User Guide

PXM/LXM

Duplex and Multifiber Optical Loss Test Set (OLTS)



www.EXFO.com

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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Patents

The exhaustive list of patents is available at EXFO.com/patent.

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Regulatory Information

USA Electromagnetic Interference Regulatory Statement

Electronic test and measurement equipment is exempt from FCC part 15, subpart B compliance in the United States of America. However, EXFO Inc. makes reasonable efforts to ensure compliance to the applicable standards.

The limits set by these standards are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user documentation, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada Electromagnetic Interference Regulatory Statement

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference.

Cet équipement génère, utilise et peut émettre de l'énergie radio-fréquence et, s'il n'est pas installé et utilisé conformément à la documentation de l'utilisateur, il peut occasionner une interférence néfaste aux communications radio. L'utilisation de cet équipement dans une zone résidentielle est susceptible d'occasionner une interférence néfaste.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Attention : Cet appareil n'est pas destiné à être utilisé dans des environnements résidentiels et peut ne pas assurer la protection adéquate à la réception radioélectrique dans ce type d'environnements.

This is a class A, group 1 product.

Ceci est un produit de classe A, groupe 1.

- Class A equipment: Equipment that is, by virtue of its characteristics, highly unlikely to be used in a residential environment, including a home business shall be classified as class A and shall comply with the class A limits specified in the applicable ICES standard. Characteristics considered in this assessment include price, marketing and advertising methodology, the degree to which the functional design inhibits applications suitable to residential environments, or any combination of features that would effectively preclude the use of such equipment in a residential environment.

  Classe A : Matériel qui, en raison de ses caractéristiques, ne sera fort probablement pas utilisé dans un milieu domiciliaire ni par des entreprises établies à domicile. Parmi les caractéristiques considérées dans cette évaluation, il y a le prix, les méthodes de commercialisation et de publicité, la mesure dans laquelle les fonctions de l'appareil font qu'il ne se prête pas à des applications convenant au milieu domiciliaire ou toute combinaison de ces caractéristiques qui aurait pour conséquence d'en prévenir effectivement l'utilisation à domicile. Utilisé également pour indiquer les limites d'émission correspondantes qui s'appliquent à un tel matériel.

- Class B equipment: Equipment that cannot be classified as Class A shall comply with the Class B limits specified in the applicable ICES standard.

  Classe B : Matériel qui ne peut pas être inclus dans la classe A. Utilisé également pour indiquer les limites d'émission correspondantes qui s'appliquent à un tel matériel.

- Group 1 equipment: group 1 contains all equipment which is not classified as group 2 equipment, and includes equipment such as laboratory and scientific equipment, industrial process, measurement and control equipment.

  Group 2 equipment: group 2 contains all ISM RF equipment in which radio-frequency energy in the frequency range 9 kHz to 400 GHz is intentionally generated and used or only used locally, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material for inspection/analysis purposes, or for transfer of electromagnetic energy.

  Appareils du groupe 1 : le groupe 1 réunit tous les appareils compris dans le domaine d'application de la présente Norme, qui ne sont pas classés comme étant des appareils du groupe 2. Le groupe 1 inclut les appareils scientifiques et de laboratoire, les processus industriels, appareils de mesure ou de contrôle.

  Appareils du groupe 2 : le groupe 2 réunit tous les appareils ISM à fréquences radioélectriques dans lesquels de l'énergie à fréquences radioélectriques dans la plage de fréquences comprises entre 9 kHz et 400 GHz est produite et utilisée volontairement ou uniquement utilisée localement sous forme de rayonnement électromagnétique, de couplage inductif et/ou capacitif, pour le traitement de la matière, à des fins d'examen ou d'analyse ou pour le transfert d'énergie électromagnétique.

Supplier's Declaration of Conformity (SDoC)

The SDoC for your product is as follows:

CAN ICES-001 (A) / NMB-001 (A)

Electromagnetic Compatibility Regulatory Statement

Warning: This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures. Your product is suitable for use in industrial electromagnetic environments.

General Wireless Compliance Related Information (Units With Wireless Capabilities Only)

Your unit comes with an internal wireless module (adapter) and two antennas for which the information hereafter applies:

This product does not contain any wireless user-serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals.

Canada and USA Wireless Compliance Related Information

Your unit comes with an internal wireless module (adapter) and two antennas for which the information hereafter applies:

- This device complies with Part 15 of the FCC Rules.
- This device complies with Innovation, Sciences and Economic Development Canada license-exempt RSS standards.
- 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.

Use in Specific Environments:

- The use of wireless products in hazardous locations is limited by the constraints posed by the safety directors of such environments.

- The use of wireless products on airplanes is governed by the Federal Aviation Administration (FAA).
- The use of wireless products in hospitals is restricted to the limits set forth by each hospital.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment.

Radiation Exposure Statement:

- The product complies with the US/Canada portable RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this user documentation.
- Further RF exposure reduction can be achieved if the device can be kept as far as possible from the user's body.

RF Function and Frequency Range:

Your unit is designed to operate in the Bluetooth and WLAN 2.4 GHz bands.

The information about the Bluetooth and Wi-Fi frequency bands is as follows:

- Bluetooth: Channels 1 through 11 - Between the frequencies 2412 MHz – 2462 MHz.
  The output power is 11.7 dBm typical.
- Wi-Fi: Channels 1 through 11 - Between the frequencies 2412 MHz – 2462 MHz.
  The maximum output power is 18.5 dBm.

European Wireless Compliance Related Information

The information about the Bluetooth band is

The output power is 11.7 dBm typical.

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy, the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying access to telecommunications and/or network services.

This device may not be used for setting up radio links in France, and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 - 2483.5 MHz. For detailed information, the end-user should contact the national spectrum authority in France.

European Declaration of Conformity

Hereby, EXFO declares that the radio equipment type “PXM/LXM” is in compliance with European Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following Internet address: *www.exfo.com/en/resources/legal-documentation*.

EU Economic Operator

EXFO Solutions SAS
2, rue Jacqueline Auriol,

Saint-Jacques-de-la-Lande,

35091 Rennes Cedex 9

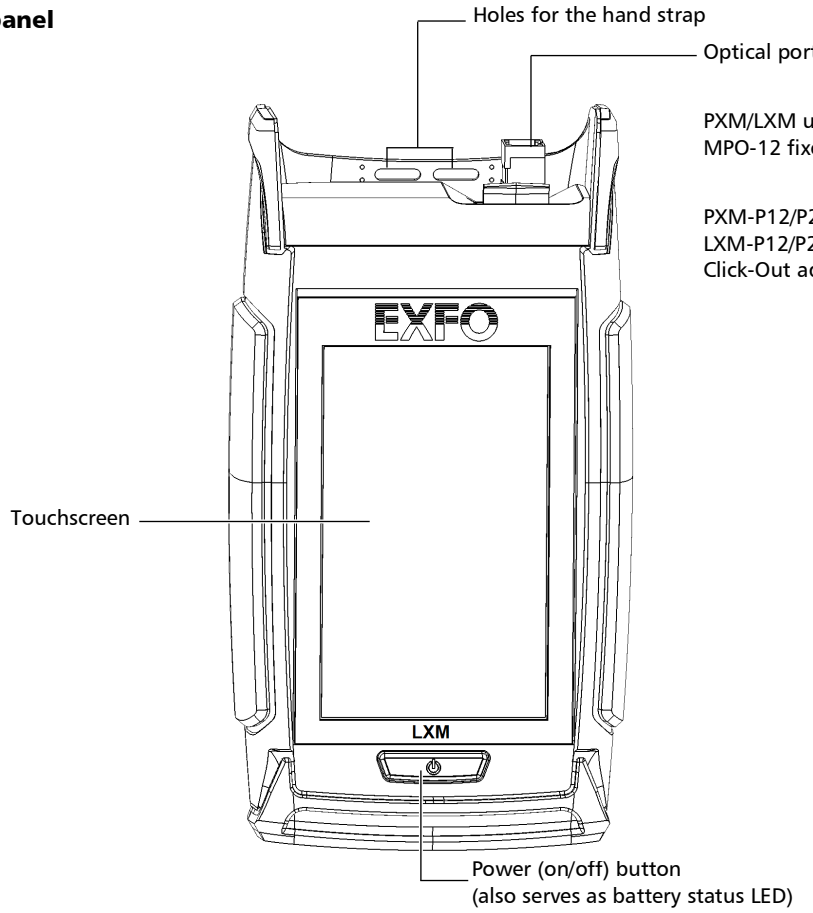
FRANCE

1 Introducing the PXM and LXM Duplex and Multifiber OLTS

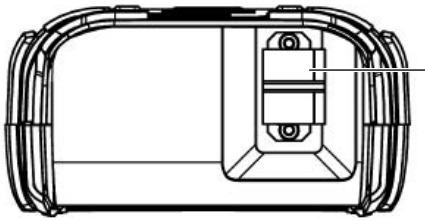
The PXM and LXM duplex and multifiber optical loss test set (OLTS) is a full-featured, easy-to-use power meter and light source that delivers the industry's fastest speeds. The PXM and LXM OLTS provides full Tier-1 duplex and multifiber certification, including loss, polarity, and length measurements, along with built-in certification standards.

Hardware Features

Front panel



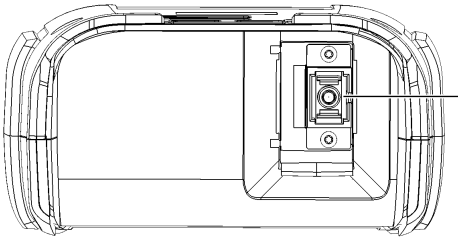
Top panel (unit with an MPO-12 fixed port)



Optical port

For the LXM, laser radiation is emitted at this port when laser is active.

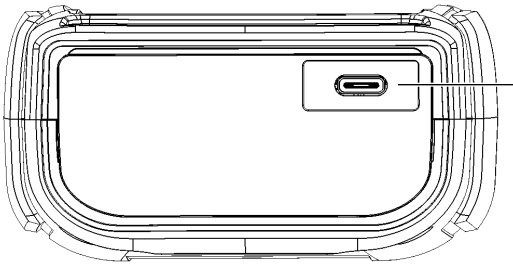
Top panel (P12/24 unit with a Click-Out adapter port)



Optical port

For the LXM-P12/24, laser radiation is emitted at this port when laser is active.

Bottom panel



USB 2.0 Type-C connector for battery charging (see *Power Sources* on page 7)

USB connection with computer to extract test results

Available Options

The following table lists the main options for the PXM/LXM. Other options follow, and the model name will then have the option's code added to the model name in the last column of the table.

Device		Connection		Fibers			Mode		
PXM	LXM	Fixed	Click-Out	Duplex	12	16/24	Single	Multi	Model name
x		x			x		x	x	PXM
x			x	x	x	x	x	x	PXM-P12/P24
	x	x			x				LXM
	x		x	x	x	x	x		LXM-P12/P24-SM1
	x		x	x	x	x		x	LXM-P12/P24-MM1

Key Features

Features	PXM/LXM	PXM-P12/LXM-P12	PXM-P24/LXM-P24
Loss measurement	Yes	Yes	Yes
Length measurement	Yes	Yes	Yes (up to 25 km)
Polarity validation	Yes	Yes	Yes
Test multifiber cables at two wavelengths in one second	Yes	Yes	Yes
Native duplex testing	No	Yes	Yes
Native multifiber testing (F=Fibers)	12 F	8/12 F	8/12/16/24 F
Dual wavelength on light source (850/1300 nm or 1310/1550 nm)	Yes	Yes	Yes
On-board certification standards with dynamic loss calculator	Yes	Yes	Yes

Features	PXM/LXM	PXM-P12/LXM-P12	PXM-P24/LXM-P24
In-line visual fault locator (VFL) for fiber tracing on source (LXM)	Yes	Yes	Yes
Complies with one-cord reference method	Limited by gender and angle orientation type	Yes	Yes
FasTesT™ native duplex-based testing	No	Yes	Yes
Variety of Click-Out adapters available for testing duplex and multifiber links	No	Yes	Yes
Supports 32 and 48 fibers using loopback or dual test set methods	No	No	Yes

LED Indicator Description

The power button, located on the front panel of your unit, also serves as a LED indicator providing you with information about the battery status.

Unit	Status	Meaning
Connected to an external power source	On	The battery is fully charged.
	Blinking – long pulse[a]	The battery is charging.
	Blinking – short pulse[b]	The battery charge has been interrupted, possibly because the unit may not be within the recommended charging temperatures. For more information, see *.Equipment Ratings* on page 18
	Fast blinking	Charge or temperature error.
		The battery level is too low to start the unit.
Not connected to an external power source	Off	The unit is not connected to an external power source.
	Fast blinking	The unit is off and the battery level is too low to start the unit.

a. LED lit during 50 % of duty cycle.
b. LED lit during 10 % of duty cycle.

Battery Status Icon Description

The battery status icon is shown in the upper right corner of the title bar. It complements the information provided by the unit's LED.

Icon	Meaning
	The portion of the icon that appears in white in the title bar (in black here) reflects the current battery level.
	A red icon indicates that the battery level is running low and that you should connect the unit to a power outlet.
	A flash symbol indicates that the unit is connected to an external power source.
	There is a charge or temperature error.
	No battery information is available.

Power Sources

The Duplex and Multifiber Optical Loss Test Set operates with the following power sources:

- For indoor charge only: the USB power delivery adapter connected to a power outlet (fastest way to charge the battery).
- The standard USB ports of a computer can power your unit and charge its battery, but it can be slower to charge than if you are using the USB power adapter.

Note: *Depending on the power supply capacity of your computer, the battery may not charge properly due to insufficient current supplied from the computer's USB port. In this case, use the USB power delivery AC adapter for charging.*

- If you have a vehicle equipped with dedicated USB charging ports, you could connect your unit to one of these ports to charge the battery.

Note: *Actual results will vary with each vehicle.*

It is possible to switch from an external power source to battery power or vice versa without affecting operation.

Note: *You can replace the main battery yourself (see* Replacing the Battery *on page 129).*

Note: *When the ambient temperature is below 0 °C (32 °F) or when it reaches or exceeds about 40 °C (104 °F), the main battery can either charge more slowly than usual, or not charge at all, depending on the internal temperature of your unit.*

For more information, see *.Electrical Safety Information* on page 17.

Technical Specifications

To obtain this product's technical specifications, visit the EXFO website at *www.exfo.com*.

Conventions

Before using the product described in this guide, you should understand the following conventions:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.



IMPORTANT

Refers to information about this product you should not overlook.

2 Getting Started With Your Unit

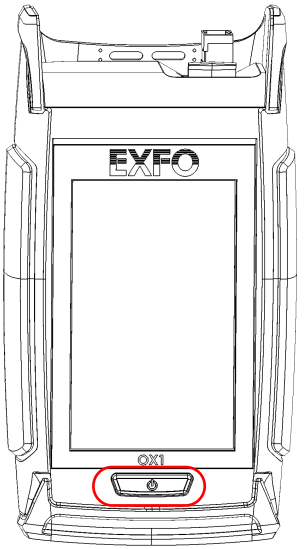
Turning on Your Unit

When you turn on the unit for the very first time, a wizard is displayed, enabling you to set the operation language, read and accept the EXFO license agreement, and set other regional settings (see the section about the first startup for more information).

Note: *The settings you modify at startup can be modified later if necessary.*

To turn on the unit:

Press the on/off button until the unit beeps once. Its LED will light up and remain lit during the whole startup process (until the splash screen is displayed).



Turning off Your Unit

Unless specified otherwise in this documentation, the settings you configure on your unit are kept in memory even when you turn the unit off.

There are several ways to turn off the unit, including the following:

- *Sleep*: keeps the unit's status information in memory (RAM). The next time you turn your unit on, you will quickly return to your work environment (running applications will still be running). If you intend to leave your unit in sleep mode for more than a few hours, you should perform a shutdown instead to save battery power. After four hours in sleep mode, your unit will go into shutdown mode automatically to save battery power.
- *Shutdown*: completely cuts power to the unit; the unit will perform a complete restart routine the next time you use it. You should perform a shutdown if you do not intend to use your unit for several hours.

  After a shutdown, the unit will start in Fiber Xplorer.

Note: *Should the unit ever stop responding, you can force a hardware reset by pressing and holding down the on/off button for at least 10 seconds. To restart your unit, release the on/off button, and then press it again as you would normally do to start your unit.*

To enter the sleep mode:

Press the on/off button. The unit's backlight will turn off and the touchscreen will be deactivated.

To exit the sleep mode and resume your work:

Press the on/off button.

To turn off the unit completely (shutdown):

Press the on/off button for about three seconds. The unit will beep once and its LED will light up briefly.

Configuring Your Unit at First Startup

The first time you turn on the unit, a wizard is displayed, enabling you to read and accept the EXFO license agreement, set the date and time, select the power units, select the distance units, and consult the user guide.

Note: *You can change the regional parameters later if necessary.*

Once the configuration is complete, you are presented with an overview of the main features of your unit.

To configure your unit at first startup:

1. If it is not already done, turn on the unit.
2. Read and accept the EXFO license agreement, then tap **NEXT**.
3. Set the date and time, then tap **NEXT**.
4. Select the power units, then tap **NEXT**.
5. Select the distance units, then tap **NEXT**.
6. Consult the user guide by scanning the QR code, then tap **CLOSE**.

You are now ready to start working with your unit.

Temperature Management

The internal temperature of your unit will vary with the ambient temperature, but also with the type of tests you perform and their intensity.

Your unit has also been designed to adapt its behavior as necessary to regulate its temperature. For this reason, in high-temperature conditions, you could receive warning messages. If the temperature keeps rising and reaches the limit your unit will turn off as self-protection.

For more information on the effects of temperature on battery charging, see *Power Sources* on page 7.



IMPORTANT

For optimum performance of your unit:

- **Ensure that it remains within the recommended operation and storage temperatures (see *Equipment Ratings* on page 18).**
- **Avoid leaving your unit in an overheated vehicle. You may have to let your unit cool down before being able to use it.**
- **Ensure that your unit is normally protected from direct sunlight (during use and storage).**

3 Safety Information

General Safety Information



WARNING

Do not install or terminate fibers while a light source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.



WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.



WARNING

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



WARNING

Use only accessories designed for your unit and approved by EXFO. For a complete list of accessories available for your unit, refer to its technical specifications or contact EXFO.



CAUTION

This product does not contain any user-serviceable components, except if indicated otherwise in this document. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals.

IMPORTANT

Refer to the documentation provided by the manufacturers of any accessories used with your EXFO product. It may contain environmental and/or operating conditions limiting their use.

IMPORTANT

When you see the following symbol on your unit  **, make sure that you refer to the instructions provided in your user documentation. Ensure that you understand and meet the required conditions before using your product.**

IMPORTANT

When you see the following symbol on your unit  **, it indicates that the unit is equipped with a laser source, or that it can be used with instruments equipped with a laser source. These instruments include, but are not limited to, modules and external optical units.**

IMPORTANT

Other safety instructions relevant for your product are located throughout this documentation, depending on the action to perform. Make sure to read them carefully when they apply to your situation.

Other Safety Symbols on Your Unit

One or more of the following symbols may also appear on your unit.

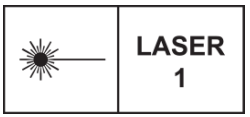
Symbol	Meaning
	Direct current
	Alternating current
	The unit is equipped with an earth (ground) terminal.
	The unit is equipped with a protective conductor terminal.
	The unit is equipped with a frame or chassis terminal.
 or 	On (Power)
 or 	Off (Power)
	On/off (Power)
	Standby (Power)
	Fuse

Laser Safety Information

Your instrument is in compliance with standard IEC 60825-1: 2014 + A11: 2021 and IEC 60825-1 Ed. 3.

Laser radiation may be encountered at the optical output port.

The following label indicates that a product contains a Class 1 source:



CLASS 1 LASER PRODUCT

APPAREIL À LASER DE CLASSE 1

Complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019.

LXM Power Values

- LXM-SM1 MPO Singlemode 1310/1550 nm sources: ≥ -13 dBm
- LXM-MM1 MPO Multimode 850/1300 nm sources: ≥ -33 dBm

Electrical Safety Information



WARNING

If you need to ensure that the unit is completely turned off, disconnect the power cable and remove the battery. For more information on how to remove the battery, see the section about replacing the battery in this user documentation.



WARNING

- **Use the external power supply (USB power adapter) indoors only.**
- **Unless otherwise specified, all interfaces are intended for connection to ES1 circuits only.**
- **Use only the listed and certified USB power adapter provided by EXFO with your unit. It provides reinforced insulation between primary and secondary, and is suitably rated for the country where the unit is sold.**



CAUTION

- **Position the unit so that the air can circulate freely around it.**
- **When you use the unit outdoors, ensure that it is protected from liquids, dust, direct sunlight, precipitation, and full wind pressure.**



CAUTION

The use of voltages higher than those indicated on the label affixed to your unit may damage the unit.

Equipment Ratings	
Temperature	
➤ Operation	➤ battery-powered unit: –10 °C to 45 °C (14 °F to 113 °F)[a] ➤ AC-powered unit (with USB power adapter): 0 °C to 40 °C (32 °F to 104 °F)[b]
➤ Storage	➤ unit – short-term[c]: –40 °C to 70 °C (–40 °F to 158 °F) ➤ unit – long-term[d]: 10 °C to 35 °C (50 °F to 95 °F)
Relative humidity[e]	➤ unit: ≤ 93 % non-condensing ➤ USB power adapter: 10 % to 90 % non-condensing
Maximum operation altitude	➤ 2000 m (6562 ft) (AC-powered unit) ➤ 5000 m (16405 ft) (battery-powered unit)

Equipment Ratings	
Pollution degree	➤ 2 (AC-powered unit) ➤ 3 (battery-powered unit)[f]
Overvoltage category	➤ unit: I ➤ USB power adapter: II
Measurement category	Not rated for measurement categories II, III, or IV
Input power[g]	➤ unit: 5 V ⎓; 2 A ➤ USB power adapter: 100 - 240 V ∼; 50/60 Hz; 1 A max

a. When the unit is used at an altitude of 5000 m, the maximum operating temperature is 27 °C (80.6 °F).
b. When the ambient temperature is below 0 °C (32 °F) or when it reaches or exceeds about 40 °C (104°F), the main battery can either charge more slowly than usual, or not charge at all, depending on the internal temperature of your unit.
c. Short-term storage corresponds to the storage of the unit for a maximum of 48 hours.
d. Long-term storage corresponds to the storage of the unit for more than three months.
e. Measured in 0 °C to 31 °C (32 °F to 87.8 °F) range, decreasing linearly to 50 % at 40 °C (104 °F).
f. Equipment must be normally protected against exposure to direct sunlight, precipitation and full wind pressure.
g. Not exceeding ± 10 % of the nominal voltage.

4 Setting Up and Using Your Units

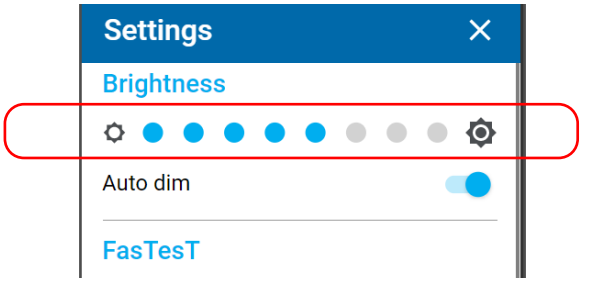
This chapter covers common LXM and PXM specific settings.

Adjusting Brightness

You can adjust the display brightness to better fit your work environment or preferences. Also reducing the brightness saves battery power (the higher the brightness level, the higher the power consumption). The brightness value is kept in memory even when you turn the unit off.

To adjust the brightness:

1. From the main menu, tap **Settings** or tap  then select .
2. Under **Brightness**, tap the dots to set it less or more bright. You can also tap the minimum or the maximum value to quickly set the brightness at that level.



The Auto dim feature is ON by default, the screen will dim automatically after a while if there is no activity on the unit. The new brightness value will take effect immediately.

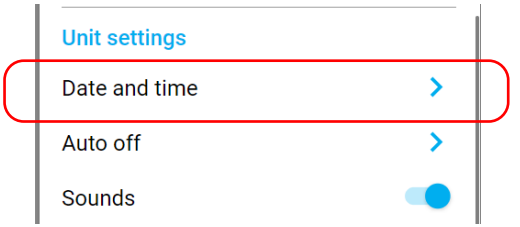
Adjusting the Date, Time and Time Zone

The time is displayed in the title bar. When saving results, the unit also saves the corresponding date and time. By default, the time is expressed in a 24-hour format, but you can select a 12-hour format (AM/PM) if you prefer.

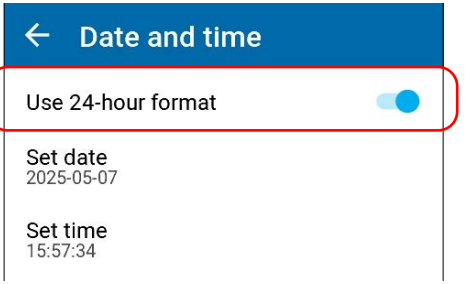
Note: *You cannot modify the format in which the date is displayed.*

To adjust the date, time and time zone:

1. From the main menu, tap **Settings** or tap the  icon to access the menu, then select ..
2. Tap **Date and time**.

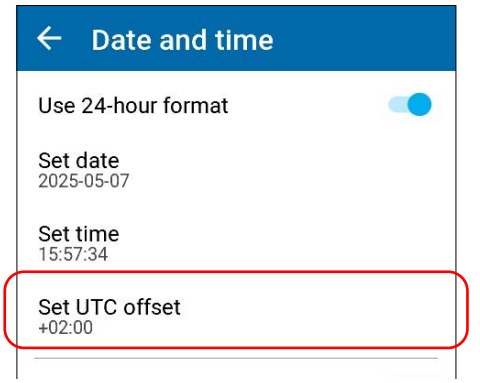


3. With the **Use 24-hour format** toggle, enable or disable the option, depending on your preference. If you prefer to view the time in a 12-hour (AM/PM) format, ensure that the **Use 24-hour format** option is disabled.



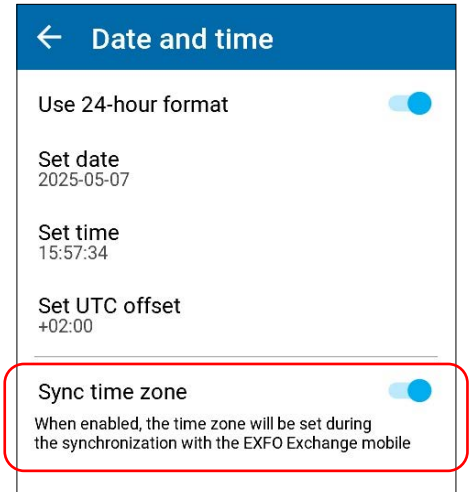
4. Tap the other elements corresponding to the values that you want to modify. **UTC offset** is the difference in hours and minutes between a particular time zone and UTC (Coordinated Universal Time), the time at zero degrees longitude. For example, New York is UTC-05:00, which means it is five hours behind London, which is UTC±00:00.

Note: *You can only configure the UTC offset on a PXM or PXM-P12/P24 unit.*



5. Modify the settings and tap **OK** to confirm.

6. Use the **Sync time zone** toggle to enable or disable automatic synchronization. When enabled, your unit automatically syncs the date and time with the EXFO Exchange mobile application each time it reconnects to Bluetooth after a lost connection.



These values will take effect immediately.

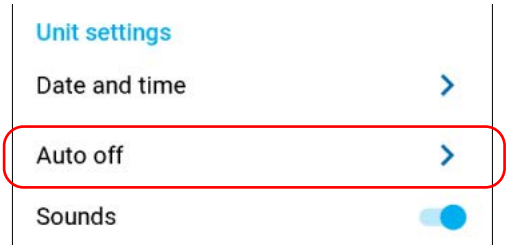
Configuring the Auto-Off Value

To help you get the optimum performance out of your unit, it comes with a predefined set of parameters to manage power. When you do not use your unit for a while, it will shut down automatically to save power.

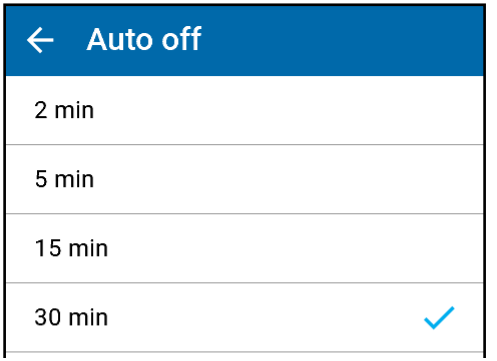
By default, the duration after which the unit shuts down is two minutes, but you can select another value. The value that you set is kept in memory even when you turn the unit off.

To configure the auto-off value:

1. From the main menu, tap **Settings** or  then select .
2. Under **Unit settings**, tap **Auto off**.



3. Select the desired number of minutes.



The new value will take effect immediately.

Enabling Sounds

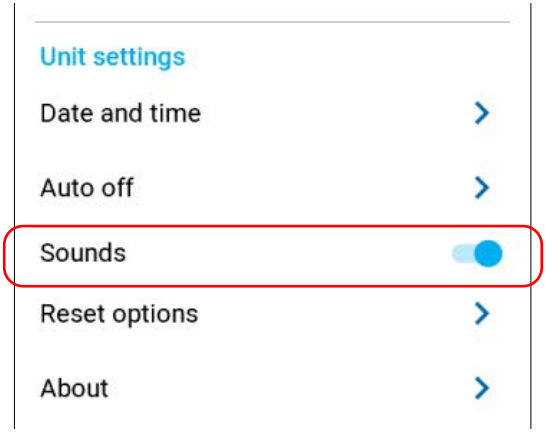
By default, your unit emits a sound when certain events occur. You can choose to disable some of them when you need. This preference will be kept in memory even when you turn the unit off.

The table below shows which notifications can be disabled or not.

Notifications that can be disabled	Notifications that cannot be disabled
➤ Tone detection ➤ FasTesT signal is detected and lost ➤ Sounds emitted at the end of the acquisition and stored (Completed/Pass/Fail) ➤ When the acquisition fails to be fully performed. ➤ When the acquisition result is undetermined because of a missing value ➤ When polarity and loss cannot be determined	➤ Unit is turned On/Off ➤ External power supply connected or disconnected. ➤ High power detected

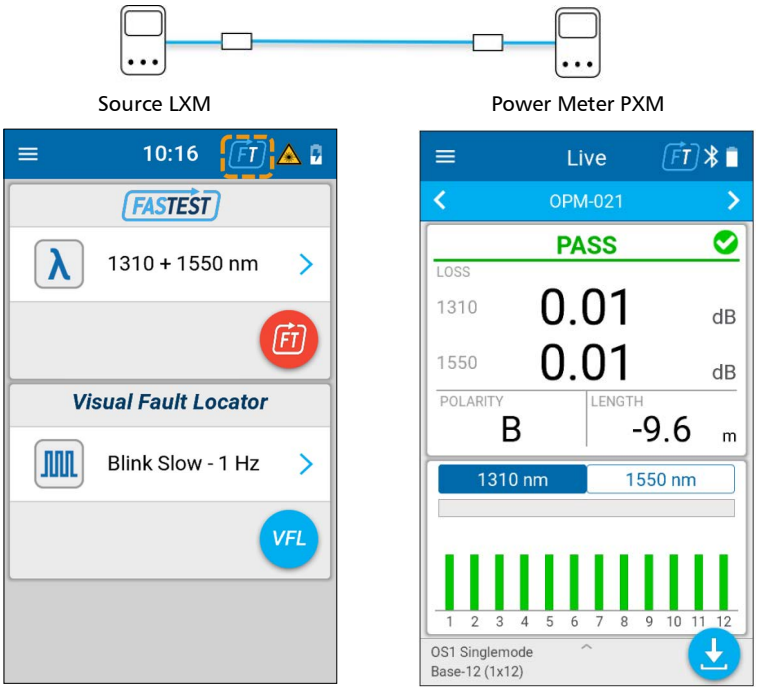
To enable or disable the sound notifications on your unit:

1. From the main menu, tap **Settings** or tap  then select .
2. Under **Unit settings**, toggle **Sounds** to enable/disable the sound notifications.



The new value will take effect immediately.

This feature allows you to automatically detect if the source LXM and power meter PXM are connected on the same cable.



To Enable Sound Notification on Continuity:

1. Turn *On* FasTesT on the LXM.

   When the PXM detects the LXM on the same fiber, you will hear a sound notification on both unit.

2. Your unit is ready to use.

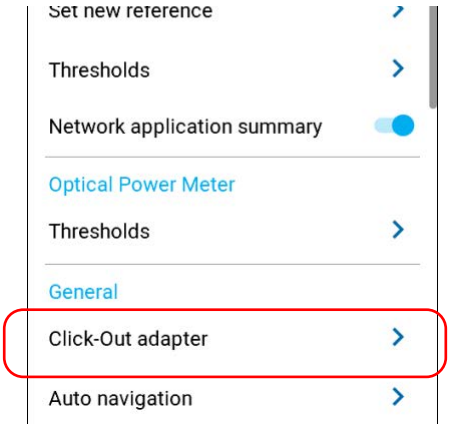
If you need to replace Click-Out optical connectors or purchase new ones, contact EXFO (see *Contacting the Technical Support Group* on page 149).

Click-Out Adapter Settings (24 Fibers only)

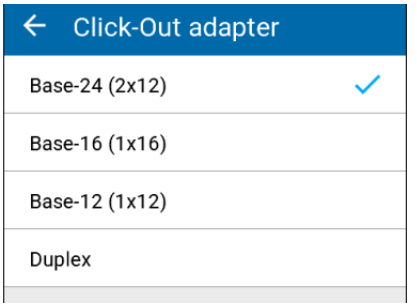
Different types of Click-Out Adapters allow you to change the connector type or gender for different applications, in the field. The same test unit can be used to test links with different types of connectors without having to deal with multiple dedicated test units. Additionally, this enables you to replace a damaged connector without having to send the test units back for repair.

To select the click-out adapter connected to your unit:

1. From the main menu, tap **Settings** or tap  then select .
2. Under **General**, tap **Click-Out adapter**.



3. Ensure that you select the correct **Click-Out adapter** your unit is connected to.



Selecting the Distance Units (PXM Units)

You can select the measurement units that your unit will use to display distance and length values.

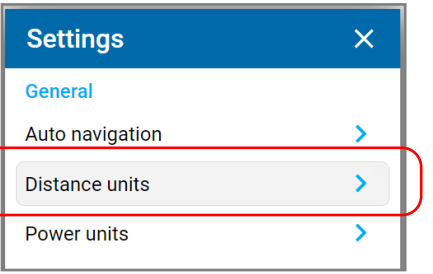
By default, the unit uses metric distance units (meters and kilometers), but you can change for imperial units (feet and kilofeet) if you prefer.

Note: *The unit expresses values smaller than 1 kilometer (in meters) or 1 kilofoot (in feet), respectively, for greater precision.*

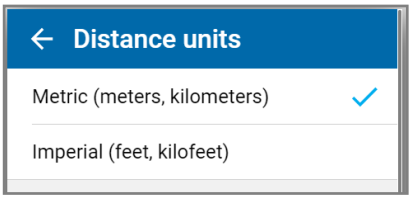
The value that you set is kept in memory even when you turn the unit off.

To select the distance units:

1. From the main menu, tap **Settings** or tap  then select .
2. Under **General**, tap **Distance units**.



3. Select the desired distance units.



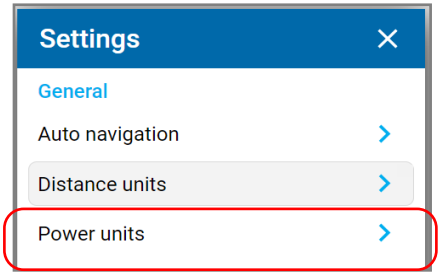
The new value will take effect immediately.

Selecting the Power Units (PXM Units)

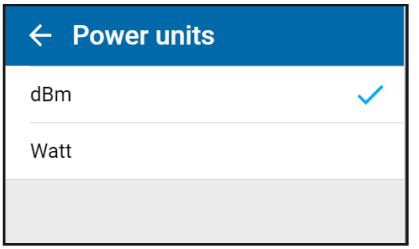
You can work with your unit using either dBm or Watts.

To select the power units:

1. From the main menu, tap **Settings** or tap  then select .
2. Under **General**, tap **Power units**.



3. Select the desired units, **dBm** or **Watt**.



These changes will take effect immediately.

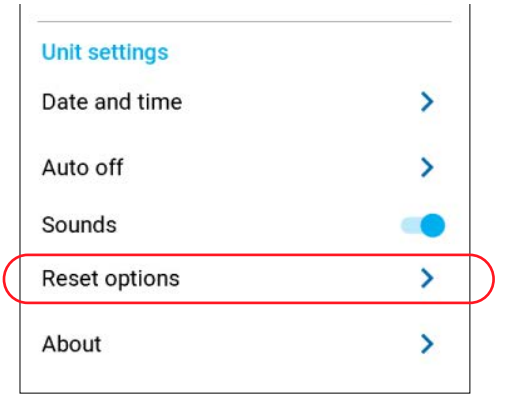
Reverting to Factory Settings(PXM Units)

There are two types of memory that can be brought back to their original state:

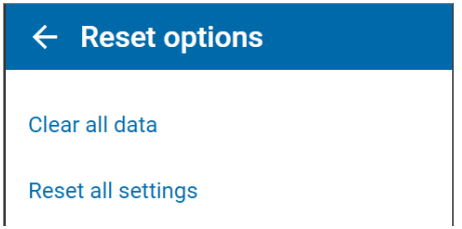
- Data: All jobs and measurements will be deleted. Your application settings will be kept.
- Settings: Restores all application settings to default values. Stored jobs and measurements remain unchanged.

To revert values to factory settings:

1. From the main menu, tap **Settings** or tap  then select .
2. Scroll down to the **Unit settings** section.
3. Tap **Reset options**.



4. Select an option.



5. To clear all data:

5a. Tap **Clear all data**.

5b. Tap **Clear** to confirm. Once all the data is permanently deleted, the unit returns to the test results screen.

6. To reset all settings:

6a. Tap **Reset all settings**.

6b. Tap **Reset** to confirm. After restarting your unit, you will be prompted to configure it as you did at first startup. For more information, see *Configuring Your Unit at First Startup* on page 11.

5 Working with Jobs (PXM Only)

You can create jobs locally on your unit or transfer them from the Cloud. You can also transfer test results via the Cloud.

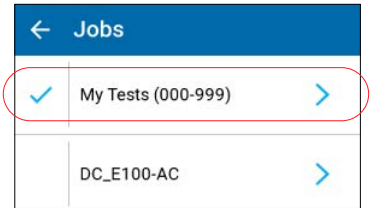
Using "My Tests"

The test unit provides a built-in default job named **My Tests** which includes a predefined identification sequence of 1000 test points: OPM-000 to OPM-999.

Note: *The job **My Tests** is always available on the test unit and cannot be deleted.*

To use My Tests:

1. From the main menu, tap  then select **Jobs**.
2. From the list of jobs, tap **My Tests**.



Selecting a Job

The test unit allows you to select a job as the current one from all those available on the unit. You can select another job at any time even if the current one is not completed.

The job list is sorted by the creation date and time except for **My Tests** which is displayed first. The job list displays some basic information related to each job state.

To select a job:

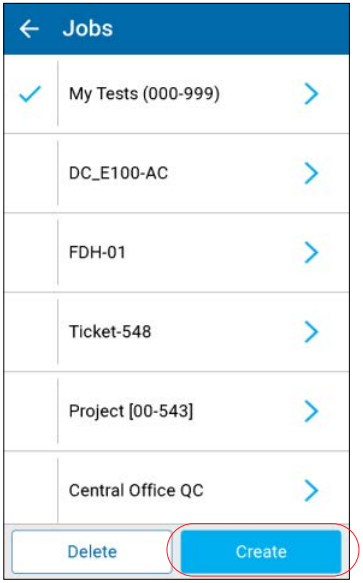
1. From the main menu, tap .
2. From the list of jobs, tap a job.

Creating a Job

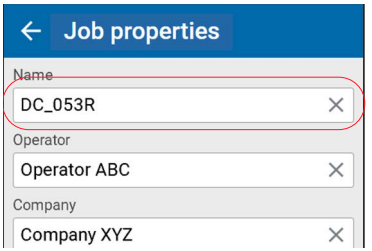
You can create your own jobs if the **My Tests** default job does not suit your needs.

To create a job:

1. From the main menu, tap  then tap **Jobs**.
2. At the bottom of the window, tap **Create**.



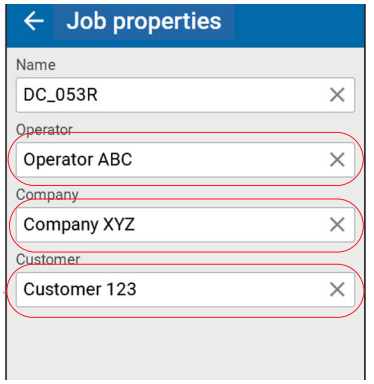
3. In the Job properties screen, enter a **Name** for the new job, or use the suggested default name which consists of the prefix **PXM** followed by the current date. The number following the decimal point will increase by one when a new job is created on the same date using the default job name.



Note: *Leaving the Job **Name** field blank will result in the default name. This is useful if you do not have a predefined job name and you want to quickly create a new job.*

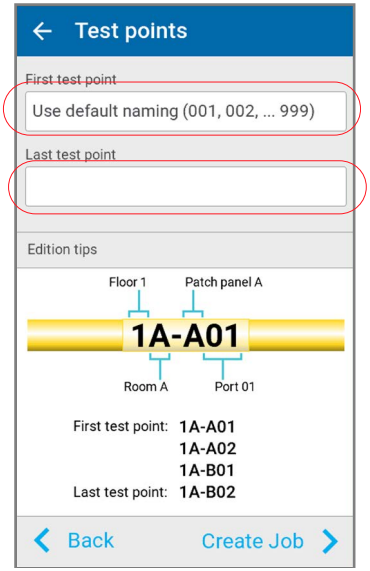
4. Optionally, enter an **Operator**, **Company**, and **Customer** name. Tap **X** to clear the values.

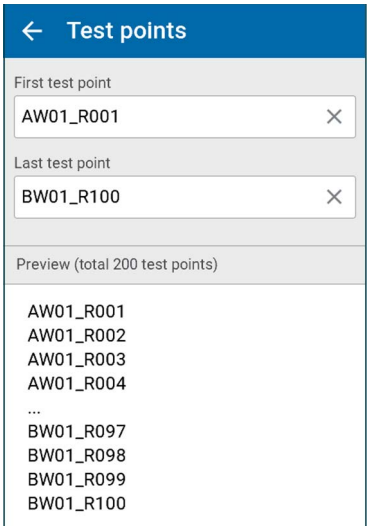
5. When completed, tap **Next** to display the **Test points** screen.



Job properties are included in the measurement data for each stored result in the current job.

6. In the **Test points** screen, enter values for the **First** and **Last test point**. Tap **X** to clear the values. See *Generating Valid Test Point Identifiers* on page 38 for more information.





Note: *Leaving both the first and last test point fields blank will result in the default naming basic sequence; for example: OPM-000 to OPM-999 test points. The text* ***Use default naming (001, 002, 003, ... 999)*** *will display for the first test point. This can be useful if you don't have a predefined naming sequence and you want to quickly create a new job. If you wish to keep the default values your unit provides for the identifiers, your unit generates a list of 1000 test points with OPM-000 as the first test point and OPM-999 as the last.*

7. When you have all the test points, tap **Create Job**.

Generating Valid Test Point Identifiers

All test points must be part of a job. For more information on creating a local job, see *Creating a Job* on page 34. You can create a list of test point identifiers by providing the first and last test points. Your unit then automatically and sequentially generates all test point identifiers between the values you provide for the first and last test points.

For your unit to create a valid list of sequential test point identifiers, you must provide a first and last test point according to the rules listed in the table below.

Note: *If you leave the first and last test point fields blank, your unit will create and display the default auto-naming of test points OPM-000 to OPM-999.*

Rule	Correct	Incorrect
The total number of test points must be less than or equal to 1000.	➤ First test point: OPM-000 ➤ Last test point: OPM-999	➤ First test point: OPM-0000 ➤ Last test point: OPM-1200
The first and last test points must have the same number of characters	➤ First test point: OPM-000 ➤ Last test point: OPM-999	➤ First test point: OPM-000 ➤ Last test point: OM-999
The first and last test points must consist of letters, numbers, or the following special characters: **@ + - & ^ % $ # ! _ ( ) ' ; ~ ` = { } [ ] ,** (comma) **.** (dot)	➤ First test point: OPM&000 ➤ Last test point: OPM&999	➤ First test point: OPM% ➤ Last test point: OPM%

Rule	Correct	Incorrect
For the first and last test points, the letters at each position must be the same or follow alphabetical order (test points are case-sensitive).	➤ First test point: AAA-000 ➤ Last test point: AAB-010	➤ First test point: AAB-000 ➤ Last test point: AAA-010
Special characters must match between the first and last test points.	➤ First test point: O@X&000 ➤ Last test point: O@X&999	➤ First test point: O@X&000 ➤ Last test point: O#X!999
For the first and last test points, character types (letters, numbers, special characters) must match at each position. Letters are case-sensitive.	➤ First test point: A&A-000 ➤ Last test point: A&B-010	➤ First test point: A&A-00A ➤ Last test point: &AB-010
Numbers in the last test point must be equal to or greater than the numbers in the first test point.	➤ First test point: OPM-000 ➤ Last test point: OPM-119	➤ First test point: OPM-119 ➤ Last test point: OPM-000
First and last test points are limited to 25 characters.	➤ First test point: Rack01_Port01 ➤ Last test point: Rack02_Port24	➤ First test point: BuildA_RoomWS-Rack01_Port01 ➤ Last test point: BuildA_RoomWS-Rack02_Port24

Working With Job Details and Results Browser

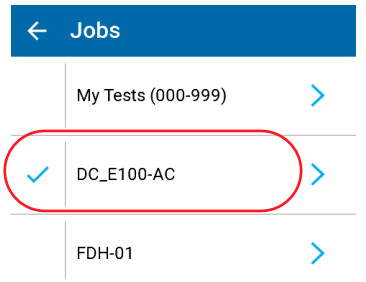
The job details page allows you to consult the **Test points** browser tab and **Properties** tab. Job properties are read-only and can only be edited while creating a job.

To see job results:

1. Select a job:

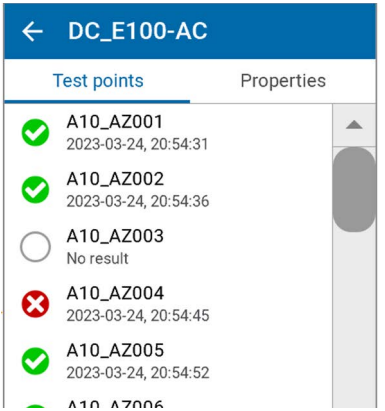
1a. From the main menu, tap .

1b. From the list of jobs, tap a job.



2. Tap a test point in the browser list.

Selecting it makes it the new active test point and leads to the measurement page (FasTesT or OPM, depending on the mode currently selected). The corresponding test point will automatically be selected in the measurement page.



Tapping a test point in the browser of a *non-active job* makes it the new active job and leads to the measurement page (FasTesT or OPM, depending on the mode currently selected). The corresponding test point will automatically be selected in the measurement page.
See *Viewing Test Results* on page 51.

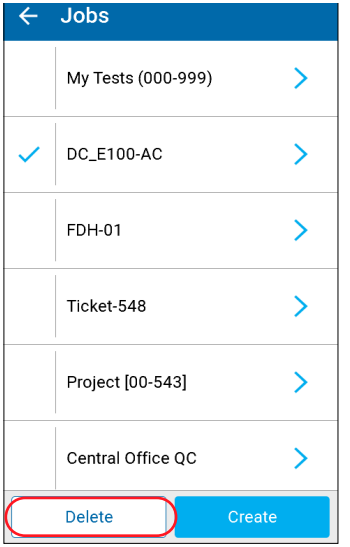
Deleting a Job

You can delete one or more jobs and its results in a single operation. You can also delete the results only. However, if If you delete the job, results will also delete themselves.

Note: ***The My Tests*** *Job cannot be deleted.*

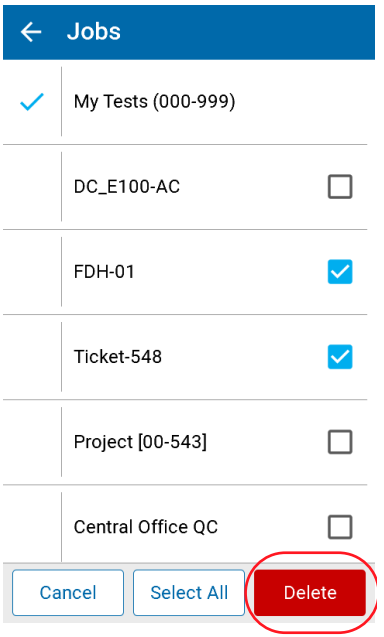
To delete a local job:

1. From the main menu, tap .
2. From the **Jobs** page, tap **Delete.**



3. Select the job(s) you want to delete by tapping the corresponding check box(es). To select all jobs at once, tap **Select All**.

4. Tap **Delete** to remove the selected job(s) or **Cancel** to abort the operation.

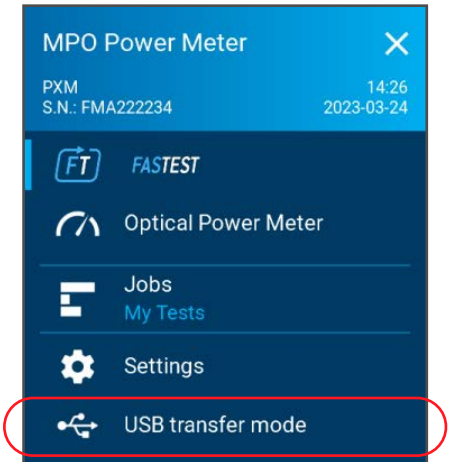


Transferring a Job from FastReporter 3 Using a USB Connection

You can generate a job in FastReporter 3 and transfer it from your computer to the PXM using a USB connection.

To transfer a job from FastReporter 3 using a USB connection:

1. Connect your unit to a computer using a USB cable. Ensure the computer has EXFO's FastReporter 3 installed.
2. From the main menu, tap **USB transfer mode** to enable the data transfer mode on your unit.



3. If it is not already done, generate a job in FastReporter 3. For more information, refer to EXFO's FastReporter 3 documentation.
4. From the FastReporter 3 interface, choose the PXM to which you want to transfer the job.
5. Push the job to the PXM. Your unit stores the job in its mass storage.
6. On your unit, tap **Disconnect** to disconnect the data transfer mode.

   After a successful transfer, the job is available on your unit.

6 Managing Tests and Results

You can set how your unit behaves when moving to the next test point based on the test results.

Setting Auto Navigation (PXM Units)

When the auto navigation option is set to go to the next test **On Pass** and the test Pass/Fail verdict is **Pass**, the application automatically selects the next test point not yet acquired. Otherwise the current test result is still displayed.

Note: *The next test point not yet acquired in the sequence only applies to the remaining test points. If the sequence reaches the last test point, it will not go back to select any previously skipped ones.*

For example, if the job has 5 test points:

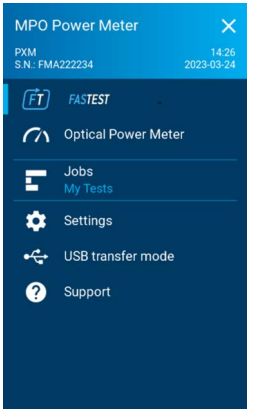
- Test point 1: Done
- Test point 2: To do
- Test point 3: Done
- Test point 4: To do
- Test point 5: Done

Case #1: If the current test point is 2 and the verdict is Pass, the next test point is 4.

Case #2: If the current test point is 4 and the verdict is Pass, the next test point is the last one of the job, test point 5, even if test point 2 does not contain test results.

To run FasTesT with Auto Navigation On Pass:

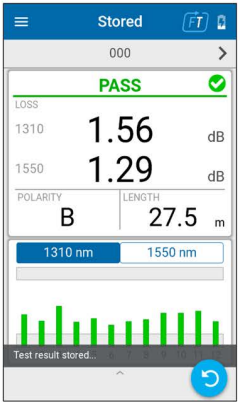
1. From the main menu, tap FasTest.



2. If the result is satisfactory, tap the **Download** icon to store results.



3. When the result is already stored, you have 4 seconds to select the **Redo** icon if you wish to retest, then it moves on to the next test point.

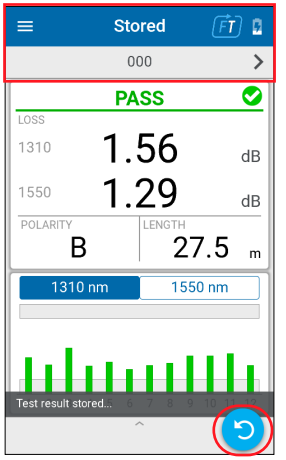


To distinguish a test not done with the Live reading vs a test done with a Stored test result:

When the test point has no test result or after tapping test again, the application title bar displays **Live** and the navigation bar is blue.



Tap the **Download**

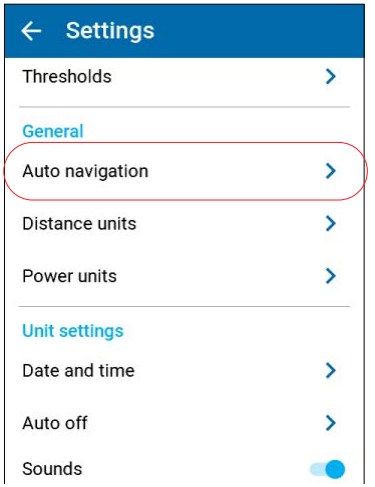


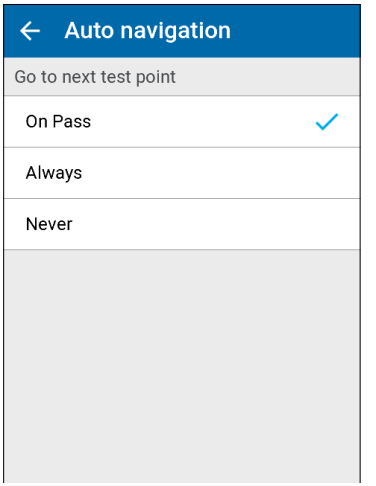
Test executed, 4 s to test again using the **Redo** icon. Then go to

When the test point has a result, the application title bar displays **Stored** and the navigation bar is gray.

To set auto navigation:

1. From the PXM main menu, select **Settings**.
2. Scroll to **General** and tap **Auto navigation**.





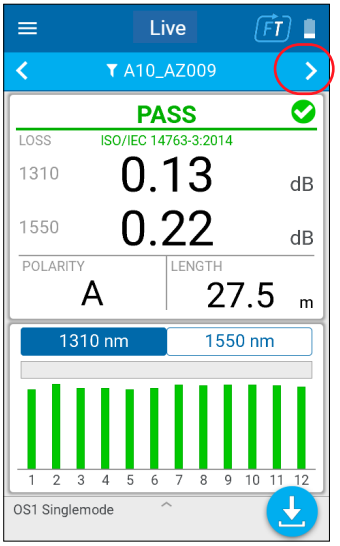
3. Select one of the following options to **Go to the next test point**:
   - **On Pass** - (default) automatically selects the next test point not yet acquired in the job sequence after a save, if the test Pass/Fail verdict is **Pass**. If the Pass/Fail verdict is **Fail** or **Unknown** after a save, the same test point remains selected and the current Fail or Unknown test point results are displayed.
   - **Always** - automatically selects the next test point not yet acquired in the sequence after a save.
   - **Never** - the test unit always remain on the current test point after a save. You need to manually select the next test to be performed by using the next/previous arrow to navigate into the Job test sequence.

Setting Test Point Filters

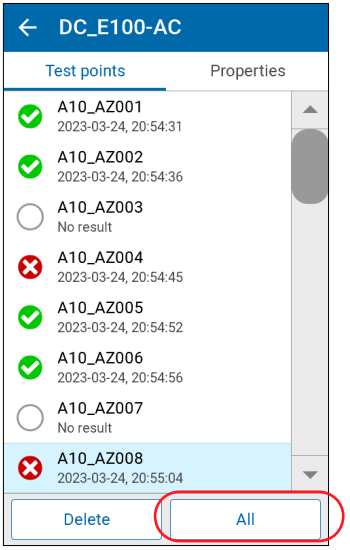
You can set test point filters based on test result criteria to refine the information shown on the screen.

To set test point filters:

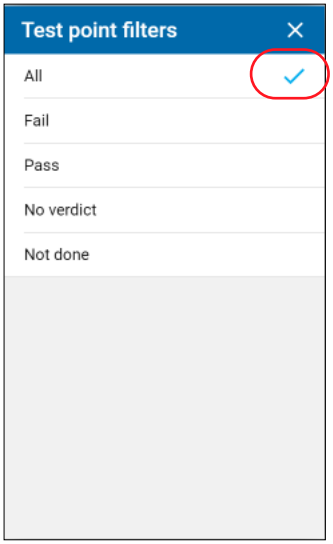
1. Tap the navigation bar to open the browser page.



2. Tap the bottom right-hand filter button to open the **Test point filters** page.

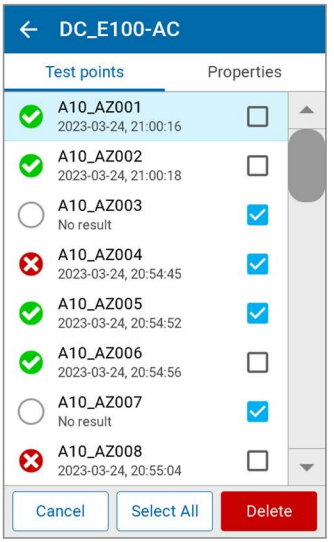


3. Select a filter.



Viewing Test Results

Test results are displayed in a browser, with a test date/time and a Pass/Fail verdict.



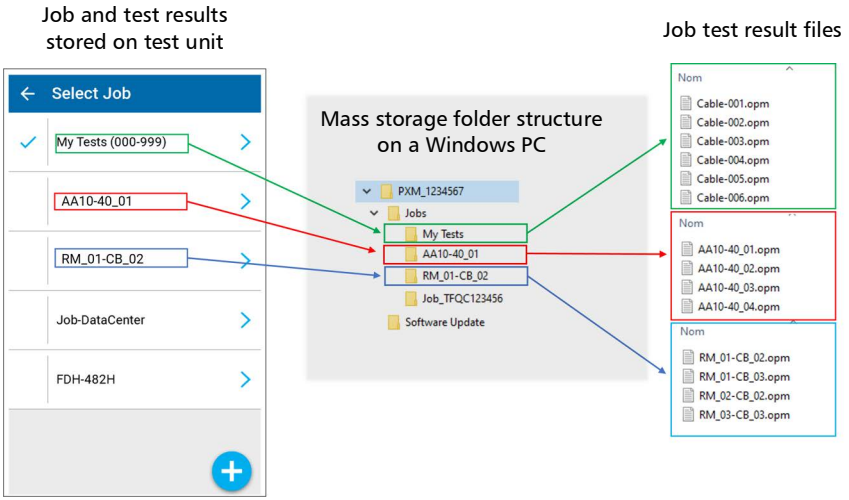
To delete all results or specific ones, select the appropriate check boxes on the test results management screen.

Transferring Results to a PC Using a USB Connection

USB data transfer supports reporting, post-processing, and archiving. When you connect the test unit to a PC, you can browse, list, and download all test results stored on the unit to the PC. No specific USB driver or application is required. The experience is similar to using a USB stick (mass storage device). From Windows File Explorer, browse the test unit, select test results, and copy them to a folder on the PC.



You can open PXM test results in FastReporter 3 to generate reports and perform post-processing tasks.



PXM_1234567 (Mass Storage Drive)

- **Jobs** (folder)
  - **Sub folders for each Job**, named with the Job name.
    - **Job test result files**, named with the test point name.
- **Software Update** (folder) for firmware update file

7 Using Your LXM Light Source

The LXM is a duplex and multifiber light source (singlemode or multimode) designed for fast and efficient link testing.

You can test duplex links using P12/P24 units that are equipped with a compatible Click-Out adapter.

The LXM has a built-in VFL (Visual Fault Locator) in the source connector to help visually identify the connection and simplify testing.

The LXM Source has 2 modes of operation:

- Source mode which is a classical CW (continuous wavelength) mode.
- FasTesT mode which is designed for automated loss tests and polarity of many wavelengths, in a fast and efficient way.

For more information on the FasTesT mode, see *Working With FasTesT* on page 70.

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dirt and dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.



WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.

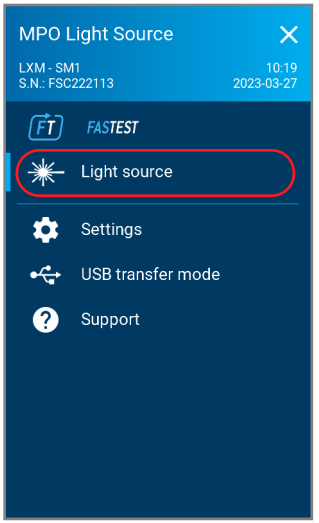
Setting up and Using your Light Source

Selecting Wavelengths

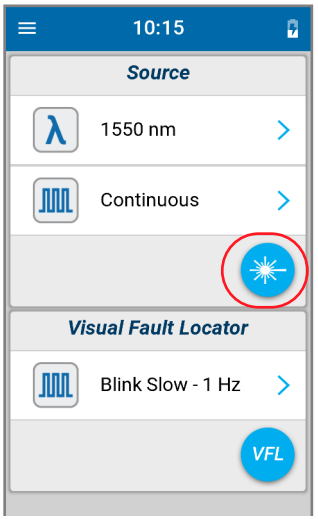
You can use the light source at different wavelengths depending on your model.

To select the light source's wavelength

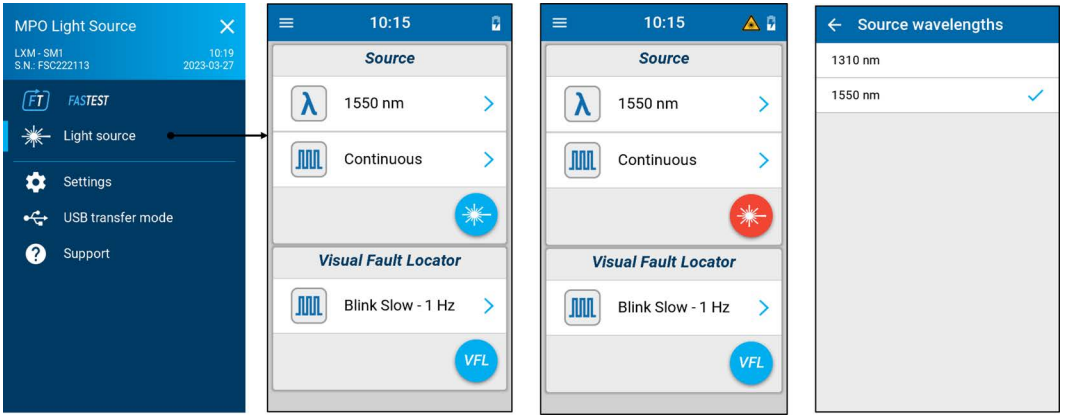
1. From the main menu, select **Light Source**.



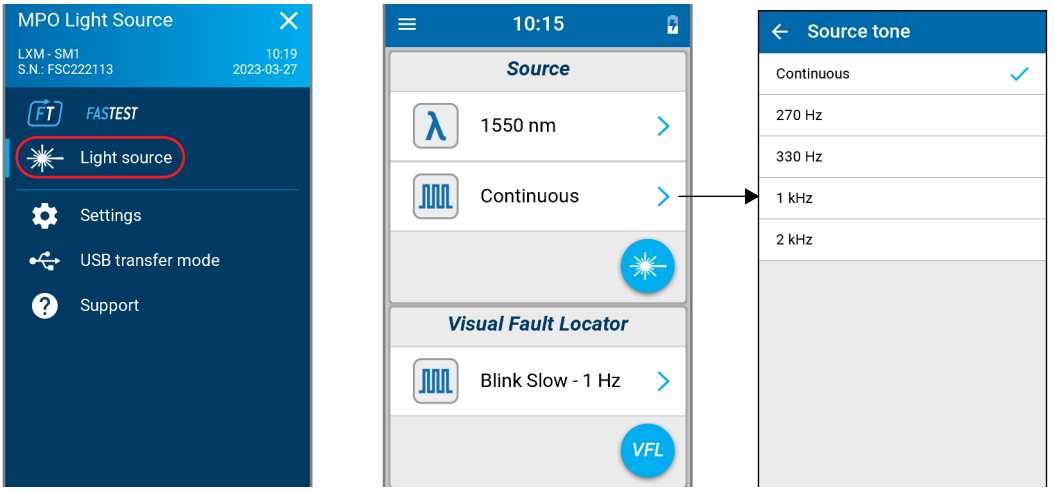
2. Tap the light source icon. It becomes red and a warning icon appears in the title bar to remind you that you need to proceed with caution because of the light source.



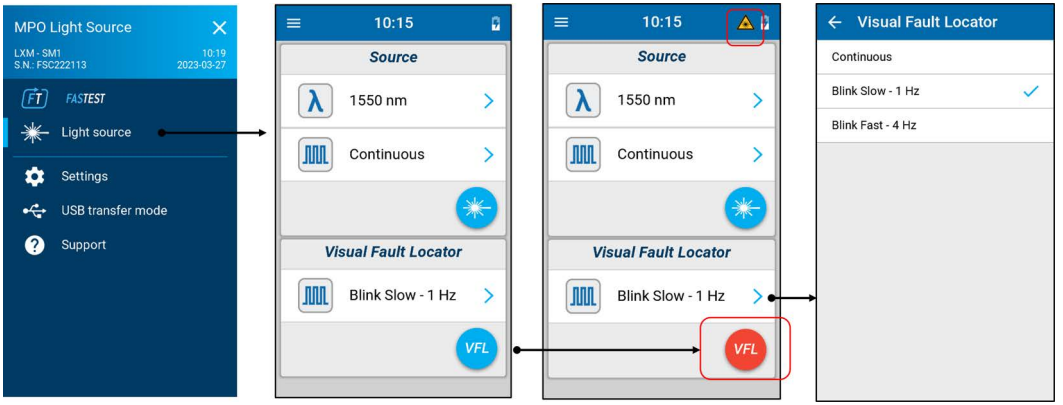
Turn on the **Source**.



Selecting Source Tones



Using the VFL



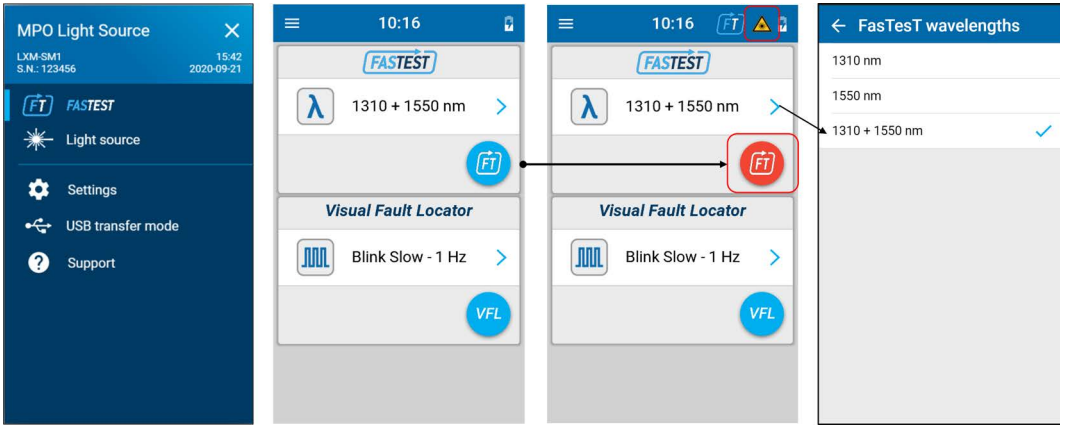
For VFL channel mapping, visible light is emitted at 650 nm on certain fibers, but not all.

Test	Model	VFL Active Fibers
Multifiber	LXM (units with an MPO-12 fixed port) - Singlemode	2, 5, 8, 10, 12
	LXM (P12 unit) - Singlemode	2, 5, 8, 10, 12
	LXM (units with an MPO-12 fixed port) - Multimode	6, 8, 10, 12
	LXM (P12 unit) - Multimode	1, 2, 3, 4, 5, 7, 9, 11
Duplex	LXM (P12 unit) - Singlemode	A
	LXM (P12 unit) - Multimode	A and B

Performing a FasTesT With Your Unit

When the LXM emits a FasTesT signal and a PXM is connected on the same cable, both test units will automatically detect the continuity.

Turn on the *FASTEST* Source Sequence.

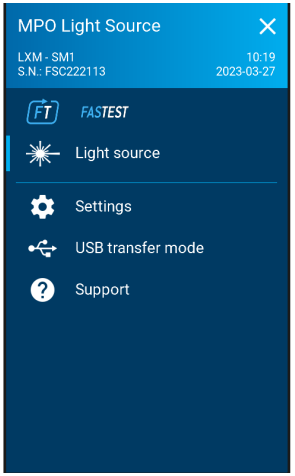


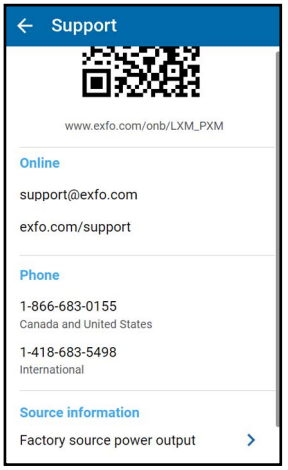
Viewing Factory Power Output

You can view the factory power output values stored for each fiber at both 1310 nm and 1510 nm wavelengths.

To view the Factory source power output:

1. From the Main Menu, tap **Support**.



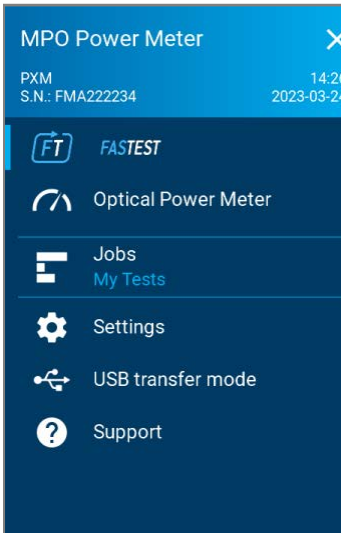




2. Under **Source information**, tap **Factory source power output** to open the **Factory power output** page.

8 Using Your PXM Optical Power Meter

The PXM is a duplex and multifiber power meter designed for fast and efficient link testing.



You can test duplex links using P12/P24 units that are equipped with a compatible Click-Out adapter. For more information, see *Introducing the PXM and LXM Duplex and Multifiber OLTS* on page 1.

The PXM has 2 modes of operation:

- Optical Power Meter (OPM) to measure any live signal power level emitted on fibers.
- FasTesT to measure the link loss, length, and polarity for all wavelength(s) included by the incoming signal emitted by an LXM source.

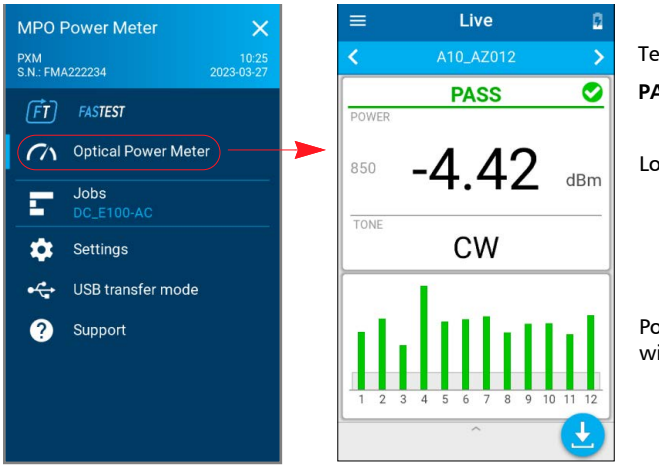
Note: *For best results, both test units must be in the same mode: OPM or FasTesT.*

Note: *To operate in FasTesT mode, the source and the power meter must be in FasTesT mode. If the source is in OPM mode, the measurement will not work.*

For more information on the FasTesT mode, see *Working With FasTesT* on page 70.

Reading/Viewing Live Power

The **LIVE** indicator is present for live signal acquiring. While the live reading is displayed, you can store the test result by tapping on the store button.



Some of the entries are listed as follows:

- Test point name.
- **Power** is stored for all 12 fibers in the case of multifiber testing and 2 fibers for duplex testing.

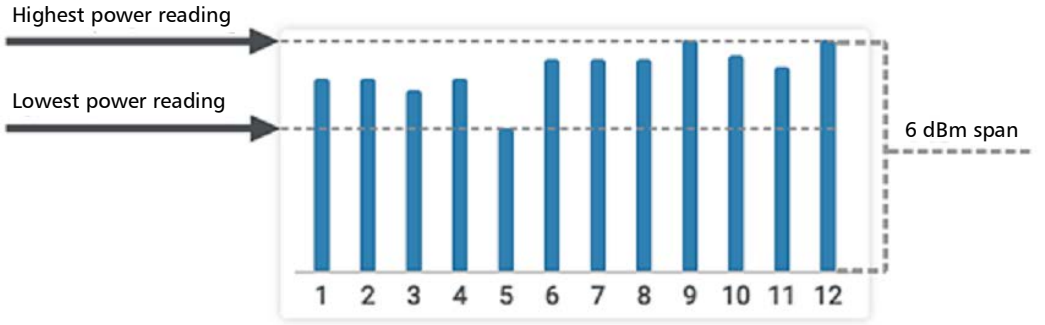
Note: *The highest power value is displayed when the maximum threshold is fail and there is no minimum threshold fail. Otherwise, the lowest power value is displayed.*

- The detected **Tone** or modulation is saved in the measurement data.

Understanding the Power Graph Bar

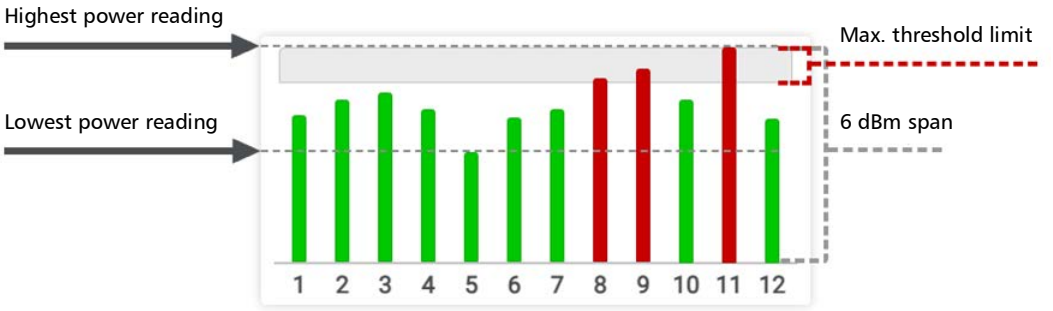
➤ When *no power threshold* is applied:

- ❖ The graph span is fixed to a 6 dBm range.
- ❖ The fiber with the highest power reading corresponds to the upper range of the graph.



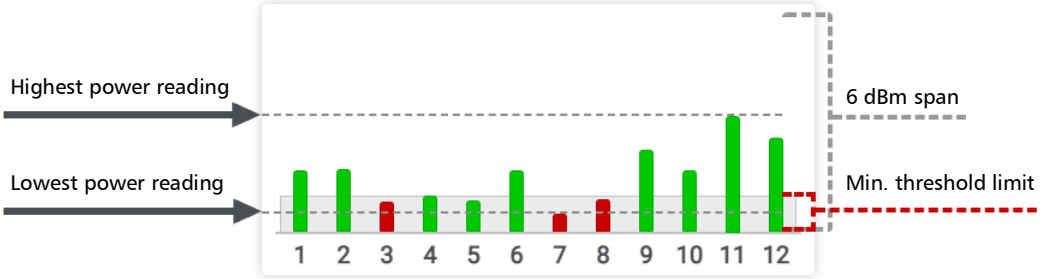
➤ When *maximum power threshold* is applied:

- ❖ The graph span is fixed to a 6 dBm range.
- ❖ The maximum power threshold corresponds to the upper range of the graph.
- ❖ The gray box indicates the maximum power threshold limit.



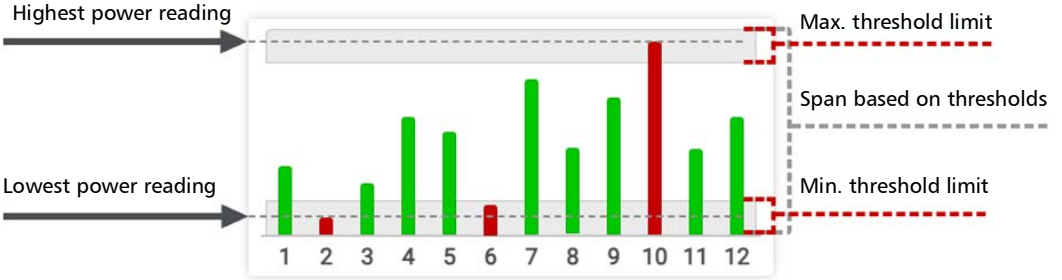
➤ When *minimum power threshold* is applied:

- ❖ The graph span is fixed to a 6 dBm range.
- ❖ The minimum power threshold corresponds to the lower range of the graph.
- ❖ The gray box indicates the minimum power threshold limit.

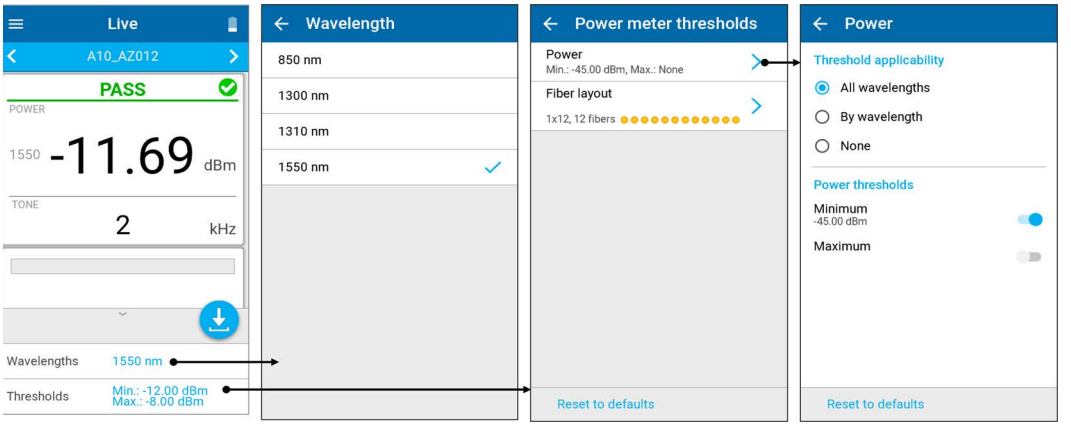


➤ When *minimum and maximum power thresholds* are applied:

- ❖ The graph span is determined to display the range between both thresholds applied.
- ❖ The upper gray box indicates the maximum power threshold limit.
- ❖ The lower gray box indicates the minimum power threshold limit.

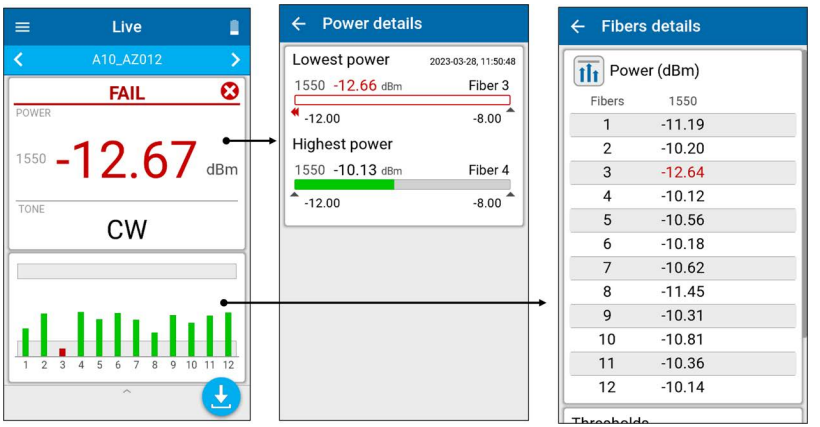


Selecting Wavelengths



From bottom drawer... Wavelength selection Power thresholds settings

Analyzing Results

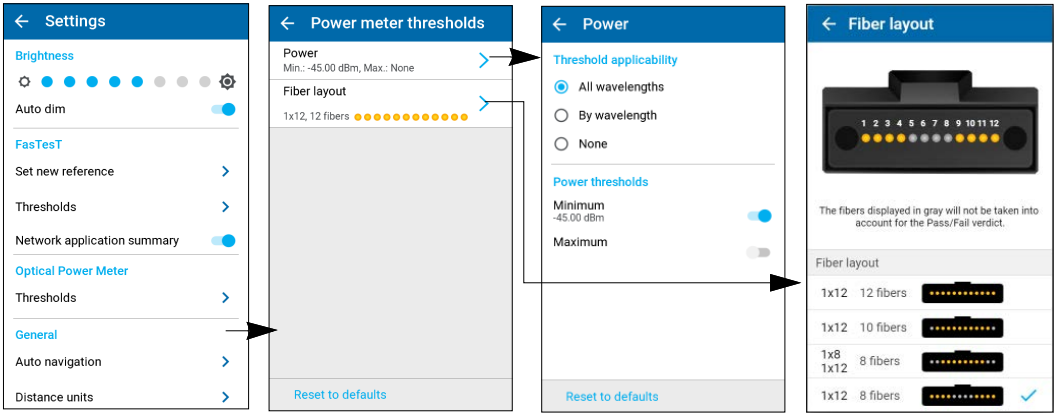


Lowest and highest power with pass/fail thresholds

Provides results table for each of the 12 fibers

Selecting a Multifiber Layout

Threshold power values and layout are available from the bottom drawer or **Settings** menu.



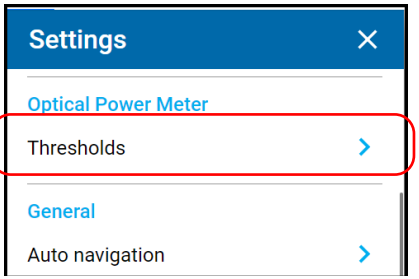
The power meter always measures all fibers no matter what layout is selected. However, as noted above, the fibers in gray will not be tested.

Configuring Thresholds

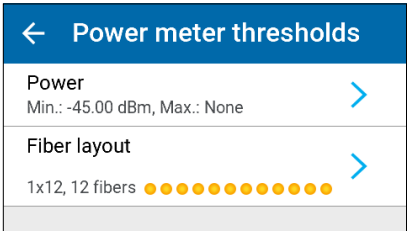
You can set Pass/Fail thresholds for the **Optical Power Meter**. As soon as a measurement is complete, the application displays a pass or fail status when thresholds are applied.

To configure thresholds:

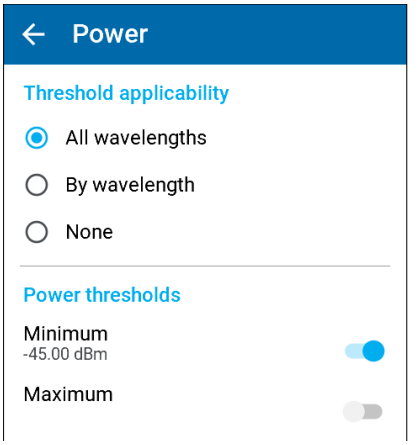
1. From the main menu, tap **Settings** or tap the icon to access the menu, then select .
2. Under **Optical Power Meter**, tap **Thresholds**.



3. Select a threshold to set.



4. Select whether the threshold values will be applied for all wavelengths, if each wavelength will have specific thresholds, or if no thresholds will be used for the measurements.

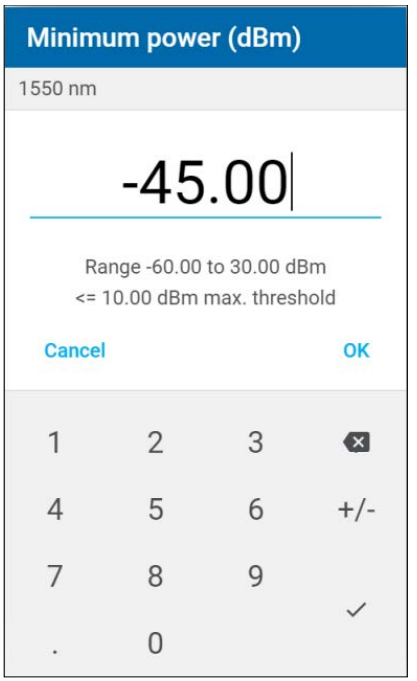


5. Depending on the option you have selected, select the corresponding menu.

Note: *If you select* ***By wavelength,*** *select the desired wavelength.*

6. You can enable or disable the **Power thresholds** using the corresponding **Minimum**/**Maximum** (dBm) sliders. Threshold values are as follows (nm):
   - 850
   - 1300
   - 1310
   - 1550

7. If you want to change the value, tap on the threshold you want to modify and enter a new value.



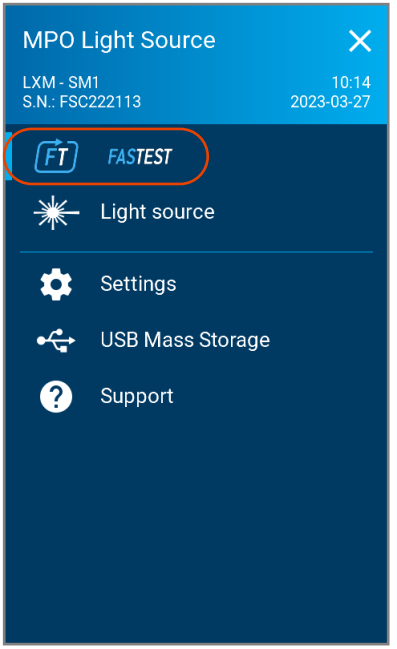
8. Tap **OK** to confirm the value or **Cancel** to abort the page. The new thresholds are taken into account for the next measurement.

9 Working With FasTesT

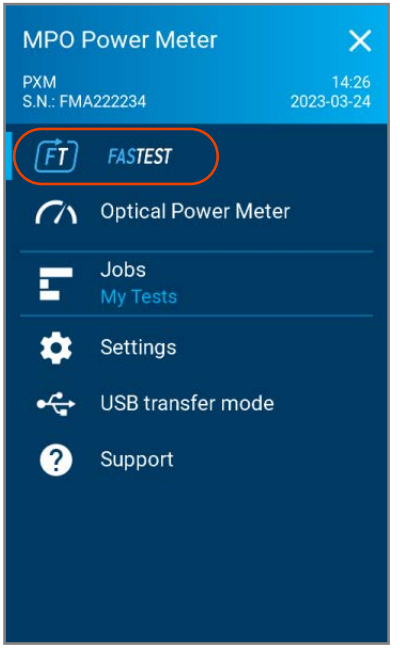
The FasTesT mode is designed for automated loss test, polarity, and link length measurement in a fast and efficient way. This section covers the following:

- Referencing
- FasTesT Operation

LXM Light Source



PXM Power Meter



Taking References

Reference Requirements

Depending on the fiber type and the referencing mode, both types A and B are supported.

➤ Reference Duplex Polarity is capable of referencing with the following duplex-fiber polarities:

- ❖ A-B (Cross-over)
- ❖ A-A (Straight)

Note: *A-to-A patch cords are not commonly deployed but are used when necessary.*

➤ Reference MPO-12/16/24 Polarity is capable of referencing with the following 8/12/16/24 fiber polarities:

- ❖ Multifiber Base-8, 12, and 16:

  A (Straight ribbon) and B (Flip ribbon)

- ❖ Multifiber Base-24:

  A (Straight ribbon | Row to row), A (Straight ribbon | Inverted row), B (Flip ribbon | Row to row), and B (Flip ribbon | Inverted row) for 24 fibers.



IMPORTANT

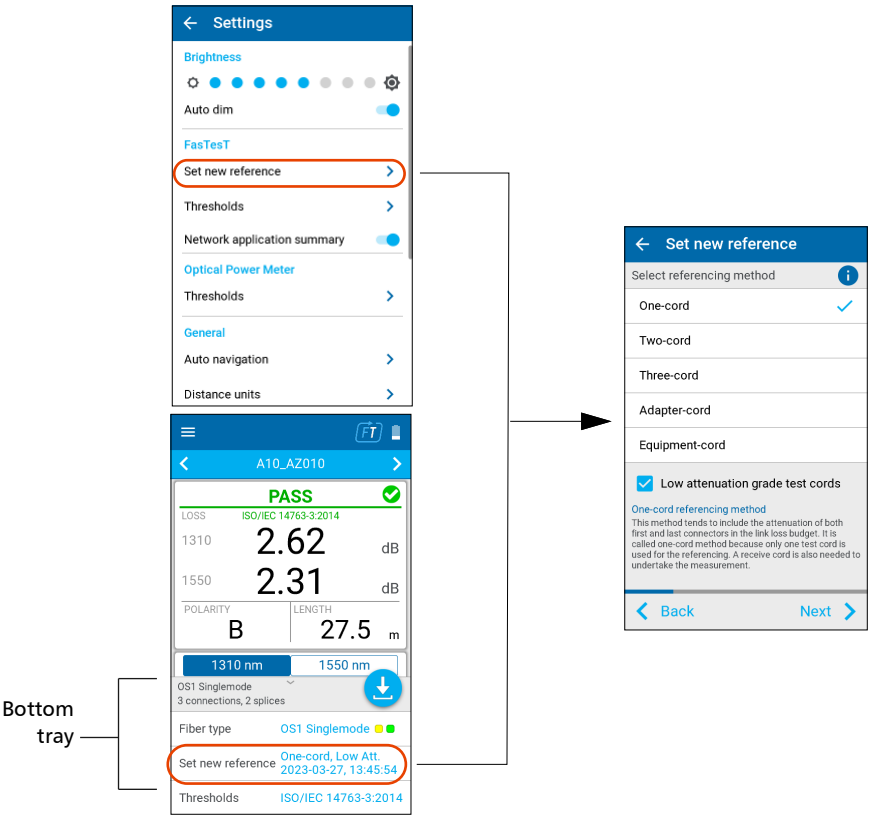
EXFO recommends using test cords with the same length, which should be between 2 and 10 meters in length. EXFO strongly recommends using low-attenuation grade test cords to produce repeatable measurements and avoid negative loss values.

Setting a New Reference

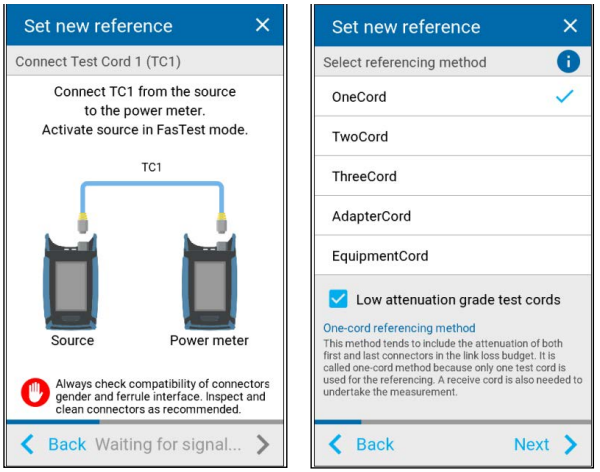
Note: *To obtain valid results, reference the FasTesT signal using the same LXM and PXM units and the same Click-Out adapters that will be used for testing.*

To set a new reference:

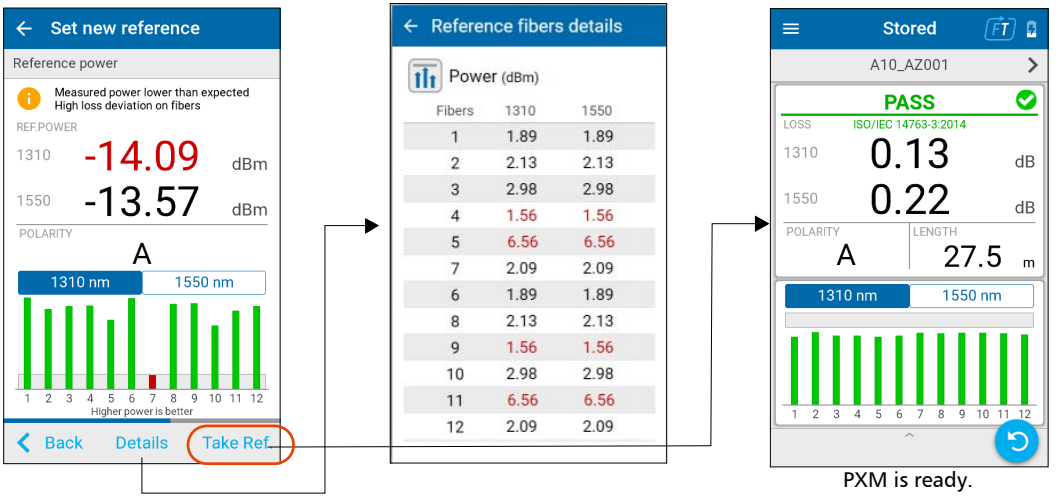
1. Tap **Set new reference** from either the **Settings** menu or from the bottom tray of a **Live** measurement page.



2. Connect both units together.
3. Select a test cord for the referencing method and tap **Next**.

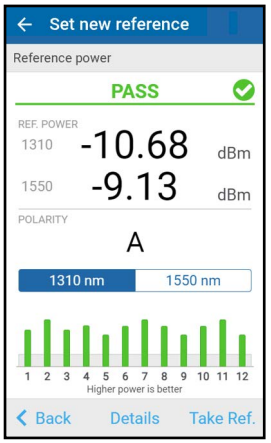


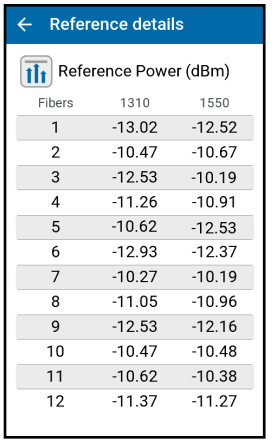
4. Tap **Take Ref** in the lower right-hand corner of the screen to take a reference.



PXM is ready.

Note: *When the reference is lower than expected, a message*  *explaining the reason is displayed, as shown in the first screen above. For more information, see Solving Common Problems* on page 140.



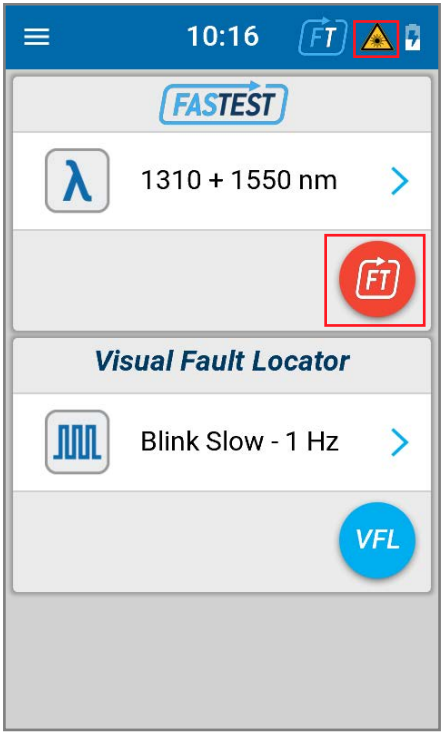


Fibers	1310	1550
1	-13.02	-12.52
2	-10.47	-10.67
3	-12.53	-10.19
4	-11.26	-10.91
5	-10.62	-12.53
6	-12.93	-12.37
7	-10.27	-10.19
8	-11.05	-10.96
9	-12.53	-12.16
10	-10.47	-10.48
11	-10.62	-10.38
12	-11.37	-11.27

Performing a FasTesT

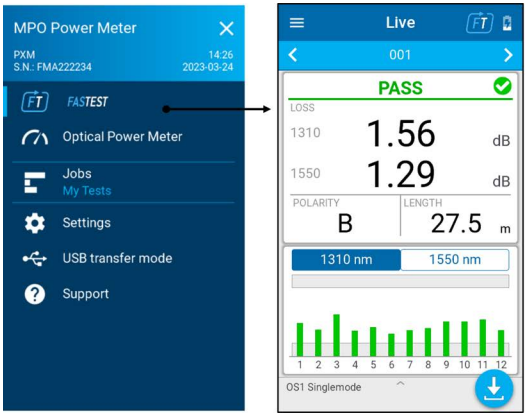
To perform a FasTesT:

1. Connect the LXM to PXM and ensure the test units are in FasTesT mode.
2. Turn on the source in FasTesT mode.



3. Ensure the reference is done and up to date. Follow the on-screen instructions. To set a new reference, see *Taking References* on page 71.

Measuring Loss (Multifiber)



Tap to store.

Tap to test again.

Test point name

PASS/FAIL Global

Highest **LOSS** wavelength

POLARITY

LENGTH

Select the graph wavelength

Selected wavelength loss graph of the 12 fibers with

Some of the entries are listed as follows:

- Test point name
- **Loss** is stored for all 12 fibers.

Note: *The lowest loss value is displayed when the minimum threshold is fail and there is no maximum threshold fail. Otherwise, the highest loss value is displayed.*

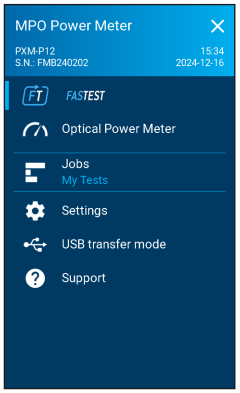
Note: *A negative loss measurement occurs when the measured power level is more than the reference power level.*

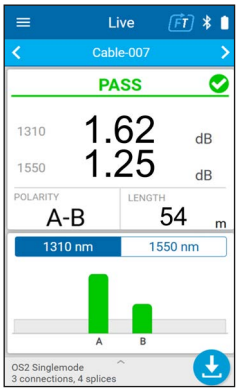
Negative loss can be caused by the following:

- The test method used may not be suitable for measuring loss on a short link; the one-cord or adapter-cord method is recommended.
- Damaged or dirty test cords.
- Poor quality of referencing test cords.
- Test cords have been disconnected since the last referencing.
- The referencing method or test cord connections are incorrect.

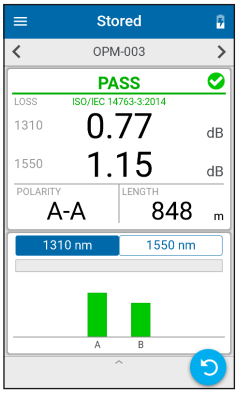
In these instances, it is strongly recommended to set a new reference.

Measuring Loss (Duplex)





Tap to store



Tap to test again

Test point name

PASS/FAIL Global

Highest **LOSS** wavelength

POLARITY

LENGTH

Select the graph wavelength

Selected wavelength loss graph of the 2 fibers with pass/fail thresholds

Some of the entries are listed as follows:

- Test point name
- **Loss** is stored for the 2 fibers.

Note: *The lowest loss value is displayed when the minimum threshold is fail and there is no maximum threshold fail. Otherwise, the highest loss value is displayed.*

Note: *A negative loss measurement occurs when the measured power level is more than the reference power level.*

Negative loss can be caused by the following:

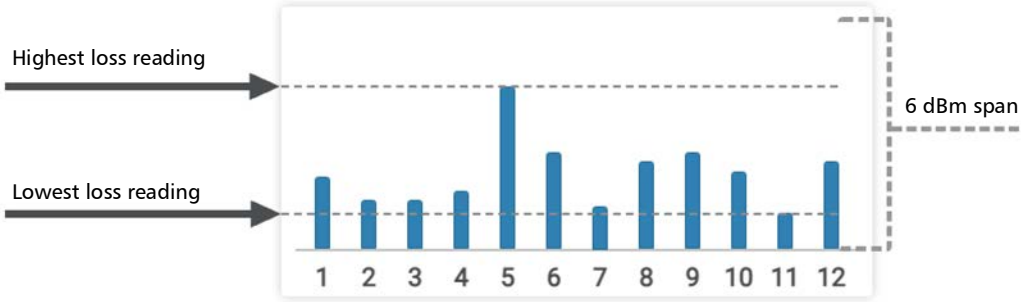
- The test method used may not be suitable for measuring loss on a short link; the one-cord or adapter-cord method is recommended.
- Damaged or dirty test cords.
- Poor quality of referencing test cords.
- Test cords have been disconnected since the last referencing.
- The referencing method or test cord connections are incorrect.

In these instances, it is strongly recommended to set a new reference.

Understanding the FasTesT Loss Graph Bar

➤ When *no loss threshold* is applied:

- ❖ The graph span is fixed to a 6 dB range.
- ❖ The fiber with the lowest loss reading will correspond to the minimum graph span.



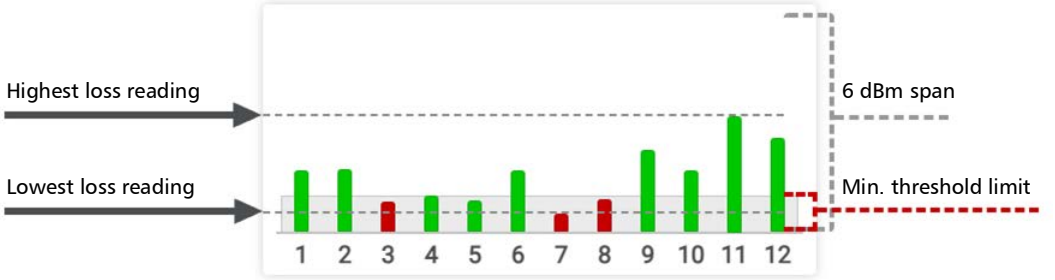
➤ When *maximum loss threshold* is applied:

- ❖ The graph span is fixed to a 6 dB range.
- ❖ The maximum loss threshold corresponds to the upper range of the graph.
- ❖ The gray box indicates the maximum loss threshold limit.



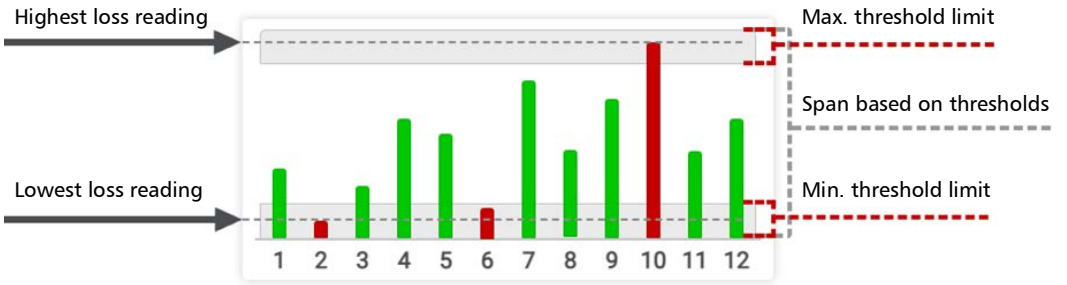
➤ When *minimum loss threshold* is applied:

- ❖ The graph span is fixed to a 6 dB range.
- ❖ The minimum loss threshold corresponds to the lower range of the graph.
- ❖ The gray box indicates the minimum loss threshold limit.



➤ When *minimum and maximum loss thresholds* are applied:

- ❖ The graph span is determined to display the range between both thresholds applied.
- ❖ The upper gray box indicates the maximum loss threshold limit.
- ❖ The lower gray box indicates the minimum loss threshold limit.



Link Length Measurement

Each time a FasTesT measurement is conducted for links, the test units automatically measure the link length for the supported polarity types

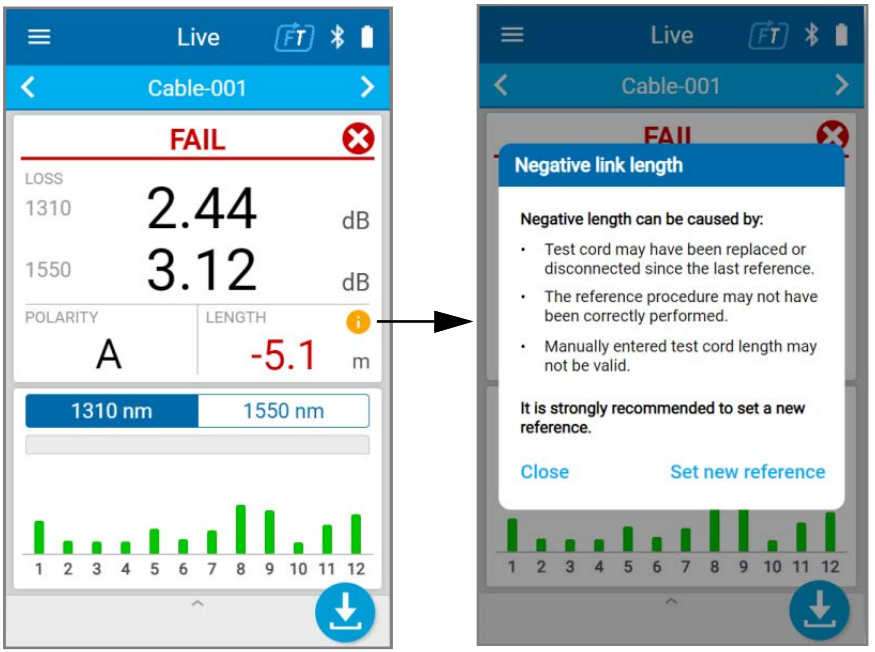
Note: *When testing with one or more multimode wavelengths, the link length is not available with Universal System type U polarity.*

Link length values are displayed according to the selected distance unit, and a single link length is reported.

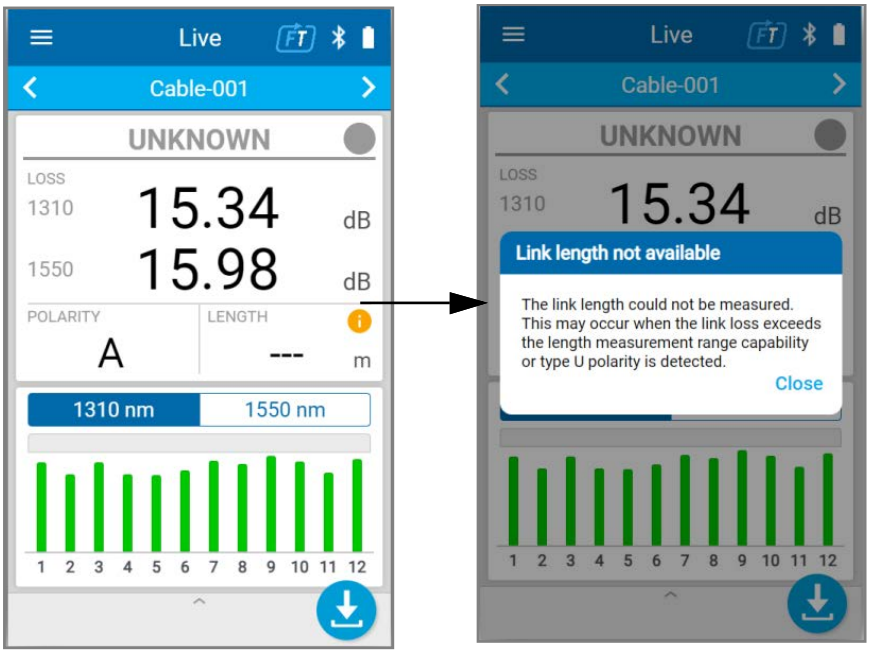
Note: *All fibers in an MPO cable are presumed to be the same length.*

The link length measurement excludes all test cord lengths currently referenced since the referencing assistant measures and calculates test cord lengths.

Negative Link Length

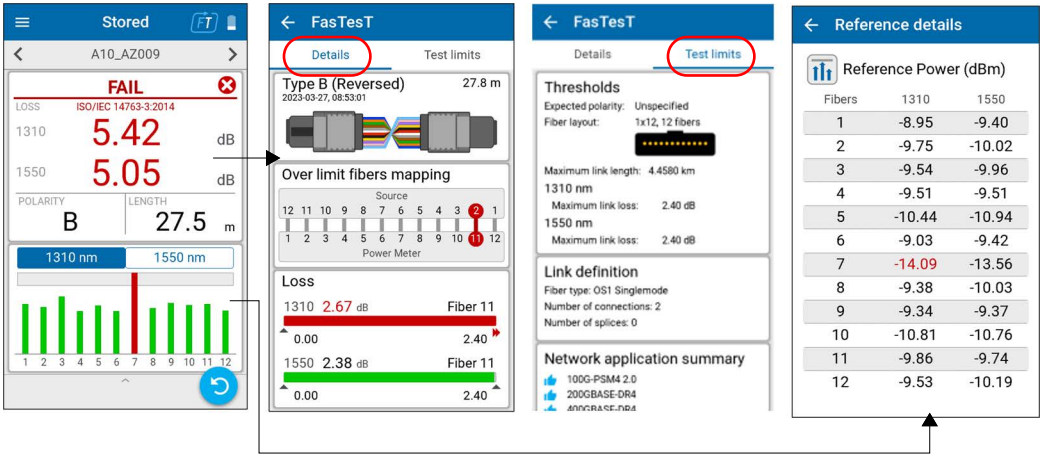


Unavailable Link Length



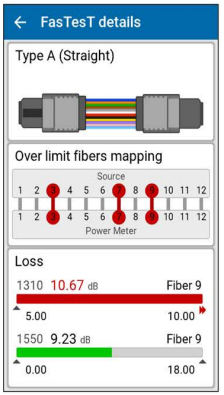
Analyzing Results (MPO)

Tap on the global result tile to see FasTesT polarity graphic representation and fiber mapping **Details** and **Test limits**, as well the corresponding Pass/Fail verdict for each fiber.

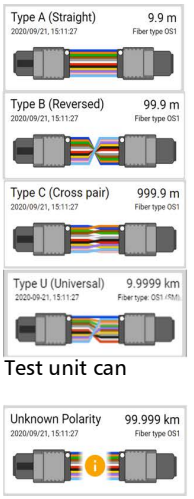


The margin meters are displayed for each wavelength reading loss according to the threshold applied. When no threshold value is defined, then the loss Pass/Fail verdict is unknown.

FasTesT Details Panel

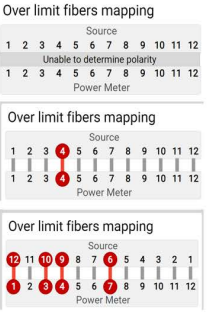


Polarity Types

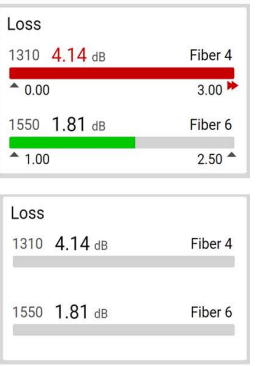


Test unit can

Fibers in Fault at LXM and PXM Connectors



Loss Values and Threshold Detailed Analysis



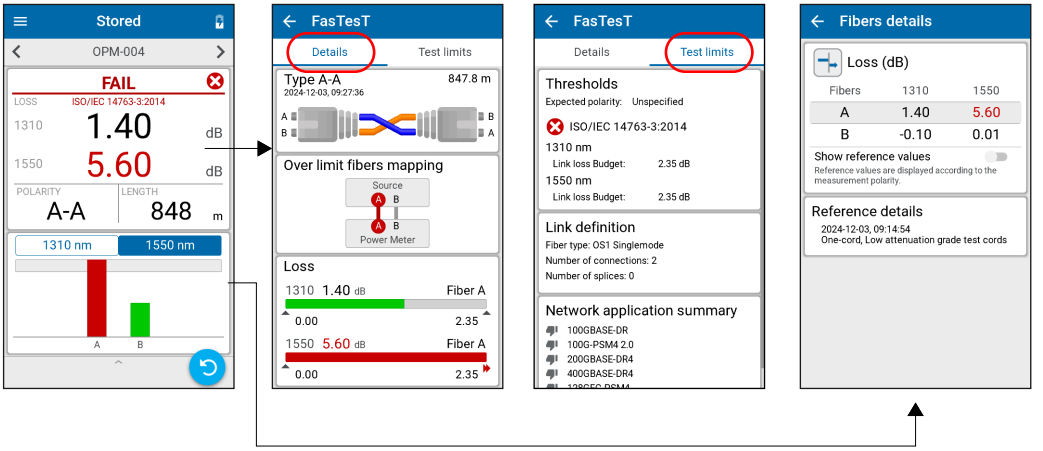
The margin page displays the lowest loss value when the minimum threshold is fail and there is no maximum threshold fail. Otherwise, the highest loss value is displayed.

Polarity Types refer to both P12 and P24.

Analyzing Results (Duplex)

Note: *PXM-P12 and LXM-P12 units with the appropriate duplex Click-Out connectors are required to analyze link loss results on duplex fibers.*

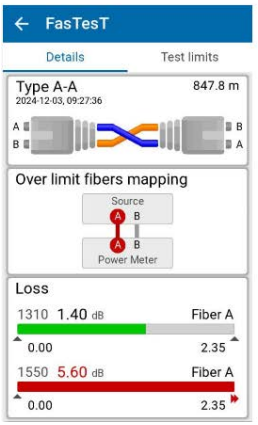
Tap on the global result tile to see FasTesT polarity graphic representation and fiber mapping **Details** and **Test limits**, as well the corresponding Pass/Fail verdict for each fiber.



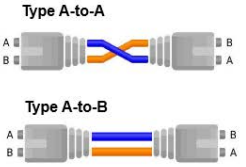
The margin meters are displayed for each wavelength reading loss according to the threshold applied. When no threshold value is defined, then the loss Pass/Fail verdict is unknown.

Note: *PXM-P12 and LXM-P12 models with the appropriate Click-Out connectors are required to view duplex polarity, fiber mapping and loss.*

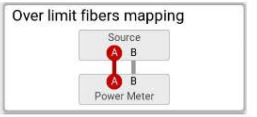
FasTesT Details Panel



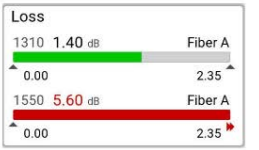
Polarity Types



Fibers in Fault at LXM-P12 and PXM-P12 Connectors



Loss Values and Threshold Detailed



The margin page displays the lowest loss value when the minimum threshold is fail and there is no maximum threshold fail. Otherwise, the highest loss value is displayed.

Understanding Polarity Messages

The FasTesT feature provides the polarity type of the link under test automatically when continuity is detected.

The test unit can detect the following polarities:

➤ For multifiber:

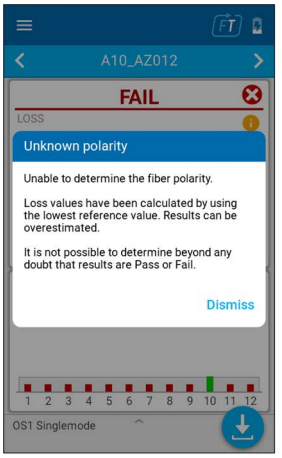
- ❖ Type A (Straight)
- ❖ Type B (Reversed)
- ❖ Type C (Cross pair)
- ❖ Type U (Universal System)

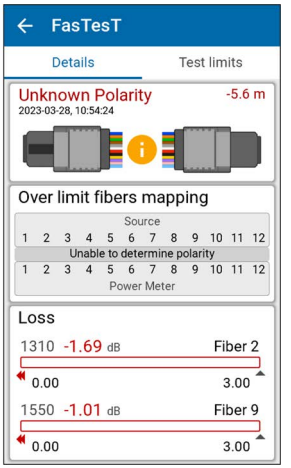
➤ For duplex fibers:

Type A-A and A-B

Pass/fail is detected on actual polarity type versus expected polarity type.

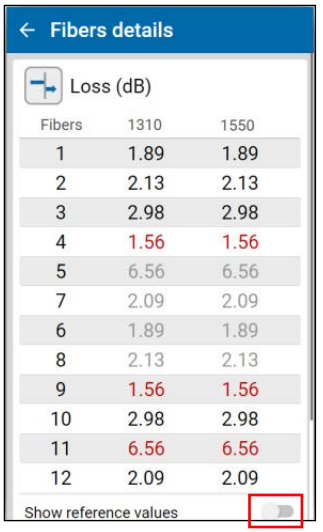
All other fiber arrangements may not be identified, therefore the test unit cannot determine the Pass/Fail verdict.

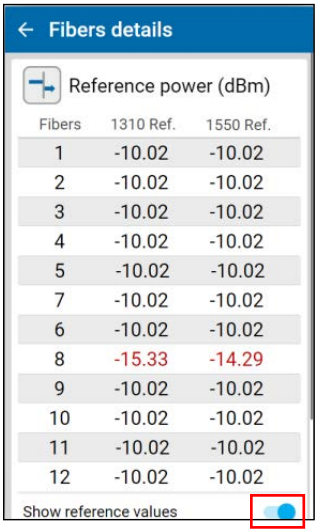




Viewing Fiber Reference Details

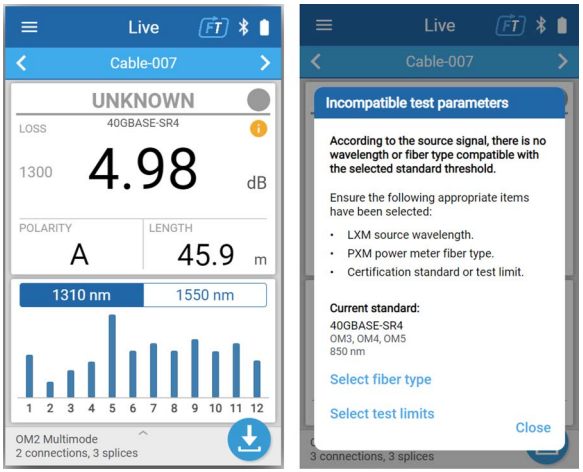
Allows for consulting the reference. See *Taking References* on page 71. You can choose to display the reference values or not by using the toggle.





Viewing Test Diagnostics

The test unit displays an icon with **Incompatible test parameters** diagnostics, along with **UNKNOWN** global Pass/Fail verdict when the current fiber type and/or the source signal do not include any wavelength to provide a loss Pass/Fail verdict.

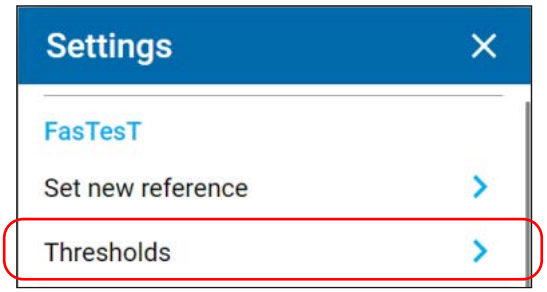


Configuring the Polarity Thresholds for MPO Links

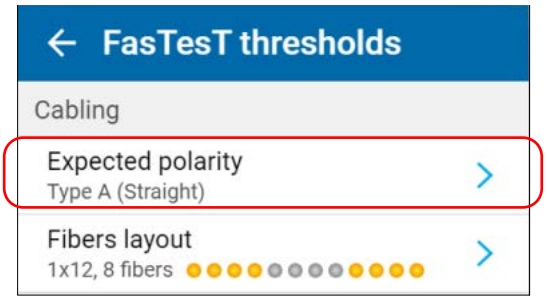
You can set Pass/Fail thresholds for FasTesT. As soon as a measurement is complete, the application displays a pass or fail status when thresholds are applied.

To configure the polarity thresholds for MPO links:

1. From the main menu, tap **Settings** or tap the icon to access the menu, then select .
2. Under **FasTesT**, tap **Thresholds**.

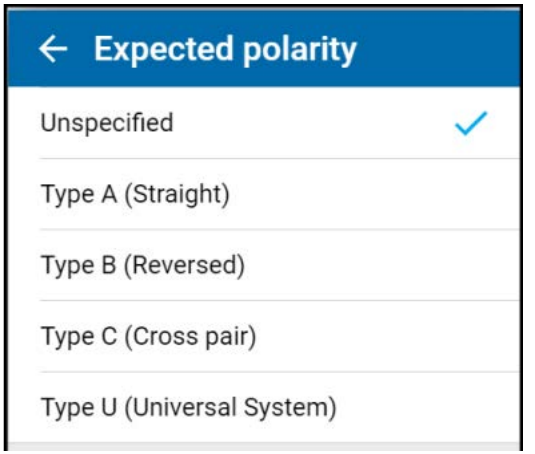


3. Tap **Expected polarity**.



4. Set the **Expected polarity** (FasTesT only).

Note: *When the **Expected polarity** is **Unspecified**, the polarity detected during the FasTesT acquisition is not tested.*



Note: *The **Expected polarity** displayed will fit with the click-out adapter selected.*

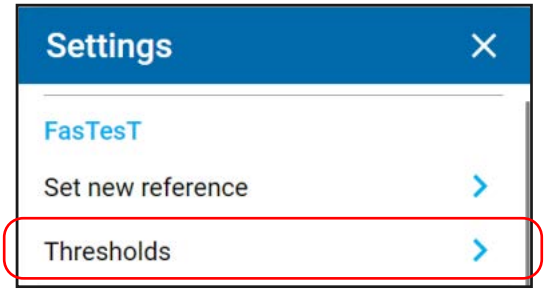
Configuring Duplex Links Polarity Thresholds

Note: *To configure the polarity thresholds for duplex links, you must use PXM-P12/P24 and LXM-P12/P24 units with the appropriate Click-Out connector.*

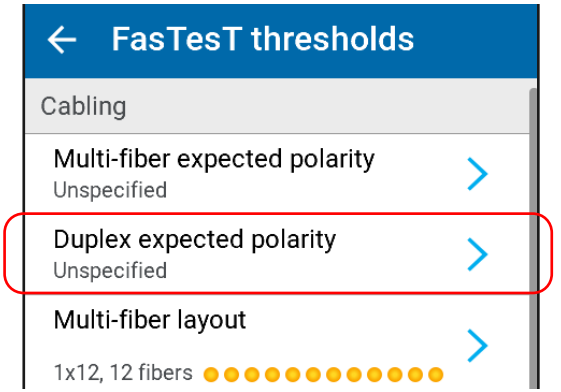
You can set Pass/Fail thresholds for FasTesT. As soon as a measurement is complete, the application displays a pass or fail status when thresholds are applied.

To configure the polarity thresholds for duplex links:

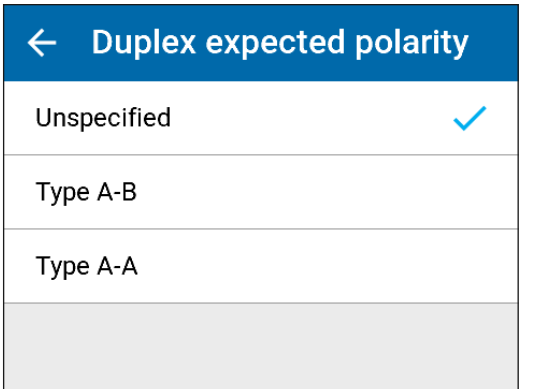
1. From the main menu, tap **Settings** or tap the icon to access the menu, then select .
2. Under **FasTesT**, tap **Thresholds**.



3. Select **Duplex expected polarity**.



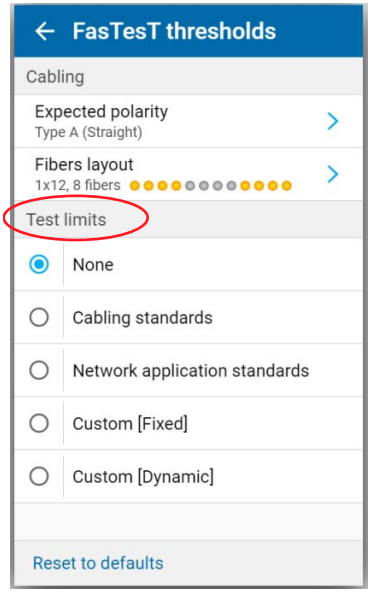
4. Set the **Duplex expected polarity** (FasTesT only).



Selecting Test Limits

The **FasTesT thresholds** page provides the means to select *one* of the following test limits:

- None
- Cabling standards
- Network application standards
- Custom [Fixed]
- Custom [Dynamic]



By selecting a single test limit, you can determine your thresholds to apply to your next measurements. Only one type of test limit can be selected.

When **None** is selected, the link loss and length are not tested.

Cabling Certification Standards

The cabling standards page provides the means to edit the number of connections and splices. These values are used for the link loss budget calculation.

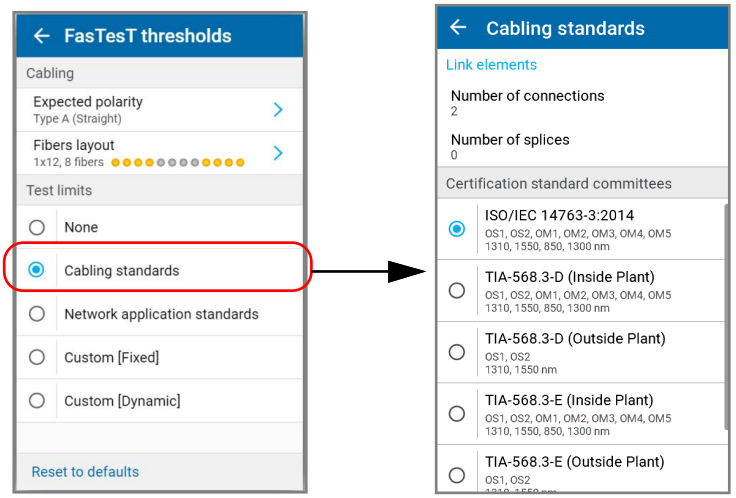
Note: *Only one cabling standard can be selected at a time.*

For each cabling standard, the test unit comes with pre-programmed threshold values based on industry standards. Internal thresholds for cabling standards are defined by fiber type. It is therefore important to select the appropriate fiber type before testing.

Test cord grades such as *Low attenuation grade* or *Standard grade* are also considered for the cabling link loss budget. You can select the grade when referencing.

For each cabling standard, the corresponding basic information like supported fiber types and wavelengths are displayed under each standard name.

Note: *Threshold values are defined in each standard.*



Dynamic loss budget is calculated according to the selected certification standard, and Pass/Fail status and global P/F verdict is displayed.

Test parameters used to calculate a cabling loss budget are as follows:

- Fiber Type (OS1, OS2, OM1…OM5)
- Number of splices
- Number of connections
- Link length.

Network Application Certification Standards

Network application certification standards include internal thresholds to calculate fixed limits such as:

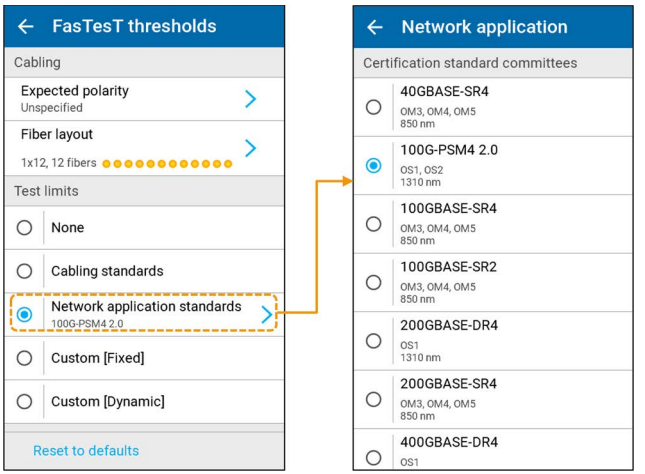
- Maximum loss (dB)
- Maximum link length (m)

For each network application standard, the test unit comes with pre-programmed threshold values defined by the industry standards.

Note: *Network application certification standards do not include thresholds to calculate a dynamic loss budget.*

For each network application standard, the corresponding basic information like fiber types and wavelengths supported are displayed under each standard name.

Note: *Only one network application standard can be selected at a time.*

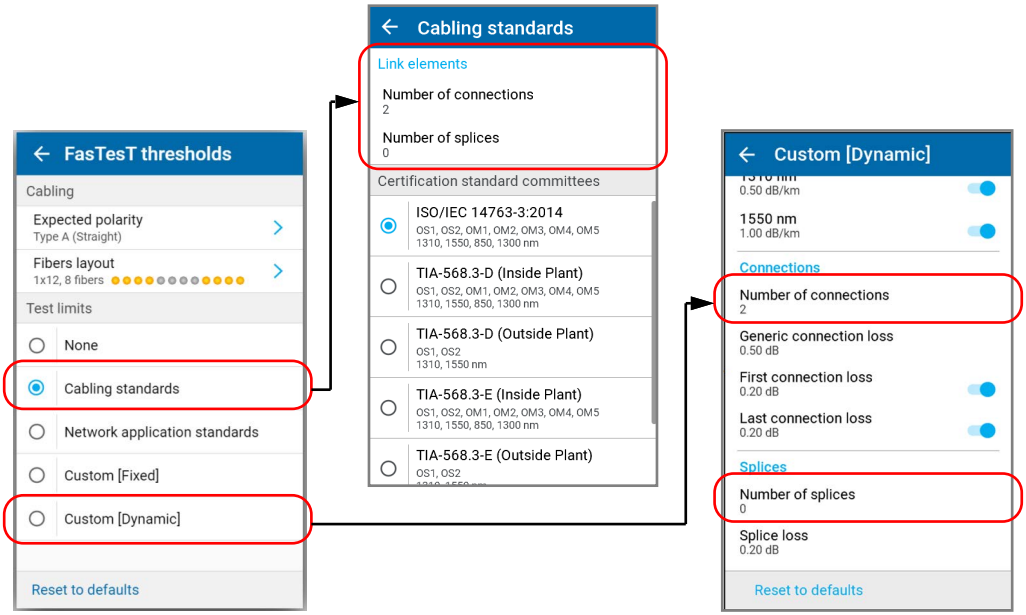


Defining Connections and Splices

For custom and certification cabling, you can calculate the budget loss by defining the number of connectors and splices.

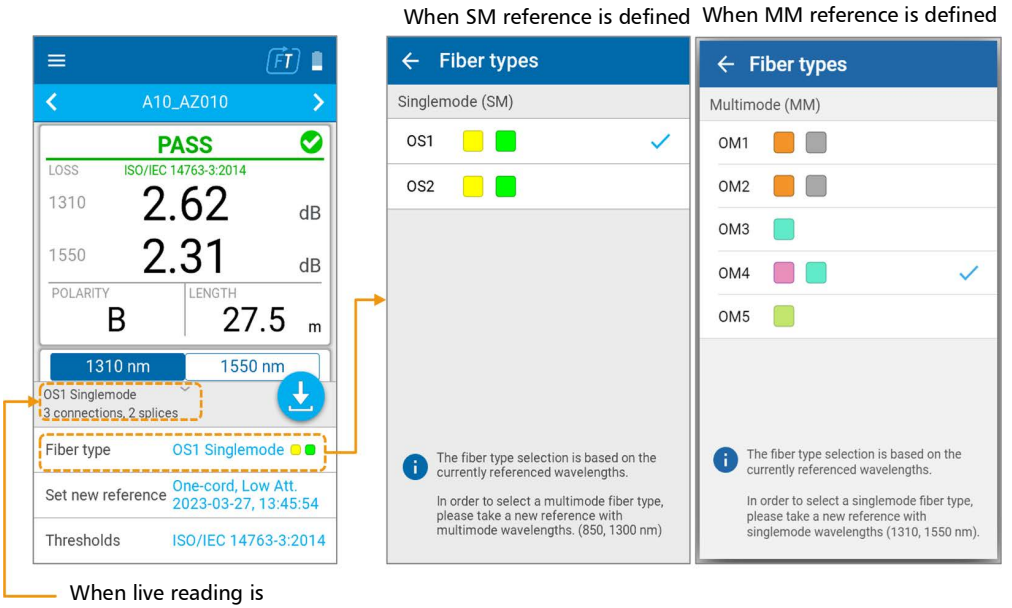
To edit the number of connections and splices:

1. From the Main Menu/**Settings**/**FasTesT**, tap **Thresholds**.
2. Under **Test limits**, tap **Cabling standards** to select one from the list of **Certification standard committees**.
3. Select **Custom [Dynamic]** to edit the number of **Connectors** and **Splices**.



Selecting the Fiber Type

The aforementioned cabling and network application standards require the selection of a fiber type based on the wavelengths currently referenced.

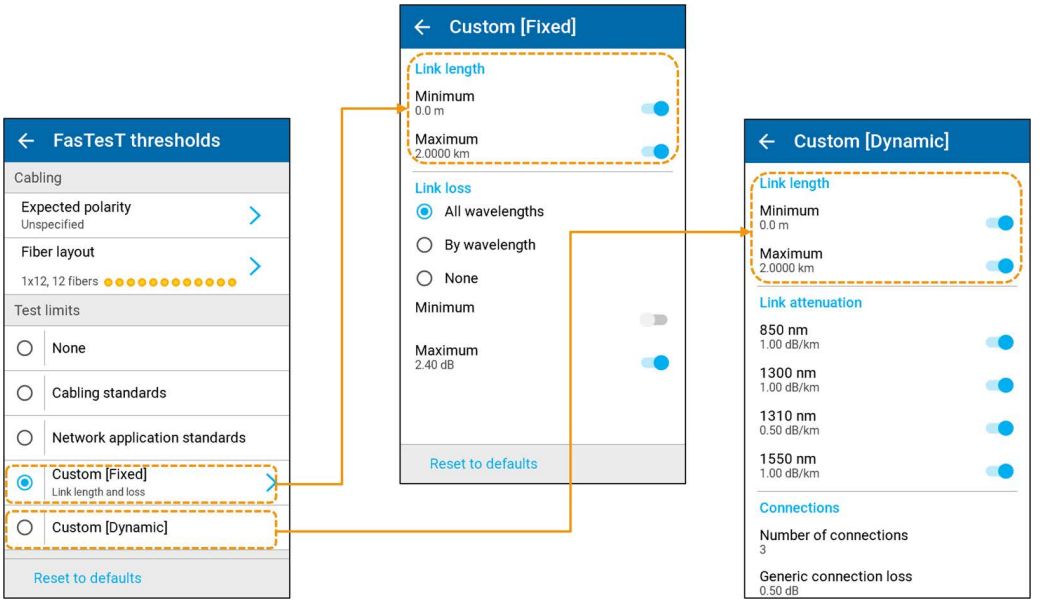


- When one or two **Singlemode (SM)** wavelengths are referenced, **Fiber types** OS1 and OS2 are available.
- When one or two **Multimode (MM)** wavelengths are referenced, **Fiber types** OM1, OM2, OM3, OM4, and OM5 are available.
- When no reference is defined, a message is displayed explaining that the fiber type selection is based on the currently referenced wavelengths. The shortcut **Set new reference** is provided.

Selecting Link Length Thresholds

From the Main Menu/**Settings**/**FasTesT**/**Thresholds** under **Test limits**, the following 2 options for **Minimum**/**Maximum** link lengths (m, km, ft, or kft) are available:

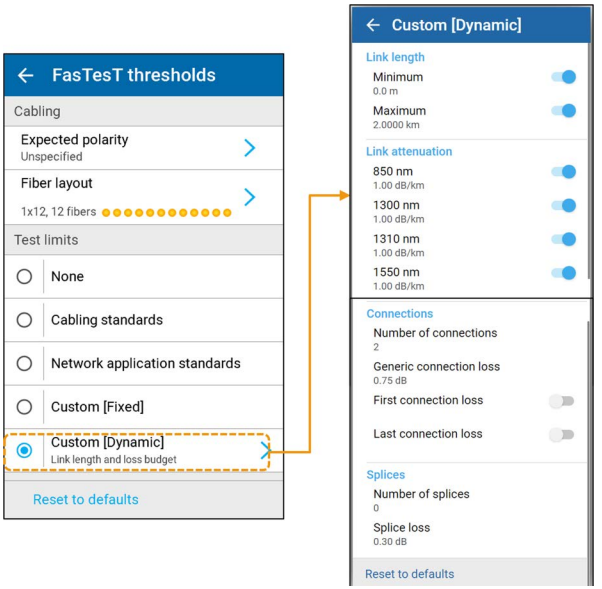
- **Custom [Fixed]** (default) allows you to view/edit the link length threshold values in a context of fixed link loss test limits.
- **Custom [Dynamic]** allows you to view/edit the link length threshold values in a context of dynamic test limits with a link loss budget.



Configuring the Custom Dynamic Loss Budget

The following custom Pass/Fail thresholds are available to calculate the **Custom [Dynamic]** loss budget:

- Link attenuation (dB/km)
- Splice loss (dB)
- Generic connection loss (dB)
- First and last connection loss (dB)



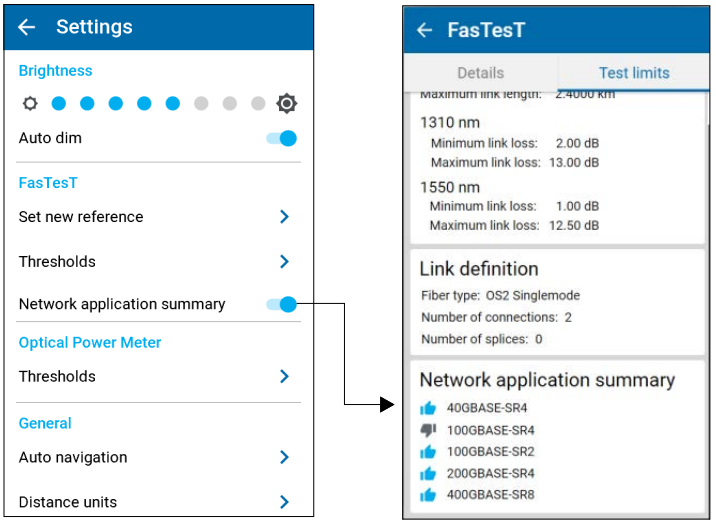
The following test parameters are used to calculate a custom loss budget:

- Measured link length
- Number of connections/splices

Note: *Custom dynamic loss budget can be applied only to a loss measurement.*

Displaying the Network Application Summary

The **Network application summary** list is based on test parameters such as the fiber type and wavelength(s) used to perform the measurement. A specific verdict is displayed for each supported network application standard with a thumbs up and thumbs down icon. The summary list informs about the capacity of the tested link without affecting the global Pass/Fail verdict.



10 Working with the EXFO Exchange Application

You can use your PXM in association with a smart device equipped with the EXFO Exchange mobile application allowing you to document your results, archive them on a cloud server, and generate reports.

Note: *If your unit does not have wireless capabilities, you cannot work with the EXFO Exchange mobile application.*

Note: *In addition to all the other features explained throughout this documentation, you also have access to the features presented hereafter if you work with cloud-based jobs.*

Note: *The EXFO Exchange mobile application gives you access to certain features even if you do not log on to your EXFO Exchange mobile application account. However, to benefit from all the available features, you will need to log in. The procedures presented throughout this user documentation will indicate if a logon is required.*

Note: *Depending on the type of smart device you are using, the appearance of the EXFO Exchange mobile application may vary slightly from the illustrations presented in this documentation. Unless otherwise specified, the information applies both to the Android- and iOS-based smart devices.*

Installing the EXFO Exchange Application on Your Smart Device

Before you start working, if you intend to connect your unit with the EXFO Exchange mobile application to work with jobs, view measurements and create reports, you will need to install the EXFO Exchange application on your smart device.

To install the EXFO Exchange application:

1. Ensure that you have access to an Internet connection.
2. From your Android-based smart device, open the Google Play Store (usually **Play Store** or **Play** icon).

   OR

   From your iOS-based smart device, open the App Store (usually the **App Store** icon).
3. From the Play Store or the App Store, search for *EXFO* or *EXFO Exchange* to localize the EXFO Exchange application.
4. Start the installation and follow the on-screen instructions.

Establishing or Closing a Connection With a Smart Device Via the Bluetooth Technology

When you want to work with the EXFO Exchange mobile application jobs, perform tasks such as generate reports, interactions are necessary between the unit and a smart device equipped with the EXFO Exchange mobile application. These interactions are accomplished using the Bluetooth technology. By default, the Bluetooth communication is enabled on your unit, but if you have disabled it, you must enable it before trying to connect to a smart device (see *Enabling or Disabling the Wireless Communication* on page 113).

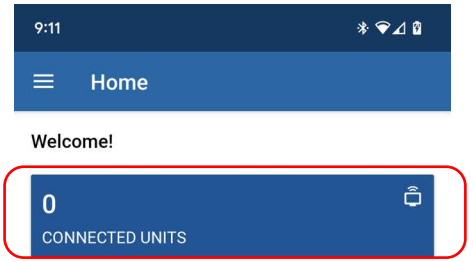
On your PXM unit, the status of the Bluetooth communication is indicated with an icon in the title bar. The table below shows the possibilities.

Icon	Meaning
Not visible	The Bluetooth communication is disabled.
	The Bluetooth communication is enabled, but no connection has been established yet between the unit and a smart device.
	A connection has been established between the unit and a smart device.

If a connection has been established with a smart device already, but you wish to use your unit with another smart device, you can close the current connection directly from your unit. Similarly, if a connection exists already, but you wish to connect a smart device to another PXM unit, you can close the connection from the smart device.

To establish a connection via the Bluetooth technology:

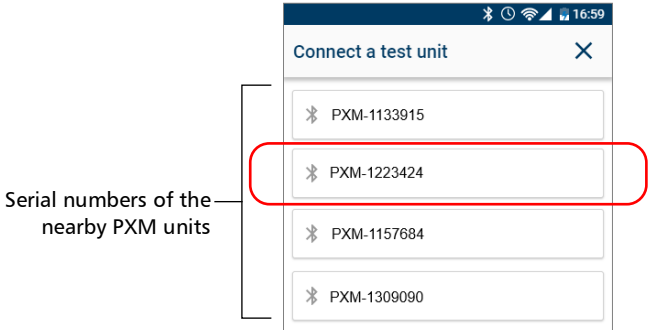
1. If necessary, enable the Bluetooth communication on your unit see *Enabling or Disabling the Wireless Communication* on page 113).
2. If it is not already done, install the EXFO Exchange application on your smart device (see *Installing the EXFO Exchange Application on Your Smart Device* on page 105).
3. On the smart device, establish the connection as follows.
   - **3a.** Open the EXFO Exchange application.
   - **3b.** If the application prompts you to sign in to a EXFO Exchange mobile application account, tap **Continue without an ID**, since you do not need to connect to a EXFO Exchange mobile application account to establish the connection between your unit and a smart device.
   - **3c.** Select a Workspace to work in.
   - **3d.** From the **Home** page, tap **CONNECTED UNITS**.



3e. From the **Test units** screen, tap the **CONNECT A TEST UNIT** button.



3f. From the list of nearby PXM units, tap the item corresponding to the desired unit you wish to connect to.



4. On your PXM unit, when you are prompted, tap **ACCEPT** to authorize the pairing with the smart phone.

   The application establishes the communication automatically.

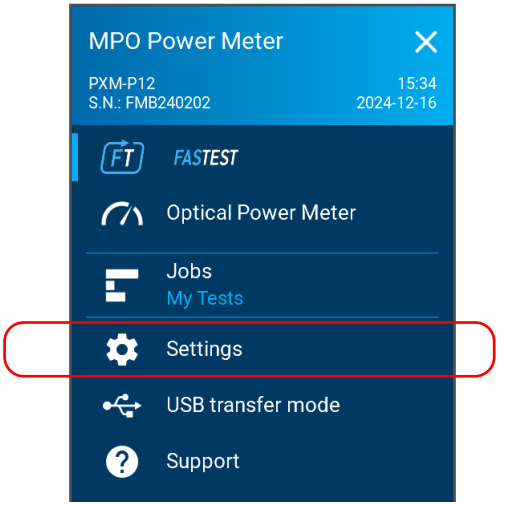
Note: *When the connection is successful, the*  *icon remains displayed in the title bar of your PXM unit. The unit (identified with its serial number) is added to the list of test units in the EXFO Exchange application.*

Note: *If the PXM unit that you want to use is already connected to another smart device, you must first close the connection between the PXM unit and the other smart device before being able to see it on the list of the nearby PXM units.*

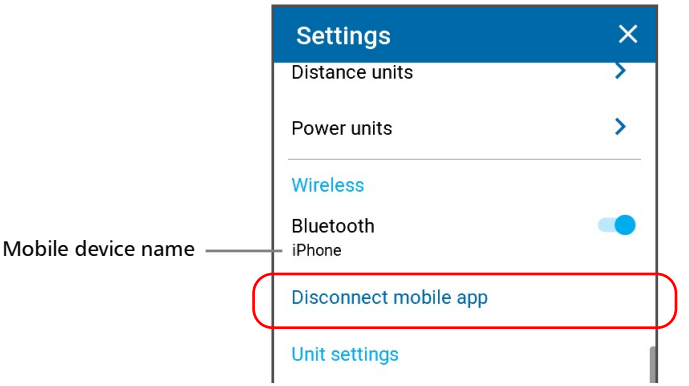
Note: *The PXM automatically synchronizes the date and time each time it connects to the smart device via Bluetooth.*

To close the connection with a smart device from your unit:

1. From the main menu, tap **Settings.**



2. From the **Wireless** section, tap **Disconnect mobile app**.

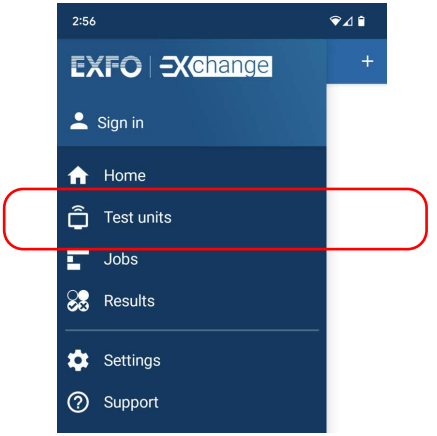


3. When the application prompts you, confirm the disconnection by tapping **YES**.

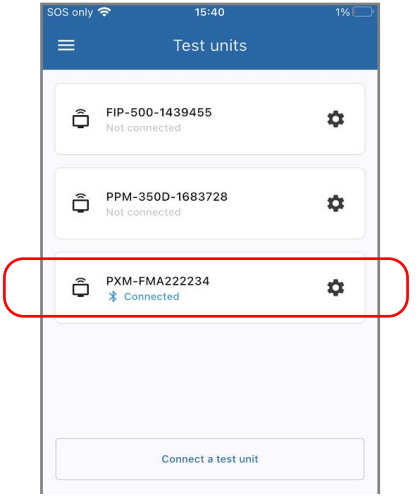
Note: *A new pairing will be required the next time you want to work with the disconnected smart device.*

To close the connection with a PXM from a smart device:

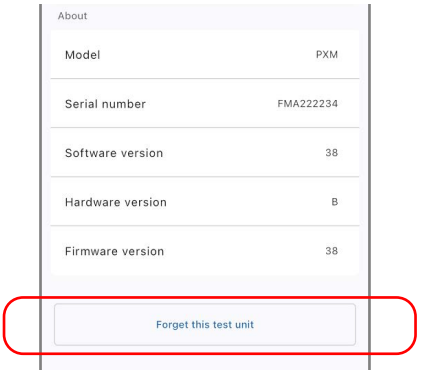
1. On the smart device, open the EXFO Exchange mobile application and access its main menu (menu).
2. From the main menu, tap **Test units**.



3. From the **Test units** screen, tap the line corresponding to your PXM unit.



4. On the resulting Test unit page, tap **Forget this test unit**.



The smart device is no longer connected to the PXM and you are ready to connect it to another unit.

Enabling or Disabling the Wireless Communication

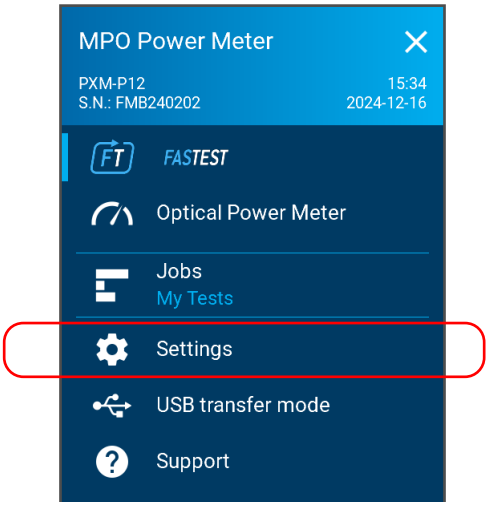
The interactions between your unit and a smart device are accomplished using the Bluetooth technology.

The interactions between your unit and the cloud server are accomplished using a connection to a wireless network.

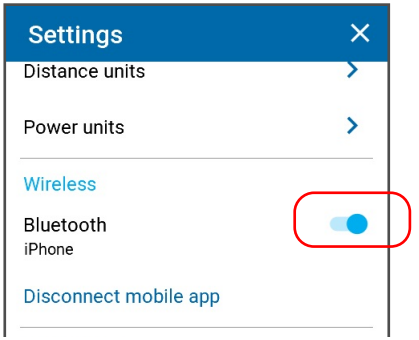
By default, the Bluetooth communication is enabled on your unit. You can enable or disable the Bluetooth communication from your unit only.

To enable or disable the wireless communication on your unit:

1. From the main menu, tap **Settings.**



2. Scroll down to the **Wireless** section and use the **Bluetooth** toggle to enable or disable the communication as needed.



The changes are taken into account immediately. You will see the icon in the title bar of your PXM unit when you enable Bluetooth. You will see the icon in the title bar when your unit is connected to a smart device via a Bluetooth connection.

Transferring a Cloud-Based Job to the PXM

Once you have created a cloud-based job or someone from your organization has created one and has assigned it to you, you have to synchronize the job with your PXM to be able to perform the associated tests. The transfer is done via Bluetooth.

When the EXFO Exchange mobile application retrieves a job, it is added to the list of available jobs and you must go select it as the active job if you want to work on it. If a job was already underway, the test results are kept in memory and you will be able to synchronize them with the EXFO Exchange mobile application later when it becomes the active job again. When the active job changes, the tests that have not been performed yet on the previous job will be available the next time you switch back to this job.

Note: *No results are erased from your PXM when you switch between jobs.*

Note: *You can only synchronize one job at a time.*

To transfer a cloud-based job to the PXM:

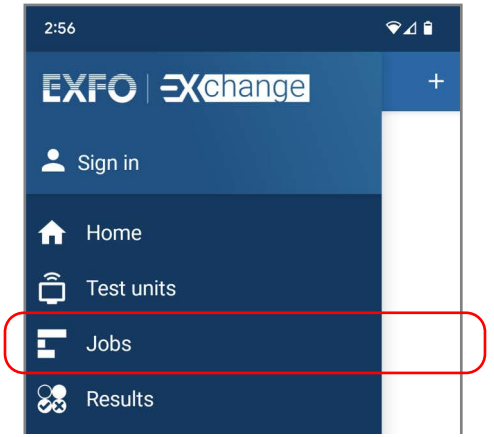
1. Before being able to retrieve a job from the cloud to transfer it to your PXM, ensure that you meet the following requirements:

   - you have a EXFO Exchange mobile application account or you have received an invitation from your organization to activate your account.
   - you have installed the EXFO Exchange mobile application on your smart device and logged on to your EXFO Exchange mobile application account (see *Installing the EXFO Exchange Application on Your Smart Device* on page 105).
   - you have created a job (directly from the EXFO Exchange mobile application or someone from your organization has created one on the cloud server and has assigned it to you).

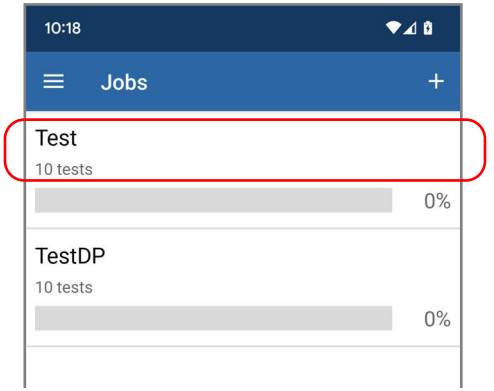
Note: *If you have created a job from the cloud server, transfer it to the EXFO Exchange mobile application.*

   - you have established a connection, via Bluetooth, between your smart device and the PXM (see *Establishing or Closing a Connection With a Smart Device Via the Bluetooth Technology* on page 106).

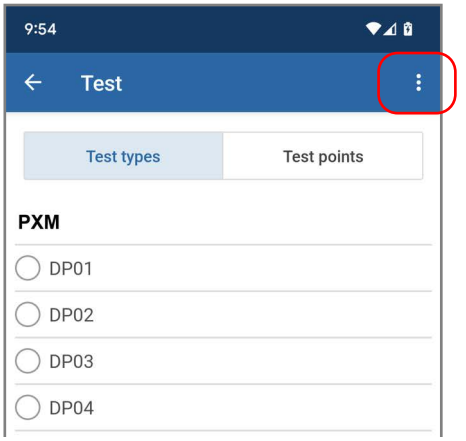
2. From the main menu in the EXFO Exchange mobile application, tap **Jobs**.



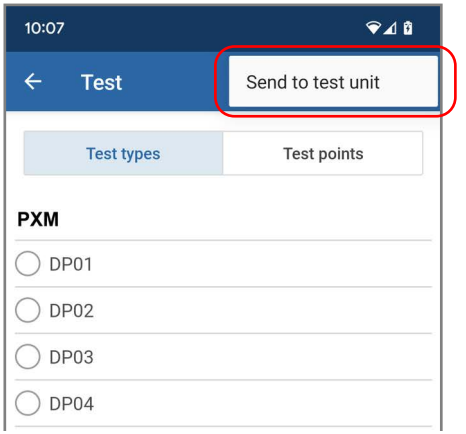
3. From the Jobs page, tap the job that you wish to transfer to the PXM.



4. Once you are in a job, tap the three-dot menu.

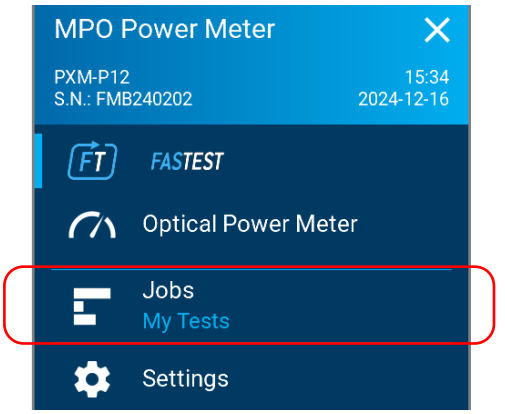


5. When the unit prompts you, tap **Send to test unit**.

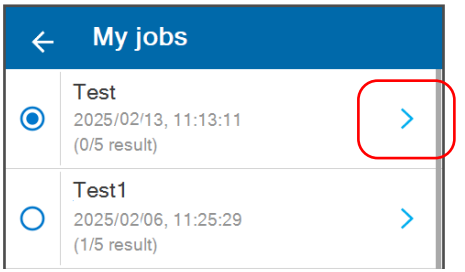


Note: *If you are not already connected to a PXM unit, the application will prompt you to select the unit you want to use.*

6. In the PXM, from the main menu, tap the name of the job you have just transferred.



7. Tap the blue arrow to access the list of test points.



8. Tap the test point you want to perform.

   You are now ready to perform the tests in a job.

Synchronizing Job Results With the Smart Device and the Cloud Server

The EXFO Exchange mobile application manages the measurements associated with jobs automatically for you.

The synchronization process begins as soon as a Bluetooth connection is established between your unit and the smart device. Test results are sent to the mobile application to allow report creation without filling the smart device's memory.

11 Maintenance

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dirt and dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.



WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.

Cleaning Connectors

Your unit is equipped with an MPO-12 fixed port or a Click-Out adapter port (P12 units) that can be cleaned using a mechanical cleaner.

Regularly cleaning the inside of the testing unit and the Click-Out adapters will help maintain your unit's long-term efficiency.

Note: *EXFO strongly recommends that both test unit and test cord connectors be cleaned.*

Note: *If you do not receive a warning message after taking a reference* , *you do not need to follow the cleaning procedure below.*

WARNING

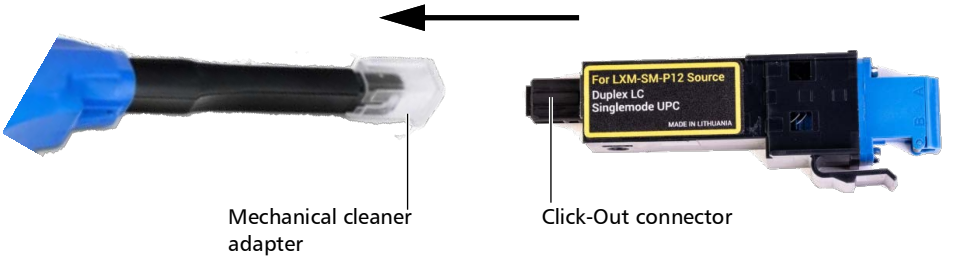
Verifying the surface of a connector with a fiber-optic microscope WHILE THE UNIT IS ACTIVE WILL result in permanent eye damage.

To clean connectors using a mechanical cleaner:

1. Insert the mechanical cleaner's cleaning tip into the optical port, then push the outer shell down at least once to activate the cleaner.
2. Remove the mechanical cleaner from the optical port.
3. Take a new reference. For more information, see *Taking References* on page 71. If a warning message appears after taking a reference and you are using a P12 unit, go to step 4. If no warning message appears, the unit is ready to use.
4. Remove the Click-Out adapter.
5. To clean the Click-Out connector, follow these steps:

   5a. Align the mechanical cleaner adapter with the tip of the cleaner and firmly insert it until it clicks into place.

   5b. Align the mechanical cleaner's tip with the Click-Out connector.



   5c. Gently insert the Click-Out connector into the mechanical cleaner's tip.

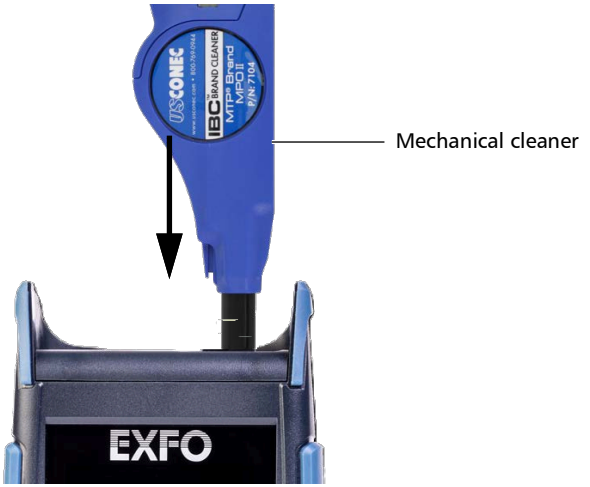
   5d. Activate the mechanical cleaner at least twice to ensure proper cleaning.

5e. Remove the Click-Out connector from the mechanical cleaner.

6. To clean the optical connector inside the unit:

6a. If you have not already done so, remove the mechanical cleaner's adapter.

6b. Insert the mechanical cleaner as shown in the following image for a PXM or an LXM.



6c. Activate the mechanical cleaner at least twice to ensure proper cleaning of the optical connector inside the unit.

Note: *The mechanical cleaner may not go through a full click cycle. This is normal as the unit's connector housing may prevent the full insertion of the mechanical cleaner.*

6d. Remove the mechanical from the unit.

7. Insert the Click-Out adapter and take a new reference. For more information, see *Taking References* on page 71. If a warning message appears after taking a reference, go to step 8. If no warning message appears, the unit is ready to use.

8. If warning messages persist after, try the following options:

8a. Insert a different Click-Out adapter and repeat the cleaning procedure from step 5. If no error message appears, replace the faulty adapter.

8b. If warning messages persist, contact EXFO technical support. For more information, see *Contacting the Technical Support Group* on page 149.

Inspecting Connectors

The EXFO PXM/LXM fiber inspection scope allows you to examine MPO and duplex connectors. For recommended inspection tips, see the PXM/LXM User Guide or visit the EXFO website.

Stickers with color-coded information are placed on the fascia of the P12 units of the PXM/LXM and on the compatible Click-Out adapters:

- Yellow = Singlemode source
- Aqua = Multimode source
- Gray = Power meter

IMPORTANT

When inserting a Click-Out adapter into a PXM-P12 or an LXM-P12, ensure that its sticker color matches the sticker color on the fascia of your unit. A color mismatch will result in incorrect test results.



Cleaning the Touchscreen

Clean the touchscreen with a soft, non-abrasive cloth, such as one used for cleaning reading glasses, dampened with water.

CAUTION

Using anything else than water can damage the special coating of the touchscreen.

Recharging the Battery

Your unit uses one lithium-ion (Li-ion) battery.

- The charge status is shown in the upper right corner of the title bar. A red icon indicates that the battery level is running low and that you should connect the unit to a power outlet. For more information, see *Battery Status Icon Description* on page 6.
- The unit also indicates the charge status with the LED on its front panel (see *LED Indicator Description* on page 5).



CAUTION

Only charge the battery with the USB power adapter provided by EXFO with your unit.



IMPORTANT

- **The battery is not charged at the factory. You must fully charge it before using the unit for the first time. The battery is fully charged after a few hours or when the battery LED indicator is steady blue.**
- **The time required to charge the battery depends on various factors such as the type of tests currently performed and the ambient temperature.**
- **To ensure that the battery functions properly, keep it in temperatures between –10 °C and 45 °C (14 °F and 113 °F). Store it between 10 °C to 35 °C (50 °F to 95 °F).**
  When the ambient temperature is below 0 °C (32 °F) or when it reaches or exceeds about 40 °C (104°F), the battery can either charge more slowly than usual, or not charge at all, depending on the internal temperature of your unit.
- **Do not leave a battery discharged for several days.**
- **After 300 cycles (approximately 18 months of use), you may want to replace the battery with a new one to maintain optimal operation conditions. Otherwise, the operating time might be reduced.**



IMPORTANT

- **If you need to store the unit (or a battery) for an extended period of time, ensure that the battery is charged at around 50 % of its capacity, and then turn the unit off (shutdown).**
- **Place the unit (or the battery) in a cool dry place, and ensure that the battery is charged at around 50 % of its capacity. Every three months during the storage period, verify the battery level. Recharge the battery when necessary, so that its charge level remains around 50 % of the total capacity. This will ensure that you get the optimum performance out of the battery.**

To recharge the battery:

Connect the unit to a power outlet using the USB power adapter (way to charge the battery).

Note: *The standard USB ports of a computer cannot power your unit or charge its battery while the unit is on. If you connect your unit to such a USB port with the USB cable, the unit will still consume battery power. If the unit is off when you connect it to the USB port of a computer, its battery could charge, but slowly.*

Note: *If you have a vehicle equipped with dedicated USB charging ports, you could connect your unit to one of these ports to charge the battery. The actual results will vary with each vehicle.*

The charge cycle will start and end automatically.

Replacing the Battery

Your unit can be powered either by battery or from an appropriate power outlet when used with the provided USB power adapter.



WARNING

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.



WARNING

Do not throw batteries into fire or water and do not short-circuit their electrical contacts. Do not disassemble.



IMPORTANT

Recycle or dispose of used batteries properly, in accordance with local regulations. Do not dispose of them in ordinary garbage receptacles. For more information, see the section about recycling and disposal in this user documentation.



WARNING

Your unit uses a lithium-ion (Li-ion) battery with built-in protection that has been especially designed for EXFO. For this reason, you can only replace it with batteries of the same type and model. You can purchase new batteries from EXFO.

For more information on the available power sources for your unit, as well as their characteristics, refer to the *Technical Specifications* of your product.



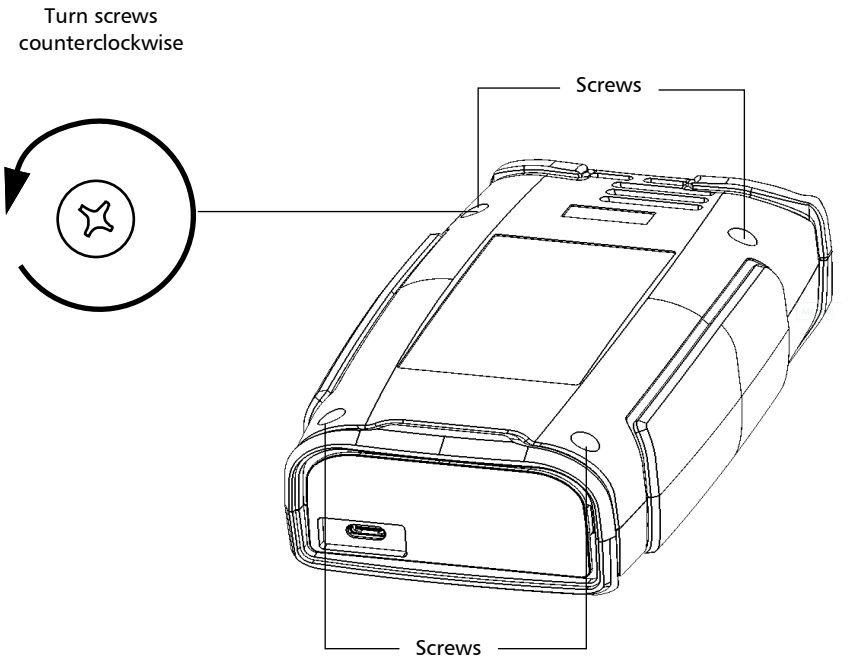
CAUTION

Electrostatic discharge (ESD) damage can cause complete or intermittent equipment failures.

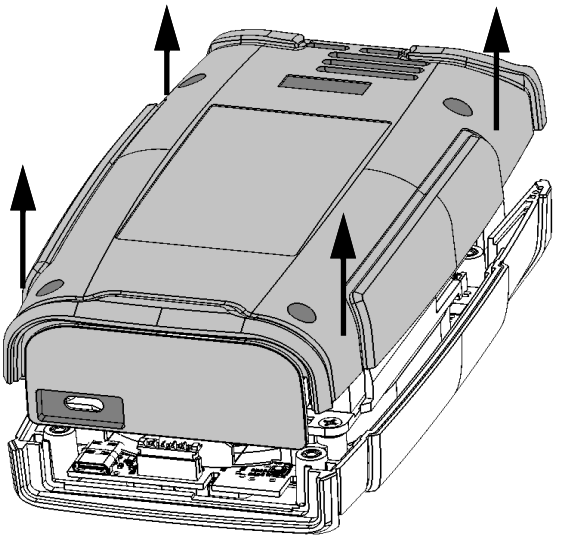
- **Always use an ESD-preventive wrist or ankle strap when replacing the battery. Ensure that the antistatic strap makes good skin contact and that the end of its wire is grounded properly.**
- **Never touch any component inside the unit other than those identified in the procedure hereafter, either with tools or your fingers.**

To replace the battery:

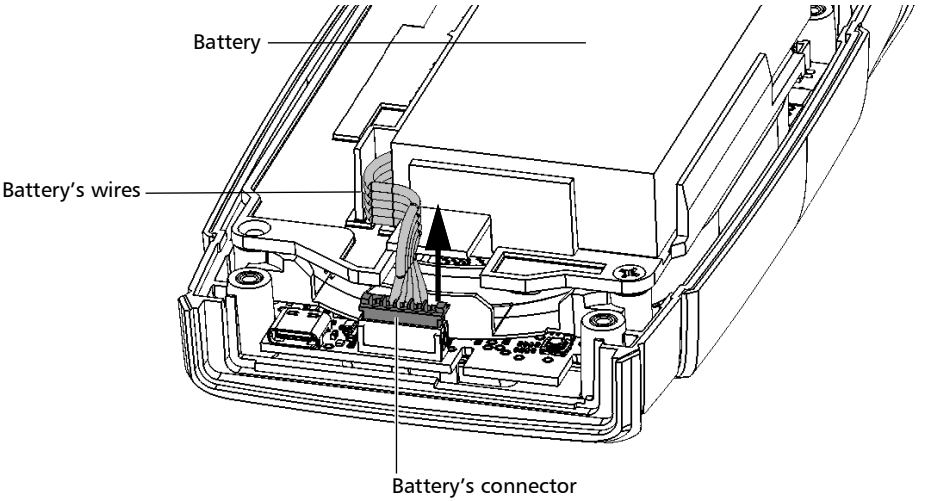
1. Turn off the unit (shutdown) and disconnect the fiber and USB cable (if applicable).
2. Position the unit so that its front panel rests on a flat surface such as a table.
3. On the back of the unit, using a Phillips screwdriver, turn the screws (4) counterclockwise until they are loose, and remove them.



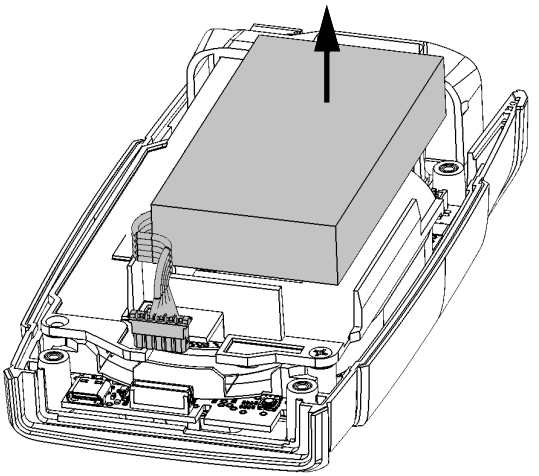
4. Hold the back panel by its sides and pull it up to remove it.



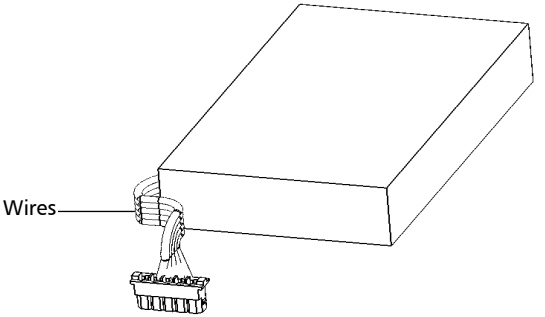
5. Gently pull on the battery's connector to disconnect it from its socket.



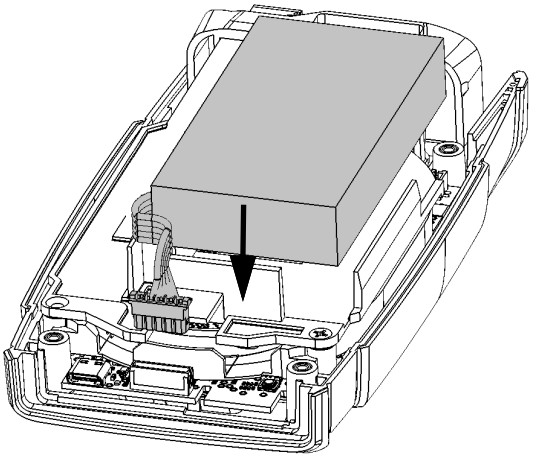
6. Pull the battery up to remove it.



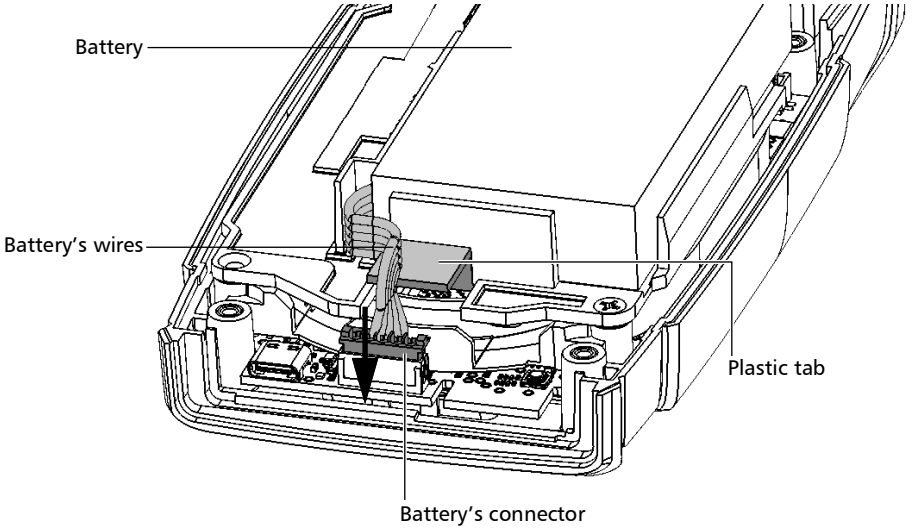
7. Place the new battery so that its wires are located on the left side, toward the front.



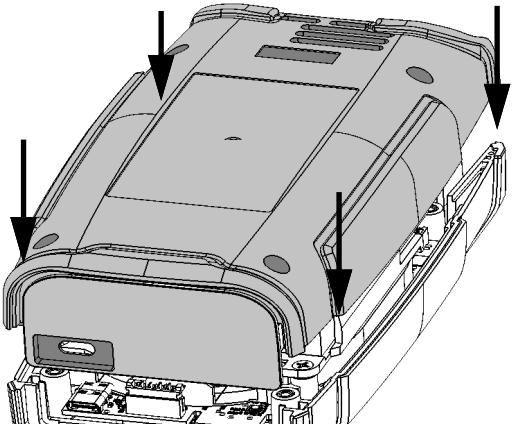
8. Push the new battery toward the bottom of the case until it stops.



9. Ensure that the battery's wires are *above* the plastic tab (not under), and then connect the battery's connector to the corresponding socket.



10. Place the back panel on the unit, making sure that it is aligned properly with the front of the unit. The sides of the back panel should be flush with those of the front. There should be no gap between the back panel and the front of the unit. If necessary, slightly move the back panel until alignment is correct.



11. Using a Phillips screwdriver, turn the screws (4) clockwise until they are tightened.

This will secure the back panel into place.

IMPORTANT

To allow the unit to take into account the new battery, reset the battery information as explained hereafter.

IMPORTANT

- **If the unit's LED turns to red when you turn on the unit, simply connect the unit to a power outlet and let the new battery charge for a few minutes.**
- **It could take a few charge/discharge cycles before the unit's LED indicator and the on-screen battery status icon reflect the actual power level of the new battery.**

Recalibrating the Unit

EXFO manufacturing and service center calibrations are based on the ISO/IEC 17025 standard (*General Requirements for the Competence of Testing and Calibration Laboratories*). This standard states that calibration documents must not contain a calibration interval and that the user is responsible for determining the re-calibration date according to the actual use of the instrument.

The validity of specifications depends on operating conditions. For example, the calibration validity period can be longer or shorter depending on the intensity of use, environmental conditions and unit maintenance, as well as the specific requirements for your application. All of these elements must be taken into consideration when determining the appropriate calibration validity period of this particular EXFO unit.

Until you collect the required empirical data to support your own calibration interval strategy, EXFO recommends that the next calibration (due) date of an instrument be established according to the following equation:

Next calibration date = Date of first usage + Recommended calibration period (three years)

Note: *You can use the date of first usage only if the product was stored in proper conditions (23 °C ± 5 °C (73,4 °F ± 9 °F)). If it is not the case or if you do not know the date of first usage, you can use the date at which you received the product, as long as the product was sourced from an official EXFO distribution channel.*

Restriction:

Next calibration date ≤ calibration date on certificate + recommended calibration period (three years)+ maximum storage period (twelve months)

Under normal use, the recommended calibration period for your Duplex and Multifiber Optical Loss Test Set is: three years.

For newly delivered units, EXFO has determined that the maximum storage period for this product is up to twelve months.

EXFO guarantees that proper storage at room temperature for up to the maximum storage period between calibration and shipment will not affect the performance of the test and measurement instruments and will not reduce the recommended validity period before requiring a new calibration.

To help you with calibration follow-up, EXFO provides a special calibration label that complies with the ISO/IEC 17025 standard and indicates the unit calibration date and provides space to indicate the due date.

To ensure that test and measurement instruments conform to the published specifications, calibration must be carried out at the relevant EXFO plant, or, depending on the product, at an EXFO service center, or at one of EXFO's certified service centers. All calibrations are performed using standards traceable to national metrology institutes.

The original calibration date is available on the calibration certificate that came with your unit. Since this date is printed on a sticker, if desired, you could affix it to your unit for easier reference. The most recent calibration date is also available from your unit (Main menu > **Settings** > **About** > **Calibration date**).

Updating Your Software

The factory has pre-installed and configured the application on your unit. However, you may have to upgrade it when new versions become available.

IMPORTANT

For a trouble-free upgrade, ensure that you connect your unit to a power outlet and that your unit remains on during all the process.

To get started:

1. Download the latest software version from the EXFO apps web site at https://www.exfo.com/en/exfo-apps/ and have it on the computer you plan to use for the update prior to upgrading your unit.
2. On the EXFO apps web site, select the test unit that you want to update, then download the update package on your computer.

Note: *There is a distinctive software package for the LXM and PXM devices.*

To upgrade the test unit software:

1. On the computer, extract the software update folder by executing the compressed update package or by extracting it with an unzip tool.
2. Connect the test unit via USB to a computer, then activate the USB transfer mode.
3. Using the file explorer, browse to your test unit internal storage and place the Software Update folder in it.
4. Once the software update folder is copied, tap **Disconnect** or disconnect the USB cable from the computer.
   The test unit will restart automatically, beginning the update process.

Note: *The update can take a few minutes to complete. After the update process, the update file is automatically deleted from the test unit internal storage.*

Recycling and Disposal



This symbol on the product means that you should recycle or dispose of your product (including electric and electronic accessories) properly, in accordance with local regulations. Do not dispose of it in ordinary garbage receptacles.

For complete recycling/disposal information, visit the EXFO Web site at www.exfo.com/recycle.

12 Troubleshooting

Solving Common Problems

Problem	Possible Cause	Solution
My unit does not start.	The battery is completely discharged (if the battery level allows it, the unit's LED will remain red for about 10 seconds when you try to turn on the unit).	Connect the unit to an external power source to recharge the battery. If the battery is no longer charging properly, you may need to replace it with a new one (see *Replacing the Battery* on page 129).
	The system has encountered a problem.	Press the on/off button for at least ten seconds to force a hardware reset on the unit.
	Some files essential to the normal operation of the unit have been corrupted.	Press the on/off button for at least ten seconds to force a hardware reset on the unit. If the problem persists, try resetting the PXM/LXM to its factory settings (see *Reverting to Factory Settings(PXM Units)* on page 31).
My unit is not responding.	The system has encountered a problem.	Press the on/off button for at least ten seconds to force a hardware reset on the unit.

Problem	Possible Cause	Solution
The battery is not recharging.	Ambient temperature is too high or too low.	In this case, the unit's LED is blue and blinks slowly. Make sure that the temperature in the location where you recharge the battery is within the specifications.
	The USB power adapter is not connected properly.	Make sure that the USB power adapter is connected to the unit and the AC outlet. In this case, the unit's LED is not blinking at all, but there is a battery icon with a flash symbol displayed on screen. If the USB power adapter is connected properly and the problem persists, it could mean that the USB power adapter is defective. In this case, try replacing the adapter. You can purchase new USB power adapters from EXFO.
I have just replaced the battery and the unit's LED turns to red when I turn on the unit.	The unit may take a little time to detect the level of a new battery.	Connect the unit to a power outlet with the provided USB power adapter and let the battery charge for a few minutes. After a short while, the unit should turn on. However, it could take a few charge/discharge cycles before the unit's LED indicator and the on-screen battery status icon reflect the actual power level of the new battery.

Problem	Possible Cause	Solution
When setting a new reference, the measured power level is lower than expected.	The test cord connectors and/or test unit ports are dirty.	Inspect and clean the test cord connectors and/or the test unit ports. Replace the test cords if they show signs of wear or damage.
	The Click-Out connector adapter and/or the internal connector of the test unit are dirty.	Clean the Click-Out connector adapter and the internal connector of the test unit. Use the appropriate mechanical cleaner for the internal cleaner. For more information, see *Cleaning Connectors* on page 121. Replace the Click-Out adapter if it shows signs of wear or damage.
I have cleaned the test cord connectors, unit ports, duplex Click-Out connector adapter and the internal connector of the test unit and when setting a new reference, the measured power is still lower than expected.	An underlying problem, other than the cleanliness of the connectors and Click-Out adapter, is preventing an expected power level.	An inspection with EXFO's FIP-500. For more information, see *Inspecting Duplex Click-Out Connectors* on page 144.

Inspecting Connectors

You can use the EXFO FIP-500 fiber to inspect connectors. For more information, refer to the FIP-500 user guide available from the EXFO website. Use the following FIP-500 tips:

Inspecting MPO Connectors

- For Singlemode LXM (LXM-SM1) connector inspection:

  STIP-MPO-A = MPO/APC SmarTip

  OR

  STIP-MPO-A-KL = Keyless MPO/APC SmarTip (used straight/keyup)

- For Multimode LXM (LXM-MM1) connector inspection:

  STIP-MPO-U = MPO/UPC SmarTip

- For PXM connector inspection:

  STIP-MPO-A-KL = Keyless MPO/APC SmarTip (used inverted/keydown)

Inspecting Duplex Click-Out Connectors

With the appropriate inspection tip on the FIP-500, you can inspect duplex Click-Out adapter connectors. For more information on inspection tips, visit the EXFO website. Follow the procedure below to configure the FIP-500 for duplex Click-Out adapter connector inspections.

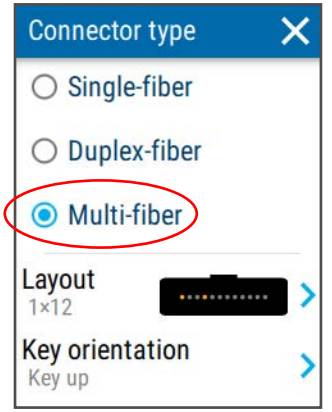


To inspect duplex Click-Out connectors using the FIP-500:

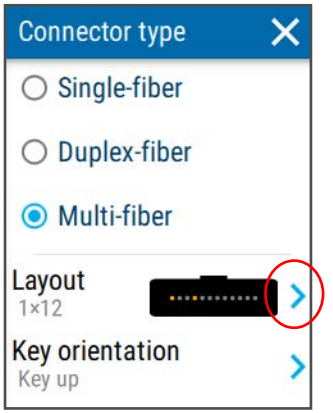
1. From the FIP-500 main menu, tap the lower left-hand side of the screen.



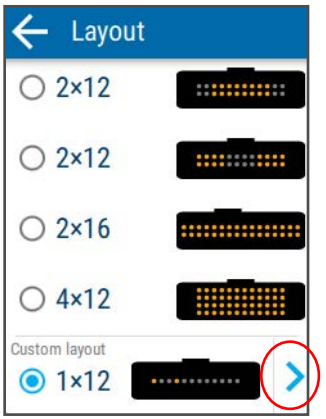
2. From the connector type screen, tap **Multi-fiber**.



3. From the connector type screen, tap the arrow in the **Layout** sub-menu.



4. Scroll down to the bottom of the screen. Tap the arrow under **Custom layout (1 x 12)**.



5. For inspecting the internal MPO connector of a duplex Click-Out adapter, tap the corresponding fiber numbers in a 1-row, 12-fiber column layout:

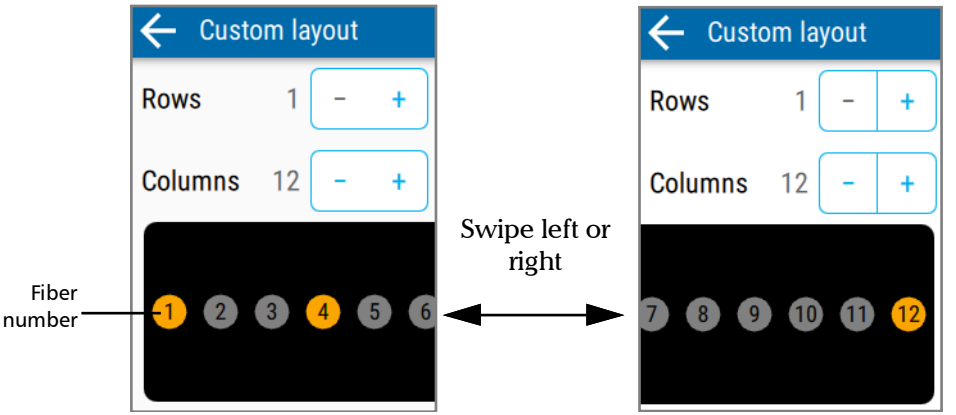
   LXM-SM1: Fibers #4 and #12

   PXM: Fibers #4 and #12

   LXM-MM1: Fibers #1 and #4

Note: *Selected fiber numbers turn orange, while non-selected fibers remain grayed out.*

Note: *Swipe left or right on the bottom part of the screen to access all fiber numbers.*



You can now inspect your duplex Click-Out connectors.

Accessing User Documentation

You can access the user guide at all times using your smart device by scanning the QR code displayed on your unit.

To access the user guide with the QR code:

1. From the main menu, tap **Support** to open the page.
2. Scan the QR code with your smart device.



Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

Technical Support Group
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

For detailed information about technical support, and for a list of other worldwide locations, visit the EXFO Web site at www.exfo.com.

If you have comments or suggestions about this user documentation, you can send them to customer.feedback.manual@exfo.com.

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

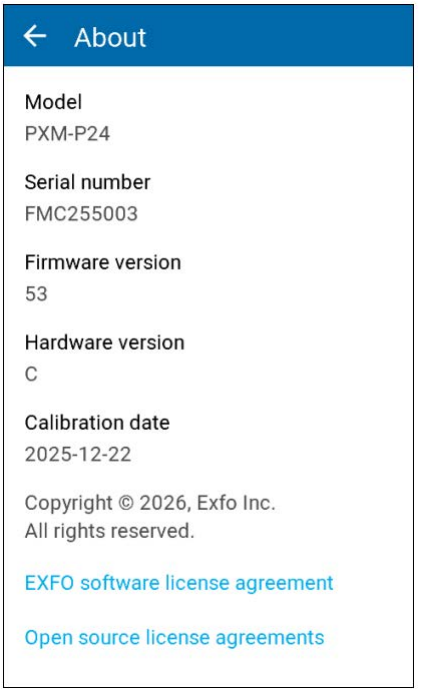
Viewing System Information

You can easily access important information such as the model of your unit, the serial number, the software and hardware versions, as well as the latest hardware calibration, directly from your unit. You can also find the contact information if you ever need to reach EXFO.

To view the system information:

From the main menu, tap **Settings**, and then **About**.

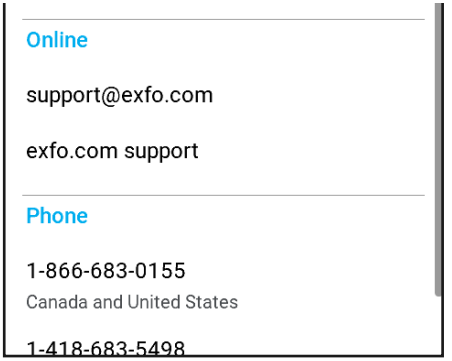
The information you want to view is displayed on screen.



To retrieve the contact information:

From the main menu, tap **Support**.

The information you want to view is displayed on screen.



Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

13 Warranty

General Information

EXFO Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.



IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Gray Market and Gray Market Products

Gray market is a market where products are traded through distribution channels that are legal but remain unofficial, unauthorized, or unintended by the original manufacturer. Intermediaries using such channels to distribute products are considered to be part of the gray market (hereafter unauthorized intermediary).

EXFO considers that a product originates from the gray market (hereafter gray market product) in the following situations:

- A product is sold by an unauthorized intermediary.
- A product is designed and destined for a particular market and sold on a second market.
- A product is resold, despite being reported lost or stolen.

When products are purchased on the gray market, rather than through an authorized EXFO distribution channel, EXFO is unable to guarantee the source and quality of those products nor the local safety regulations and certifications (CE, UL, etc.).

EXFO will not honor warranty, install, maintain, repair, calibrate, provide technical support nor make any support contracts available for gray market products.

For complete information, refer to EXFO's policy regarding gray market products at www.exfo.com/en/how-to-buy/sales-terms-conditions/gray-market/

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond the control of EXFO.



IMPORTANT

In the case of products equipped with optical connectors, EXFO will charge a fee for replacing connectors that were damaged due to misuse or bad cleaning.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 156). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 156).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

EXFO Europe Service Center
Winchester House, School Lane
Chandlers Ford, Hampshire S053 4DG
ENGLAND

Tel.: +44 2380 246800
Fax: +44 2380 246801
support.europe@exfo.com

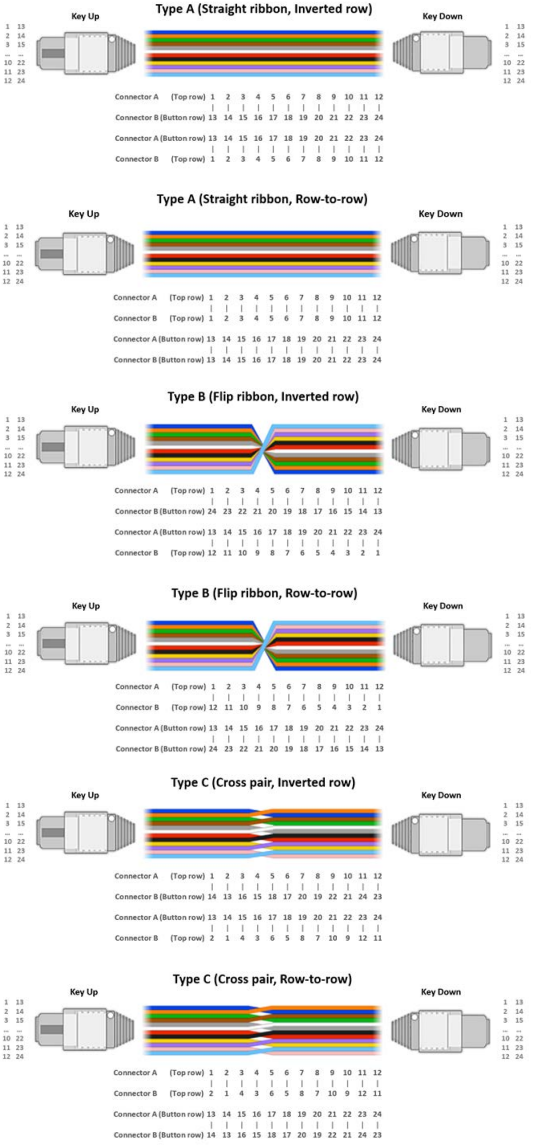
EXFO Telecom Equipment (Shenzhen) Ltd.
3rd Floor, Building C,
FuNing Hi-Tech Industrial Park, No. 71-3,
Xintian Avenue,
Fuhai, Bao'An District,
Shenzhen, China, 518103

Tel: +86 (755) 2955 3100
Fax: +86 (755) 2955 3101
support.asia@exfo.com

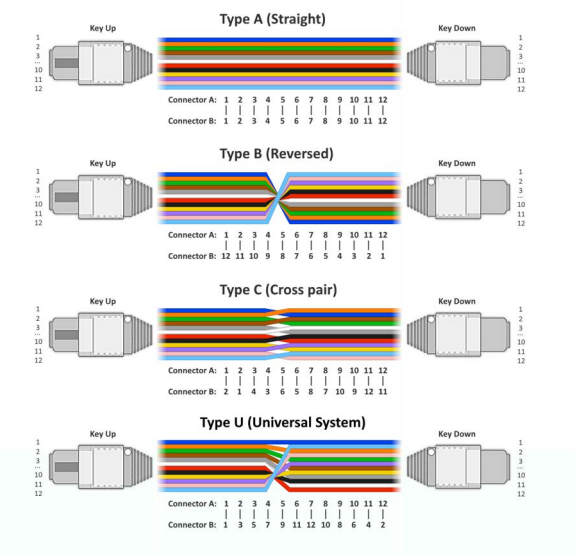
To view EXFO's network of partner-operated Certified Service Centers nearest you, please consult EXFO's corporate website for the complete list of service partners:
https://www.exfo.com/en/services/field-network-testing/exfo-service-centers.

A MPO/Duplex Types and Test Cords

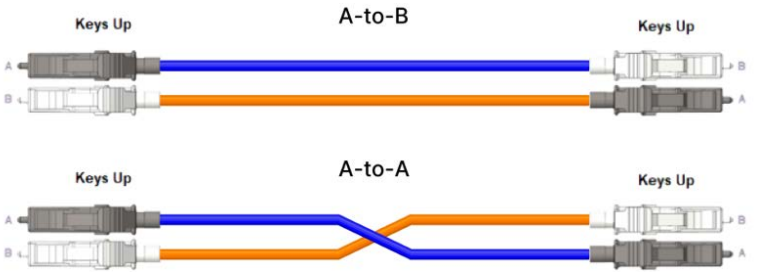
Polarities (Multifiber 24)



Polarities (Multifiber 12)



Polarities (Duplex)



EXFO Test Cords

- Polarities A (Straight) and B (Reversed)
- Reference-grade: Ensures low insertion point and high precision for accurate testing
- 3 m/0.5 m length (test cord/adapter cord)
- Offered in Unpinned/Unpinned and Pinned/Unpinned

Singlemode Test Cords

- 9 mm (OM4)
- MPO APC Type

Multimode Test Cords

- 50 mm (OM4)
- MPO UPC Type
- 0.5 m adapter cord without Mandrel

Adapters

In all configurations, MPO adapters are Key up/Key down, and Keys up/Keys up for duplex adapters. Pinned/Pinned test cords are not offered since the product is pinned.

Adapter cords are as follows:

- Unpinned/Pinned
- Unpinned/Unpinned
- Pinned/Pinned (for 3-cord method)

B MPO-12 and Duplex Test Methods

IMPORTANT

When performing the following test methods for duplex-fiber testing, ensure you are using P12 units with the appropriate duplex connector Click-Out adapters.

One-Cord Test Method

Note: *This section explains the different referencing methods for PXM and LXM units with fixed MPO connectors. P12 units allow connector adaptation with Click-Out adapters, enabling the recommended one-cord test method in all cases.*

The one-cord is the recommended test method. This method tends to include the attenuation of both first and last connectors in the link loss budget. It is called one-cord method because only one test cord is used for the referencing. A receive cord is also needed to undertake the measurement.

This is the most commonly used method in the industry, as it will yield the most accurate testing results since there is only one connection during the referencing step (uncertainty coming from the connection mating is minimal). The one-cord method allows for testing of the fiber optic link from end-to-end including losses from all connections. Since connectors are the major contributor to the overall loss, and not the fiber itself, including connector losses becomes very important as the link gets shorter.

Fiber under test compatibility:

- Pinned/Pinned
- Pinned/Unpinned

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

Pinned/Pinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

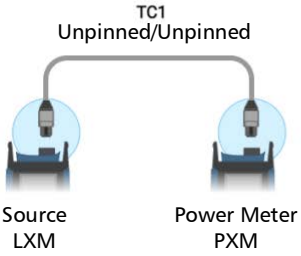


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Unpinned/Unpinned

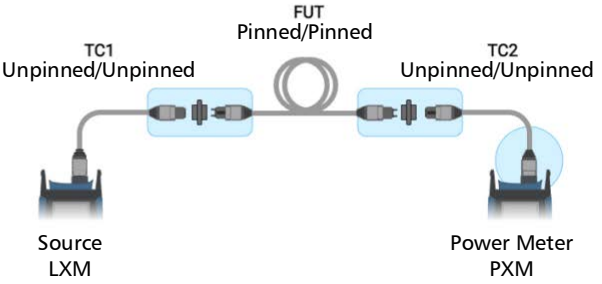
1 Reference

Connect TC1 from the source to the power meter.
Activate source in FasTesT mode.



2 Test method

Disconnect TC1 from the power meter.
Connect TC2 to the power meter.
Insert FUT between TC1 and TC2.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

TC1 must remain connected to the source port, otherwise a new reference will be required.

Pinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

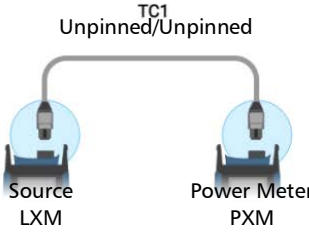


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Pinned/Unpinned

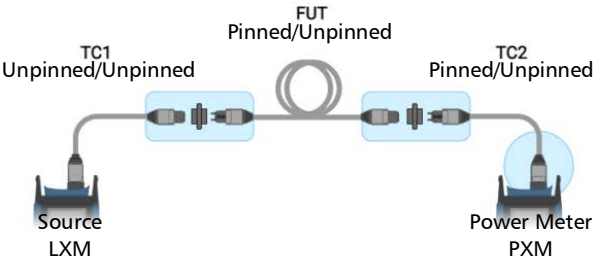
1. Reference

   Connect TC1 from the source to the power meter.
   Activate source in FasTesT mode.



2. Test method

   Disconnect TC1 from the power meter.
   Connect TC2 to the power meter.
   Insert FUT between TC1 and TC2.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

TC1 must remain connected to the source port, otherwise a new reference will be required.

When TC1 and TC2 ends are different (Unpinned and Pinned), they can be connected together for a verification step. EXFO recommends this step to improve the measurement accuracy by validation the connectors quality.

Two-Cord Test Method

This method tends to include only the attenuation of the first or last connector in the link loss budget. It is called two-cord method because launch and receive test cords are used for the referencing.

This method will yield less accurate test results than the recommended one-cord reference method, since it includes a connection mating in the reference.

Fiber under test compatibility:

- ✗ Pinned/Pinned
- ✓ Pinned/Unpinned
- ✗ Unpinned/Unpinned

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

Pinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

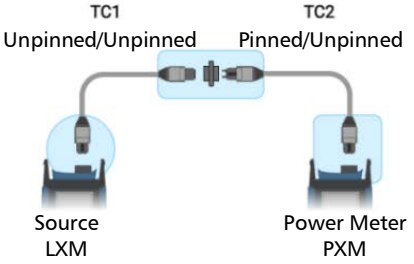


Test cords required:

- ➤ TC1 Launch Cord - Unpinned/Unpinned
- ➤ TC2 Receive Cord - Pinned/Unpinned

1 Reference

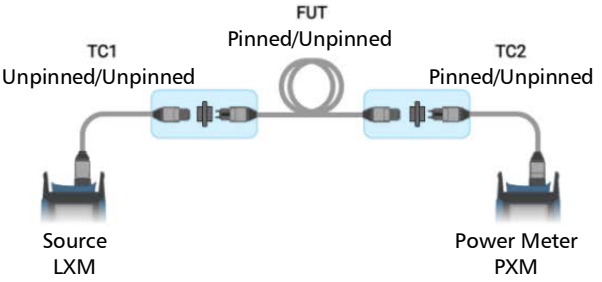
Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Insert FUT between TC1 and TC2.



TC1 must remain connected to the source port, otherwise a new reference will be required.

The attenuation of both test cords and the connection losses are included in the reference.

Impact of including connector mating in the reference:

1. May yield optimistic loss values if the loss exhibited by the TC1 and TC2 connection is relatively high.
2. May yield negative loss readings if connection was dirty (higher loss) during the referencing and cleaned afterwards.
3. There is no guarantee that the connection included in the reference will exhibit a similar loss when connected to the link under test.

Three-Cord Test Method

This method tends to exclude the attenuation of both first and last connectors from the link loss budget. Three test cords are used: launch, substitution, and receive. The loss of connections between test cords is critical for the uncertainty of the measurement.

Fiber under test compatibility:

- Pinned/Pinned
- Pinned/Unpinned
- Unpinned/Unpinned

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

Pinned/Pinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

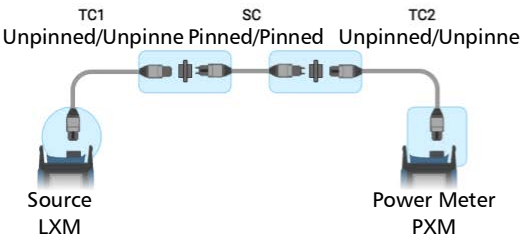


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Unpinned/Unpinned
- SC Substitution Cord - Pinned/Pinned

1. Reference

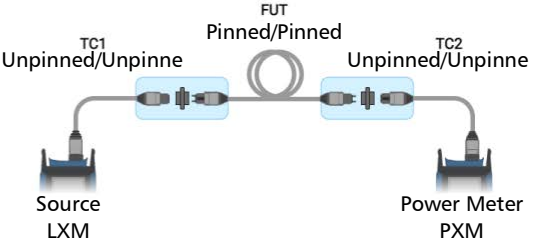
   Connect TC1 to the source and TC2 to the power meter. Insert SC between test cords, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2. Test method

   Replace the SC with the FUT.



TC1 must remain connected to the source and TC2 connected to the power meter, otherwise a new reference will be required.

Pinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

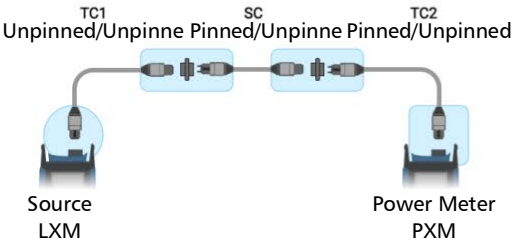


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Pinned/Unpinned
- SC Substitution Cord - Pinned/Unpinned

1. Reference

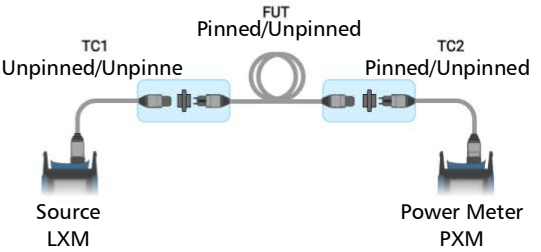
   Connect TC1 to the source and TC2 to the power meter. Insert SC between test cords, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2. Test method

   Replace the SC with the FUT.



TC1 must remain connected to the source and TC2 connected to the power meter, otherwise a new reference will be required.

Unpinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

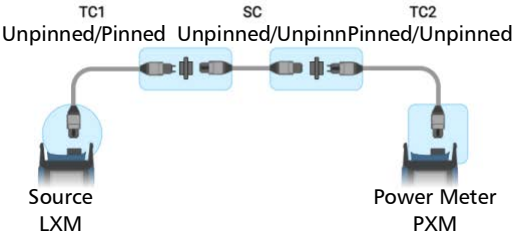


Test cords required:

- TC1 Launch Cord - Unpinned/Pinned
- TC2 Receive Cord - Pinned/Unpinned
- SC Substitution Cord - Unpinned/Unpinned

1. Reference

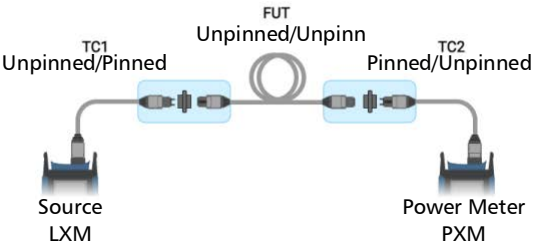
   Connect TC1 to the source and TC2 to the power meter. Insert SC between test cords, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2. Test method

   Replace the SC with the FUT.



TC1 must remain connected to the source and TC2 connected to the power meter, otherwise a new reference will be required.

Adapter-Cord Test Method

When the MPO test cable connector gender is not compatible with the test unit's connector gender, a one-cord reference method cannot be applied. This is because the reference test cord cannot be connected to the test unit. In this case, an alternative adapter-cord method is recommended.

The adapter-cord method tends to include the attenuation of both first and last connectors in the link loss budget. It is called adapter-cord because after the referencing step, an adapter cord is added during the FUT measurement.

Fiber under test compatibility:

Pinned/Pinned

Pinned/Unpinned

Unpinned/Unpinned

Although pinned/pinned and pinned/unpinned are compatible with the adapter-cord, the one-cord method is recommended for these FUT types.

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

Unpinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

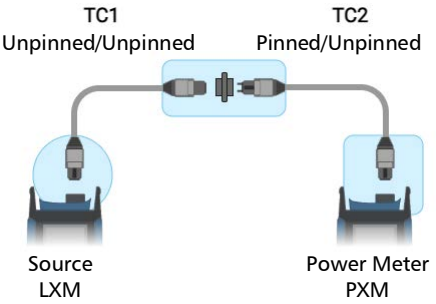


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Pinned/Unpinned
- AC Adapter Cord - Pinned/Pinned

1 Reference

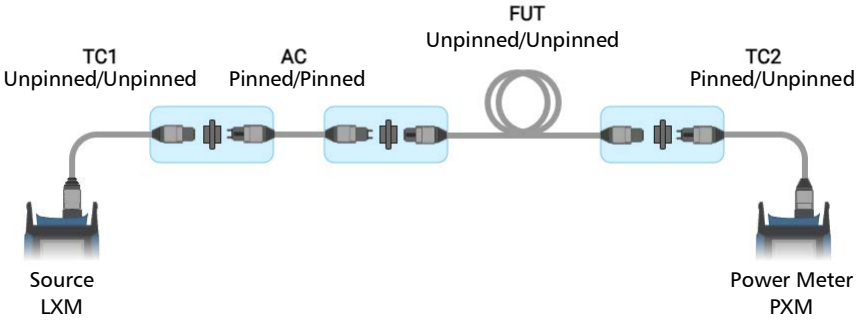
Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Equipment-Cord Test Method

This method tends to include in the link loss budget, the attenuation of the fiber under test, the attenuation of equipment cord connections to the fiber under test, and the fiber attenuation of one equipment cord. The attenuation of the first equipment cord EC1 is not included. Equipment cord method is adapted for the link with a presence of permanent patch cords on both ends of the FUT.

According to standard, the equipment cord method is only suitable if both equipment cords are present during testing. They should remain in place and apply to the cabling that is pinned to pinned; and have equipment cords terminated with MPO plugs on both ends, unpinned to unpinned. The attenuation of the optical fiber in the equipment cords is negligible if the equipment cords are short.

Fiber under test compatibility:

- ✗ Unpinned/Unpinned
- ✓ Pinned/Pinned
- ✗ Pinned/Unpinned

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

Pinned/Pinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

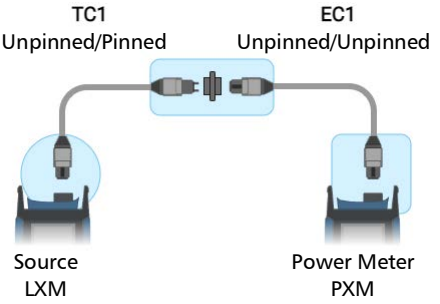


Test cords required:

- ➤ TC1 Launch Cord - Unpinned/Pinned
- ➤ EC1 Equipment Cord 1 - Unpinned/Unpinned
- ➤ EC2 Equipment Cord 2 - Unpinned/Unpinned

1 Reference

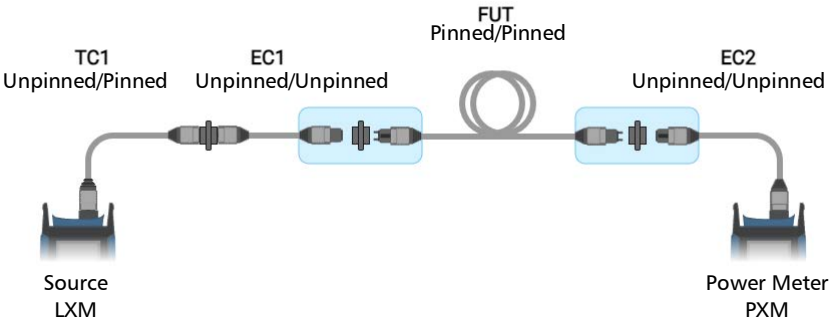
Connect TC1 to the source and EC1 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect EC1 from the power meter. Connect EC2 to the power meter.
Insert FUT between EC1 and EC2.



TC1 must remain connected to the source port and EC1 connected to TC1, otherwise a new reference will be required.

C MPO-24 Adapter-Cord Testing Method

Note: *To be used with P12 models.*

When testing MPO-24 cable, the adapter-cord method is advised. The recommended one-cord method is not possible because test cords cannot be connected directly to the test unit.

The adapter-cord method tends to include the attenuation of both first and last connectors in the link loss budget. It is called adapter-cord because after the initial reference is made, an adapter cord is added during the cabling measurement.

Two-Pass FasTesT Testing Sequence

In order to avoid a new referencing for each MPO-24 under test, it is strongly recommended to make a two-pass test sequence. To perform MPO-24 tests, two Y cables (two MPO-12 to one MPO-24) should be used in order to separate two-pass test sequences and take a measurement without disconnecting the referencing test cords. This is due to the fact that after referencing, TC1 and TC2 must remain connected to the source and power meter, otherwise a new reference will be required.

One pair of LXM and PXM is used in this two-pass FasTesT sequence.

First pass:

- The sequences begin with a reference of the first group of 12 fibers.
- Then the first 12 fibers of all FUT (Fiber Under Test) are tested.

Second pass:

- The sequences begin with a reference of the second group of 12 fibers.
- Then the second 12 fibers of all FUT are tested.

Results management occurs via naming in the PXMs and later in the FastReporter computer application. See *Creating a Job* on page 34.

Best practice: Create two Jobs to properly distinguish the first and second pass when testing MPO-24 cables. The incremental value should match the number of cables.

Fiber under test compatibility:

- Pinned/Pinned
- Pinned/Unpinned
- Unpinned/Unpinned

Note: *The adapter-cord method is recommended for all fiber under test genders.*

Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

When mating two MPO-24 connectors with the key Up/key Down adapter, the first and second fiber rows become inverted. For this reason, the Y cable branch is inverted on the power meter side. This particular case is unique to the MPO-24 cable since the connector layout is composed of two rows.



Pinned/Pinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).



Test cords required:

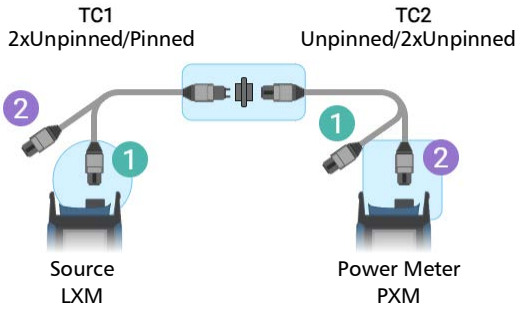
- TC1 Launch Cord
  2x MPO-12 Unpinned/MPO-24 Pinned (*Y test cord*)
- TC2 Receive Cord
  MPO-24 Unpinned/2x MPO-12 Unpinned (*Y test cord*)
- AC Adapter Cord
  Unpinned/Unpinned (*MPO-24 test cord*)

First Pass: First group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

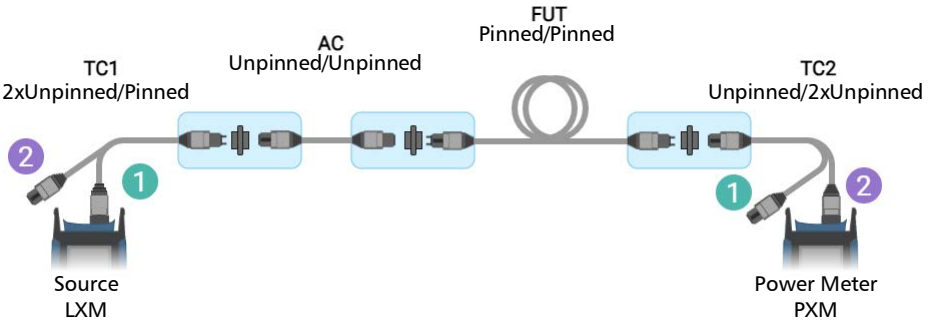
Caution: For the TC1 Y test cord, connect branch 1 to the source. For TC2 Y test cord, connect branch 2 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



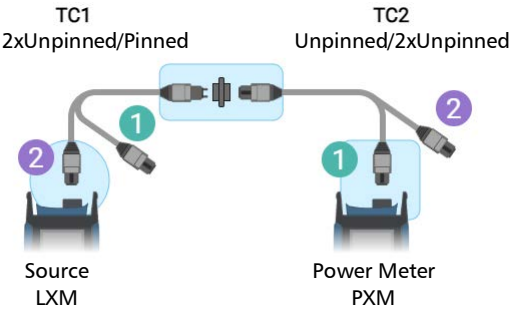
TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Second Pass: Second group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

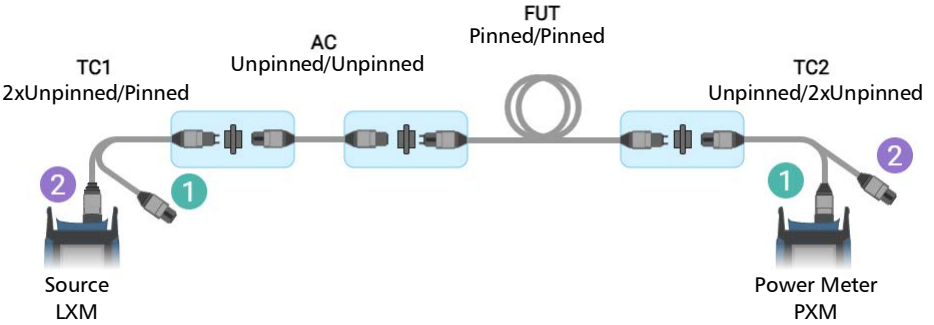
Caution: For the TC1 Y test cord, connect branch 2 to the source. For TC2 Y test cord, connect branch 1 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Pinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).



Test cords required:

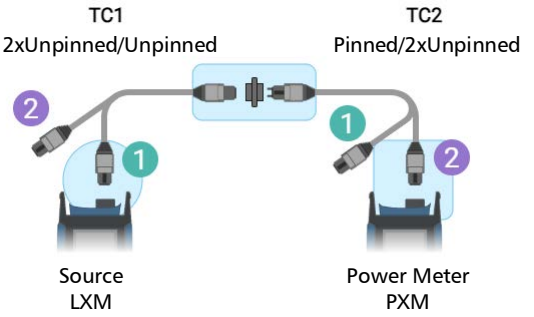
- TC1 Launch Cord
  2x MPO-12 Unpinned/MPO-24 Unpinned (*Y test cord*)
- TC2 Receive Cord
  MPO-24 Pinned/2x MPO-12 Unpinned (*Y test cord*)
- AC Adapter Cord
  Pinned/Unpinned (*MPO-24 test cord*)

First Pass: First group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

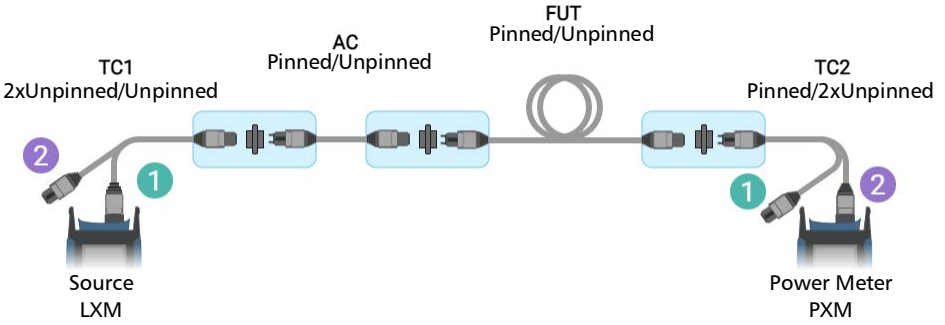
Caution: For the TC1 Y test cord, connect branch 1 to the source. For TC2 Y test cord, connect branch 2 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



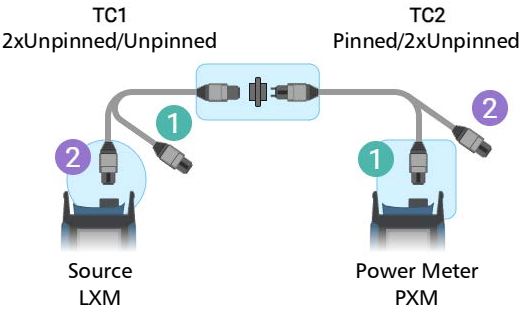
TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Second Pass: Second group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

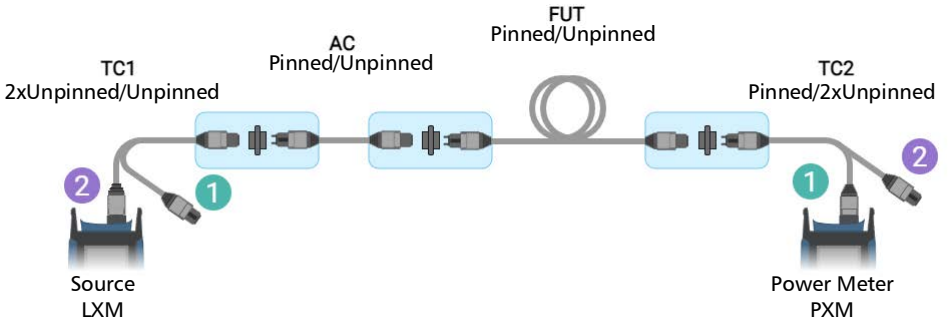
Caution: For the TC1 Y test cord, connect branch 2 to the source. For TC2 Y test cord, connect branch 1 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Unpinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).



Test cords required:

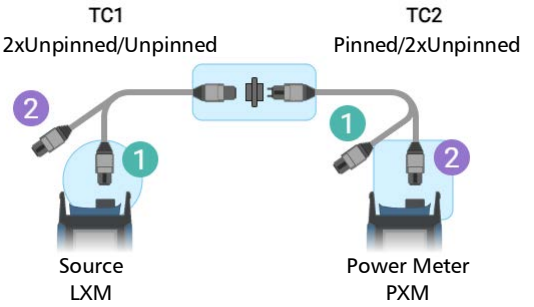
- TC1 Launch Cord
  2x MPO-12 Unpinned/MPO-24 Unpinned (*Y test cord*)
- TC2 Receive Cord
  MPO-24 Pinned/2x MPO-12 Unpinned (*Y test cord*)
- AC Adapter Cord
  Pinned/Pinned (*MPO-24 test cord*)

First Pass: First group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

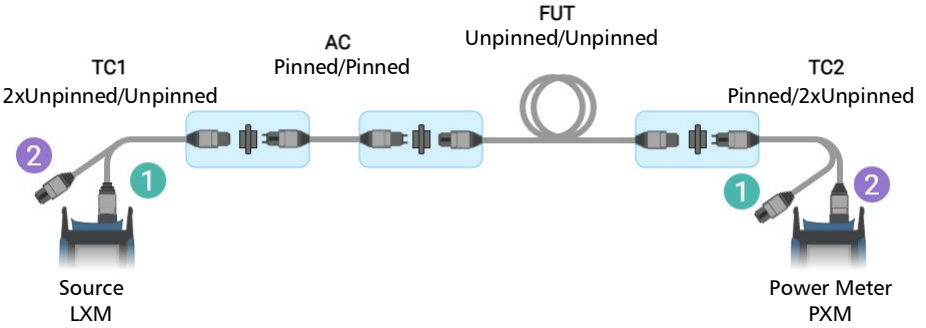
Caution: For the TC1 Y test cord, connect branch 1 to the source. For TC2 Y test cord, connect branch 2 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



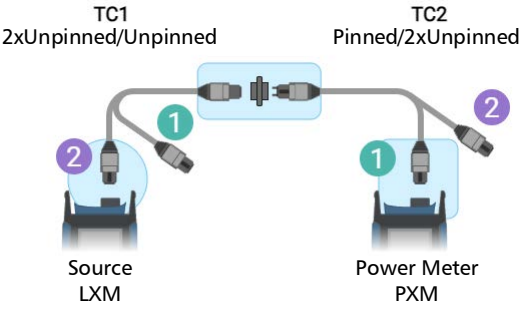
TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

Second Pass: Second group of 12 fibers

1 Reference

Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT mode.

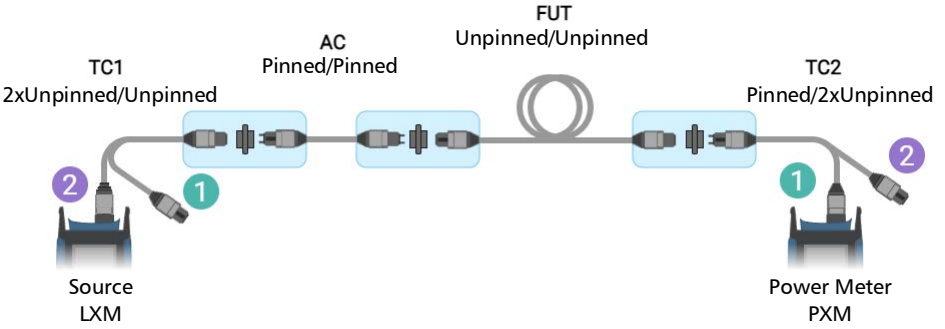
Caution: For the TC1 Y test cord, connect branch 2 to the source. For TC2 Y test cord, connect branch 1 to the power meter.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2 Test method

Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



TC1 and TC2 must remain connected to source and power meter, otherwise a new reference will be required.

D Bidirectional Testing Method

IMPORTANT

When performing the following test methods for duplex-fiber testing, ensure you are using P12 units with the appropriate duplex Click-Out connector adapters.

Two-Pass FasTesT Testing Sequence

The same testing and referencing methods as the one-cord, two-cord, or adapter-cord method must be used while testing in both directions.

One pair of LXM and PXM is used in this two-pass FasTesT sequence.

First pass:

- The sequences begin with a reference.
- Then the first direction of all FUT (Fiber Under Test) are tested.

Second pass:

- If a test cord has been disconnected or changed, a new reference should be taken. Otherwise, no reference is required to test the second direction.
- The second direction of all FUT is tested.

Results management occurs via naming in the PXMs and later in the FastReporter computer application. See *Creating a Job* on page 34.

Best practice: Create two jobs to properly distinguish the first and second direction when testing bidirectional MPO-12 cables. The incremental value should match the number of cables.

Bidirectional Fiber under test compatibility:

- Pinned/Pinned (One-cord method is recommended)
- Pinned/Unpinned (Two-cord method is recommended)
- Unpinned/Unpinned (Adapter-cord method is recommended)

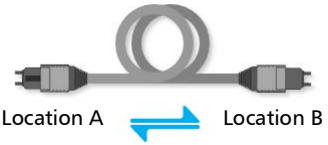
Note: *All test cords are type A (Straight) polarity. The mating adapter type key Up/key Down must be the same for all connections.*

MPO-12 Pinned/Pinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

One-Cord Method



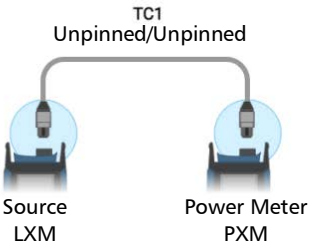
Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Unpinned/Unpinned

1 Reference, same for both directions

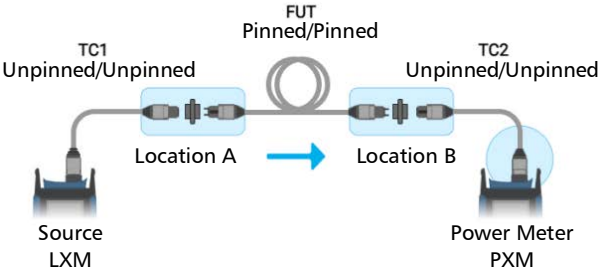
Connect TC1 from the source to the power meter.

Activate source in FasTesT mode.



2 **First Direction: Test method for A to B**

Disconnect TC1 from the power meter.
Connect TC2 to the power meter.
Insert FUT between TC1 and TC2.



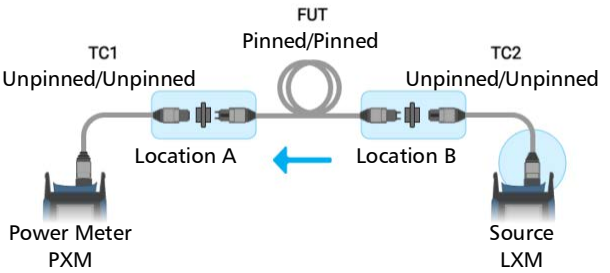
3 **Second Direction: Test method for B to A**

Insert FUT between TC1 and TC2.

Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

TC1 must remain connected to the source port, otherwise a new reference will be required.

No need for a new reference for the second direction since the same launch TC1 and receive TC2 cables can be used for both directions.



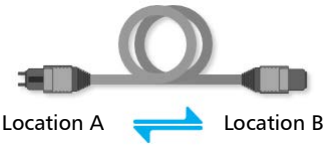
Caution for direction B to A, the position of the LXM and PXM are reversed in this diagram.

MPO-12 Pinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

Two-Cord Method



Test cords required direction A to B:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Pinned/Unpinned

Test cords required direction B to A:

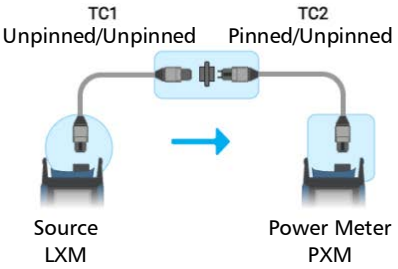
- TC1 Launch Cord - Pinned/Unpinned
- TC2 Receive Cord - Unpinned/Unpinned

Note: *The same test cords TC1 and TC2 are interchanged when referencing in the second direction.*

First Direction

1. Reference for direction A to B

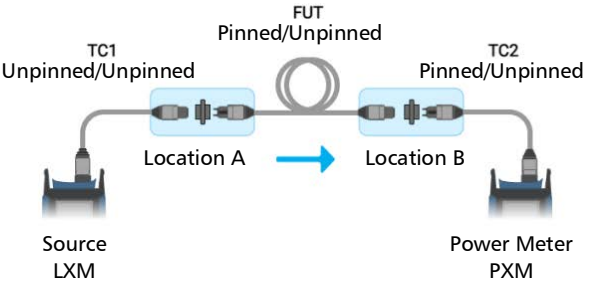
   Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

2. Test method for direction A to B

   Disconnect TC1 from TC2.
   Insert FUT between TC1 and TC2.

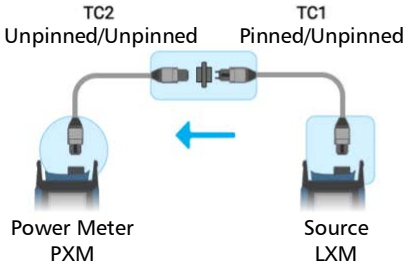


TC1 must remain connected to the source and TC2 connected to the power meter, otherwise a new reference will be required.

Second Direction

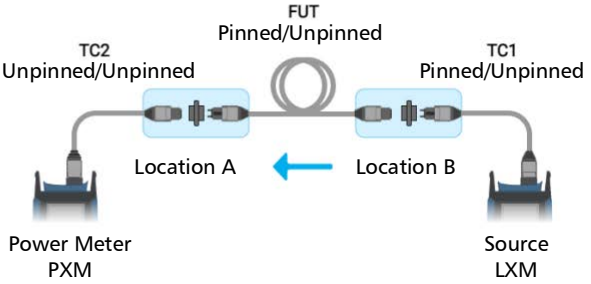
1. Reference for direction B to A

   Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTesT.



2. Test method for direction B to A

   Disconnect TC1 from TC2.
   Insert FUT between TC1 and TC2.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

TC1 must remain connected to the source and TC2 connected to the power meter, otherwise a new reference will be required.

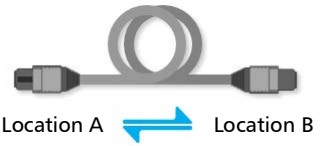
Caution for direction B to A, the position of the LXM and PXM are reversed in this diagram.

MPO-12 Unpinned/Unpinned FUT

IMPORTANT

To ensure optimal results, take a new reference after replacing the Click-Out adapter (P12 units only).

Adapter-Cord Method

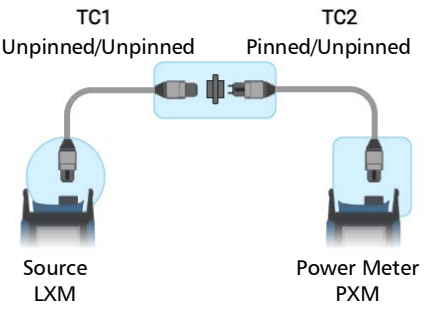


Test cords required:

- TC1 Launch Cord - Unpinned/Unpinned
- TC2 Receive Cord - Pinned/Unpinned
- AC Adapter Cord - Pinned/Pinned

1. Reference, same for both directions

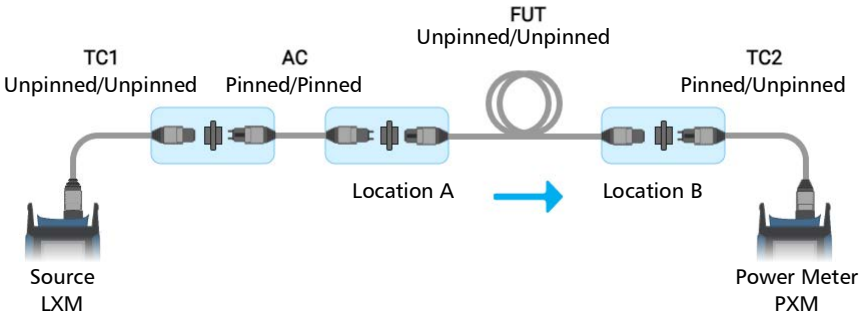
   Connect TC1 to the source and TC2 to the power meter. Connect test cords to each other, then activate the source in FasTest.



Never connect pinned connectors to test units. Always inspect and clean connectors as recommended.

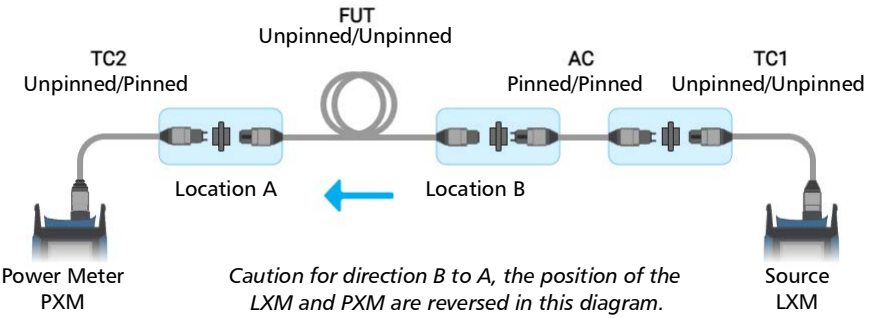
First Direction: Test method for direction A to B

2 Disconnect TC1 from TC2.
Connect AC to TC1 end.
Insert FUT between AC and TC2.



Second Direction: Test method for direction B to A

3 Insert FUT between AC and TC2.



Caution for direction B to A, the position of the LXM and PXM are reversed in this diagram.

TC1 and TC2 must remain connected to the source and power meter, otherwise a new reference will be required. No need for a new reference for the second direction since the same launch TC1 and receive TC2 cables can be used for both directions.

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CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES (RoHS)
中国关于危害物质限制的规定

NAMES AND CONTENTS OF THE TOXIC OR HAZARDOUS SUBSTANCES OR ELEMENTS CONTAINED IN THIS EXFO PRODUCT
包含在本 EXFO 产品中的有毒有害物质或元素的名称及含量

Part Name 部件名称	Lead 铅 （Pb）	Mercury 汞 （Hg）	Cadmium 镉 （Cd）	Hexavalent Chromium 六价铬 （Cr(VI)）	Polybrominated biphenyls 多溴联苯 （PBB）	Polybrominated diphenyl ethers 多溴二苯醚 （PBDE）
Enclosure 外壳	O	O	O	O	O	O
Electronic and electrical sub-assembly 电子和电气组件	X	O	X	O	X	X
Optical sub-assembly[a] 光学组件 [a]	X	O	O	O	O	O
Mechanical sub-assembly[a] 机械组件 [a]	O	O	O	O	O	O

Note:
注：
This table is prepared in accordance with the provisions of SJ/T 11364.
本表依据 SJ/T 11364 的规定编制。
O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.
O：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。
X: indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572. Due to the limitations in current technologies, parts with the “X” mark cannot eliminate hazardous substances.
X：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求。
标记“X”的部件，皆因全球技术发展水平限制而无法实现有害物质的替代。
a. If applicable.
如果适用。

MARKING REQUIREMENTS
标注要求

Product 产品	Environmental protection use period (years) 环境保护使用期限 （年）	Logo 标志
This EXFO product 本 EXFO 产品	10	
Battery[a] 电池	5	

a. If applicable.
如果适用。

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