

EXFO FOT-922X SpecsProvided by [www.AAATesters.com](http://www.AAATesters.com)

- Fast automated bidirectional loss testing
- FasTesT-compatible
- Optical return loss testing
- Simultaneously talk, test, and locate
- Complete test documentation

# MAXimizing Testing Efficiency

The FOT-920 MaxTester is a compact, portable test tool that stands up to virtually any field environment. It features a splashproof casing, durable shoulder strap, and long battery

operating time. The backlit alphanumeric display quickly and easily shows you results and messages under any lighting conditions.

|        |        |                |
|--------|--------|----------------|
|        | 1550   | 1625           |
| A+B    | -00.38 | -00.65         |
| B+A    | -00.41 | -00.70         |
| AUG    | -00.39 | -00.68         |
| REF    |        |                |
| A      | -01.75 | -03.34         |
| B      | -02.12 | -04.44         |
| MARGIN | STORE  | REDO TEST      |
|        |        | CANCEL FASTEST |

1625 nm testing

With L-band transmission on the rise, testing at 1625 nm is now a must! (Testing at this wavelength provides worst-case attenuation for the L-band.)



Supports many languages

|                          |
|--------------------------|
| 1: NÄCHSTES KABEL        |
| 2: NÄCHSTE FASER         |
| 3: PROBL.- RUF UNS AN    |
| 4: PROBL.- 5 MIN. WARTEN |
| HAUPT-MENU               |
| SENDEN                   |
| MENU                     |

Two languages are installed: English plus your choice of French, Spanish, German, or Czech.

|       |              |               |
|-------|--------------|---------------|
|       | λ            | THRESHOLD     |
|       | 1550         | -01.70 dB     |
|       | 1625         | -10.14 dB     |
|       | ♦BOTH        | ENABLED       |
| PREV. | LANG. / TIME | AUTO-OFF      |
|       |              | FASTEST SETUP |

Configure Pass/Fail thresholds for each wavelength. If results exceed thresholds, an alarm and a highlighted value on the screen will inform you.

|                          |
|--------------------------|
| 1: GO TO NEXT CABLE      |
| 2: GO TO NEXT FIBER      |
| 3: TROUBLE - CALL ME     |
| 4: TROUBLE - WAIT 5 MIN. |
| MAIN MENU                |
| SEND                     |
| PREV. MENU               |

To speed up testing procedures, choose from several pre-programmed messages to send a test partner.

|                           |                |
|---------------------------|----------------|
| DATE:                     | 96/10/29       |
| TIME:                     | 10:29          |
| CABLE:                    | CBL00002       |
| FIBER:                    | FBR12345       |
| PRESS Fastest TO CONTINUE |                |
| VIEW RESULTS              | TAKE REF.      |
| IDENTIFY                  | CANCEL FASTEST |

Organize test results using alphanumeric identifiers that directly reflect your cable and fiber identification system.

|               |
|---------------|
| AUTO-OFF      |
| ENABLED       |
| PREV.         |
| LANG. / TIME  |
| AUTO-OFF      |
| FASTEST SETUP |

Save battery operating time. The auto-off function shuts the unit down after 15 minutes of inactivity.

|                |
|----------------|
| LOOPBACK       |
| CONNECT AND OK |
| OK             |
| CANCEL         |

Set up your references from different sites by using the loopback reference method.

# FOT-920 Equipment Highlights

The FOT-920 MaxTester is the result of more than a decade of research and development. We have integrated these six top-of-the-line products into a single powerful unit:

- Optical loss test set (OLTS)
- Power meter
- Dual light source
- Optical return loss (ORL) test set
- Talk set
- Visual fault locator



## Detector port

Compatible with almost every connector on the market; perform manual power and loss testing efficiently.

## RS-232 interface

Transfer data to a PC or print to a portable printer.

## VFL

Built-in 650 nm visual fault location.

## **FASTEST** port

Transmit one or two wavelengths through a single port. Also, use this port to perform ORL measurements, send messages, and use the light source feature.



## Talk set port

For full-duplex voice communication.

## Headset port

For hands-free talk set operation.

## Benefits

### Automated bidirectional testing

- Checks bidirectional loss in installed couplers
- Detects network faults
- Checks connector quality at both ends
- Eliminates most operator errors
- Substantially reduces testing time (two directions, two wavelengths, <30 seconds)
- Reduces training time

### Dual-wavelength testing

- Detects macrobends
- Detects components such as WDM couplers and wavelength-specific amplifiers
- Simplifies WDM system installations and tune-ups

# The All-in-One Unit

## Bidirectional, dual-wavelength testing

EXFO understands that your time is valuable; that's why the FOT-920 features the patented FasTesT system. FasTesT automatically measures single-fiber loss in both directions, at two wavelengths, and in less than 30 seconds. To speed up the reporting process, the FOT-920 stores all test results in its non-volatile memory; later, you can file test data according to your own cable identification scheme.

## Professional reporting

For more extensive reports, including user and test location information, ToolBox 5 software (included) can be used to download, print, or store results on a computer hard drive.



## Talk set communication

Fiber-optic talk sets are very useful for coordinating end-to-end testing between remote sites. The FOT-920 features an optional full-duplex digital talk set for crystal-clear voice transmission. If the talk set cannot be used, the unit can send pre-set or pre-programmed messages via the fiber under test.

## Visual fault location

Perform end-to-end identification, or pinpoint breaks, bends, faulty connectors, splices, and other causes of signal loss over a distance of up to 5 km. At the exact fault location, the visual fault locator (VFL) creates a red glow that is visible through most yellow-jacketed fibers.

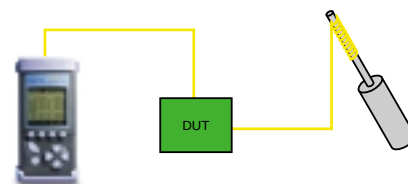
## Optical return loss (ORL)

With widespread use of OC-48 and OC-192 transmission systems, bandwidth is essential. Flawless operation of high-data-rate systems depends on measurement and control of a critical parameter known as backreflection or optical return loss. ORL can affect transmissions by

- Destabilizing DFB laser sources
- Interfering with high-frequency analog signals
- Increasing the bit error rate (BER) in high-frequency digital signals

Measuring ORL with the FOT-920 is easy. Here's how:

- Select the ORL menu.
- Coil the fiber around a mandrel right before the device under test (DUT).
- Press the zero reference button.
- Coil the fiber around a mandrel immediately after the DUT and check the FOT-920 display for the measurement.



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With increasing fiber deployment in Telco and CATV networks, busy fiber installation companies sometimes hire subcontractors to perform installation jobs. But subcontractors need to provide test documentation to show that a job meets specifications.

The screenshot shows the 'Results' window of the 'SPL' software. The window title is 'Results'. It contains a table with the following data:

| Time    | S-0   | S-1   | Avg   | S-1   | S-0   | Avg   |
|---------|-------|-------|-------|-------|-------|-------|
| FMS0001 | -1.88 | -1.76 | -1.77 | -1.71 | -1.88 | -1.78 |
| FMS0002 | -1.84 | -1.70 | -1.80 | -1.85 | -1.80 | -1.82 |
| FMS0003 | -1.88 | -1.80 | -1.80 | -1.84 | -1.84 | -1.84 |
| FMS0004 | -1.78 | -1.88 | -1.79 | -1.27 | -1.84 | -1.60 |
| FMS0005 | -1.88 | -1.84 | -1.84 | -1.87 | -1.84 | -1.85 |
| FMS0006 | -1.81 | -1.88 | -1.84 | -1.87 | -1.88 | -1.85 |
| FMS0007 | -1.77 | -1.72 | -1.74 | -1.80 | -1.71 | -1.73 |
| FMS0008 | -1.81 | -1.88 | -1.79 | -1.27 | -1.88 | -1.80 |
| Average | -1.82 | -1.58 | -1.58 | -1.34 | -1.55 | -1.48 |

The window also includes buttons for 'Print', 'Save', 'Export', 'Delete', 'Quit', 'About', and 'Help'. The 'S-0' and 'S-1' columns are highlighted in blue. The 'Average' row shows values: -1.82, -1.58, -1.58, -1.34, -1.55, -1.48.

Now, subcontractors who use the FOT-920 can produce quality documentation efficiently. Thanks to the data logging and management features of the FOT-920, users can archive results and download information through the RS-232 port to a PC for analysis and professional report generation.

[illegible]

Once the data has been downloaded, it is possible to write up customized, detailed reports to be submitted for the job.

# The Complete Test Kit Solution

The FOT-920 MaxTester is part of EXFO's test kit series for all users of test and measurement instruments. These test kits are ideal for singlemode and multimode applications. Test kits offer a competitive measurement range, extreme ruggedness, and several key options, including a high-power detector and an RS-232 interface. All EXFO fiber-optic test kits contain accessories such as cleaning kits,

AC adapters, test jumpers, and fiber-optic adapters. Test equipment and accessories are stored in a convenient carrying case.

For more information about our various test kits, please consult EXFO's Fiber-Optic Test Kit brochure.

## Key test tools



### Fiber-Optic Microscope (FOMS)

Checks the endface of the connector ferrule; available at 200X or 400X magnification.



### Visual Fault Locator (FLS-235B series)

Checks system continuity by shining a visible light (635 nm or 670 nm) through connection flaws and cracked cables.



### Live Fiber Detector (LFD-100)

Checks for traffic, optical tones, and continuous signals without disrupting communication, and also displays power levels.



### Cletop (FCC-02R)

Cleans the endface of connectors.



OC-KIT-100

|            |                                                                                                                                                                                                                                                                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OC-KIT-100 | <ul style="list-style-type: none"><li>• FOT-920: high-power germanium detector and return loss option, 1310/1550 nm source, universal adapter</li><li>• FLS-235B at 670 nm</li><li>• FOMS microscope 200x</li><li>• LFD-100 Live Fiber Detector</li><li>• Cletop connector cleaner</li></ul>                                                                |
| OC-KIT-134 | <ul style="list-style-type: none"><li>• FOT-920: high-power germanium detector and return loss option, 1550/1625 nm source, universal adapter (optional germanium and InGaAs detector)</li><li>• FLS-235B series (635 nm or 670 nm)</li><li>• FOMS series (200x or 400x)</li><li>• LFD-100 Live Fiber Detector</li><li>• Cletop connector cleaner</li></ul> |
| OC-KIT-200 | <ul style="list-style-type: none"><li>• FOT-920: high-power germanium detector and return loss option, 1310/1550 nm source, talk set, 1310 nm, VFL-XX</li><li>• FLS-235B at 670 nm</li><li>• FOMS microscope 400x</li><li>• LFD-100 Live Fiber Detector</li><li>• Optional FCD-10B Clip-On Device</li><li>• Cletop connector cleaner</li></ul>              |
| OC-KIT-400 | <ul style="list-style-type: none"><li>• Two FOT-920 high-power germanium detectors and return loss option, 1550/1625 nm source, universal adapter (optional talk set and VFL)</li><li>• Optional talk set and FOMS microscope</li></ul>                                                                                                                     |

## SPECIFICATIONS

| Power meter <sup>1,2,4</sup>    | FOT-922     | FOT-922X    | FOT-923     |
|---------------------------------|-------------|-------------|-------------|
| Detector type                   | Ge          | GeX         | InGaAs      |
| Power range <sup>2</sup> (dBm)  | +10 to -68  | +21 to -60  | +4 to -70   |
| Uncertainty <sup>3,4</sup>      | ±5%         | ±5%         | ±5%         |
| Wavelength range (nm)           | 780 to 1625 | 780 to 1625 | 840 to 1650 |
| Resolution <sup>8</sup> (dB)    | 0.01        | 0.01        | 0.01        |
| Linearity <sup>2,4,8</sup> (dB) | ±0.06       | ±0.06       | ±0.06       |

| FasTesT/Source/ORL <sup>1</sup>       | -12C                 | -12D                 | -23B                  | -23BL                 | -34BL <sup>9</sup>    | -BR23BL               | -BR34BL <sup>9</sup>  |
|---------------------------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Emitter type                          | LED                  | LED                  | LED                   | laser                 | laser                 | laser                 | laser                 |
| Wavelengths (nm)                      | 850 ±30/<br>1300 ±30 | 850 ±30/<br>1300 ±30 | 1310 ±25/<br>1550 ±25 | 1310 ±25/<br>1550 ±25 | 1550 ±25/<br>1625 ±20 | 1310 ±25/<br>1550 ±25 | 1550 ±25/<br>1625 ±20 |
| Output power (dBm)                    | >-23/>-19            | >-20/>-21            | >-25/>-30             | >-3.5/>-5.5           | >-5.5/>-5.5           | >-5/>-6.8             | >-7.0/>-7.0           |
| Spectral width <sup>7</sup> (nm)      | ≤50/≤80              | ≤50/≤80              | ≤80/≤80               | ≤5/≤5                 | ≤5/≤5                 | ≤5/≤5                 | ≤5/≤5                 |
| Stability (8 hours) <sup>4</sup> (dB) | ±0.15/±0.15          | ±0.15/±0.15          | ±0.15/±0.15           | ±0.1/±0.1             | ±0.1/±0.1             | ±0.1/±0.1             | ±0.1/±0.1             |
| FasTesT range (dB)                    | 41                   | 44                   | 39                    | 60                    | 60                    | 60                    | 60                    |
| FasTesT uncertainty <sup>5</sup> (dB) | ±0.5/±0.5            | ±0.5/±0.5            | ±0.35/±0.5            | ±0.35/±0.5            | ±0.35/±0.5            | ±0.35/±0.5            | ±0.35/±0.5            |
| ORL range <sup>6</sup> (dB)           | —                    | —                    | —                     | —                     | —                     | 65                    | 65                    |
| ORL uncertainty <sup>3,4</sup> (dB)   | —                    | —                    | —                     | —                     | —                     | ±0.4                  | ±0.4                  |

| Talk set option <sup>1,4</sup> | -T02C | -T02BL | -T03BL |
|--------------------------------|-------|--------|--------|
| Emitter type                   | LED   | laser  | laser  |
| Wavelength (nm)                | 1300  | 1310   | 1550   |
| Dynamic range (dB)             | 30    | 45     | 45     |

| VFL option <sup>1,4</sup> |         |
|---------------------------|---------|
| Emitter type              | laser   |
| Wavelength (nm)           | 650 ±10 |
| Output power (dBm)        | -1      |

## GENERAL SPECIFICATIONS

|                       |                                                                                                                                                 |                                   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Size (H x W x D)      | 22.5 cm x 10.5 cm x 6 cm                                                                                                                        | 8 3/4 in. x 4 1/4 in. x 2 1/4 in. |
| Weight                | 1 kg                                                                                                                                            | 2.2 lb.                           |
| Temperature operating | -5 to 50°C                                                                                                                                      | 23 to 122°F                       |
| storage               | -20 to 60°C                                                                                                                                     | -4 to 140°F                       |
| Storage capacity      | 512 fibers                                                                                                                                      |                                   |
| Relative humidity     | 0 to 95% non-condensing                                                                                                                         |                                   |
| Power                 | - NiMH battery 8 hours (for light source and talk set)<br>- 9 V battery lasts 2 hours as backup<br>- 6 hours to fully recharge when unit is off |                                   |

## STANDARD ACCESSORIES

Instruction manual, AC adapter/charger, built-in NiMH batteries, 9 V alkaline battery, shoulder strap, Certificate of Calibration

### NOTES

- All specifications are for a temperature of 23°C/73°F with FC/PC connector unless otherwise specified.
- At 1310 nm.
- Uncertainty is function of the resolution and power level detected.
- After a warm-up time of 20 minutes, followed by an offset nulling for the power meter.
- When loopback/side-by-side reference is taken.
- Specification taken at a temperature of 23°C/73°F with FC/APC connector.
- As defined per Bellcore TR-TSY-000887, rms for lasers and FWHM for LEDs.
- Resolution and linearity are functions of the power level detected.
- Also available with 1625 nm laser only. See ordering information.

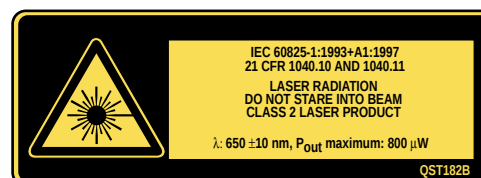
### SAFETY

The emitter types for backreflection, FasTesT, light source, and talk set comply with 21 CFR 1040.10 and 1040.11, and comply with IEC 60825-1:1993+A1:1997.

CLASS 1 LASER PRODUCT

CLASS 1 LED PRODUCT for IEC 60825 only

The VFL option of the FOT-920 is a class 2 laser product. Actual output power level may be lower than specified on label. Refer to "Specifications" for output power and wavelength combinations.



## ORDERING INFORMATION

### FOT-92X - XXXXXX - XX, (XXXX - XX, XXX - XX) options

#### Detector code

2 = Ge  
2X = GeX  
3 = InGaAs

#### Source code

12C = 850/1300 nm LED (50/125  $\mu$ m)  
12D = 850/1300 nm LED (62.5/125  $\mu$ m)  
23B = 1310/1550 nm LED  
04BL = 1625 nm laser  
23BL = 1310/1550 nm laser  
34BL = 1550/1625 nm laser  
BR04BL = 1625 nm laser with ORL option  
BR23BL = 1310/1550 laser with ORL option  
BR34BL = 1550/1625 laser with ORL option

#### Source or talk set connector code

50 = FC/PC<sup>1</sup>  
54 = SC/PC<sup>1</sup>  
58 = FC/APC narrow key  
74 = ST/PC<sup>1</sup>  
88 = SC/APC  
89 = FC/UPC  
90 = ST/UPC  
91 = SC/UPC  
95 = E-2000/PC  
96 = E-2000/APC  
EI = UPC Universal Interface  
EA = APC Universal Interface

#### Talk set code

T02C = 1300 nm LED (50/125  $\mu$ m)  
T02BL = 1310 nm laser  
T03BL = 1550 nm laser

#### VFL connector code

50 = FC/PC  
54 = SC/PC  
74 = ST/PC

#### VFL code

VFL

The fixed baseplate (EI or EA) must be ordered with a removable universal connector adapter. (EUI-XX). Please specify one EUI from the following list:  
EUI-28 = DIN 47256  
EUI-76 = HMS-10/AG (EI only)  
EUI-89 = FC  
EUI-90 = ST (EI only)  
EUI-91 = SC  
EUI-95 = E-2000



#### Example:

FOT-922-23BL-EI-EUI-89 for FC/UPC interface  
FOT-922-BR23BL-EA-EUI-89 for FC/APC interface

## NOTES

1. For multimode sources only.

EXFO is certified ISO 9001 and attests to the quality of its products. These products are accompanied by a 12-month warranty and an excellent after-sales support service.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

EXFO has made every effort to ensure that the information contained in this brochure is accurate. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics, and products at any time without obligation.

Contact EXFO for prices and availability or to obtain the phone number of your local EXFO distributor.

# EXFO



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