

# MAX-FIP

## INTELLIGENT CONNECTOR AND FIBER CERTIFIER



ConnectMax2

Feature(s) of this product is/are protected by one or more of: US design patents D710222 and equivalent patent(s) pending and/or granted in other countries.

Rugged, tablet-inspired design featuring the latest innovations in automated connector and fiber certification.  
Ensures that workflow and best practices are followed by simplifying and speeding up the critical inspection phase.

### TEST SET KEY FEATURES

Bright, 7-in touchscreen display

Rugged, compact tablet-inspired form factor

Power meter and visual fault locator (VFL) (plug-and-play options)

Full-day, rechargeable Li-ion battery

WiFi and Bluetooth connectivity (plug-and-play options)

### INSPECTION PROBE KEY FEATURES

Fully automated, one-step process:

- › Automatic fiber-connection detection
- › Automatic image-centering
- › Automatic focus adjustment and optimization
- › Automatic capture
- › Automatic pass/fail analysis
- › Automatic reporting

Onboard connector endface analysis (IEC, IPC or custom standards) including MPO/MTP analysis

Pass/fail LED indicator for immediate diagnosis of connector health

Optimal digital image quality with three levels of magnification

USB wired or wireless models available



Data Post-Processing Software  
FastReporter2



Cleaning Kits

EXFO

# MAX-FIP TEST UNIT

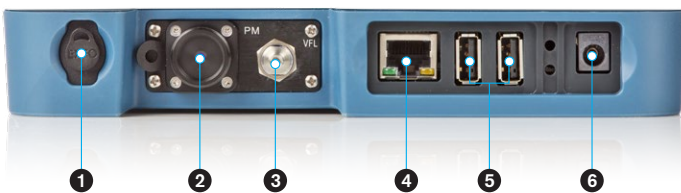
## FEATURES AND CHARACTERISTICS

### SMALL ENOUGH TO BE HANDHELD. LARGE ENOUGH FOR FULL-SCREEN VIEWING.

The MAX-FIP features the largest screen in the industry, providing the highest magnification level for precise viewing of even the smallest defects on fiber endfaces. The unit's tablet-inspired design featuring an icon-based graphical user interface (GUI) makes it easy to navigate and toggle between different applications (inspection, connector analysis, power measurement and VFL troubleshooting). Additionally, its bright 7-inch touchscreen ensures fast and easy operation of the instrument even in full daylight, in turn eliminating eye fatigue associated with prolonged connector inspection (typically experienced during full-day fiber-patch-panel certification routines).

### PACKAGED FOR EFFICIENCY

- |                               |   |
|-------------------------------|---|
| 1 Stylus                      | 6 AC adapter  |
| 2 Power meter                 | 7 Home/switch application and screen capture (hold) |
| 3 Visual fault locator        | 8 Power on/off/standby                              |
| 4 10/100 Mbit/s Ethernet port | 9 Battery LED status                                |
| 5 Two USB 2.0 ports           | 10 Built-in WiFi/Bluetooth                          |



## EXTENSIVE STORAGE CAPABILITY

The MAX-FIP standard 6 GB internal memory offers extensive storage of up to 4000 fiber certification results, and is expandable using USB memory sticks, optional WiFi and Bluetooth capability for cloud-based storage, and wireless FIP-425/FIP-435B connectivity.



## BEST-IN-CLASS AUTONOMY

Take full advantage of the MAX-FIP's amazing eight-hour battery operation that never lets you down, and enables you to complete full-day jobs without having to recharge the unit. Also, save money by not having to pay expensive battery replacement costs associated with other handheld inspection kits on the market operating on standard alkaline batteries.



## PLUG-AND-PLAY OPTICAL OPTIONS

### Integrated optical power meter

- › Extensive range of connectors
- › Auto-Lambda and Auto-Switching
- › Offers measurement storage and reporting
- › Seven standard calibrated wavelengths

### Visual fault locator (VFL)

The integrated VFL easily identifies breaks, bends, faulty connectors and splices, in addition to other causes of signal loss. This basic yet essential troubleshooting tool should be part of every field technician's toolbox. Visually locating faults by creating a bright-red glow at the exact location of the fault on singlemode or multimode fibers, it can detect faults over distances of up to 5 km.



Figure 1. The power meter and VFL piece are offered as an easy-to-install option that's as simple as removing four screws.

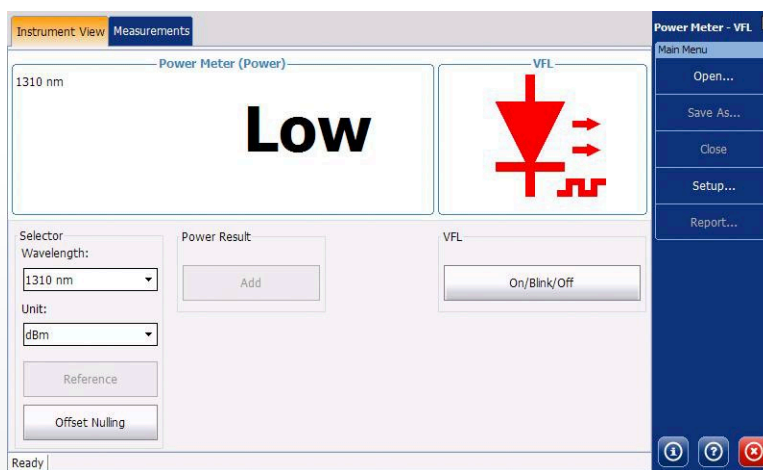


Figure 2. The optical power meter (up to 27 dBm) and VFL can be controlled directly from the main GUI, or using ConnectorMax 2 software.

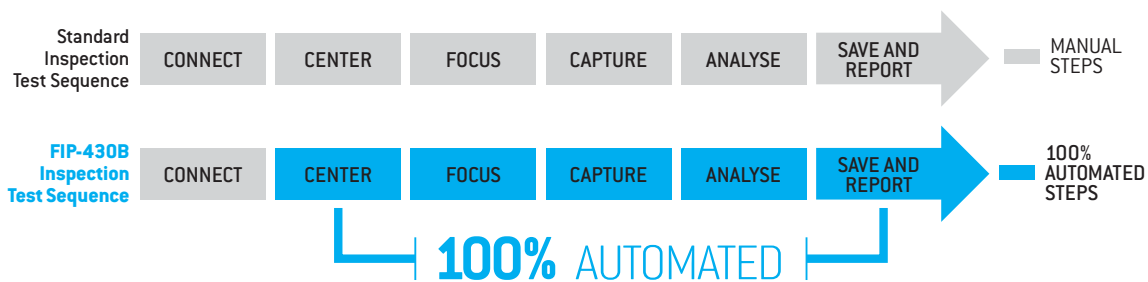
# FIP-400B INSPECTION PROBE SERIES: FEATURES AND CHARACTERISTICS

Neglecting to clean, inspect and certify connectors can lead to serious, time-consuming problems accounting for up to 80% of network failures. Years of experience in the field have provided EXFO with the expertise to re-engineer a major, patent-pending fiber inspection probe designed to both simplify and speed up this critical step of network construction and maintenance.

## UNIQUE AUTOFOCUS FEATURE ENABLING FULLY AUTOMATED FIBER INSPECTION

### Turning fiber inspection into a one-step process

Enabled by its unique automatic focus-adjustment system, the FIP-430B and FIP-435B automates each operation in the test sequence, transforming the critical inspection step into a quick and simple one-step process accessible to technicians of any skill level.

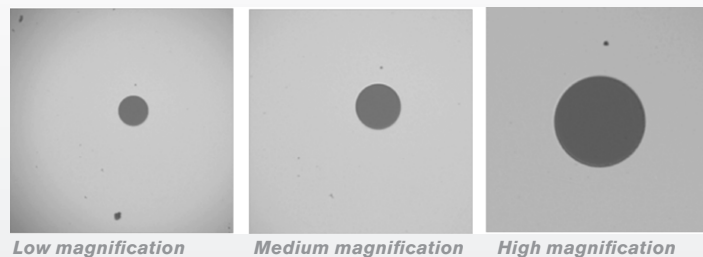


**Automated focus adjustment:** ensures that each connector image is captured at maximum quality for enhanced identification of defects.

**Focus protection:** prevents image capture in the event of improper focus adjustment. This ensures that no performance-affecting defects or residues are ignored in the analysis, thus preventing the reporting of false-positive results.

## RE-ENGINEERED DESIGN

The unit's rubber casing and controls are designed for intense field operation, with controls strategically positioned to simplify the inspection process. In addition, the very bright LED status can be easily viewed from different angles. The FIP-400B is designed for seamless manipulation by both right- and left-handed users.



## TRIPLE MAGNIFICATION MODE

By optimizing the image size, users get a detailed view of all defects. This series features the only probes in the industry offering three magnification levels.



## FAST-TRACKED CONNECTOR INSPECTION

When outsourcing your fiber testing, you'll want to be certain that the technician will apply best practices and properly certify every single connector. Neglecting to do so, at this critical step, will lead to serious, time-consuming problems. The new FIP-400B Series is the result of years of fiber-inspection experience in the field: its patent-pending, re-engineered design was developed based on feedback from actual end-users in order to optimize and speed up the inspection process.

# 57%

shorter  
inspection  
time

### The FIP-400B's hassle-free, automatic image-centering feature saves precious time

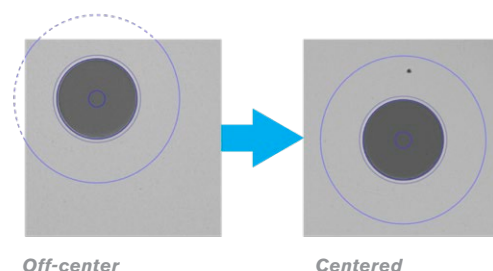
- › Save over two hours on a typical FTTH cabinet inspection (432 fibers)
- › 14-second inspection time per port (down from 32 seconds)\*
- › \$25 000 in potential savings in one year based on one cabinet inspection per day at a cost of \$50 per hour

\* Data sourced from EXFO's case study, with calculation based on typical analysis time.  
Data based on time savings resulting exclusively from the automatic image-centering function.

## AUTOMATIC FIBER IMAGE-CENTERING

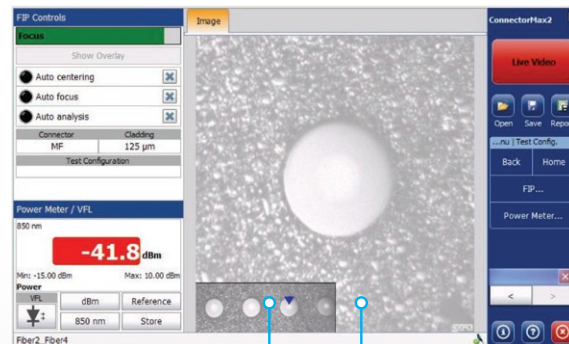
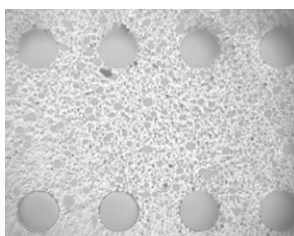
This function cuts inspection time in half by automatically detecting the fiber endface and instantly centering the image. All the user has to do is focus and capture. This is especially handy when inspecting patch panels and hard-to-reach connectors, and also ensures that users will not miss defects in the critical zones of the connectors.

Hit the bull's-eye, every time.



## SIMULTANEOUS MULTIFIBER VIEW WITH PICTURE-IN-PICTURE (PIP)

The FIP-400B's unique 912  $\mu\text{m}$  x 912  $\mu\text{m}$  field of view (FOV) greatly facilitates viewing of the multi-fiber push on (MPO) connector. Plus, ConnectorMax 2 includes a low-magnification PIP window that displays multiple fibers (four or eight at a time), ensuring that you never miss a fiber while scanning.



**Low-magnification view with PIP**  
See and track which fiber is being inspected

**High-magnification view**  
Analyze each fiber for contamination and defects

## FIVE MODELS TO FIT YOUR BUDGET

**The FIP-410B:** all the basic inspection features needed for manual inspection only.

**The semi-automated FIP-420B:** same features as the FIP-430B, without the automated focus adjustment.

**The semi-automated FIP-425B:** wireless version of the semi-automated FIP-420B.

**The FIP-430B:** complete and fully automated feature set, includes the powerful fiber image-centering system, focus adjustment and optimization, and onboard pass/fail analysis.

**The FIP-435B:** go one step further with the wireless probe (includes all FIP-430B features).



FEATURES	USB WIRED			WIRELESS	
	Basic FIP-410B	Semi-automated FIP-420B	Fully automated FIP-430B	Semi-automated FIP-425B	Fully automated FIP-435B
Three magnification levels	✓	✓	✓	✓	✓
Image capture	✓	✓	✓	✓	✓
Five-megapixel CMOS capturing device	✓	✓	✓	✓	✓
Automatic fiber image-centering function	✗	✓	✓	✓	✓
Automatic focus adjustment	✗	✗	✓	✗	✓
Onboard pass/fail analysis	✗	✓	✓	✓	✓
Pass/fail LED indicator	✗	✓	✓	✓	✓
WiFi connectivity	✗	✗	✗	✓	✓

For additional information, please refer to the FIP-400B USB or FIP-400B wireless specification sheets.

# AUTOMATIC PASS/FAIL CONNECTOR CERTIFICATION WITH CONNECTORMAX 2 SOFTWARE

## Powerful connector-endface image viewing and analysis software

- › Automatic pass/fail analysis of the connector endfaces
- › Lightning-fast results in seconds with simple one-touch operation
- › Complete test reports for future referencing
- › Stores images and results for record-keeping

ConnectorMax2

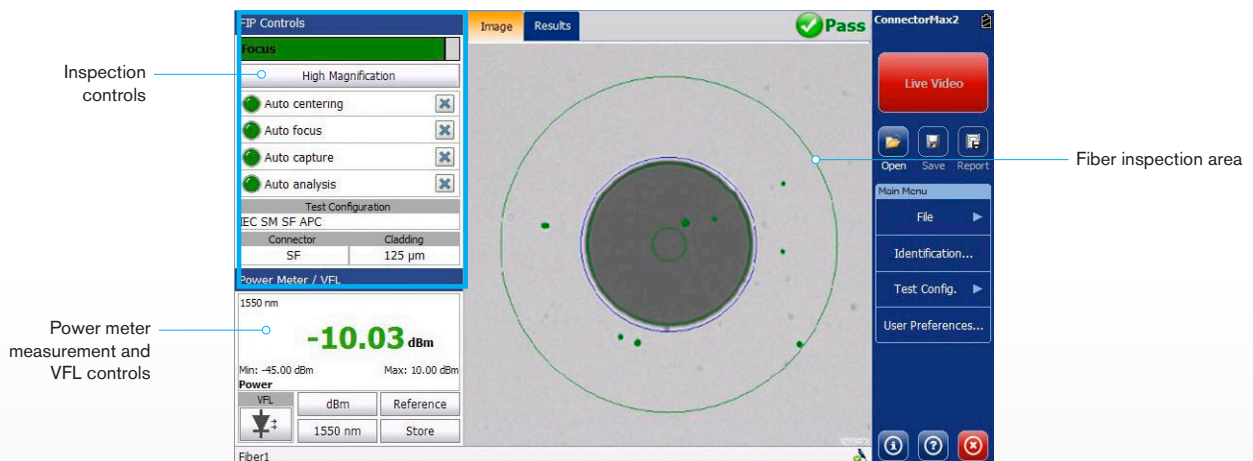
Delivering fast pass/fail assessment of connector endfaces, EXFO's ConnectorMax 2 Software is designed to save both time and money in the field. The ConnectorMax 2 automated inspection application eliminates guesswork by providing clear-cut connector endface analysis.

Using ConnectorMax 2 in conjunction with FIP-400B Series of fiber inspection probes (models with onboard analysis feature), field technicians are able to analyze defects and scratches, and measure their impact on connector performance. Results are then compared against preprogrammed IEC/IPC standards or user-defined criteria, leading to accurate pass/fail verdicts established right on-site.

Therefore, running a pass/fail analysis helps avoid two-time, money-draining situations (i.e., undetected connector defects that require technicians to return to the site at a later date) and unnecessary replacement of connectors with slight defects so small that they do not generate a fail verdict.

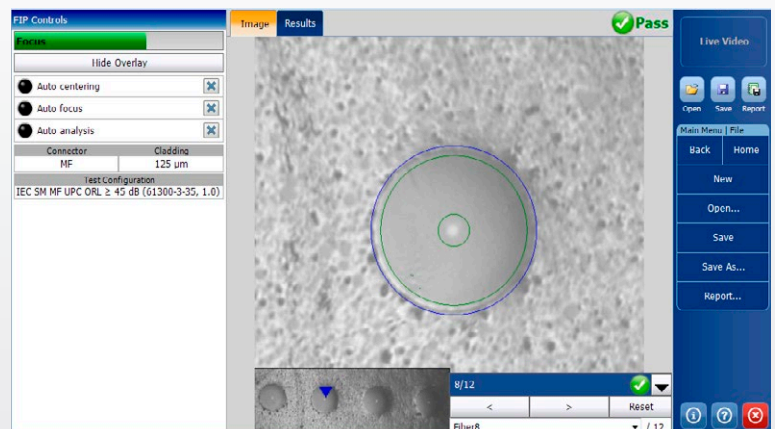
Thanks to ConnectorMax 2's newly redesigned interface, the unit features a unique all-in-one integrated GUI with a touchscreen providing quick access to all of the instrument's main functionalities.

ConnectorMax 2 software is included with all FIP-400B Series Fiber Inspection Probes as the default image viewer and results saving tool. However, please note that the automated pass/fail analysis functionality can only be enabled when used in conjunction with FIP-420B, FIP-425, FIP-430 and FIP-435B probe models, which offer onboard analysis features.



ConnectorMax 2 also offers the smoothest MPO/MTP connector analysis process thanks to its unique PIP multifiber view, which is paired with the automated centering and focusing functions of the FIP-430/435. This leaves your hands free to control the X and Y scanning tool, enabling you to sequentially run the pass/fail analysis on each fiber of the connector in order to obtain a global status as per the standards.

**Fewer manipulations in less time.**



## HANDS-FREE UTILITY BAG (OPTIONAL)

Inspecting fiber connectors on an occasional basis is one thing, but having to inspect numerous connectors day in and day out in the field (e.g., when installing an FTTH cabinet or inspecting crowded data-center patch panels) can be quite challenging. To help optimize your test process and get maximal performance from your MAX-FIP solution, EXFO offers a hands-free utility bag that ensures secure, hands-free operation of the unit when you are working with fibers, connectors and inspection tools. In addition to protecting the unit from various environmental conditions, the utility bag accommodates all essential tools and accessories required for intensive certification work (e.g., connectors, inspection tips, cleaning devices and fiber jumpers) in one handy and lightweight soft bag.



## MAX-FIP HOOK SUPPORT (OPTIONAL)

The MAX-FIP hook support is an optional accessory that fits any type of fiber cabinet door perfectly, enabling hands-free operation for easier and faster fiber manipulation during the connector certification test process. Inspecting and analyzing fiber connector endfaces has never been easier thanks to this automated and intelligent digital fiber inspection probe.



Figure 3. Using the optional GP-2176 hook for the MAX-FIP



## SPECIFICATIONS

### GENERAL SPECIFICATIONS

Size (H x W x D)	200 mm x 155 mm x 50 mm (7 <sup>7</sup> / <sub>8</sub> in x 6 <sup>1</sup> / <sub>8</sub> in x 2 in)
Weight (with battery)	1 kg (2.2 lb)
Temperature	Operating Storage
	–10 °C to 50 °C (14 °F to 122 °F) –40 °C to 70 °C (–40 °F to 158 °F) <sup>a</sup>
Relative humidity	0 % to 95 % non-condensing

### USB FIBER INSPECTION PROBE SPECIFICATIONS <sup>b</sup>

Size (H x W x D)	47 mm x 42 mm x 162 mm (1 <sup>7</sup> / <sub>8</sub> in x 1 <sup>5</sup> / <sub>8</sub> in x 6 <sup>3</sup> / <sub>8</sub> in) <sup>c</sup>
Weight	0.3 kg (0.66 lb)
Resolution	0.55 µm
Camera sensor	Five-megapixel CMOS
Visual detection capability	<1 µm
Field of view	304 µm x 304 µm (high magnification)    608 µm x 608 µm (mid magnification)    912 µm x 912 µm (low magnification)
Light source	Blue LED
Lighting technique	Coaxial
Capture button	Available on all models
Magnification button	Available on all models
Digital magnification	Three levels
Connector	Minimum USB 2.0

### WiFi FIBER INSPECTION PROBE SPECIFICATIONS <sup>b</sup>

Size (H x W x D)	55 mm x 39 mm x 207 mm (2 <sup>3</sup> / <sub>16</sub> in x 1 <sup>1</sup> / <sub>2</sub> in x 8 <sup>1</sup> / <sub>8</sub> in) <sup>c</sup>
Weight	0.3 kg (0.7 lb)
Resolution	0.55 µm
Camera sensor	Five-megapixel CMOS
Visual detection capability	<1 µm
Field of view	304 µm x 304 µm (high magnification)    608 µm x 608 µm (mid magnification)    912 µm x 912 µm (low magnification)
Light source	Blue LED
Lighting technique	Coaxial
Capture button	Available on all models
Magnification button	Available on all models
Digital magnification	Three levels
Connector	Micro USB
Connectivity	WiFi 802.11g
Frequency band	2.4 GHz
Smart device OS compatibility <sup>d</sup>	Android™ 4.2 and above, iOS 8.1 and above
Power	1 x removable battery
Autonomy <sup>e</sup>	FIP-425B: ≥10 h    FIP-435B: ≥8 h
Recharge time <sup>f</sup>	≤ 4 h
Distance range <sup>g</sup>	2.5 m (8.2 ft)

a. –20 °C to 60 °C (–4 °F to 140 °F) with the battery pack.

b. Typical.

c. Measurement excluding tip and including strain relief.

d. Software is qualified with Google Nexus, Apple iPhone and Apple iPad devices. Other models are not guaranteed to be 100% compatible.

e. One (1) test per minute. The probe remains in live mode for 20 seconds during each test.

f. Using USB AC Adapter. When probe is in use the recharge time may take longer.

g. WiFi interferences and physical obstacles may affect distance range.

**BUILT-IN POWER METER SPECIFICATIONS (GeX) (optional) <sup>a</sup>**

Calibrated wavelengths (nm)	850, 1300, 1310, 1490, 1550, 1625, 1650
Power range (dBm) <sup>b</sup>	27 to -50
Uncertainty (%) <sup>c</sup>	±5 % ± 10 nW
Display resolution (dB)	0.01 = max to -40 dBm 0.1 = -40 dBm to -50 dBm
Automatic offset nulling range <sup>b, d</sup>	Max power to -34 dBm
Tone detection (Hz)	270/330/1000/2000

**VISUAL FAULT LOCATOR (VFL) (optional)**

Laser, 650 nm ± 10 nm
CW/Modulate 1 Hz
Typical P <sub>out</sub> in 62.5/125 µm: > -1.5 dBm (0.7 mW)
Laser safety: Class 2

**LASER SAFETY****ConnectorMax 2 SOFTWARE**

The following minimum requirements must be met in order to install and run ConnectorMax 2 on a computer:

**PC OPERATING SYSTEM COMPATIBILITY AND REQUIREMENTS**

System requirements	Minimum requirements Windows XP (32 bit and 64 bit)	Minimum requirements Windows 7 (32 Bit and 64 bit)	Minimum requirements Windows 8 (32 Bit and 64 bit)
Processor	Pentium (800 MHz or higher recommended)	Pentium (1.6 GHz or higher recommended)	Pentium (1.6 GHz or higher recommended)
RAM	256 MB (512 MB recommended)	512 MB (2 GB recommended)	1 GB for 32; 2 GB for 64 (2 GB or more recommended)
Disk space	40 MB	40 MB	40 MB
Other	Latest version of .NET Framework 3.5 DirectX 9.0; USB 2.0, minimum	Latest version of .NET Framework 3.5 DirectX 9.0; USB 2.0, minimum	Desktop applications supported

**FIP-400B INCLUDED ACCESSORIES****FIP-410B/420B/430B (USB wired probe)**

Video inspection probe, bulkhead and patchcord tips
ConnectorMax 2 software
FIPT-BOX      Compartmentalized plastic case for tips
GP-10-094      Soft pouch
GP-2175      Protective cap and cord assembly

**FIP-425B/435B (wireless probe)**

Video inspection probe, bulkhead and patchcord tips
ConnectorMax 2 software
FIPT-BOX      Compartmentalized plastic case for tips
GP-10-094      Soft pouch
GP-2175      Protective cap and cord assembly
GP-2225      USB to Micro USB cable
GP-2226      Rechargeable battery (quantity: one)
GP-2227      USB AC adapter

**MAX-FIP OPTIONAL ACCESSORIES**

GP-302      USB mouse	GP-2177      Hands-free bag for MAX-FIP
GP-1008      VFL adapter (2.5 mm to 1.25 mm)	GP-2178      Right-angle USB adapter cable for MAX-FIP (USB male to USB female)
GP-2001      USB keyboard	GP-2205      DC vehicle battery-charging adapter (12 V)
GP-2016      10-foot RJ45 LAN cable	GP-10-072      Semi-rigid carrying case
GP-2144      USB 16G microdrive	GP-10-061      Soft carrying case
GP-2176      Hook for MAX-FIP	

a. At 23 °C ± 1 °C, 1550 nm and FC connector. Battery-operated after 20-minute warm-up.

b. Typical.

c. At calibration conditions.

d. For ±0.05 dB, from 10 °C to 30 °C.

## ORDERING INFORMATION

## Stand-alone units

MAX-FIP-XX-XX-XX

## Power meter

00 = Without power meter  
 P2X = Power meter; GeX detector  
 VP2X = VFL and power meter; GeX detector

## WiFi and Bluetooth

00 = Without RF components  
 RF = With RF capability (WiFi and Bluetooth)

Connector adapter<sup>a</sup>

FOA-12 = Biconic  
 FOA-14 = NEC D4: PC, SPC, UPC  
 FOA-16 = SMA/905, SMA-906  
 FOA-22 = FC/PC, FC/SPC, FC/UPC, FC/APC  
 FOA-28 = DIN 47256, DIN 47256/APC  
 FOA-32 = ST: ST/PC, ST/SPC, ST/UPC  
 FOA-54 = SC: SC/PC, SC/SPC, SC/UPC, SC/APC  
 FOA-78 = Radiall EC  
 FOA-96B = E-2000/APC  
 FOA-98 = LC  
 FOA-99 = MU

Example: MAX-FIP-VP2X-FOA-54-RF

a. Available if power meter selected.

## ORDERING INFORMATION

## Kits

TK-MAX-FIP-XX-XX-XX-XX-XX-XX

Power meter <sup>a</sup>

00 = Without power meter

P2X = Power meter; GeX detector

VP2X = VFL and power meter; GeX detector

Connector adapter <sup>a</sup>

FOA-12 = Biconic

FOA-14 = NEC D4: PC, SPC, UPC

FOA-16 = SMA/905, SMA-906

FOA-22 = FC/PC, FC/SPC, FC/UPC, FC/APC

FOA-28 = DIN 47256, DIN 47256/APC

FOA-32 = ST: ST/PC, ST/SPC, ST/UPC

FOA-54 = SC: SC/PC, SC/SPC, SC/UPC, SC/APC

FOA-78 = Radiall EC

FOA-96B = E-2000/APC

FOA-98 = LC

FOA-99 = MU

WiFi and Bluetooth <sup>a</sup>

00 = Without RF components

RF = With RF capability (WiFi and Bluetooth)

Inspection Probe Model <sup>b</sup>FIP-410B = Digital Video Inspection Probe  
Triple MagnificationFIP-420B = Analysis Digital Video Inspection Probe  
Automated pass/fail analysis  
Triple magnification  
AutocenteringFIP-425B = Wireless Digital Video Inspection Probe <sup>g</sup>  
Automated pass/fail analysis  
Triple magnification  
AutocenteringFIP-430B = Automated Analysis Digital Video Inspection Probe  
Automated focus  
Automated pass/fail analysis  
Triple Magnification  
AutocenteringFIP-435B = Wireless Analysis Digital Video Inspection Probe <sup>g</sup>  
Automated focus  
Automated pass/fail analysis  
Triple magnification  
AutocenteringBase tips <sup>a</sup>

APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC

UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Example: TK-MAX-FIP-VP2X-FOA-54-RF-FIP-420B-UPC-FIPT-400-FC-SC-FIPT-400-U25M

Extra FIP-400B tips <sup>c</sup>

## Bulkhead tips

FIPT-400-FC-APC = FCAPC tip for bulkhead adapter

FIPT-400-FC-SC = FC and SC tip for bulkhead adapter <sup>d</sup>

FIPT-400-LC = LC tip for bulkhead adapters

FIPT-400-LC-APC = LC/APC tip for bulkhead adapter

FIPT-400-MU = MU tip for bulkhead adapters

FIPT-400-SC-APC = SC APC tip for bulkhead adapter <sup>e</sup>

FIPT-400-SC-UPC = SC UPC tip for bulkhead adapter

FIPT-400-ST = ST tip for bulkhead adapter

## Patchcord tips

FIPT-400-U12M = Universal patchcord tip for 1.25 mm ferrules

FIPT-400-U12MA = Universal patchcord tip for 1.25 mm ferrules APC

FIPT-400-U16M = Universal patchcord tip for 1.6 mm ferrules

FIPT-400-U20M2 = Universal patchcord tip for 2.0 mm ferrules (D4, Lemo)

FIPT-400-U25M = Universal patchcord tip for 2.5 mm ferrules <sup>d</sup>FIPT-400-U25MA = Universal patchcord tip for 2,5 mm ferrules APC <sup>e</sup>Multifiber tips <sup>f</sup>

FIPT-400-MTP2 = MTP/MPO UPC tip for bulkhead adapter

FIPT-400-MTPA2 = MTP/MPO APC tip for bulkhead adapter

FIPT-400-MTP-MTR = MTP/MPO Multi-Row UPC tip for bulkhead adapter

FIPT-400-MTP-MTRA = MTP/MPO Multi-Row APC tip for bulkhead adapter

## Tip kits

FIPT-400-LC-K = LC tip kit including:

FIPT-400-LC: LC tip for bulkhead adapters,

FIPT-400-LC-APC: LC/APC tip for bulkhead adapter,

FIPT-400-U12M: Universal patchcord tip for 1.25 mm ferrules,

FIPT-400-U12MA: Universal patchcord tip for 1.25 mm ferrules APC

FIPT-400-LC-K-APC = LC tip kit including:

FIPT-400-LC-APC: LC/APC tip for bulkhead adapter

FIPT-400-U12MA: Universal patchcord tip for 1.25 mm ferrules APC

FIPT-400-LC-K-UPC = LC tip kit including:

FIPT-400-LC: LC tip for bulkhead adapters

FIPT-400-U12M: Universal patchcord tip for 1.25 mm ferrules

FIPT-400-MTP-MTR-K = MTP/MPO Multi-Row APC and UPC tip for bulkhead adapter <sup>f</sup>

a. Available if power meter selected.

b. Includes ConnectorMax 2 software.

c. This list represents a selection of fiber inspection tips that covers the most common connectors and applications but does not reflect all the tips available. EXFO offers a wide range of inspection tips, bulkhead adaptors and kits to cover many more connector types and different applications. Please contact your local EXFO sales representative or visit [www.EXFO.com/FIPtips](http://www.EXFO.com/FIPtips) for more information.

d. Included when UPC base tips are selected.

e. Included when APC base tips are selected.

f. Includes a bulkhead adapter for patchcord inspection.

g. RF option mandatory and included with this model.

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