LTK-1

BENCHTOP OPTICAL KITS

40G

100G

SPEC SHEET

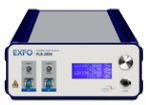
Compact and flexible test kits in the new LTB-1 Lab Benchtop Platform

KEY FEATURES

- High-performance power meter with choice of one, two or four detectors
- Singlemode and multimode variable attenuator
- Easy-to-use web-based user interface
- The FIP-400B Fiber Inspection Probe can be added as an option
- IVI-compliant drivers for fast and simple integration into automated test systems

RELATED PRODUCTS AND ACCESSORIES

Fiber inspection probe
FIP-400B



Tunable light source
FLS-2800

EXFO

FLEXIBILITY TO FIT YOUR NEEDS

The LTK-1 Benchtop Optical Kits have been designed to provide the flexibility you need to build and configure your benchtop test instrument to your precise requirements. You can select simple power meter or variable attenuator versions, or combine multiple modules into a single platform.

CHOOSE YOUR FACTORY-CONFIGURED KIT

LTK-1-1 + FTB-1750

or

LTK-1-1 + FTB-3500

or

LTK-1-2 + FTB-1750 + FTB-3500

or

LTK-1-2 + 2 X FTB-1750

or

LTK-1-2 + 2 X FTB-3500

+

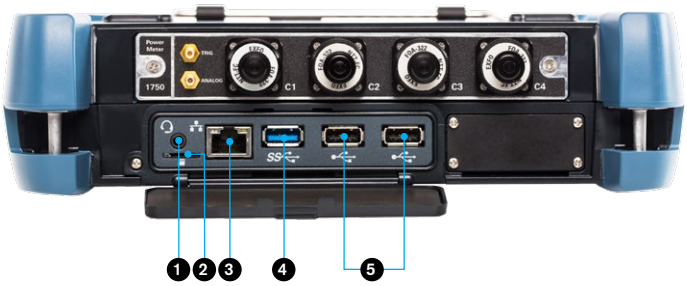
FIP-430B

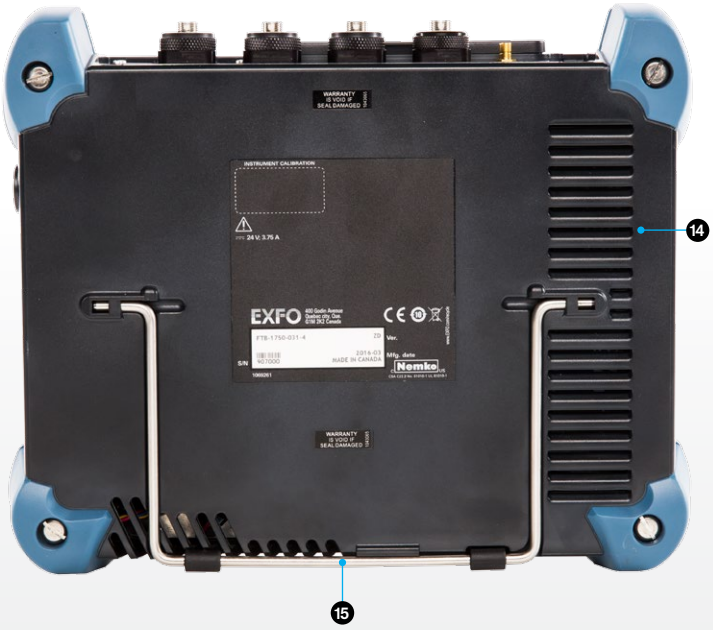
THE LTB-1 LAB BENCHTOP PLATFORM—COMPACT, YET POWERFUL

The new Windows-based LTB-1 Lab Benchtop Platform offers maximum efficiency and flexibility with its powerful processor, touchscreen display and Ethernet remote control port. It is also compatible with the industry's leading and fully automated fiber inspection probe–the FIP-400B.

DESIGNED FOR EFFICIENCY

1. Microphone/headset jack
2. Micro SD card slot
3. One GigE port
4. One USB 3.0 port
5. Two USB 2.0 ports
6. AC adapter
7. Kensington security lock slot
8. Speaker
9. Brightness control
10. Keyboard/screen capture
11. Switch application
12. Power on/off
13. Battery LED
14. Module back
15. Stand support





GET FAST, HIGH-PERFORMANCE MEASUREMENTS WITH THE FTB-1750 HIGH-PERFORMANCE POWER METER

The FTB-1750 High-Performance Power Meter is EXFO's answer to meeting your power measurement requirements. Designed for the LTB-1 Lab Benchtop Platform, this power meter delivers speed, accuracy and flexibility in a compact form-factor.

High-speed acquisition with an extended range

The FTB-1750's unique and patented design* helps you save time and cut costs while significantly enhancing throughput with a continuous-mode peak-acquisition speed of 5208 samples per second. With its dynamic range greater than 88 dB and fast stabilization time, this power meter lets you simultaneously measure low and high signals on up to four channels.

Data acquisition

Perform acquisitions on a single-channel, or on all four channels simultaneously, and save all test results in a file on the LTB-1 Platform or on your network.

Easy-to-use interface

The web-based graphical user interface (GUI) is optimized for use with the LTB-1 touchscreen display and allows for easy configuration of the power meter. The GUI also gives a clear view of power readings and settings.

Figure 1. Test four channels simultaneously and easily with the user-friendly interface.

* Protected by US patent 7,167,655.

FTB-3500 VARIABLE ATTENUATOR

Network equipment manufacturers and transceiver manufacturers know that variable attenuators are essential components of their test systems. They look for performance, user-friendliness, complete control of test parameters and advanced programming capability. EXFO's FTB-3500 Variable Attenuator combines innovative design techniques, high-quality components and meticulous calibration procedure.

Option: automatic power monitoring

The power monitoring option allows the attenuator output power level to be set directly. When enabled, this function ensures power stability, even if the source power fluctuates. This option also simplifies test setups, eliminating the need for an external power meter.

Rugged and reliable

Flexible, fully programmable and built for both singlemode and multimode applications, the FTB-3500 features an extremely rugged design allowing 24/7 operation for years without maintenance.

The attenuating filter technology used in the FTB-3500 makes it ideal for multimode BER and transceiver testing.

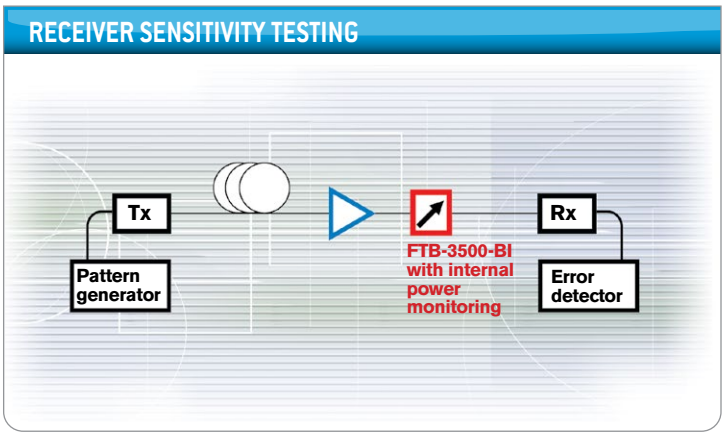


Figure 2. Typical receiver sensitivity setup

Featuring integrated power monitoring, the FTB-3500-BI allows you to precisely control the amount of power your receiver (Rx) under test detects, thereby enabling you to achieve proper BER measurements. The FTB-3500-CI or FTB-3500-DI enable similar characterization for multimode applications.

When calibrating your system, you can choose between two offsets. The first is wavelength-independent and can be used to account for loss in the test setup, if applied to the attenuation or power setting. The second offset acts as a calibration factor, ensuring wavelength-specific correction levels and compensating for loss due to patchcords and connectors.

LOCALLY, REMOTELY OR AUTOMATED—THE CHOICE IS YOURS

Control your FTB-1750 and FTB-3500 locally using the LTB-1 touchscreen display or access the same application remotely via any web browser by connecting the LTB-1 to your network.

The FTB-1750 and FTB-3500 can also be easily integrated into an automated test station using the IVI-compliant drivers or SCPI commands available. Remote control is easily performed using Telnet over the LTB-1 Lab Benchtop Platform's built-in Ethernet port.

FIBER CONNECTOR INSPECTION AND CERTIFICATION—THE ESSENTIAL FIRST STEP

Taking the time to properly inspect a fiber-optic cable can prevent a slew of problems down the line–saving you time, money and headaches.

FIP-430B—The First Fully Automated Fiber Inspection Probe for the Field

Housing a unique automatic focus adjustment system, the FIP-430B automates each operation in the connector endface inspection sequence, transforming this critical process into one quick and easy step, which can be performed by technicians of all skill levels.

100% Automated [a] | **1-step** process [a] | **57%** shorter test time [b]

THREE MODELS TO FIT YOUR BUDGET

FEATURES	Basic **FIP-410B**	Semi-Automated **FIP-420B**	Fully-Automated **FIP-430B**
Three magnification levels	√	√	√
Image capture	√	√	√
Five-megapixel CMOS capturing device	√	√	√
Automatic fiber image-centering function	X	√	√
Automatic focus function	X	X	√
On-board pass/fail analysis	X	√	√
Pass/fail LED indicator	X	√	√

Read the FIP-400B specification sheet or visit **www.EXFO.com/keepthefocus** for more information.

Notes

a. Model FIP-430B only.

b. Data sourced from EXFO's case study, with calculation based on typical analysis time.

SOFTWARE TEST TOOLS

This set of platform-based software testing tools enhances the value of the LTB-1 Platform, providing additional testing capabilities without the need for additional modules or units.

SOFTWARE APPLICATIONS

ConnectorMax2

Providing lightning-fast results in the first step of fiber-link testing, ConnectorMax2 is a powerful platform-based, automated inspection application; it delivers quick pass/fail assessment of connector endfaces and is specifically designed to save both time and money in the field and in the lab.

LTB-1 LAB BENCHTOP PLATFORM SPECIFICATIONS

SPECIFICATIONS

Mainframe	Dual-core processor/4 GB RAM/Windows 10
Display	Multitouch, wide-screen, color, 1280 x 800 TFT 203 mm (8 in)
Interfaces	RJ45 LAN 10/100/1000 Mbit/s Two USB 2.0 ports One USB 3.0 port Micro SD card slot 3.5 mm headset/microphone port
Storage	64 GB internal memory (flash)
Battery	Rechargeable Li-ion smart battery
Power supply	AC/DC adapter, input: ~ 100 V – 240 V; 50/60 Hz; 2.5 A max, output: ⎓ 24 V; 3.75 A

GENERAL SPECIFICATIONS

Size (H x W x D)		With single-depth module 210 mm x 254 mm x 66 mm (8 ¼ in x 10 in x 2 ⅝ in) With double-depth module 210 mm x 254 mm x 96 mm (8 ¼ in x 10 in x 3 13⁄16 in)
Weight	Minimum [a] Maximum [b]	2.36 kg (5.20 lb) 3.70 kg (8.15 lb)
Temperature Operating Storage		 0 °C to 40 °C (32 °F to 104 °F) –40 °C to 70 °C (–40 °F to 158 °F)
Relative humidity		0 % to 80 % non-condensing
Instrument drivers		IVI drivers and SCPI commands
Remote control		GPIB (IEEE-488.1, IEEE-488.2) and Ethernet
Standard accessories		User guide, Certificate of Compliance and Certificate of Calibration

ACCESSORIES

GP-302	USB mouse	GP-2233 [c]	90 W, AC adapter with power cord
GP-2016	RJ45 LAN cable (10 ft)	GP-2235	Stylus (quantity: 5)
GP-2137	USB to RS-232 DB9 male serial converter (5 m)	GP-2253	Li-ion smart battery (quantity: 1)
GP-2219	Compact USB keyboard	GP-2258	USB to GPIB adapter

Notes

a. Single instrument (FTB-1750).

b. Dual instrument (FTB-3500).

c. Specify country power cord: A = North America, C = China, E = Europe, G = Argentina, I = India J = Japan, S = Australia and New Zealand, U = United Kingdom

FTB-1750 HIGH-PERFORMANCE POWER METER SPECIFICATIONS

SPECIFICATIONS [a]

Model	FTB-1750-031-1/2/4	FTB-1750-02X-1/2/4
Number of detectors	1/2/4	1/2/4
Detector type	InGaAs	GeX
Detector size	1 mm	3 mm
Wavelength range (nm)	800 to 1700	800 to 1660
Power range (dBm), typical [b, c]	8 to –80 (9 to –84)	22 to –53 (22 to –60)
Uncertainty	±(5 % + 10 pW) [c, d]	±(5 % +5 nW) [c, e]
Polarization-dependent responsivity (dB) [f, g]	±0.015 typical	±0.015 typical
Linearity [h]	±0.015 dB (5 dBm to –55 dBm)	±0.015 dB (5 dBm to –37 dBm)
Wavelength resolution (nm)	0.01	0.01
Stabilization time (ms), typical	0.4	1.0
Sampling rate (sample/s/channel)	Up to 5208	Up to 5208
Trigger input voltage (Vdc)	0-5 (TTL-type)	0-5 (TTL-type)
Analog output voltage (Vdc), typical	0-5	0-5
Fiber type (µm)	5/125 to 62.5/125	5/125 to 62.5/125

Notes

a. Unless otherwise specified, all specifications are valid at 1550 nm, 23 °C ± 1 °C, after a 20-minute warm-up.

b. From 18 °C to 28 °C.

c. Averaging time of 1 s, after nulling.

d. At 23 °C ± 1 °C with an FOA-322 and an FC non-angled connector, between 1290 nm and 1340 nm, and between 1420 nm and 1640 nm. Add 1 % to uncertainty below 1000 nm, and 6 % over 1640 nm.

e. At 23 °C ± 1 °C with an FOA-322 and an FC non-angled connector, between 1000 nm and 1570 nm. Add 1 % to uncertainty below 1000 nm, and 3 % over 1570 nm.

f. At 23 °C ± 3 °C, constant wavelength (1550 nm), constant power and with an FC non-angled connector.

g. Calculated from "(Max-Min)/2".

h. At constant temperature in the 0 °C to 40 °C range; nulling required.

FTB-3500 HIGH-PERFORMANCE POWER METER SPECIFICATIONS

SPECIFICATIONS [a]

		Without power monitoring	With power monitoring
Singlemode configurations			
Models		**FTB-3500-B**	**FTB-3500-BI**
Fiber type (µm)		9/125	9/125
Wavelength range (nm)		1250 to 1650	1250 to 1650
Maximum attenuation [b] (dB)		≥ 65	≥ 65
Insertion loss [c, d] (dB)			
	Typical	1.0	1.5
	Maximum	1.5	2.2
Attenuation setting resolution (dB), typical		0.002	0.002
Attenuation linearity [e] (dB)		±0.1	±0.1
Attenuation repeatability [f] (dB), typical		±0.01	±0.01
Spectral uniformity, 1510 nm to 1605 nm [g] (dB)		±0.05	±0.05
Spectral uniformity, 1450 nm to 1630nm [g] (dB)		±0.09	±0.09
Power meter linearity [h] (dB)		N/A	±0.03
Power setting repeatability [f] (dB), 2σ		N/A	±0.035
PDL [i] (dB) peak-to-peak		0.15	0.2
Return loss [c, j] (dB), typical		60	60
Max. input power (dBm)		23	23
Transition speed (ms), typical [k]	1 dB	≤ 160	≤ 160
	10 dB	≤ 515	≤ 515
Shutter isolation (dB), typical		≥ 100	> 100
Multimode configurations			
Models		**FTB-3500-C, D**	**FTB-3500-CI, DI**
Fiber type (µm)		50/125, 62.5/125	50/125, 62.5/125
Wavelength range (nm)		700 to 1350	700 to 1350
Maximum attenuation (dB), typical		≥ 60	≥ 60
Insertion loss [c,d] (dB)	Typical	1.3	1.5
	Maximum	2.0	3.0
Attenuation setting resolution (dB), typical		0.002	0.002
Attenuation linearity [e] (dB)		±0.1	±0.1
Attenuation repeatability [f] (dB), typical		±0.01	±0.01
Power meter linearity [l] (dB)		N/A	±0.03
Power setting repeatability [f] (dB), 2σ		N/A	±0.035
Return loss [c, j] (dB), typical		40	40
Max. input power (dBm)		20	20
Transition speed (ms), typical [k]	1 dB	≤ 160	≤ 160
	10 dB	≤ 515	≤ 515
Shutter isolation (dB), typical		> 100	> 100

Notes

a. At 23 °C ± 1 °C.

b. At 1550 nm and below.

c. Measured at 1310 nm and 1550 nm for singlemode units, measured at 850 nm for multimode units.

d. Excluding connectors.

e. Measured at 1310 nm and 1550 nm (up to 40 dB) for singlemode units and at 850 nm and 1300 nm (up to 45 dB) for multimode units, with non-polarized light.

f. Up to 40 dB attenuation.

g. For 20 dB attenuation, relative to 0 dB attenuation.

h. At 1550 nm, after a 30-minute warm-up and an offset nulling, for an input power between 20 dBm and –40 dBm.

i. Up to 20 dB attenuation at 1550 nm.

j. For FC/APC connectors.

k. Including platform processing time.

l. At 1300 nm, after a 30-minute warm-up and an offset nulling, for an input power between 17 dBm and –40 dBm.

ORDERING INFORMATION

Single-Instrument Models

LTK-1-1-XX-XX-XX

Inspection Probe Model
00 = Without probe
FP410B = Digital video inspection probe
Triple magnification
FP420B = Analysis digital video inspection probe
Automated pass/fail analysis
Triple magnification
Autocentering
FP430B = Automated analysis digital video inspection probe
Automated focus
Automated pass/fail analysis
Triple magnification
Autocentering

Base Tips [a]
APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC
UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Instrument

Instrument–Select ONE of the instruments below

XX-XX-XX-XX

Power Meter
FTB-1750 = With FTB-1750 High-Performance Power Meter

Detector
02X = 3 mm GeX detector
031 = 1 mm InGaAs detector

Number of channels
1 = Single channel
2 = Two channels
4 = Four channels

Connector adapter
FOA-316 = SMA 906 ultra-low-reflection
FOA-322 = FC ultra-low-reflection: FC (PC/SPC/UPC/APC), NEC-D3
FOA-328 = DIN 47256 (LSA) ultra-low-reflection: DIN 47256 (PC/APC)
FOA-332 = ST ultra-low-reflection: ST (PC/SPC/UPC)
FOA-340 = Diamond HMS-0, HFS-3 (3.5 mm) ultra-low-reflection
FOA-354 = SC ultra-low-reflection: SC (PC/SPC/UPC/APC)
FOA-376 = FSMA HMS-10/AG, HFS-10/AG ultra-low-reflection
FOA-384 = Diamond HMS-10, HFS-13 ultra-low-reflection
FOA-397 = LX.5 ultra-low-reflection
FOA-398 = LC ultra-low-reflection
FOA-399 = MU ultra-low-reflection

Example: LTK-1-1-FP430B-UPC-FTB-1750-031-5-FOA-322

XX-XX-XX

Variable Attenuator
FTB-3500 = With FTB-3500 Variable Attenuator

Configuration
B = Singlemode 9/125 µm
BI = Singlemode 9/125 µm with power monitoring
C = Multimode 50/125 µm
CI = Multimode 50/125 µm with power monitoring
D = Multimode 62.5/125 µm
DI = Multimode 62.5/125 µm with power monitoring

Connector adapter
EI-EUI-28 = UPC/DIN 47256 z
EI-EUI-76 = UPC/HMS-10/AG
EI-EUI-89 = UPC/FC narrow key
EI-EUI-90 = UPC/ST
EI-EUI-91 = UPC/SC
EI-EUI-95 = UPC/E-2000
EI-EUI-98 = UPC/LC
EA-EUI-28 = APC/DIN 47256
EA-EUI-89 = APC/FC narrow key
EA-EUI-91 = APC/SC
EA-EUI-95 = APC/E-2000
EA-EUI-98 = APC/LC

Example: LTK-1-1-FP430B-UPC-FTB-3500-B-EI-EUI-89

Note

a. Available only if probe option is selected.

ORDERING INFORMATION

Dual-Instrument Models LTK-1-2-XX-XX-XX-XX

Inspection Probe Model
00 = Without probe
FP410B = Digital video inspection probe
Triple magnification
FP420B = Analysis digital video inspection probe
Automated pass/fail analysis
Triple magnification
Autocentering
FP430B = Automated analysis digital video inspection probe
Automated focus
Automated pass/fail analysis
Triple magnification
Autocentering

Base Tips [a]
APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC
UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Instrument 1

Instrument 2

Instruments–Select TWO of the instruments below

XX-XX-XX-XX

Power Meter
FTB-1750 = With FTB-1750 High-Performance Power Meter

Detector
02X = 3 mm GeX detector
031 = 1 mm InGaAs detector

Number of channels
1 = Single channel
2 = Two channels
4 = Four channels

Connector adapter
FOA-316 = SMA 906 ultra-low-reflection
FOA-322 = FC ultra-low-reflection: FC (PC/SPC/UPC/APC), NEC-D3
FOA-328 = DIN 47256 (LSA) ultra-low-reflection: DIN 47256 (PC/APC)
FOA-332 = ST ultra-low-reflection: ST (PC/SPC/UPC)
FOA-340 = Diamond HMS-0, HFS-3 (3.5 mm) ultra-low-reflection
FOA-354 = SC ultra-low-reflection: SC (PC/SPC/UPC/APC)
FOA-376 = FSMA HMS-10/AG, HFS-10/AG ultra-low-reflection
FOA-384 = Diamond HMS-10, HFS-13 ultra-low-reflection
FOA-397 = LX.5 ultra-low-reflection
FOA-398 = LC ultra-low-reflection
FOA-399 = MU ultra-low-reflection

XX-XX-XX

Variable Attenuator
FTB-3500 = With FTB-3500 Variable Attenuator

Configuration
B = Singlemode 9/125 µm
BI = Singlemode 9/125 µm with power monitoring
C = Multimode 50/125 µm
CI = Multimode 50/125 µm with power monitoring
D = Multimode 62.5/125 µm
DI = Multimode 62.5/125 µm with power monitoring

Connector adapter
EI-EUI-28 = UPC/DIN 47256
EI-EUI-76 = UPC/HMS-10/AG
EI-EUI-89 = UPC/FC narrow key
EI-EUI-90 = UPC/ST
EI-EUI-91 = UPC/SC
EI-EUI-95 = UPC/E-2000
EI-EUI-98 = UPC/LC
EA-EUI-28 = APC/DIN 47256
EA-EUI-89 = APC/FC narrow key
EA-EUI-91 = APC/SC
EA-EUI-95 = APC/E-2000
EA-EUI-98 = APC/LC

Example: LTK-1-2-FP430B-UPC-FTB-1750-031-4-FOA-322-FTB-3500-B-EI-EUI-89

Note

a. Available only if probe option is selected.

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