000. All options are user-exchangeable

Documentation

- 3.5″ floppy disk drive: for high density 720/1440 kByte floppy disks. MS-DOS format compatible. Reduced operating temperature of +5°C to +45°C, with 35% to 80% humidity at +40°C.
- Memory Card: PCMCIA Type II. 512 MB with up to 16000 traces (typical with 16000 data points).
- Internal memory: SRAM up to 2 MB. Up to 140 traces (typical with 8000 data points)
- Trace format: compliant to the following Bellcore/Telcordia OTDR trace formats:
  - GR 196, Revision 1.0
  - GR 196, Revision 1.1
  - SR-4731 Revision 2.0.
- Trace Information: 5 comment labels of up to 15 alphanumeric characters, and 5 comments of up to 41 alphanumeric characters are provided for each trace.
- Real-time clock and date

Display

- Color VGA-LCD: 18.3 cm (7.2″)
- Display points: 640 x 480 points

Interfaces

RS232C:
Maximum baud rate: 115200 bps

Centronics:
Standard parallel port (SPP).

Keyboard: PS2 (Mini-DIN).
For English Standard, PS2, or AT keyboard.

General

- Dimensions: 194 mm H, 290 mm W, 75 mm D (7.7″ x 11.4″ x 3.0″).
- Weight: net < 2.9 kg (6.4 lbs.) typical, including battery pack and one OTDR module.

Built in Applications

- Fiber Break Locator
- Visual Fault Finder mode
- Optical Return Loss
- End to End Loss
- Reflectance
- Pass/Fail Test
- Easy OTDR
- OTDR Training
- OTDR Assistant
- Automatic Multi Fiber Test

Environmental

- Operating Temperature: 0°C to +50°C
- Storage Temperature: –40°C to +60°C
- Humidity: 95% R.H. from 0°C to +40°C, non-condensing

Power

- AC: 100–240 Vrms ± 10% 50–60 Hz
- DC: 16–24V
- External Battery: NiMH typ. 5 hours continuous operation (minimum 3.5 hours). Charging time < 3 hours.
- Low battery indicator
- Battery charge status indicator

[1] Characteristics and typical data provide information about the non-warranted instrument performance. Specifications describe the instrument's warranted performance.

OTDR Module Specifications[a]

Measured at 22°C ± 3K. Guaranteed specifications unless otherwise noted. Guaranteed values are tested specifications. **Bold** values are typical specifications.

Option (Module)	E6020B-011					E6020B-012, E6020B-013			
Central Wavelength	**1310 nm** ± 25 nm					**1310 nm** ± 25 nm/**1550 nm** ± 25 nm			
Applicable Fiber	single-mode					single-mode			
Pulsewidth	10 ns	100 ns	1 µs	10 µs		10 ns	100 ns	1 µs	10 µs
Dynamic Range[b] [dB]	13	18	23	**30**		13/13	18/18	23/23	**30/30**

Option (Module)	E6020B-013, E6020B-014		
Central Wavelength	**850nm** ± 30 nm/**1300 nm** ± 30 nm		
Applicable Fiber	multimode 62.5 µm		
Pulsewidth	10 ns	100 ns	1 µs
Dynamic Range[c] [dB]	12/12	18/18	- /23

Notes:

a Specifications describe the instrument's warranted performance, measured with typical PC-type connectors. Uncertainties due to the refractive index of fiber are not considered.

b Measured with a standard single-mode fiber at SNR=1 noise level and with 3 minutes averaging time. Optimize mode: dynamic.

c Measured with a standard 62.5 µm guided index multimode fiber at SNR=1 noise level and with 3 minutes averaging time. Optimize mode: dynamic.

OTDR Module Characteristics[1]

Distance Accuracy[2]

- Offset Error: ± 1 m
- Scale Error: ± 10^{-4}
- Sampling Error: ± 0.5 sampling spacing

Loss/Reflectance Accuracy[3]

- Backscatter Measurements: ± 0.05 dB (1 dB step), typical
- Reflectance Measurements[4]: ± 2.0 dB, typical

Deadzones

- Event Deadzone: 3 m (typical)
- Attenuation Deadzone[5]: 10 m (850 nm, 1300 nm, 1310 nm), 12 m (1550 nm)

Recommended recalibration period: 2 years.

Acoustic Noise Emission

< 40 dBA, not continuous.
Data are results from type tests per ISO 7779 (EN 27779).

Agilent E6007A Visual Fault Finder Submodule

Characteristics

- Source type: Laser diode
- Center Wavelength: 635 nm ± 10 nm (visible red light)

Output power level (CW)

- 0 dBm maximum
- into 9 µm fiber (typ.): –3 dBm

Detection range: up to 5 km

Optical output: user-exchangeable Connector Interface

Supplementary Performance Characteristics

- Continuous Wave and Blink Mode (1 Hz for better visibility).
- Single-mode and multimode fibers applicable.

General Specifications:

Dimensions: ca. 120 mm H x 40 mm W x 25 mm D (4.7" x 1.6" x 1.0")

Weight: < 100 g

Operating Temperature: 0°C to +40°C

Storage Temperature: –40°C to +60°C

Humidity: 95% R.H. from 0°C to +40°C, non-condensing

1 Characteristics and typical data provide information about the non-warranted instrument performance.

2 Total distance accuracy = ±(offset error + scale error x distance + sampling error).

3 SNR ≥ 15 dB and with 1 µs, averaging time max. 3 minutes.

4 –20 dB to –60 dB

5 Typical Specification at Reflectance ≤ –50 dB at 30 ns pulsewidth, and with span ≤ 4 km (typical value).

Accessories

The Agilent Technologies E6020B is an FTTx optimized OTDR. It is available in various configurations for the best possible match to the most common applications. The instrument comes with color display and visual fault finder submodule, regardless of which OTDR module has been chosen.

Instrument and Options

Agilent Product	Opt	Description
E6020B		FTTx OTDR with color display and visual fault finder submodule
	011	1310 nm single-mode OTDR module, 30 dB
	012	1310 nm/1550 nm single-mode OTDR module, 30 dB
	013	1310/1550 nm single-mode OTDR module, 30 dB
		and 850 nm/1300 nm multimode OTDR module, 23 dB
	014	850 nm/1300 nm multimode OTDR module, 23 dB
	021	Straight connector
	022	Angled connector
	AB2	Simplified Chinese user interface
	ABD	German user interface
	ABF	French user interface

Support Options

For all Agilent FTTx OTDRs the following support options are available.

	3 years of Customer Return Repair Service
	3 years of Customer Return Calibration Service

Accessories Included

The following accessories are supplied with your FTTx OTDR

	Soft carrying case
	Power cord
	AC Adapter
	User's Guide
	Support CD
	RS232 cable
	NiMH battery pack

The following connector interfaces are supplied with your FTTx OTDR modules:

Option	Connector Interface	Description
E6020B-011	81000FI, 2 ea	FC/PC connector interface (E6020B-021 straight connector only)
	81000NI, 2 ea	FC/APC connector interface (E6020B-022 angled connector only)
	81000KI, 2 ea	SC connector interface
E6020B-012	81000FI, 2 ea	FC/PC connector interface (E6020B-021 straight connector only)
	81000NI, 2 ea	FC/APC connector interface (E6020B-022 angled connector only)
	81000KI, 2 ea	SC connector interface
E6020B-013	81000FI, 2 ea	FC/PC connector interface (E6020B-021 straight connector only)
	81000NI, 2 ea	FC/APC connector interface (E6020B-022 angled connector only)
	81000KI, 3 ea	SC connector interface
	81000VI, 2 ea	ST connector interface
E6020B-014	81000KI, 2 ea	SC connector interface
	81000VI, 2 ea	ST connector interface

All modules come with a commercial calibration certificate.

Additional Accessories

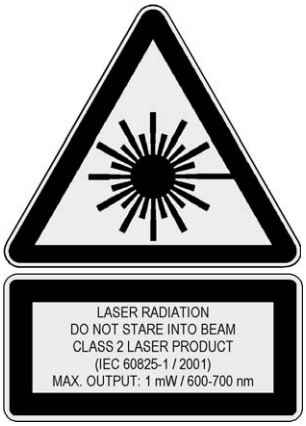
The following accessories are also available. To order these products, please contact your Agilent Technologies representative.

Product	Description
E6006A	Power meter submodule (connector interfaces must be ordered separately)
E6080A	Spare NiMH battery pack
E6081A	Mini-Keyboard
E6082A	Hard transit case
E6092A	OTDR Toolkit III Plus software for acceptance test documentation
81000HI	E2000 connector interface
81000SI	DIN 47256 connector interface
81000LI	LC connector interface
81000MI	MU connector interface
81000FI	FC/PC connector interface
81000KI	SC connector interface
81000VI	ST connector interface

Safety Information

All OTDR laser sources specified by this data sheet are classified as Class 1M according to IEC 60825–1 (2001). They bear the laser label

The Visual Fault Finder Sub-Module E6007A complies with Class 2 according to IEC 60825–1 (2001). It bears the laser labels



All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26

All modules also bear the CE conformity marking

You **must** return instruments with malfunctioning laser modules to an Agilent Technologies Service Center for repair and calibration, or have the repair and calibration performed on-site by Agilent Technologies personnel.

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Agilent Technologies is a worldwide leader in testing computer and communications devices, elements, systems and services that enable high-speed computation and communications. The test portfolio includes:

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