FIP-400B Wireless Fiber Inspection Probe

FULLY AUTOMATED WiFi INSPECTION TOOL WITH EMBEDDED ANALYSIS

Available for
iOS and Android™

ConnectorMax2 MOBILE

2015 DIAMOND TECHNOLOGY REVIEWS
BTR
BROADBAND TECHNOLOGY REPORT

2015 Cabling Installation & Maintenance
Gold
Innovators Awards

2017 Cabling Installation & Maintenance
Silver
Innovators Awards

Feature(s) of this product is/are protected by one or more of: US design patents D751434 and equivalents in other countries; US design patent D742394; US patent 9,841,579 and equivalent patent(s) pending and/or granted in other countries; US patent 9,921,373; patent appl. US 2017/0003195 A1 and equivalent patent(s) pending and/or granted in other countries; and/or other US patent pending.

Turn your smart device into a fully automated fiber inspection solution delivering fast and consistent test results for both single and multifiber connectors, from a single tool. With no wire in your way or cumbersome battery pack, it provides unmatched user experience combined with bring-it-anywhere portability.

KEY FEATURES

100% automated, one-step inspection process

Completely wireless, self-powered unit

Screenless operation enabled by pass/fail LED indicator

On-board connector endface analysis (IEC, IPC or custom standards)

Feature-rich ConnectorMax2 mobile application compatible with Android™ and iOS devices

Full reporting capabilities on mobile devices

All-day battery life that will never let you down

MF-ready version compatible with patent-pending automated multifiber connector inspection tip

APPLICATIONS

Fiber-to-the-antenna (FTTA)

FTTx and hybrid networks

DAS and fiber-fed small cells

Data centers

Campus and private networks

Central office

RELATED PRODUCTS

FIP-400B MF-ready
USB fiber inspection probe

FIPT-400-MF
Patent-pending automated multifiber inspection tip

FastReporter2
Data post-processing software

Cleaning kits

EXFO

FULLY AUTOMATED.
WIRELESS. UNRESTRICTED.

By combining unmatched ease of use and WiFi connectivity along with the flexibility and conviviality of Android or iOS smart devices, EXFO is removing the last roadblocks in connector certification and making testing simple and headache-free. With the FIP-435B, there is nothing restricting your field crews from following fiber-testing best practices and eradicating faulty connector issues impacting the performance of your network.

ACCESSIBLE TO ANYONE, ANYWHERE.

Everyone working on your network—regardless of background or skill level—can be equipped with the FIP-435B and perform first-level troubleshooting tasks, thus addressing the most common source of problems. Whenever problems arise in whichever type of fiber network deployed—FTTx, central offices, private networks, data centers, and more—fiber connectors are the first critical elements to validate. With the FIP-435B's 100% automated test sequence, validating the health status of connector endfaces is now a fast and easy one-step process. Install the ConnectorMax2 mobile application on an Android or iOS device and turn anyone's smartphone or tablet into a fully-fledged fiber inspection solution, without compromising on functionality or accuracy of test results.

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FIBER INSPECTION REACHES NEW HEIGHTS

During fiber-to-the-antenna (FTTA) installation, operators and infrastructure owners have to hire climbing specialists to mount towers and install the fibers and connect the remote-radio-heads (RRH). This is a costly endeavour. Crews usually familiar with copper or RF technology don't always have the required fiber-testing background and it is difficult to carry bulky equipment up the towers.

Thanks to a fully automated test process, the FIP-435B helps close the technology gap, reduces the number of climbs required and streamlines the work needed at the top of the tower. The device's automatic focus adjustment feature delivers optimal image capture resolution while its focus protection feature prevents any risk of false positive results, ensuring technicians won't have to climb the same mountain twice.

Moreover, it enables tower climbers to leave their phones in their pockets, relying only on the LED pass/fail indicator to get an immediate analysis result based on industry standards. With no heavy platform or phone to handle, the probe can be operated with just one hand, allowing them to concentrate on the task at hand and reach hard-to-access locations more easily.

INSPECTION—WITHOUT RESTRICTIONS

The FIP-435B is a true wireless solution. The live video feed is streamed via WiFi without any wired connection between the probe and the smart device or any need for a cumbersome external battery pack. This greatly improves functional design and eliminates the risk of damaging your smart device by accidentally pulling a wire while manipulating the inspection tool. With its unmatched automation, simplified test ergonomics and pure freedom of operation, the FIP-435B makes technicians lives much easier and facilitates the adoption of best practices.
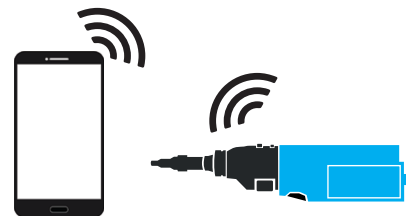
Moreover, you can benefit from smart device connectivity in any location, allowing you to sync results and reports to cloud servers via email or other communication means available through your smart device.
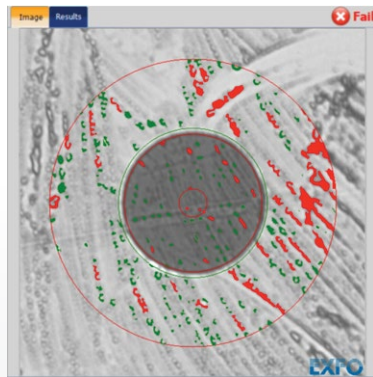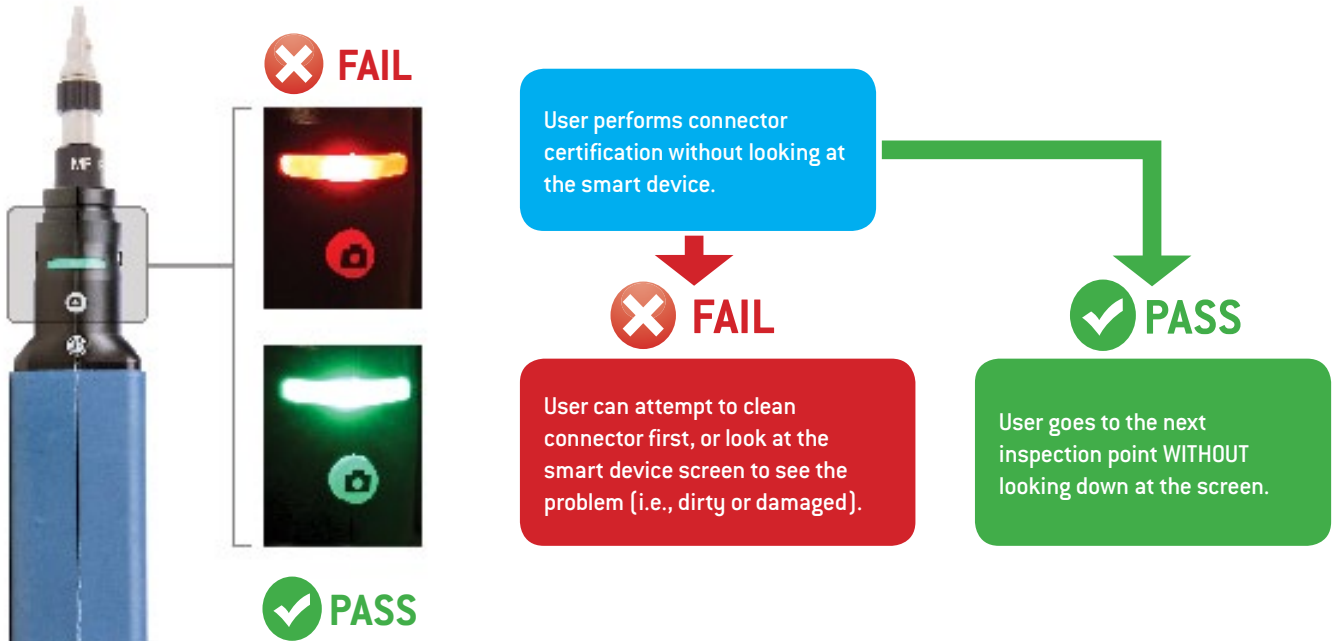
FIP-400B WIRELESS FIBER INSPECTION PROBE

1. Interchangeable adapter tip (FIPT-400-XX)
2. Retaining nut
3. Activity and pass/fail status LED
4. Image capture control
5. Magnification control
6. Power button
7. Battery status LED
8. WiFi status LED
9. Battery compartment
10. Focus adjustment wheel
11. Finger grip
12. Wrist-strap eyelet
13. Micro-USB port (power/recharge)
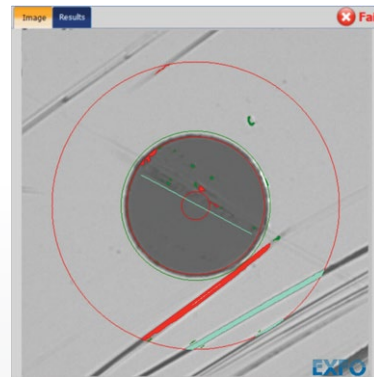14. USB wire holder

EXFO
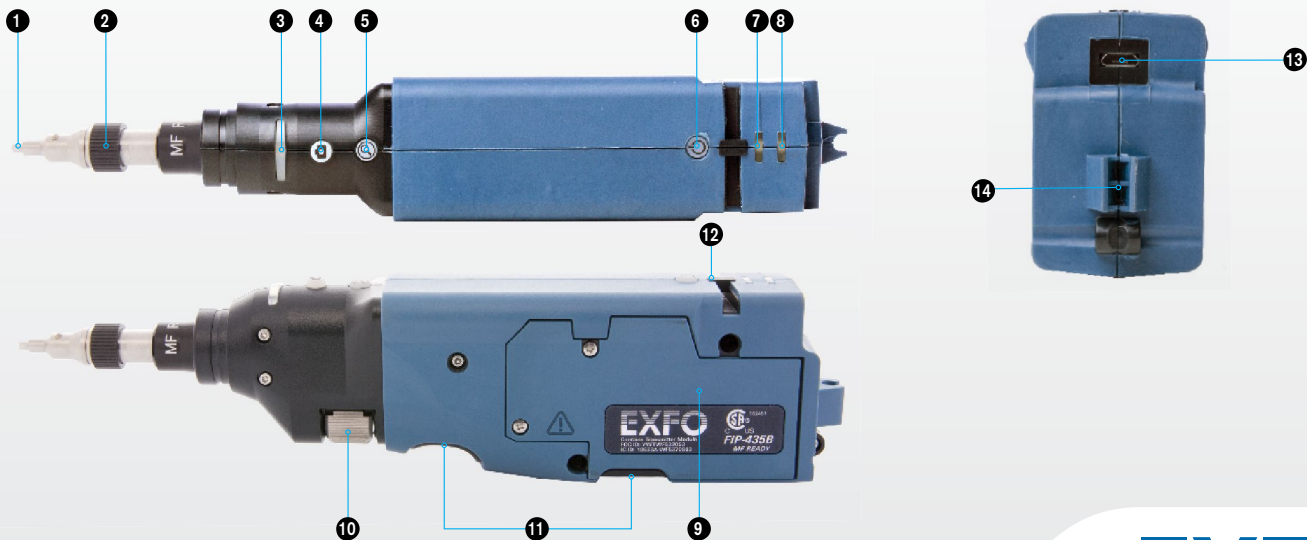
SCREENLESS OPERATION

Thanks to the pass/fail LED, users can perform connector certification without having to look back at the smartphone to view the results. This enables the user to keep their smart device in their pocket, thereby freeing them up to use two hands in the inspection process.

❌ **FAIL**

✅ **PASS**

User performs connector certification without looking at the smart device.

❌ **FAIL**

User can attempt to clean connector first, or look at the smart device screen to see the problem (i.e., dirty or damaged).

✅ **PASS**

User goes to the next inspection point WITHOUT looking down at the screen.

Dirty=must clean the connector

Damaged=must replace the connector

NO MORE SMART DEVICE BATTERY DRAIN

EXFO's wireless fiber inspection probes are not relying on your smart device for power. Probes are self-powered by an onboard battery that can provide a full day of inspection when fully charged. Batteries can be easily recharged when connected to a standard AC power outlet via the USB cable provided.
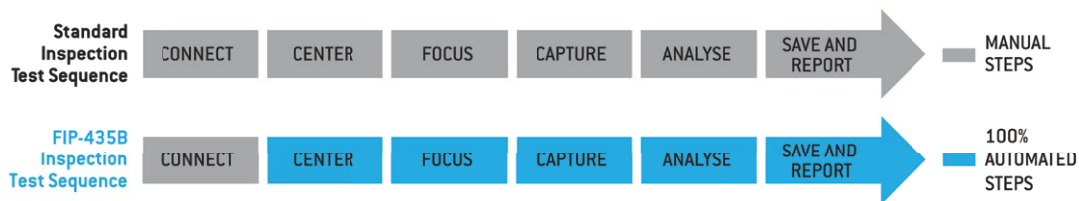
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FAST-TRACKING CONNECTOR INSPECTION

When you outsource your fiber testing, you want to be certain that the technician will apply the best practices and properly certify every connector. Neglecting to do so, at this critical step, will lead to serious, time-consuming problems. The new FIP-400B Wireless Series is the result of years of fiber-inspection experience in the field. Its patent-pending, re-engineered design was developed from actual, end-user feedback for the purpose of optimizing and speeding up the inspection process.

AUTOMATING THE COMPLETE INSPECTION PROCESS

Enabled by its unique automatic focus-adjustment system, the 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.

The focus-adjustment system ensures that each connector image is captured with maximum quality to facilitate the identification of defects. Moreover, a focus protection feature prevents image capture in the event of improper focus adjustment, ensuring that no defects or residues affecting performance are ignored by the analysis, thus avoiding the reporting of false-positive results. These features all lead to more accurate and consistent test results leading to first-time-right network deployment.

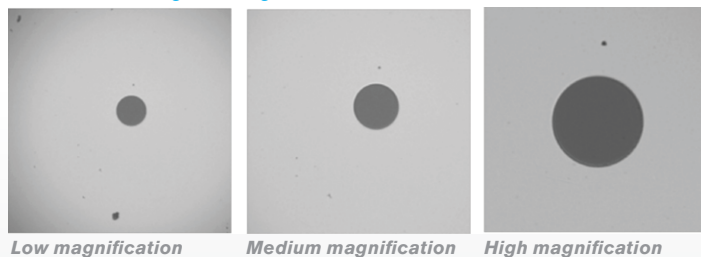| Standard Inspection Test Sequence | CONNECT | CENTER | FOCUS | CAPTURE | ANALYSE | SAVE AND REPORT | → | MANUAL STEPS |
| FIP-435B Inspection Test Sequence | CONNECT | CENTER | FOCUS | CAPTURE | ANALYSE | SAVE AND REPORT | → | 100% AUTOMATED STEPS |

AUTOMATIC, FIBER IMAGE CENTERING

This function cuts inspection time in half, because it automatically detects the fiber endface and instantly centers the image. The user simply has to focus and capture. This is especially handy when inspecting patch panels and hard-to-reach connectors. It also ensures that users will not miss defects in the critical zones of the connectors.

Off-center   *Centered*
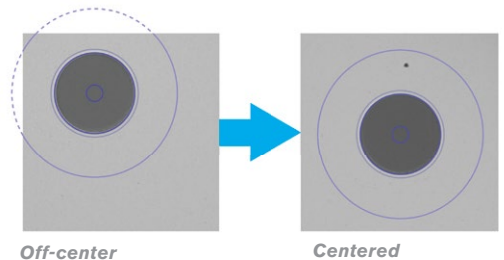
Hit the bull's-eye, every time.

Low magnification   *Medium magnification*   *High magnification*

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.

PATENT-PENDING AUTOMATED MULTIFIBER INSPECTION

The FIP-400B is a versatile fiber inspection probe that allows users to inspect single fiber connectors as well as multifiber connectors, such as MPO, MTP® [a], OptiTip® [b] MT and Q-ODC® [c]-12. The FIPT-400-MF uses a patent-pending trigger to scan all fibers automatically.

Simply swap the adapter tip for EXFO's automated multifiber probe to quickly and easily inspect all multiple- and single-row MPO connectors without missing any fibers or dealing with the hassle of manipulating one or multiple scanning knobs. These features make it possible to inspect densely populated panels without having to disturb adjacent fibers that may be carrying information. Users can easily operate this instrument with just one hand—it's automated and fumble-free fiber inspection. Take advantage of first-time right inspections! [d]
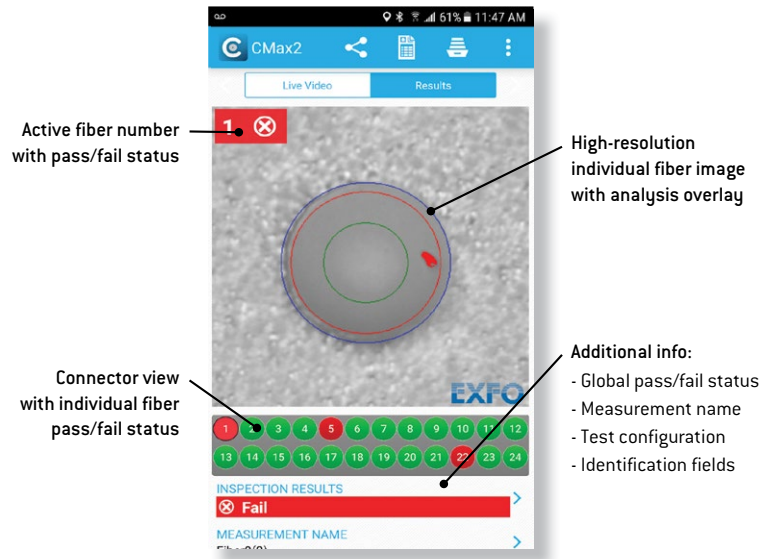
Notes

a. MTP is a registered trademark of US Conec Ltd.

b. OptiTip is a registered trademark of Corning Cable Systems.

c. Q-ODC is a registered trademark of HUBER+SUHNER.

d. For more information on Automated Multifiber Inspection, refer to the FIPT-400-MF specification sheet www.exfo.com/library/technical-resources/specification-sheets/speca-fipt-400-mf

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## PATENT-PENDING MULTIFIBER INTERFACE

EXFO's patent-pending interface enables a quick assessment of the entire multifiber connector in a single view. Access single fibers as well as the entire connector pass/fail status all at once via a simple interface. Quickly navigate through individual high-resolution fiber images on demand by selecting fibers in the connector view or swiping over the fiber image.

Active fiber number with pass/fail status

High-resolution individual fiber image with analysis overlay

Connector view with individual fiber pass/fail status

Additional info:
- Global pass/fail status
- Measurement name
- Test configuration
- Identification fields

WORKFLOW INTEGRATION AND PROCESS COMPLIANCE

As some telecom operators have already made the switch—or will soon—to smart devices for their field crews, the FIP-425/435B, with Android and iOS compatibility, ensures compliance with current operator's processes and enables users to benefit from smart device connectivity (3G, 4G, WiFi, etc.) directly in the field.

› Sync results and data with operator's database

› Compliance with operator process and requirements for workflow integration and optimization

Operator database
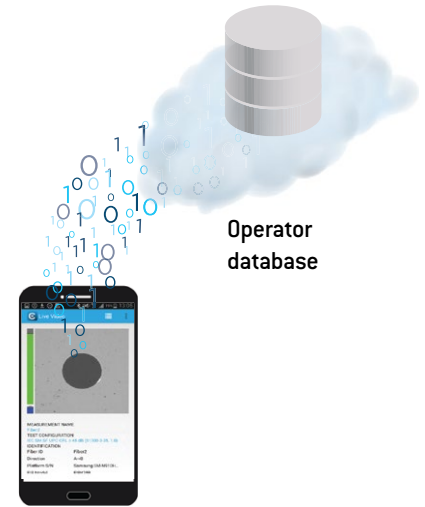
FIP-400B SERIES OF FIBER INSPECTION PROBES

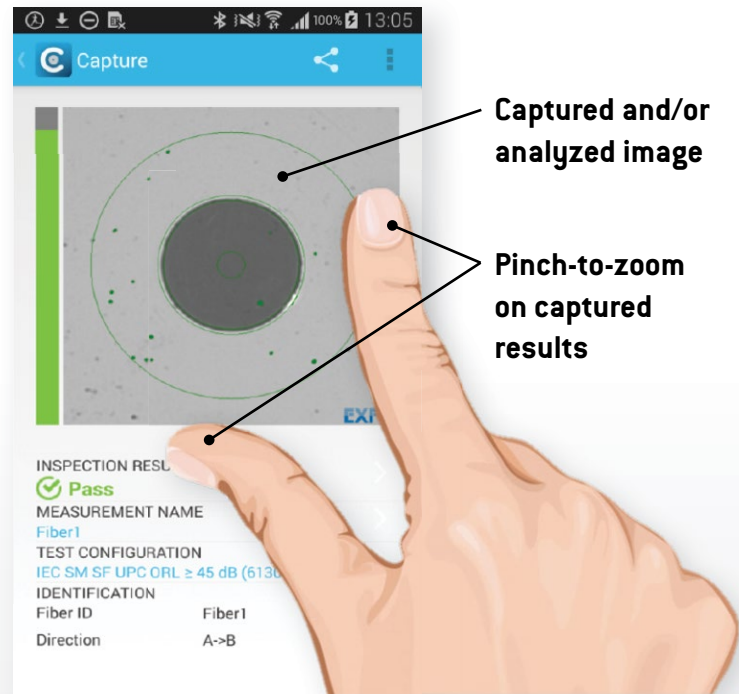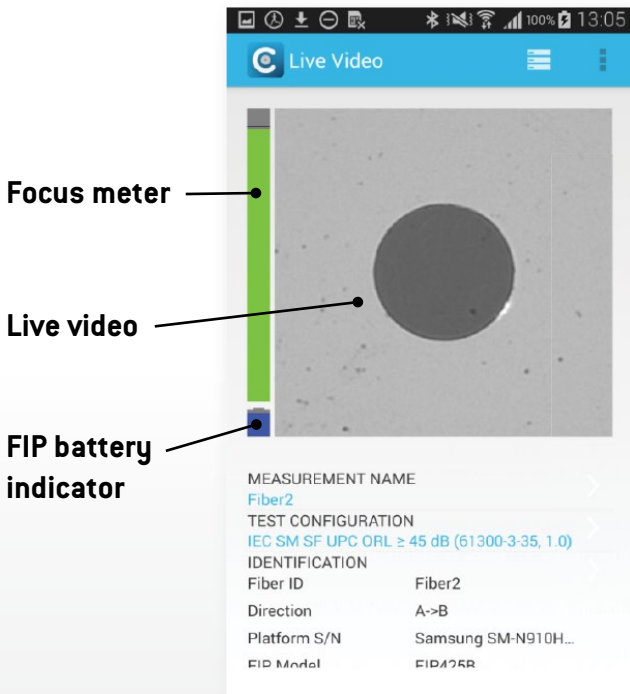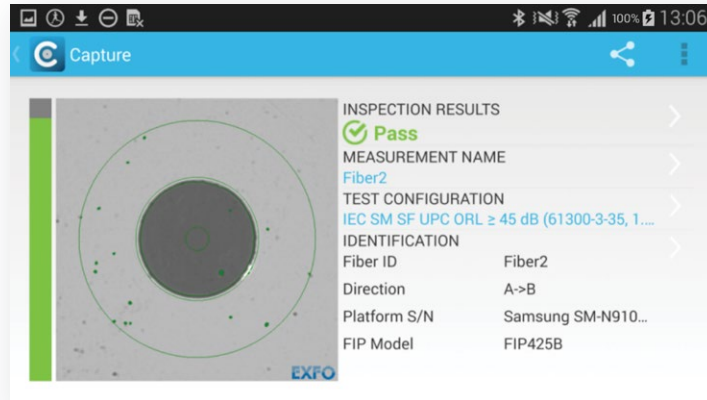| FEATURES	USB WIRED			WIRELESS	
	Basic **FIP-410B**	Semi-automated **FIP-420B**	Fully automated **FIP-430B**	Semi-automated **FIP-425B**	Fully automated **FIP-435B**
Three magnification levels	√	√	√	√	√
Image capture	√	√	√	√	√
Five-megapixel CMOS capturing device	√	√	√	√	√
Automatic fiber image-centering function	X	√	√	√	√
Automatic focus adjustment	X	X	√	X	√
On-board pass/fail analysis	X	√	√	√	√
Pass/fail LED indicator	X	√	√	√	√
WiFi connectivity	X	X	X	√	√
Manual scanning for multifiber/MPO connectors	√	√	√	√	√
Automated multifiber/MPO inspection	√	√	√	√	√

EXFO

ConnectorMax2
MOBILE

Paired with the FIP-425B or FIP-435B WiFi fiber probes, this application turns your smartphone or tablet into a complete and fully automated fiber inspection solution. Combining the connectivity and conviviality of your smart device with the freedom of operation of EXFO's wireless probe removes the last roadblocks in making fiber inspection accessible to anyone.

This new edition of ConnectorMax2 features a mobile-friendly design with absolutely no compromise on performance or functionality—you can inspect, certify, save, document and report instantly from your smart device—all with an unmatched user-experience.

On top of the connector endface viewing and analysis features, ConnectorMax2 Mobile brings an abundance of value-added features from the world of smartphones and tablets to its testing application, such as pinch-to-zoom on captured results, voiced or handwritten input and the support of screen orientation changes.

Available on the **App Store**

GET IT ON **Google play**

Focus meter

Live video

FIP battery indicator

Captured and/or analyzed image

Pinch-to-zoom on captured results

EXFO

High-resolution connector image with analysis summary

Complete and detailed analysis results

TIME-SAVING FEATURES FOR DOCUMENTATION

In addition to using a standard keyboard, you can also input the required identification information using the Android voice recognition system or with a stylus using the handwriting feature (if these features are offered on the smart device).

Voice   **Handwriting**   **Keypad**

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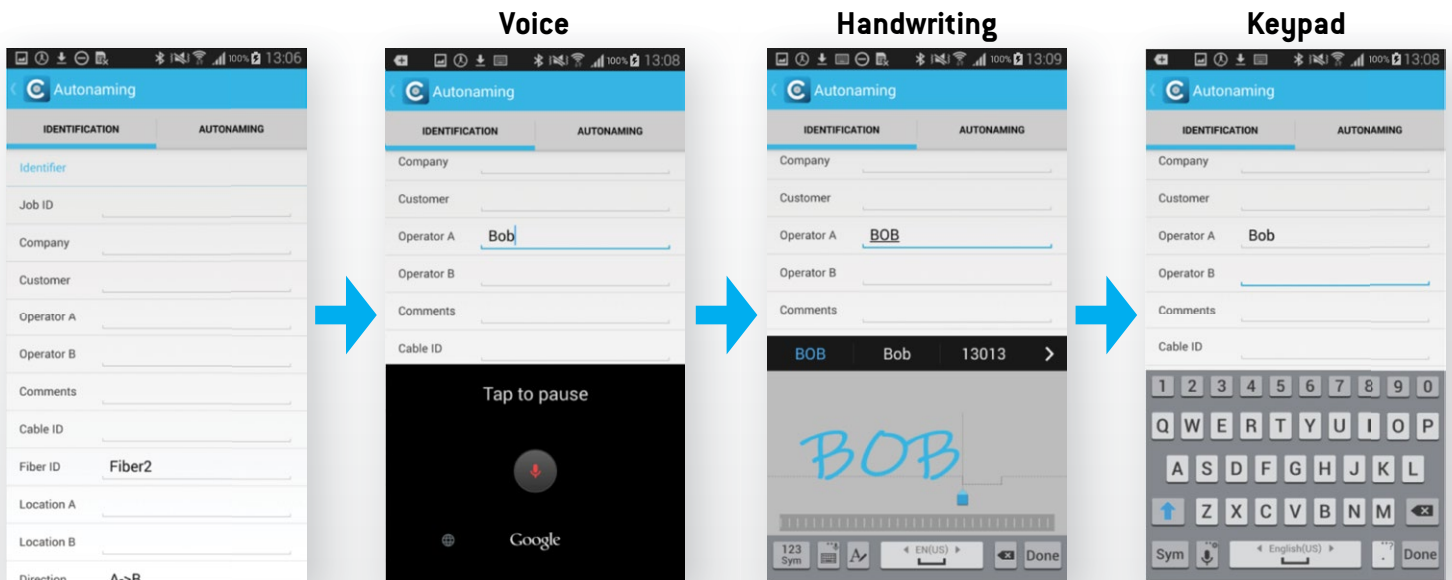
HOW CONFIDENT ARE YOU ABOUT YOUR CONNECTOR CLEANLINESS?

Connector inspection using automated analysis software to assess connector quality is an essential step during fiber commissioning and installation, and an integral part of best practices. Maintaining connector certification records is important for future reference. When combined with fiber certification, connector inspection provides end-to-end certification.

However, users may not be aware of the fact that standards do not specify the focus level needed to achieve proper connector assessment. A slightly out-of-focus image may hide defects and trigger a "pass" result when analyzed in accordance with specific inspection standards. Unfortunately, if these hidden defects exceed acceptance criteria, the result will be a false positive.
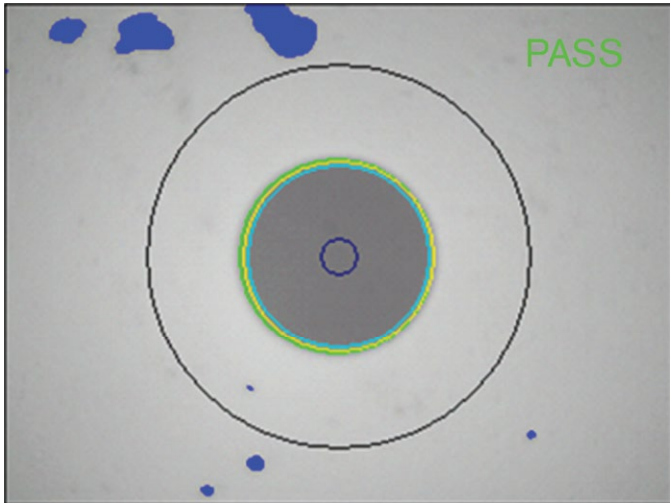

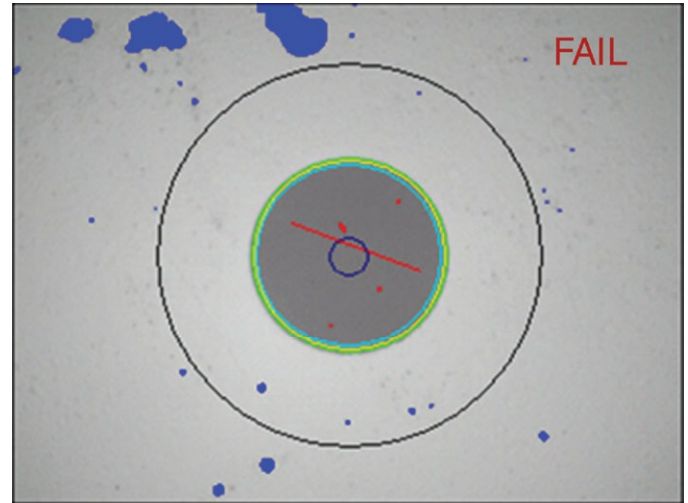*Figure 1. An out-of-focus image can hide critical defects capable of delivering a "pass" verdict.*

Figure 2. An optimized focus adjustment will ensure that all defects affecting performances are seen.

› Such false-positive results are likely to mislead users and result in costly consequences. Future upgrades to higher data rates such as 40G/100G may fail, as tolerances for insertion loss (IL) and optical return loss (ORL) become much tighter with higher data rates. For example, a connector hiding small defects in the core area may be able to handle 2.5G or 10G, but could fail at 100G. If a specific link is chosen for an upgrade to a higher data rate, and tied to a service-level agreement (SLA), there could be grave financial consequences.

› False positives may also become the root cause of long and tedious troubleshooting tasks, because engineers will seek out issues at the fiber level (transmission cards, splice points) before rechecking connectors that are displaying pass results.

› Bad connectors can also affect test results. A good example of this is higher ORL readings from the OTDR due to dirty connectors, which typically exhibit more reflection. Another commonly encountered example involves erratic readings during 40G or 100G OTN BERT testing. Problems such as forward error correction (FEC) may also arise and lead to unnecessary troubleshooting of TX and RX equipment, when in actual fact, the problem is at the connector level. When these issues surface, the only solution is to obtain reliable results by returning on-site and retesting the link.

AVOID FALSE POSITIVES

To avoid such issues, users are now requesting methods that optimize image quality to ensure the integrity of inspection results. This is exactly where the new FIP-430B/435B inspection probe comes into play. Thanks to its fully automated features, the FIP-430B/435B ensures optimized image quality. This inspection probe automatically adjusts and optimizes focus and image centering, and then automatically captures and analyzes in accordance with pre-programmed IEC, IPC or custom standards delivering accurate results—and all in just ONE step.

EXFO

BRING IT EVERYWHERE WITH THE BELT HOLSTER

GP-2224*

The perfect accessory to carry:

› 1 x FIP-425B/435B unit

› 2 x IBC cleaner tools

› A selection of fiber inspection tips

› Smartphone

› FLS-140 VFL (or pen)

*Accessories not included.

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SPECIFICATIONS [a]

Size (H x W x D)	55 mm x 39 mm x 207 mm (2 $^3/_{16}$ in x 1 $^1/_2$ in x 8 $^1/_8$ in) [b]
Weight	0.3 kg (0.7 lb)
Resolution	0.55 µm
Camera sensor	Five-megapixel CMOS
Visual detection capability [g]	<1 µm
Field of view [g]	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 [c]	Android 4.4 and above, iOS 9 and above
Power	1 x removable battery
Autonomy [d]	FIP-425B: ≥10 hours FIP-435B: ≥8 hours
Recharge time [e]	≤ 4 h
Distance range [f]	2.5 m (8.2 ft)

GENERAL SPECIFICATIONS

Temperature operating	Unit powered by batteries: −10 °C to °C 40 °C (14 °F to 104 °F) Unit connected to USB adapter: 0 °C to 40 °C (32 °F to 104 °F)
Temperature storage	Unit without batteries: −40 °C to 70 °C (−40 °F to 158 °F) Unit with batteries: −20 °C to 60 °C (−4 °F to 140 °F)
Relative humidity	Unit: 0% to 95% non-condensing USB Adapter: 5% to 95% non-condensing for storage. 8% to 90% for operating temperature

ACCESSORIES (INCLUDED)

Video inspection probe (FIP-425B/435B)

Bulkhead and patch cord tips

GP-2175: Protective cap and cord assembly

FIPT-BOX: Compartmentalized plastic case for tips

GP-3108: Compartmented soft pouch

GP-2225: USB to micro USB cable

GP-2226: Rechargeable battery (qty. 1)

GP-2227: USB AC adapter

Notes

a. Typical.

b. Measurement excluding tip.

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

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

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

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

g. Single Fiber Connector mode.

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ORDERING INFORMATION

Single fiber configuration

FIP-4XXB-XX-XX

Inspection probe model [a]
FIP-425B = Wireless analysis digital video inspection probe
           Automated pass/fail analysis
           Triple magnification
           Autocentering
FIP-435B = Wireless analysis digital video inspection probe
           Automated focus
           Automated pass/fail analysis
           Triple magnification
           Autocentering

Base tips
APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC
UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Extra FIP-400B tips [b]
Bulkhead tips
FIPT-400-FC-APC = FCAPC tip for bulkhead adapter
FIPT-400-FC-SC = FC and SC tip for bulkhead adapter [c]
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 [d]
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 [c]
FIPT-400-U25MA = Universal patchcord tip for 2.5 mm ferrules APC [d]

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

Example: FIP-425B-APC-FIPT-400-FC-SC-FIPT-400-U25M

Notes

a. ConnectorMax2 Mobile software available on the App Store and on Google Play™.

b. 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** for more information.

c. Included when UPC base tips are selected.

d. Included when APC base tips are selected.

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ORDERING INFORMATION

Multifiber and single-fiber configuration

FIP-4XXB-XX-FIPT-400-MF-MPO-XX-XX

Inspection probe model [a]
FIP-425B = Wireless analysis digital
video inspection probe
Automated pass/fail analysis
Triple magnification
Autocentering
FIP-435B = Wireless analysis digital
video inspection probe
Automated focus
Automated pass/fail analysis
Triple magnification
Autocentering

Base tips
APC = Includes FIPT-400-U25MA and FIPT-400-SC-APC
UPC = Includes FIPT-400-U25M and FIPT-400-FC-SC

Automated multifiber tips
UPC = For MPO/UPC connectors 12-24 fibers
Includes: FIPT-400-MPO-BLK and FIPT-400-NZ-MPO
APC = For MPO/APC connectors 12-24 fibers
Includes: FIPT-400-MPO-BLK and FIPT-400-NZ-MPO-APC
X = For MPO/APC connectors 16-32 fibers
Includes: FIPT-MPO-X-BLK and FIPT-NZ-MPO-X

Example: FIP-435B-APC-FIPT-400-MF-MPO-APC-FIPT-400-U25M

Extra FIP-400B tips [b]
Bulkhead tips
FIPT-400-FC-APC = FCAPC tip for bulkhead adapter
FIPT-400-FC-SC = FC and SC tip for bulkhead adapter [c]
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 [d]
FIPT-400-SC-UPC = SC UPC tip for bulkhead adapter
FIPT-400-ST = ST tip for bulkhead adapter

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FIPT-400-U20M2 = Universal patchcord tip for 2.0 mm ferrules (D4, Lemo)
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FIPT-400-U25MA = Universal patchcord tip for 2.5 mm ferrules APC [d]

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

Extra nozzle for FIPT-400-MF tip
FIPT-400-NZ-MPO = For MPO/UPC connectors 12-24 fibers
FIPT-400-NZ-MPO-APC = For MPO/APC connectors 12-24 fibers
FIPT-400-NZ-MPO-X = For MPO/UPC connectors 16-32 fibers
FIPT-400-NZ-OTIP-APC = For OptiTip/APC connectors male and female
FIPT-400-NZ-QODC-12 = For Q-ODC-12/UPC connectors male and female
FIPT-400-NZ-QODC-12-APC = For Q-ODC-12/APC connectors male and female

Notes

a. ConnectorMax2 Mobile software available on the App Store and Google Play™.

b. 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** for more information.

c. Included when UPC base tips are selected.

d. Included when APC base tips are selected.

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