



# FX80 / FX81 / FX81T

## PON Optical Power Meters

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# 1.0 General Information

This user manual is suitable for novice, intermediate, and experienced users and is intended to help use the features and capabilities of VeEX products successfully. It is assumed that the user has basic computer experience and skills, and is familiar with telecommunication and other concepts related to VeEX product usage, terminology, and safety.

Every effort was made to ensure that the information contained in this user manual is accurate. Information is subject to change without notice and we accept no responsibility for any errors or omissions. In case of discrepancy, the web version takes precedence over any printed literature. The content in this manual may vary from the software version installed in the unit. For condition of use and permission to use these materials for publication in other than the English language, contact VeEX, Inc.

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## 1.1 Customer Support

For more technical resources, visit [www.veexinc.com](http://www.veexinc.com).

For assistance or questions related to the use of this product, call or e-mail our customer care department for customer support. Before contacting our customer care department, have the product model, serial number, and software version ready. Please locate the serial number on the back of the chassis. Please provide this number when contacting VeEX, Inc. customer care.

Support hours may vary depending on the product.

### Product Technical Support

Support is generally available 8:00 AM to 8:00 PM, Eastern Standard Time, Monday to Friday.

**Phone:** +1 510 651 0500

**E-mail:** [customercare@veexinc.com](mailto:customercare@veexinc.com)

## MPA Product Technical Support

Support is generally available 8:30 AM to 5:30 PM, Eastern Standard Time, Monday to Friday.

**Phone:** +1 877 929 4357

**International:** +1 727 475 1206

**E-mail:** [serviceandsupport@veexinc.com](mailto:serviceandsupport@veexinc.com)

## 1.2 Warranty

For warranty information on VeEX products, go to <https://www.veexinc.com/Support/Warranty>.

To activate the warranty, please register your product at <https://www.veexinc.com/Support/ProductRegistration>.

## 1.3 Patent Information

VeEX product hardware and software may be protected by one or more patents on file with the United States Patent Office.

## 1.4 Documentation Conventions

Icons used in this manual:



Marks a helpful tip (action or method), which can save time and improve usability of the product.



Provides important information needed to use this product and avoid missteps.



Cautions against an action or inactivity, which can hinder productivity.



Strongly warns against a condition, an action, or inactivity which can lead to a health hazard, injury, equipment damage, data loss, and/or financial losses.



Stop and read before continuing.

The VeEX Inc. constantly works on improving user experience with the devices and software, that is why screenshots and menus shown in this manual may insignificantly vary from actual ones.

## 2.0 Safety Information



Safety precautions should be observed during all phases of operation of this instrument. The instrument has been designed to ensure safe operation however please observe all safety markings and instructions. Do not operate the instrument in the presence of flammable gases or fumes or any other combustible environment. VeEX Inc. assumes no liability for the customer's failure to comply with safety precautions and requirements.



### Optical Connectors

Make sure that optical sources are inactive before connecting fiber to the test set to avoid skin or eye damage, or damage to the unit. It is recommended to:

Deactivate the laser before connecting or disconnecting optical cables or patchcords.

Never look directly into an optical patchcord or an optical interface (e.g., CFP, CFP2, CFP4, QSFP+, SFP+, SFP, OTDR, LS, VFL) while the laser is enabled. Even though optical transceivers are typically fitted with Class 1 lasers, which are considered eye safe, optical radiation for an extended period can cause irreparable damage to the eyes.

Never use a fiber microscope to check the optical connectors when the laser source is active.

The operator is assumed to have received basic training in fiber optics and related testing and measurement practices.

## 3.0 Introduction

The FX80 and FX81 optical power meters are designed to verify, troubleshoot and perform service activation on next generation Passive Optical Networks (PON). The units feature a pass-through mode to measure optical levels on various wavelengths being transmitted between the Optical Line Terminal (OLT) and the Optical Network Terminal (ONU/ONT).

The FX80 supports GPON/EPON while the FX81 supports GPON/EPON including XG(S)-PON and 10G-EPON. The units can be connected onto the PON network at any available access point along the Optical Distribution Network (ODN). The access point can be at the OLT (central office - CO, head end or sub-headend or remote hut), Fiber Distribution Point (FDP 1 or 2/splitter (if connectorized) or at the ONU/ONT (customer premises - CP). The figure in Section [6.2.4. Performing Optical Power Measurements in PON](#) shows a typical PON with the four possible locations for measurement.

The FX80 and FX81 units passively measure signal levels to standards compliance:

- GPON and EPON channels: 1490 and optional 1550 nm RF video downstream, and 1310 nm upstream PON optical power levels (**FX80 and FX81**)
- XG(S)-PON and 10G-EPON channels: 1270 nm upstream and 1577 downstream PON optical power levels (**FX81 only**)

The FX81T unit passively measures only downstream signal levels to standard compliance:

- GPON and EPON channels: 1490 nm
- XG(S)-PON and 10G EPON channels: 1577 nm

The measurement results can be transferred to a PC and/or Fiberizer™ Mobile Android, as well as uploaded to a Fiberizer™ Cloud account.



*FX80 and FX81 PON power meters can be configured with additional options per customer requirements. FX80 can be equipped with an optional VFL or Broadband OPM. FX81 can be configured with optional Broadband OPM if RF Video measurement is not required. FX81T does not allow any additional options.*

## 3.1 FX80/FX81/FX81T Features

All devices share:

- Testing B/E/GPON and/or XG(S)-PON optical signal levels at OLT, FDP or ONT/ONU
- Optional Broadband InGaAs power meter
- High contrast LCD 128 x 64 pixels with backlight
- Tone detection for fiber identification
- Rechargeable Li-Polymer battery including AC/DC adapter operation with 5V USB output
- Rugged compact design with protective rubber boot
- Windows™ PC desktop software (LTSync) or Fiberizer mobile software application (FMOLTS) for data transfer to PC, R-server or Fiberizer Cloud for further analysis and reporting

### **3.1.1 FX80 / FX81 Specific Features**

- Dual SC/APC low reflectance test ports for passive, pass-through measurement of optical signal levels
- Pass/Fail or numeric measurement results
- Optional Visual Fault Locator (VFL), FX80 only

### **3.1.2 FX81T Specific Features**

- Single port SC/APC low reflectance test ports for passive, terminated measurement of optical signal levels
- ITU-T compliant Pass/Fail or numeric measurement results



# 4.0 Overview

## 4.1 Control Elements



Colors, screen-labeled function keys, and screen fonts and inscriptions can vary with different device models, firmware, and backlight settings. For example, in FX81T the F1 button in the **XGPON T** mode can read **THRES** (Threshold) instead of **P/F** (Pass/Fail).



FX80/FX81/FX81T front view

**[Power]:** To turn device ON/OFF, press and hold the button for 3 seconds. The VeEX logo, current date and time, and current mode of operation will be displayed.

**[MODE]:** Select the mode of operation:

**FX80:** PON Burst, PON CW, Read, optional PM1/2, optional VFL (default is PON Burst/PON). For more information about FX80/FX81 modes, see Section [6.1.1 FX80/FX81 Modes](#).

**FX81:** XGPON Burst, XGPON CW, Read, optional PM1/2. For more information about FX80/FX81 modes, see Section [6.1.1 FX80/FX81 Modes](#).

**FX81T:** XG-PONT, optional PM2, Read. For more information about FX81T modes, see Section [6.1.2 FX81T Modes](#).

**[Shift/Enter]:** Edit a parameter and confirm selection when setting up the device; execute the selected action.

**[Up], [Down]:** Change the selected field parameter.

### 4.1.1 Button Combinations:

**|Shift/Enter|+|Up|**: Save measurement results.

**|Shift/Enter|+|Down|**: Enter Instrument Settings mode.

**|Shift/Enter|+|Mode|**: Turn backlight ON/OFF.

**|F1|, |F2|, |F3|**: Context-defined, the function indicated at the screen bottom.

## 4.2 FX80/81/81T Test Ports

### 4.2.1 Optical Ports



*FX80/FX81/FX81T optical ports*

**OLT**: optical connector port input which measures 1490 nm downstream power levels and optional 1550 nm (RF Video) in a GPON network. On FX81, measures 1577 nm downstream power levels for XGS-PON/10G-EPON.

**ONT**: optical connector port input which measures 1310 nm upstream power level. On FX81, measures the 1270 nm upstream power levels for XGS-PON/10G-EPON.

**OPM (optional for FX80 and FX81)**: Measures optical power in absolute and relative mode and to save the measurement results.

**XG-PONT/OPM**: Combined port for downstream measurement and optional broadband power measurement (**FX81T Only**)

**VFL (optional, FX80 Only)**: Use the 650 nm visual fault locator to visually locate breaks or excessive bends in fibers.



*The FX80 can be configured with either optional OPM or VFL, but not both. The F81 with 5 wavelength PON optical configuration cannot support the optional BB-OPM.*

## **4.2.2 Service Port**

The service port (micro-USB) located on the left side of the device is used for battery charging and transferring OPM and XG-PONT results to the LTSync and/or Fiberizer OLTS Mobile software applications. An OTG cable is required when using the service port to transfer results to an Android mobile device.

# 5.0 Getting Started



Before using the power meter for the first time, fully charge the battery and set the local date and time. The date and time are required to time-stamp the test results.

## 5.1 Battery Charging

The unit is equipped with a built-in, rechargeable Li-Polymer smart charge battery which is partially charged upon delivery. VeEX recommends charging the battery to full capacity before using the power meter for the first time.



*The device is powered from the built-in Li-Polymer battery and can be operated with the AC/ DC adaptor plugged in.*

When the power meter is plugged into the AC/DC adapter, the Plugged icon (  ) appears in the top left corner of the display. When the unit is operating on battery, the Battery icon (  ) appears.



*It is recommended to charge the battery at room temperature to preserve its life and to obtain maximum charge.*

To charge the test set, connect the AC/DC adaptor to the micro-USB service port located on the left side of the device. The charging time depends on the battery condition and ambient temperature. Use only the USB cables provided with the device to charge the battery.

While the device battery is charging, the LED indicator on the front panel will turn orange. When the battery is fully charged, the LED indicator will turn green provided the device is powered ON. The LED will turn off when the unit is powered OFF.



***The Li-Polymer battery is designed for maximum safety. However, the battery may explode, leak, or catch fire when:***

It is exposed to high temperatures

It is damaged for any reason

To save the battery charge, enable the **Auto Shutdown** mode, configured in the **Settings** mode (see Section [5.2. Configuring Device Settings](#)).

### 5.1.1 Battery Replacement

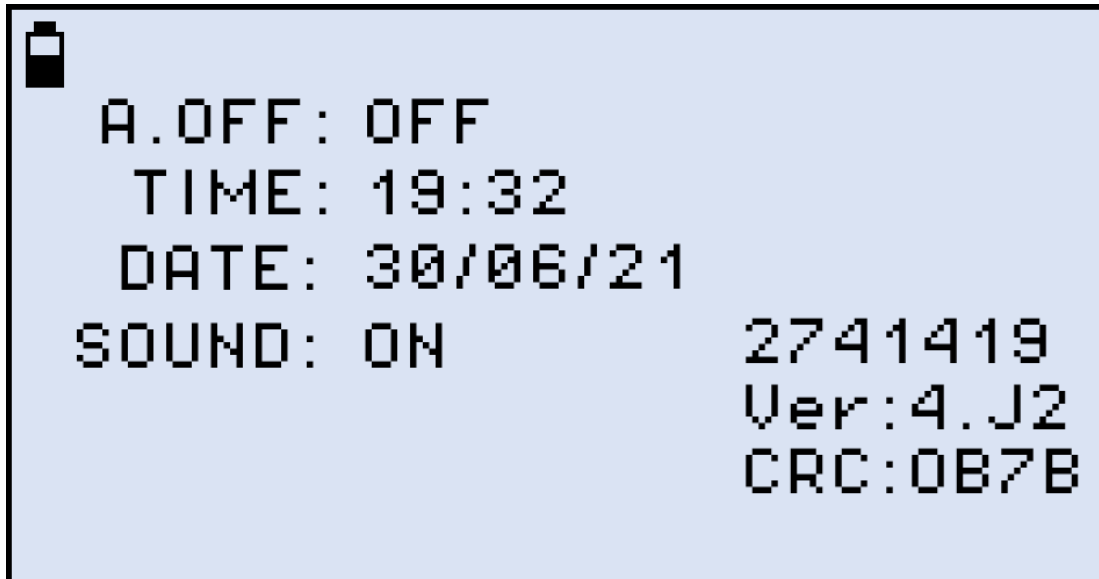
Battery replacement in the field is not authorized or permitted. To replace the battery, return the unit to an authorized VeEX service center or sales partner.

## 5.2 Configuring Device Settings

Before saving measurement results for the first time, set the device date and time.

To configure settings:

1. Power ON the FX80/FX81/FX81T unit by pressing and holding the **[Power]** button for 3 seconds.
2. Press **[Shift/Enter]+[Down]** to enter the **Settings** mode. The test parameter selected will flash and is then available to edit. The following parameters can be set:
  - **Auto Shutdown** mode: after the preset time of inactivity the device shuts down. The options are 45 min, 30 min, 15 min, and OFF (never).
  - **Time**: current time.
  - **Date**: current date.
  - **Sound**: if ON, pressing the keyboard buttons produces a sound.



*FX80/FX81/FX81T Instrument Setting screen*

3. Press **[Up]** and **[Down]** to select the parameter to edit.
4. Press **[MODE]** to select the field to edit, then change the value, if necessary, by pressing **[Up]** and **[Down]**.
5. Press **[Shift/Enter]** to save the settings.

## 5.3 Resetting Test Device

To reset the FX80/FX81/FX81T power meter to factory default settings:

1. Disconnect the external power supply from the device.
2. With the device **OFF**, press and hold the red **[Power]** button for at least 15 seconds.

After the device reboots, reset the date and time (see [Section 5.2. Configuring Device Settings](#)).



***During reset, the threshold and reference values will be lost, and they will have to be set again. Also, the ZERO level operation must be performed again. For more information, see Sections [6.2.1. Setting ZERO Level](#) and [6.2.2. Setting Pass/Fail Thresholds for FX80/FX81](#).***



*The reset DOES NOT erase any previously stored measurement data.*

# 6.0 Optical Power Measurements

## 6.1 Modes for Optical Power Measurements

### 6.1.1 FX80/FX81 Modes

**PON Burst/PON:** OLT to ONT pass-through test mode measures optical levels on active, in-service PON networks. It is specifically optimized for upstream burst signal measurement.

**PON CW:** OLT to ONT pass-through test mode measures optical levels on out-of-service PON networks that have ONU/ONT devices that can be set to maintenance CW test mode. Also useful for characterizing loss of Co-Existence (CEX) elements using a companion light source.

**PM (PM1 or PM2):** OPM test mode to measure any optical signal level from 800 nm to 1700 nm. The signal can be CW, or modulated with 270, 330, 1000, or 2000 Hz. The Wave ID function will automatically set the wavelength calibration to match the input wavelength provided a compatible VeEX source is used.

### 6.1.2 FX81T Modes

**XG-PONT:** Terminated PON test mode that measures downstream PON signal levels for 1490 nm and 1577 nm only. Enable/disable the **Pass/Fail** indicator depending on PASS/FAIL threshold settings.

**PM2:** FX81T broadband OPM to measure any optical signal from 800nm to 1700nm (refer to datasheet for range and calibrated wavelengths).

## 6.2 PON Power Measurements

To use the FX80 or FX81 for PON measurements, connect the two fibers to the correct OLT and ONT test port. For FX81T, connect only one fiber to the XG-PONT/OPM test port. Then press the **[MODE]** button to enter the required measurement mode.



*FX80/FX81 Top Panel. The OPM port on the right is optional.*



FX81T Top Panel. The OPM is optional.



**For best results, wait for 15 minutes after the FX80/81 is powered ON. This is especially recommended for environments with extreme temperature changes.**

## 6.2.1 Setting ZERO Level



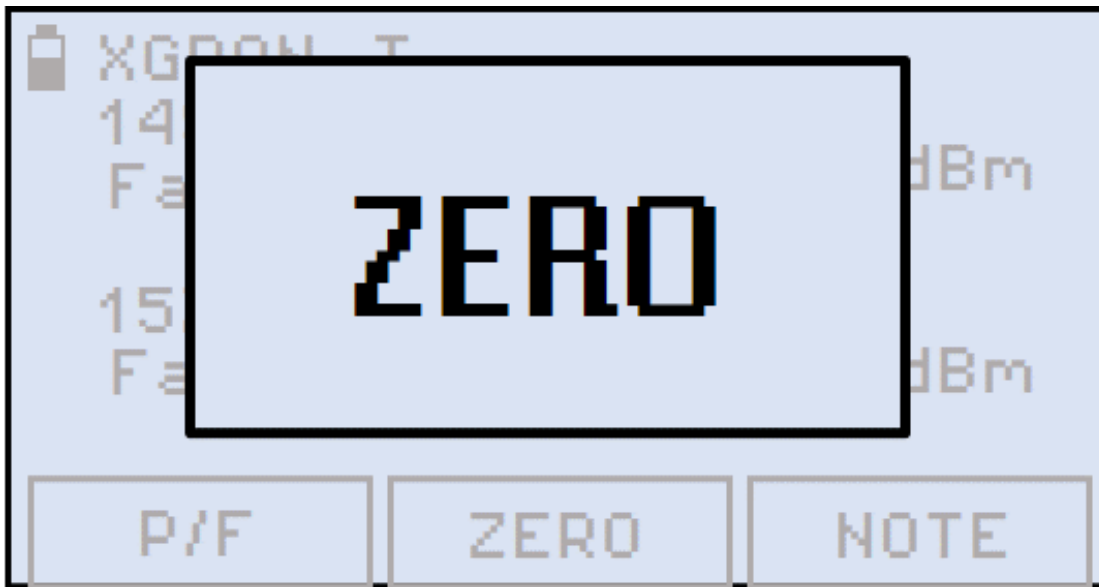
**Set the ZERO level with the dust caps closed before first using the device for PON power measurements. Do NOT zero the power meter with the light source transmitting into the OPM port, or the device may stop reading values or show display random or inaccurate values. It is recommended to set the ZERO level prior to each new batch of measurements, or after measurement conditions have changed.**

To set the ZERO level, press **[F2] (ZERO)**. The ZERO notification will display briefly on screen.



Setting the ZERO level, FX80/FX81





*Setting the ZERO level, FX81T*

The FX80/81/81T is now ready for measurements.

## 6.2.2 Setting Pass/Fail Thresholds for FX80/FX81

In addition to measuring the PON signal levels, the FX80/FX81 PON meters can also be configured to provide Pass/Fail (P/F) notifications for each wavelength.

### Thresholds Definition

If the threshold value set for a wavelength in the Pass/Fail sub-menu is greater than or equal to the current power reading for that wavelength, a **FAIL** reading will be displayed.

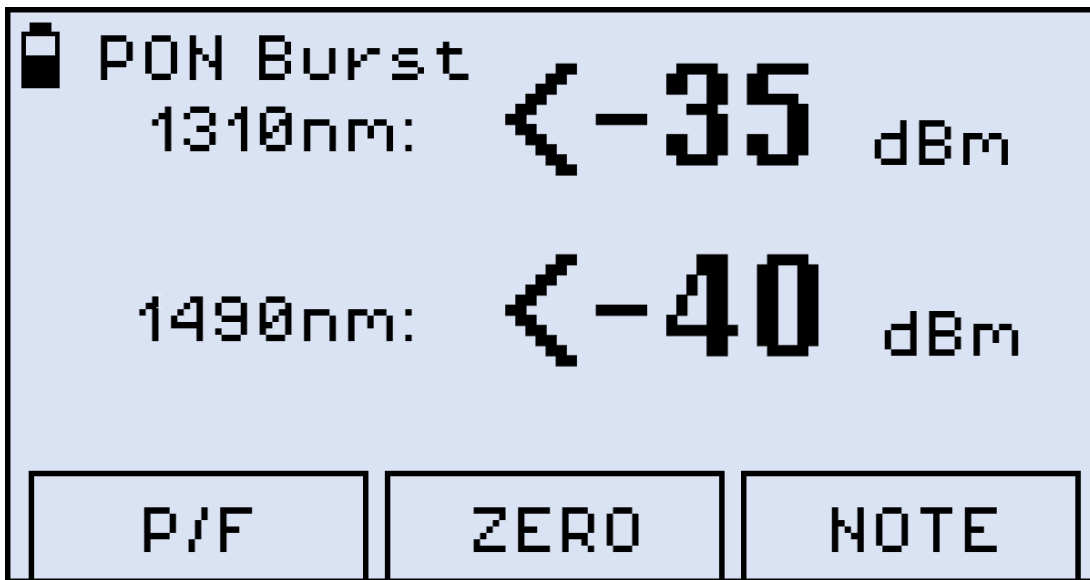
If the threshold value set for a wavelength in the Pass/Fail submenu is less than the current power reading for that wavelength, a **PASS** reading will be displayed.



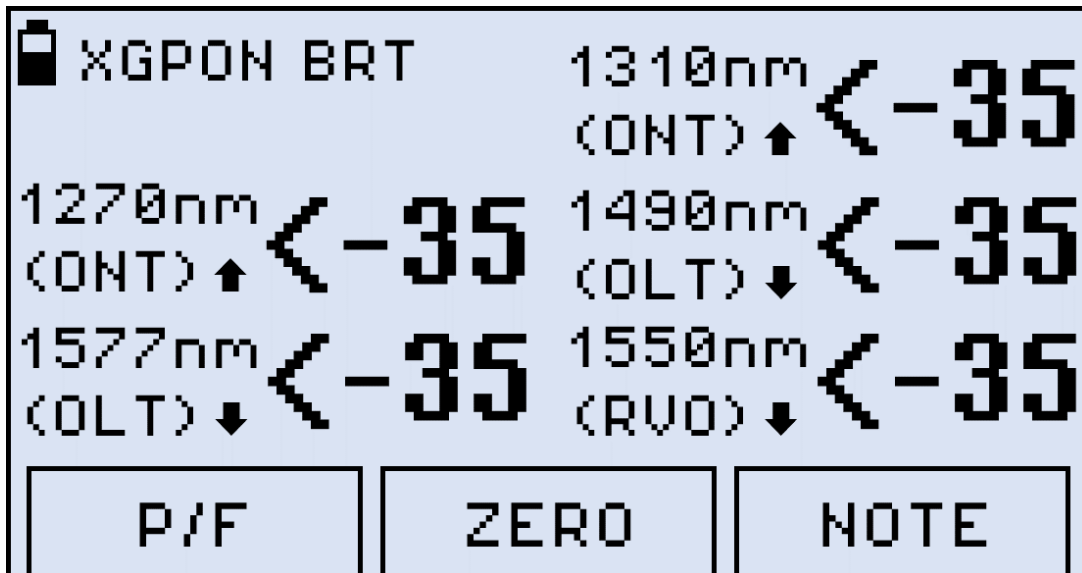
*The procedure described below is the same for FX80 and FX81. The screenshots may be different depending on optical configuration.*

To set custom **Pass/Fail** thresholds:

1. Press the **[MODE]** button to enter the required PON measurement mode (PON Burst/PON or PON CW) to set the thresholds. PON/PON Burst is used in the figures below, but the user interface is identical.

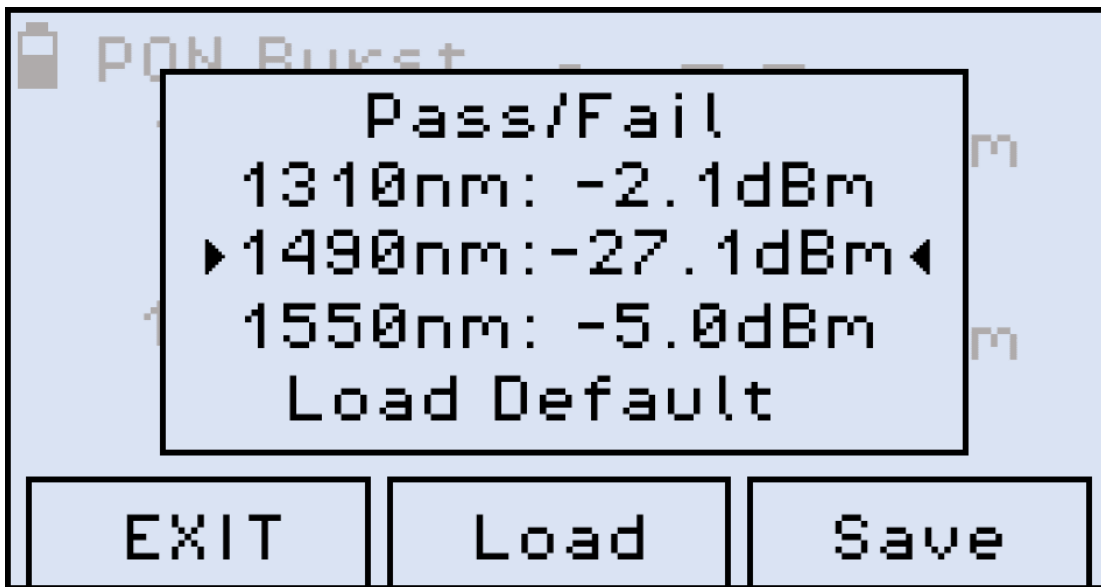


*PON Burst mode, FX80*

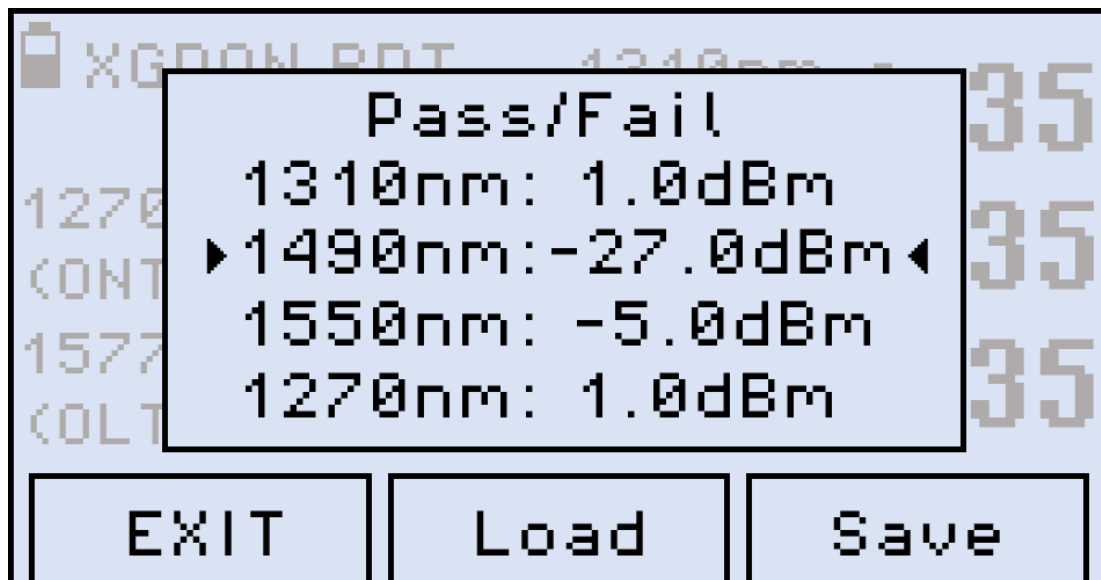


*XGPON Burst mode, FX81*

2. Press F1 (P/F).



Setting Pass/Fail thresholds, FX80



Setting Pass/Fail thresholds, FX81

3. Press the **[Up]** and **[Down]** arrow button to select the wavelength.
4. Press **[Shift/Enter]** to set the threshold. The corresponding value starts flashing.
5. Set the necessary value pressing **[Up]** and **[Down]**.
6. Confirm the value by pressing **[Shift/Enter]**.
7. Press **[F1] (EXIT)** to exit the Setting Pass/Fail thresholds mode.

The FX80/FX81 is now ready to measure PON levels and compare values against the Pass/Fail thresholds settings. The thresholds settings will remain active until changed.



***If the device battery is allowed to fully discharge, all settings such as Pass/Fail and Device settings will return to original factory defaults. To retain Pass/Fail settings for future use, save them to a profile.***

### 6.2.2.1 Creating a Pass/Fail Threshold Profile for FX80/FX81

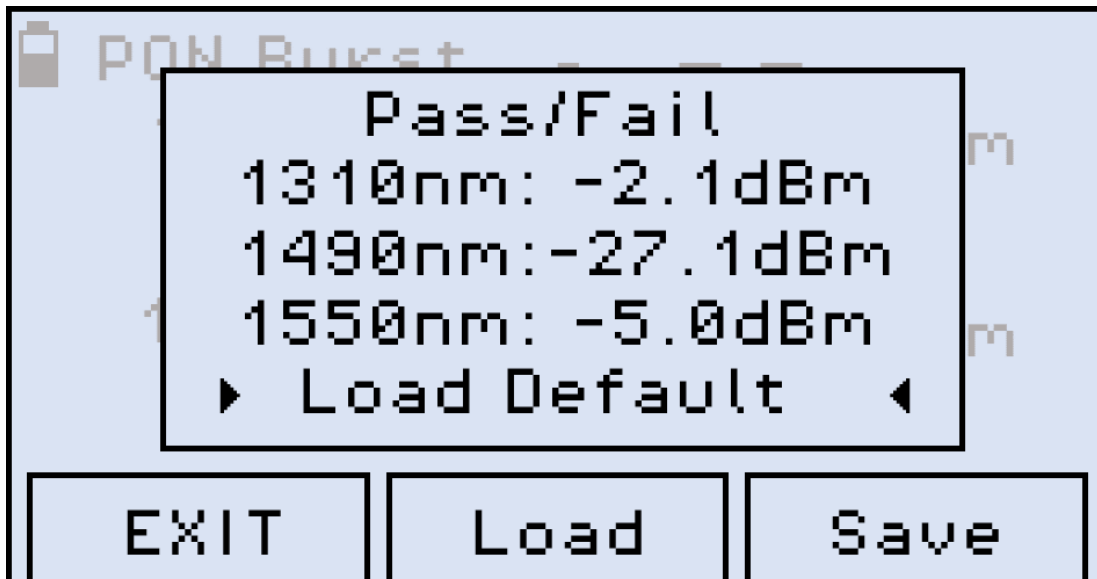
One profile with threshold values can be created and saved in memory for future recall.

**To save the current set of thresholds as a profile:**

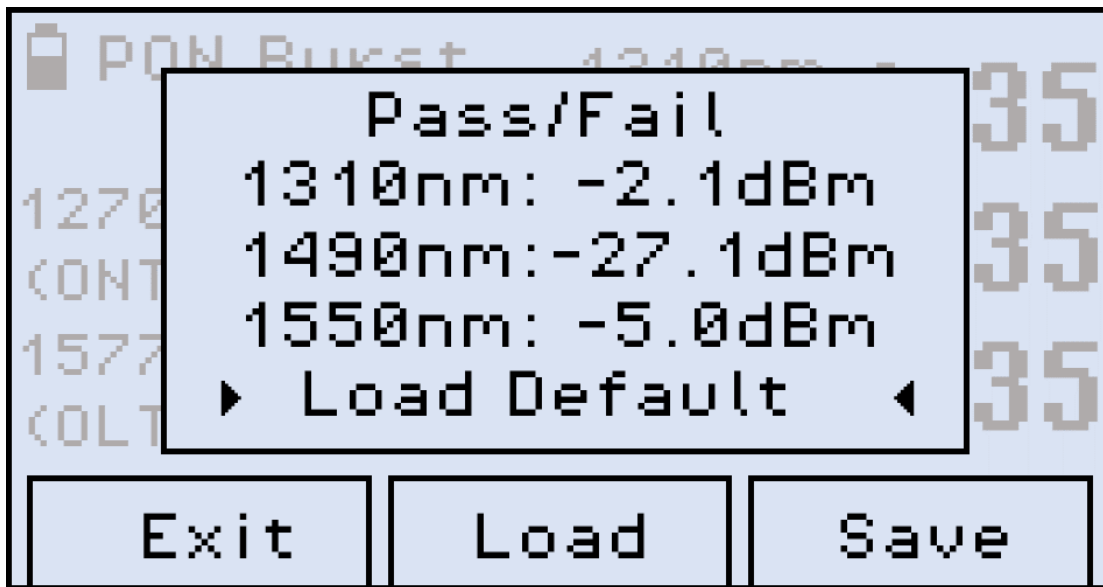
1. In the **P/F** mode, enter the desired values, but do NOT exit the **Setting Pass/Fail thresholds** mode.
2. To save the values as the profile, press **[F3] (Save)**. Now the threshold values are saved in the device memory.

**To load the previously saved profile**, press **[F2] (Load)**. The values from the custom profile appear immediately on the screen.

**To load the default threshold profile**, press **[Down]** until **Load Default** is selected, then press **[Shift/Enter]**. The values from the default profile appear immediately on the screen.



*Selecting the Default profile, FX80*



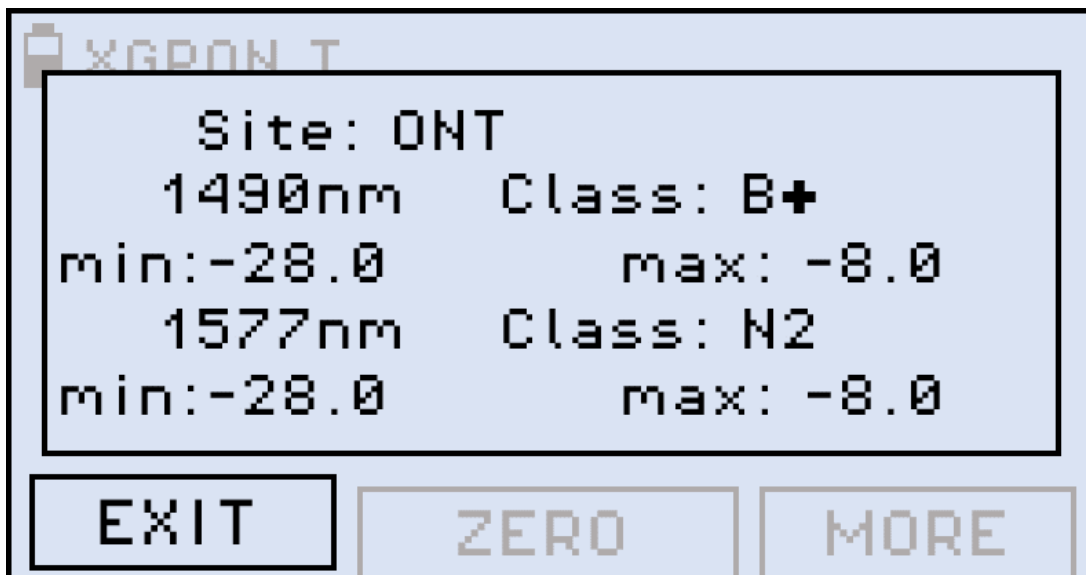
*Selecting the Default profile, FX81*

### 6.2.2.2 FX81T Pass/Fail Thresholds

The FX81T offers built-in ITU-T 1G/10G PON compliant standards with location-based settings and user-defined values mode designated as FDP (Fiber Distribution Point) and “user” for Pass/Fail notification.

#### To set Pass/Fail thresholds for FX81T:

1. In the **XG-PONT** mode, press **|F1| (THRES)**. The thresholds form appears onscreen, with the **Site** field flashing as active:



*Thresholds form for FX81T*

2. To change the active (flashing) field value, press **|Up|** or **|Down|**. To jump to the next active field, press **|Mode|**.



### Thresholds Definition

If the measured power level falls in within the **min** and **max** threshold value defined in the **THRES** (Pass/Fail) submenu, a **PASS** reading is displayed. Any values below the **min** threshold value or above the **max** threshold value result in **FAIL** reading.

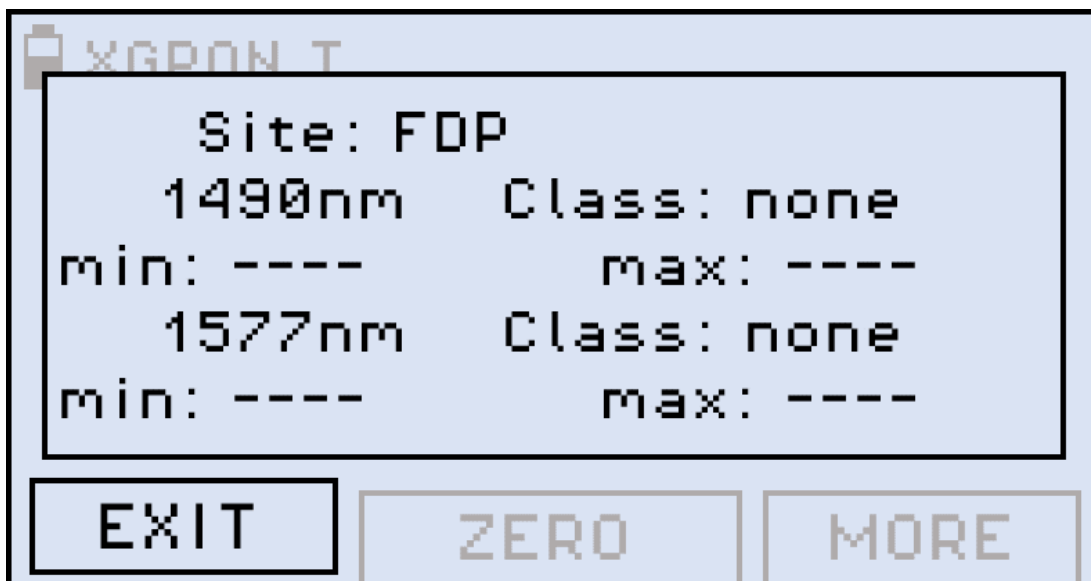
### Values for active sites (locations for measurement):

**Site:** sets the location for measurement (see the Figure in Section [6.2.4. Performing Optical Power Measurements in PON](#) showing a typical PON with the four possible locations for measurement). Three available options for sites (locations) are:

- **ONT:** Optical Network Terminal. The **min** and **max** values for **1490** nm and **1577** nm wavelengths are set according to the IEC Standard and cannot be changed. For the **ONT** site the ITU-T classes available are **A, B, B+, C, C+** for **1490** nm, and **E1, N1, N2** for **1577** nm.
- **OLT:** Optical Line Terminal. The **min** and **max** values for **1490** nm and **1577** nm wavelengths are set according to the IEC Standard and cannot be changed. For the **OLT** site the ITU-T classes available are **A, B, B+, C, C+** for **1490** nm, and **E1, N1, N2** for **1577** nm.
- **FDP:** Fiber Distribution Point. To change the **min** and **max** values for **1490** nm and **1577** nm wavelengths for the **FDP** site, press **[Mode]** to jump to the necessary field until the field starts flashing, then press **[Up]** and **[Down]** to change the value. For the **FDP** site the available options are **user** and **none**.



If no pass/fail thresholds are necessary for measurement and only values are to be displayed onscreen, select the **FDP** site and set **Class: none** for both wavelengths (see the Figure below).



*No Pass/Fail threshold selected*

## 6.2.3 Thresholds Adhering to the Current 1G/10G PON Standards

The following tables are provided as reference to set thresholds adhering to the current 1G/10G PON standards when performing measurements onsite.

### ITU-T G.984-2 Standard Pass/Fail Thresholds

	1.244 Gbps DS direction					
	1490 nm OLT Launch Power			1490 ONT/ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-4	1	5	-25	-25	-26
Max Avg Power (dBm)	1	6	9	-4	-4	-4

	2.488 Gbps DS direction					
	1490 nm OLT Launch Power			1490 ONT/ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	0	5	3	-21	-21	-28
Max Avg Power (dBm)	4	9	7	-1	-1	-8

2.488 Gbps US direction						
	1490nm OLT Launch Power			1490 ONT/ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	Undefined	Undefined	Undefined	Undefined	Undefined	Undefined
Max Avg Power (dBm)	Undefined	Undefined	Undefined	Undefined	Undefined	Undefined

1.244 Gbps US direction						
	1310nm ONT/ONU Launch Power			1310 OLT Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-3	-2	2	-24	-28	-29
Max Avg Power (dBm)	2	3	7	-3	-7	-8

622 Mbps DS direction						
	1310nm ONT/ONU Launch Power			1310 ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-6	-1	-1	-27	-27	-32
Max Avg Power (dBm)	-1	4	4	-6	-6	-11

622 Mbps US direction						
	1310nm ONT/ONU Launch Power			1310 ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-6	-1	-1	-27	-27	-32
Max Avg Power (dBm)	-1	4	4	-6	-6	-11



	155 Mbps DS direction					
	1310nm ONT/ONU Launch Power			1310 ONU Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-6	-4	-2	-27	-30	-33
Max Avg Power (dBm)	0	2	4	-5	-8	-11

	155 Mbps US direction					
	1310nm ONT/ONU Launch Power			1310 OLT Receive Power		
ODN Class	Class A	Class B	Class C	Class A	Class B	Class C
Min Avg Power (dBm)	-6	-4	-2	-27	-30	-33
Max Avg Power (dBm)	0	2	4	-5	-8	-11

### ITU-T G.987.2 Standard Pass/Fail Thresholds (10G asymmetric)

	9.95328 Gbps DS direction															
	1577nm OLT Launch Power						1577nm ONT/ONU Receive Power									
ODN Class	Class N1		Class N2		Class E1		Class E2		Class N1		Class N2		Class E1		Class E2	
		N2a	N2b		E2a	E2b			N2a	N2b		E2a	E2b			
Min Avg Power (dBm)	2.0	4.0	10.5	6.0	8.0	14.5	-28.0	-	-	-	-	-28.0	-28.0	-	-	21.5
Max Avg Power (dBm)	6.0	8.0	12.5	10.0	12.0	16.5	-8.0	-8.0	-3.5	-8.0	-9.0	-3.5				

	2.44832 Gbps US direction							
	1270nm OLT Launch Power				1270nm ONT/ONU Receive Power			
ODN Class	Class N1	Class N2	Class E1	Class E2	Class N1	Class N2	Class E1	Class E2
Min Avg Power (dBm)	2.0	2.0	2.0	2.0	-27.5	-29.5	-31.5	-33.5
Max Avg Power (dBm)	7.0	7.0	7.0	7.0	-7.0	-9.0	-11	-13

## ITU-T G.9807.1 Standard Pass/Fail Thresholds (10G symmetric)

9.95328 Gbps DS direction						
	1577nm OLT Launch Power			1577nm ONT/ONU Receive Power		
ODN Class	Class N1	Class N2	Class E1	Class N1	Class N2	Class E1
Min Avg Power (dBm)	2.0	4.0	6.0	-28.0	-28.0	-28.0
Max Avg Power (dBm)	5.0	7.0	9.0	-9.0	-9.0	-9.0

9.95328 Gbps US direction						
	1270nm ONT/ONU Launch Power			1270nm OLT Receive Power		
ODN Class	Class N1	Class N2	Class E1	Class N1	Class N2	Class E1
Min Avg Power (dBm)	4.0	4.0	4.0	-26.0	-28.0	-30.0
Max Avg Power (dBm)	9.0	9.0	9.0	-5.0	-7.0	-9.0

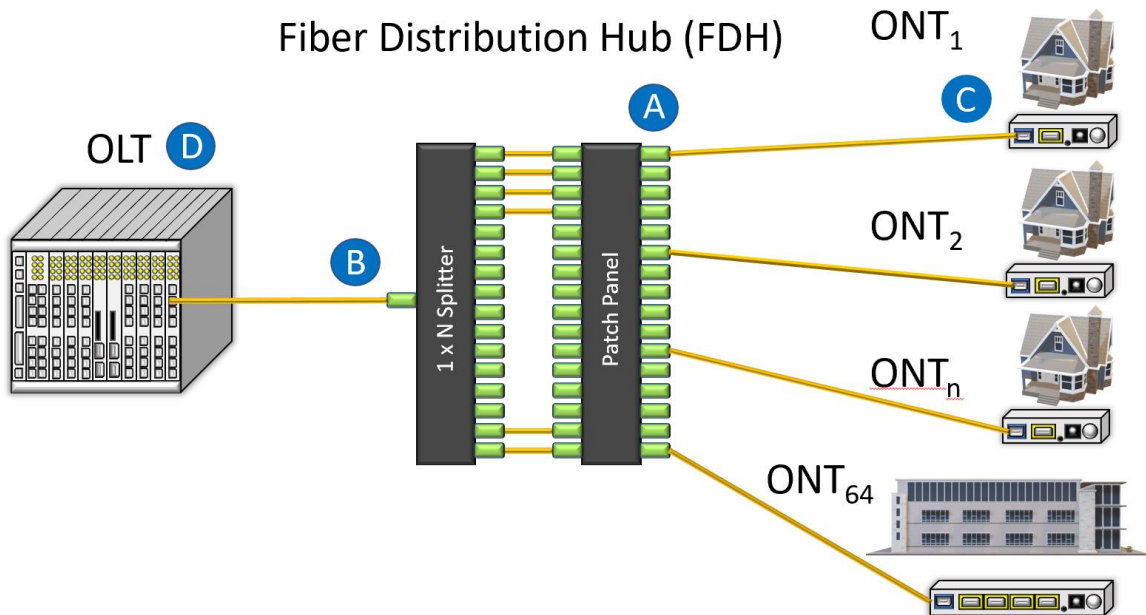
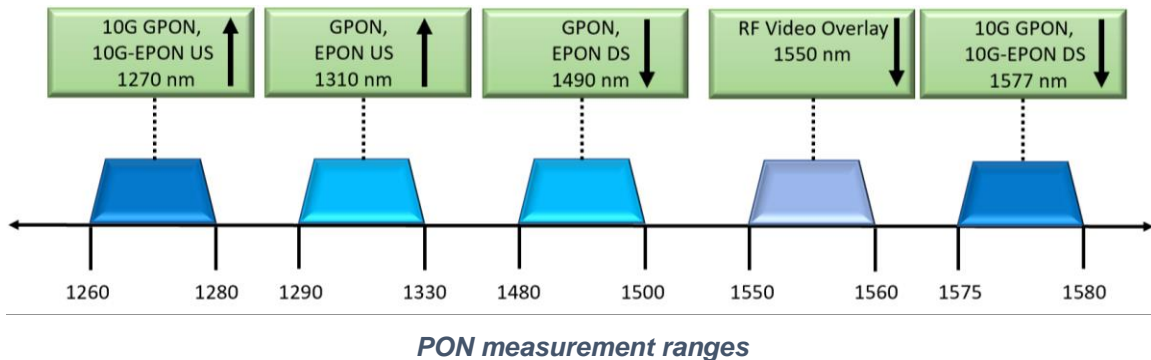
9.95328 Gbps DS direction						
	1490nm OLT Launch Power			1490nm ONT/ONU Receive Power		
OPL Class	Class B+	Class C+	N/A	Class B+	Class C+	N/A
Min Avg Power (dBm)	2.0	6.0	N/A	-27.0	-27.0	N/A
Max Avg Power (dBm)	5.0	9.0	N/A	-8.0	-8.0	N/A

9.95328 Gbps US direction						
	1310nm ONT/ONU Launch Power			1310nm OLT Receive Power		
OPL Class	Class B+	Class C+	N/A	Class B+	Class C+	N/A
Min Avg Power (dBm)	3.0	3.0	N/A	-26.0	-30.0	N/A
Max Avg Power (dBm)	8.0	8.0	N/A	-5.0	-9.0	N/A

## 6.2.4 Performing Optical Power Measurements in PON



Please inspect and clean fibers before connecting to the device.



*A typical passive optical network (PON) with possible sites (locations) of measurement*

### To measure optical power in a passive optical network (PON):

1. Press the **[MODE]** button to select the necessary mode (see [Section 6.1. Modes for Optical Power Measurements](#) for details). The FX81T device has one mode (**XG-PONT**) for both cases.
  - a. For networks with signals: **PON Burst** for FX80, or **XGPON BRT** for FX81.
  - b. For networks without signals: **PON CW** for FX80, or **XGPON CW** for FX81.
2. To test a PON network, connect the FX80/FX81 at the OLT or ONT of the network (see the Figure above). The locations OLT (**B** or **D**), Fiber Distribution Hub/Point (**A**) or ONU/ONT (**C**) are the possible test points.

3. Connect fiber carrying downstream traffic from the OLT to the OLT test port. Confirm that the 1490 nm (GPON/EPON) and 1577 nm (XGS-PON/10G-EPON) wavelengths are detected.



*For FX80/FX81 1550 nm option, the 1550 nm wavelength appears only if the network includes RF video overlay signal traffic (RVO). If no signal is detected, begin troubleshooting and make sure the FX81 is configured to measure 1550 nm by checking the Serial # label and verifying that the fiber is connected to the correct test port.*

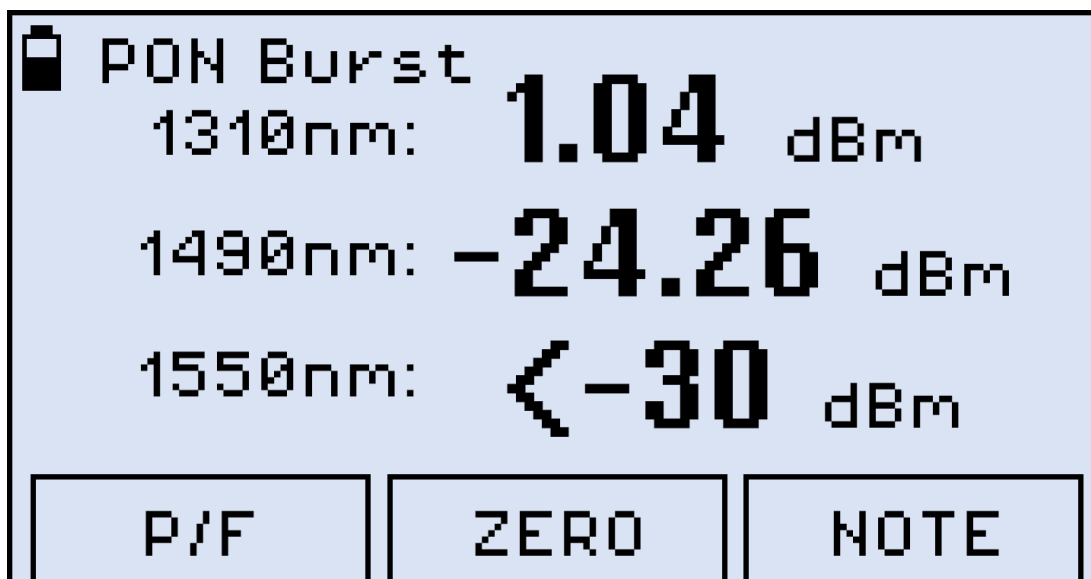


*At least one extra patchcord is needed to perform a pass-through test. If PON network elements have SC/UPC connectors and the FX80/FX81 has SC/APC, two conversion patchcords are needed.*

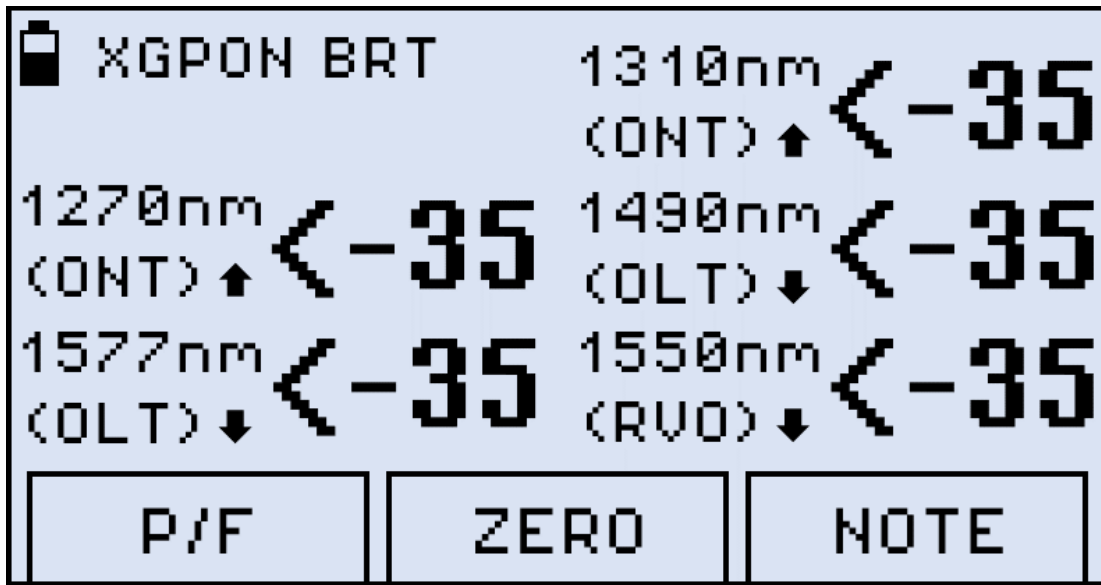
4. For FX80/FX81 pass-through measurement, after a good 1490 nm and/or 1577 nm signal level is detected, connect the ONU/ONT test port to measure the 1310 nm and/or 1270 nm upstream signal coming from the ONT. There may be a small delay before seeing the upstream signal/s pending completion of the PON network activation process. The measurement results are displayed on screen. The example below shows typical values when connected at the ONU (location C) and no P/F thresholds have been set.



*If the ONT/ONU undergoes a power-cycle, it can take up to one minute or longer for ranging and activation to complete before the PON network is fully operational again.*

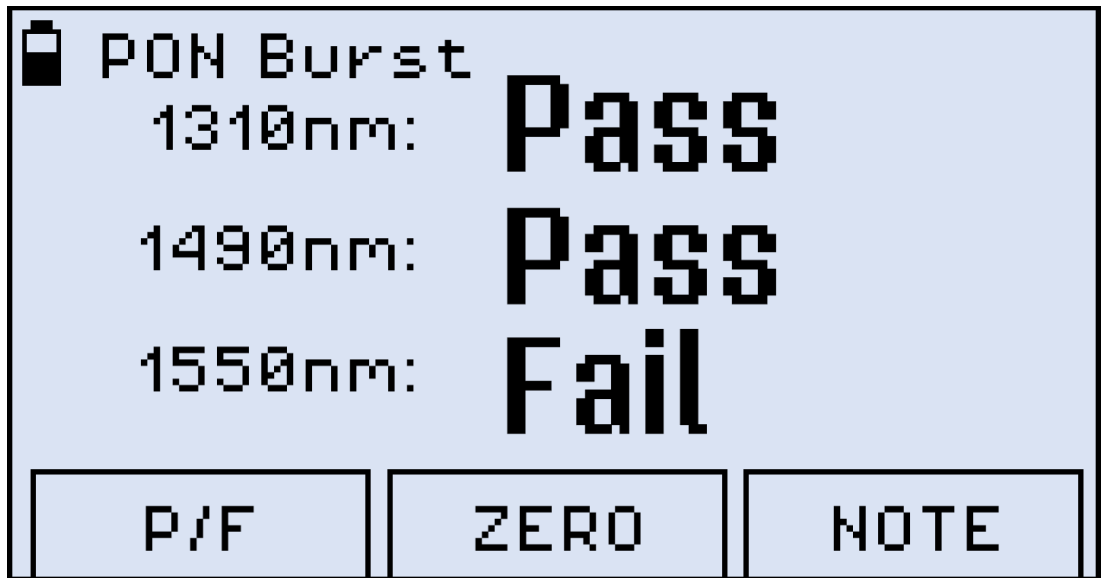


*PON Burst mode measurement results as values, FX80 (no thresholds set)*

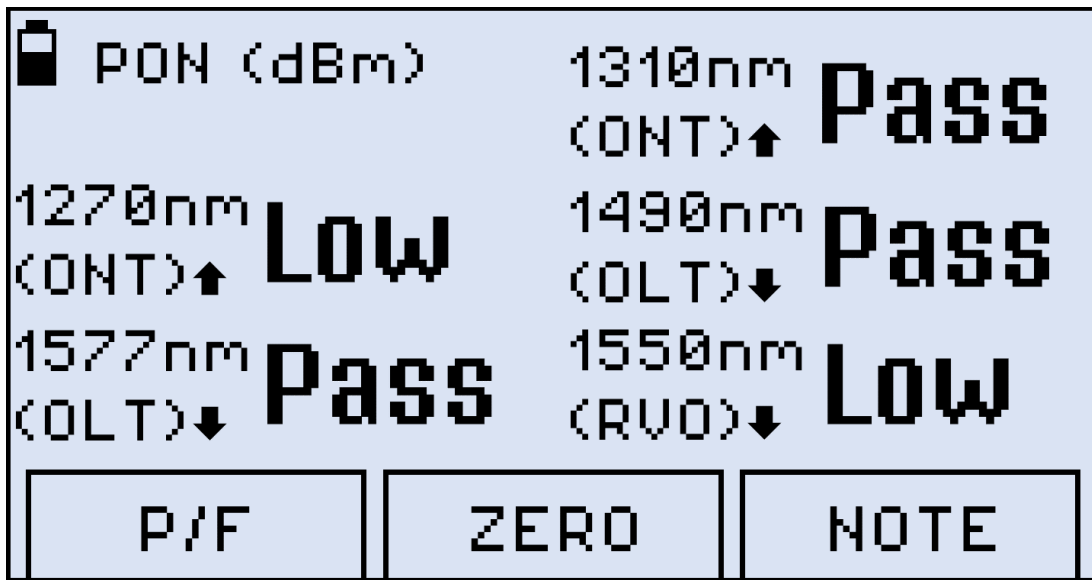


*PON Burst mode measurement results as values, FX81*

If **P/F** thresholds have been set, the measurement results are presented as **Pass** or **Fail** (see the example below).

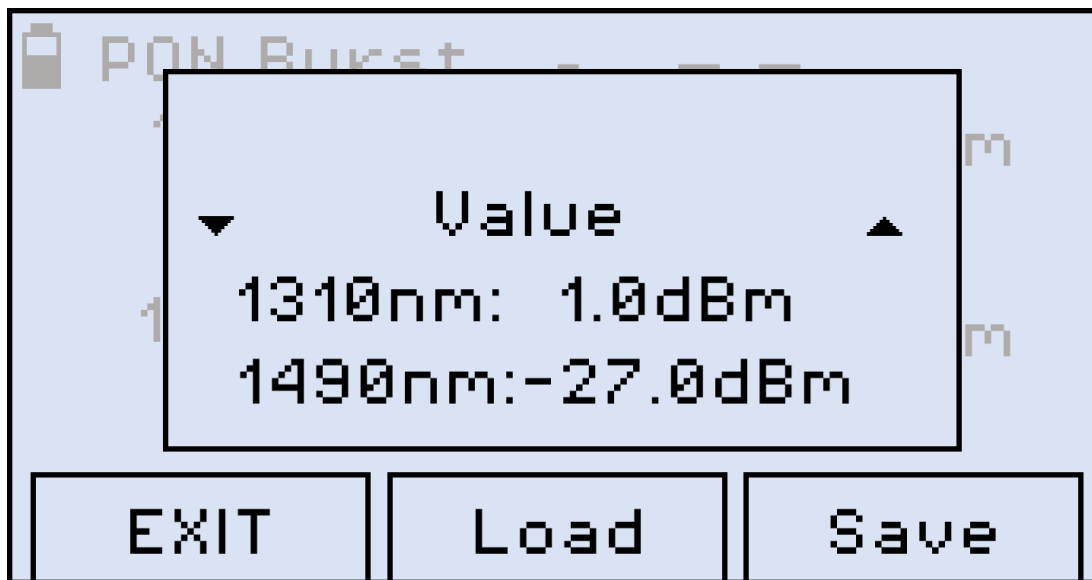


*PON Burst mode measurement results as P/F thresholds, FX80*

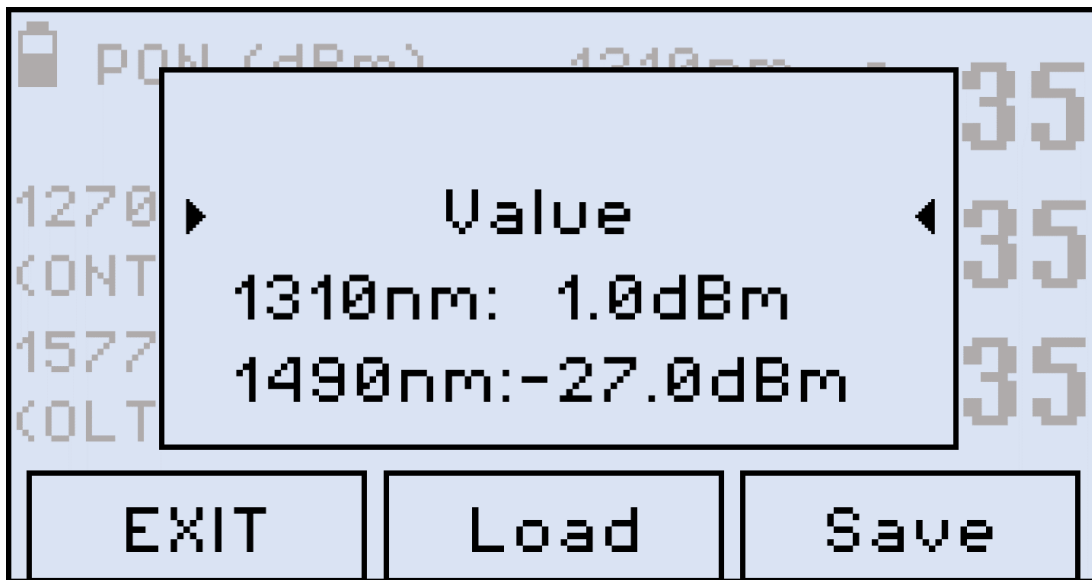


*PON Burst mode measurement results as P/F thresholds, FX81*

To switch back to actual values for the same measurement, press the **[F1] (P/F)** button.



*Switching from thresholds to values for the same measurement, FX80*



*Switching from thresholds to values for the same measurement, FX81*

With the 'Value' line selected >....<, press **[Shift/Enter]** to confirm the selection. The screen returns to representing numeric values for the same measurement.

# 7.0 Broadband Power Measurements

The Broadband OPM functionality is available on the FX80/FX81 and FX81T. The optional Broadband OPM features an InGaAs detector with a wavelength range from 800 to 1700 nm. Power readings can be absolute (dBm or watts) or relative (dB). To measure optical power, insert the test fiber on the OPM test port and press **[MODE]** until the PM1 or PM2 test mode appears at the upper left corner of the display.

## 7.1 Mode for Broadband Power Measurements

**PM (PM1 or PM2):** BB-OPM test mode to measure any incoming optical signal level (CW, 270, 330, 1000, or 2000 Hz) within the wavelength range of 800-1700 nm. Select a calibrated wavelength that matches the incoming source wavelength.

This mode is available for FX80, FX81, and FX81T. The screenshots shown below are from the FX81 device.



*VeEX offers an additional OPM (factory) calibration option on FX8x OPM/OLTS to support all 18 CWDM wavelengths, 1271-1611 nm, upon quote (not field upgradable).*

## 7.2 Broadband Power Measurement Procedure

### 7.2.1 Setting ZERO Level



***Set the ZERO level before first using the test unit for optical power measurements. It is strongly recommended to set the ZERO level BEFORE every new batch of measurements and AFTER measurement conditions have changed.***

To set the ZERO level:

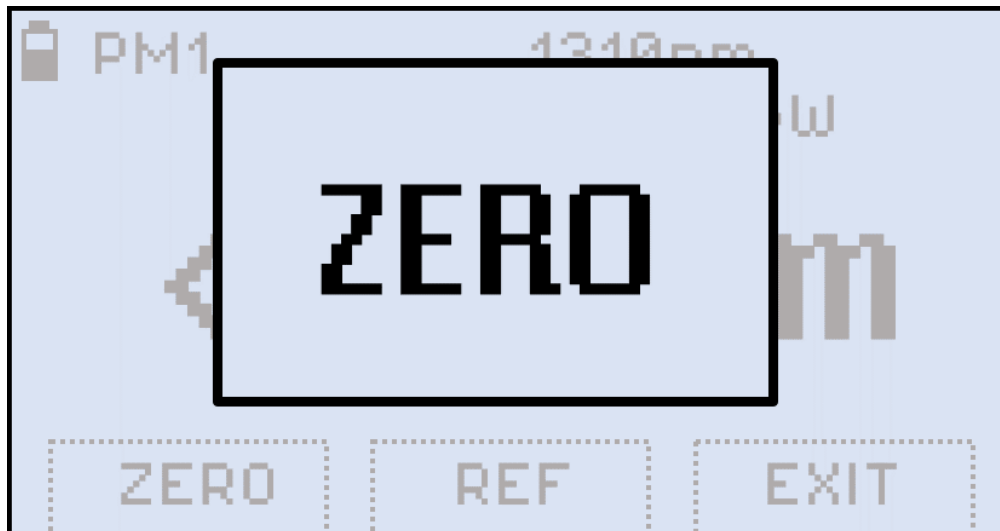
1. Close the dust caps and press the **[MODE]** button until the **PM1** or **PM2** test mode appears at the upper left corner of the display, then press **[F3] (MORE)**.





*PM Test Mode*

2. Press **[F1] (ZERO)**. The **ZERO** notification shows briefly on the display.



*Setting the ZERO level*

The test unit is now ready for measurements.

## 7.2.2 Performing Broadband Power Measurements



*Clean the fiber before connecting it to the device.*



*The screenshots below may differ depending on the device configuration.*

The Broadband OPM is an InGaAs detector with a wavelength range from 800 to 1700 nm. The displayed power readings can be absolute (dBm and watts) or relative (dB). To measure the

optical power in a fiber, insert the test fiber on the OPM test port and press **[MODE]** until the PM1 or PM2 test mode appears at the upper left corner of the display.

To use FX80, FX81, and FX81T for Broadband power measurements, connect the fiber to the OPM port:



*The OPM port is optional for FX80 and FX81. In FX81T the OPM port can be combined with XG-PONT port.*



*Devices with options BB-OPM functionality: FX80/FX81 on the left, FX81T on the right*



**For best results, wait for 15 minutes after the device is powered ON. This is especially recommended in environments with extreme temperature changes.**

The result is then shown onscreen:

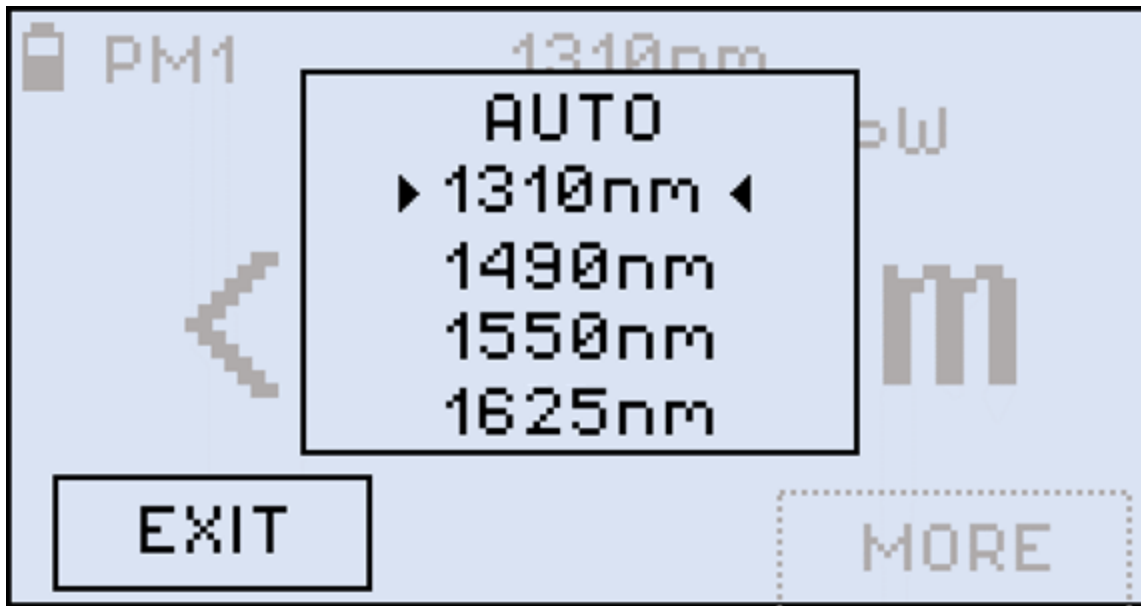


*Results of PM measurement*

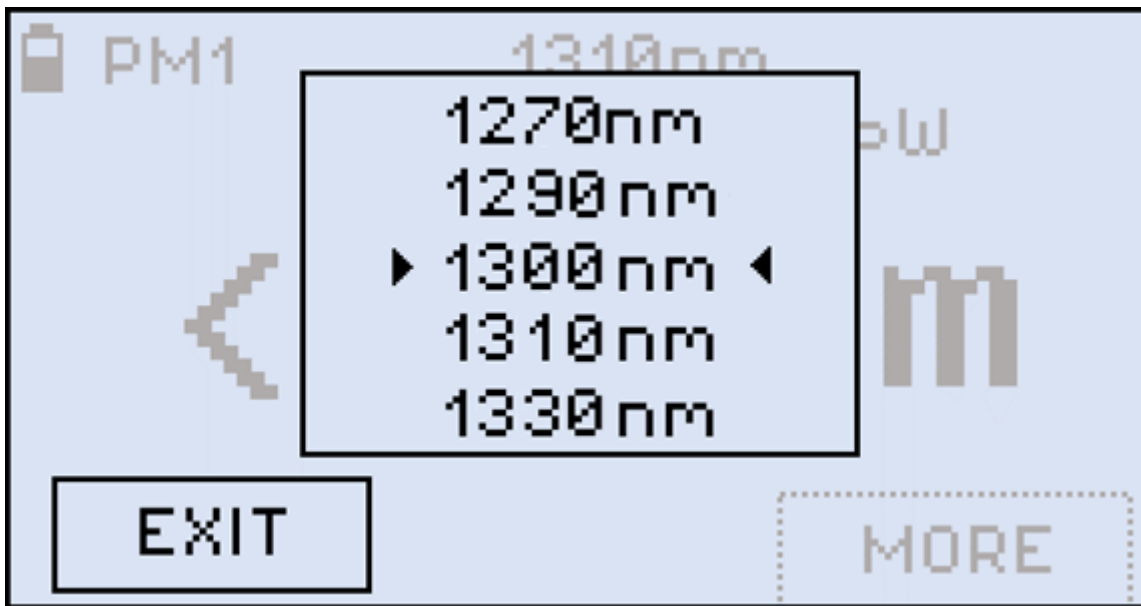


*The fiber under test must have only one wavelength present. If there are several wavelengths present, the measurement results will NOT be valid.*

To change the wavelength, press the **[F1]** button (**WAVE**). The resulting calibrated wavelength list is then shown below:



*Selecting a wavelength for PM measurement*



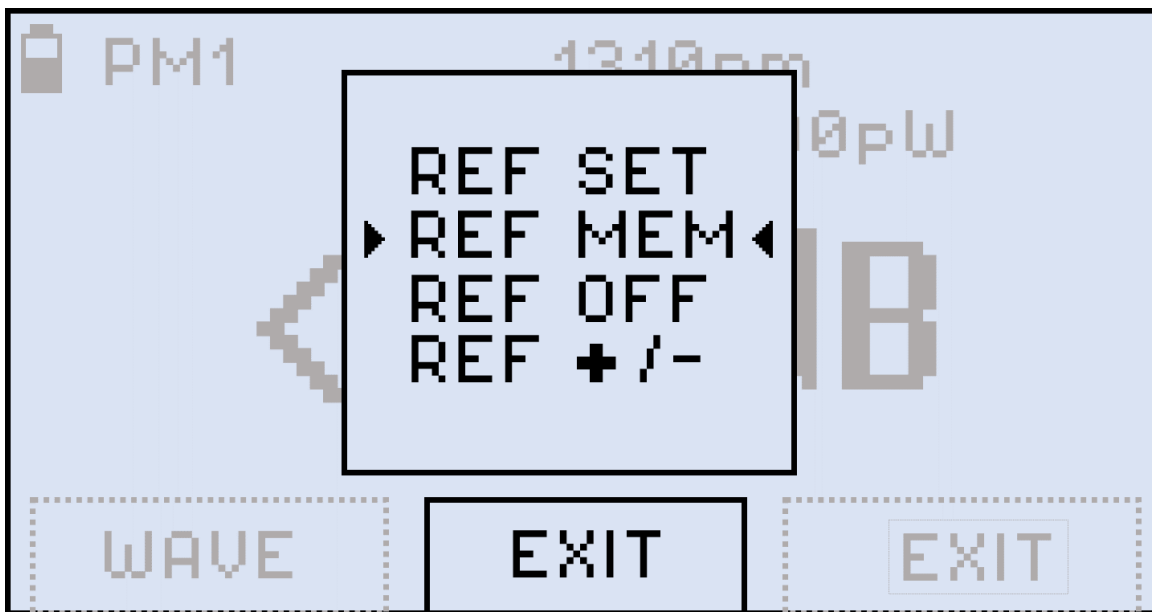
*Selecting a wavelength for PM measurement (CWDM wavelengths calibration)*

Select a wavelength by pressing the **[Up]** and **[Down]** buttons, then press the **[Shift/Enter]** button to confirm the choice. The new wavelength then appears in the top-right corner of the display. To leave the previous wavelength effective, press the **[F1] (EXIT)** button.

## 7.3 Measuring FUT Span Loss

### 7.3.1 Setting Power Reference Level

To measure the FUT (fiber under test) span loss, first set a reference level for each test wavelength. In the **PM1/PM2** mode, press the **[F3] (MORE)** and then press **[F2] (REF)**.



*Selecting a reference option for PM measurement*

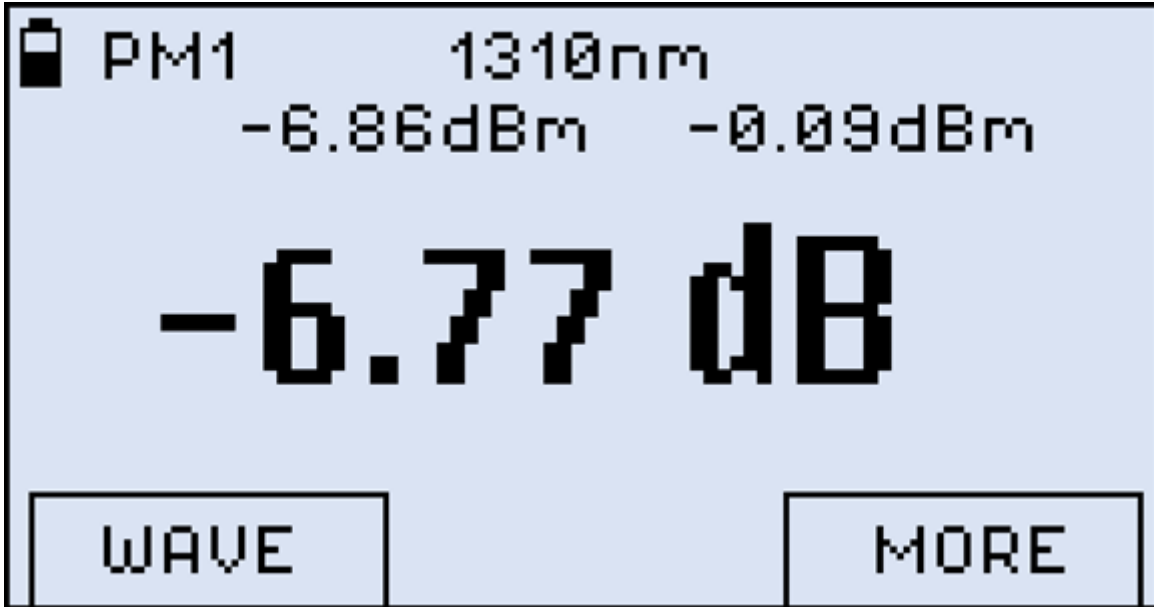
**REF SET** function: saves the current absolute power value as the reference level. Select **REF SET** with the cursor and press the **[Shift/Enter]** button. The value onscreen then changes to 0.00 dB. The current reference level value is shown on the second row to the right (-6.86 dBm in the example below). In older FW versions, **REF FIX** is same as **REF SET**.



*Broadband measurement taken against a reference level*

**REF MEM** function: recalls the saved, initial reference level used on a calibrated wavelength made active from **WAVE [F1]**. This function requires performing the **REF SET** operation on an absolute measurement for that specific calibrated wavelength.

**REF OFF** function: makes the previously stored reference level inactive, return to normal absolute measurement.



*Current power value set as the reference level*



*The initial set reference level value (value saved from REF SET operation) measured is shown at the second row to the right (-0.09 dBm). The current reference level value with the fiber under test is shown at the second row to the left (-6.86dBm). Therefore, the insertion loss is given as  $-6.86 \text{ dBm} - (-0.09 \text{ dBm}) = -6.77 \text{ dB}$ .*

**REF +/-** function: finely adjusts the initially set reference level. Press the **[Up]** and **[Down]** buttons to change the reference level by 0.01. This function is useful to add or subtract any known connector (adapter) or splice loss(es) in the system under test. To set the adjusted level as reference, press **[Shift/Enter]**. To exit without setting, press **[F3] (EXIT)**.

### 7.3.2 Saving Measurement Results

To save the result, press the **[Shift/Enter]** and **[Up]** buttons simultaneously. The result is then saved with the comment (note) from the previously saved result.

### 7.3.3 Using WaveID

If the fiber under test carries a signal with WaveID details, select **[ AUTO ]** under F1 (WAVE) on any FX8x with BB-OPM port. Then, the optional BB-OPM determines the wavelength automatically.

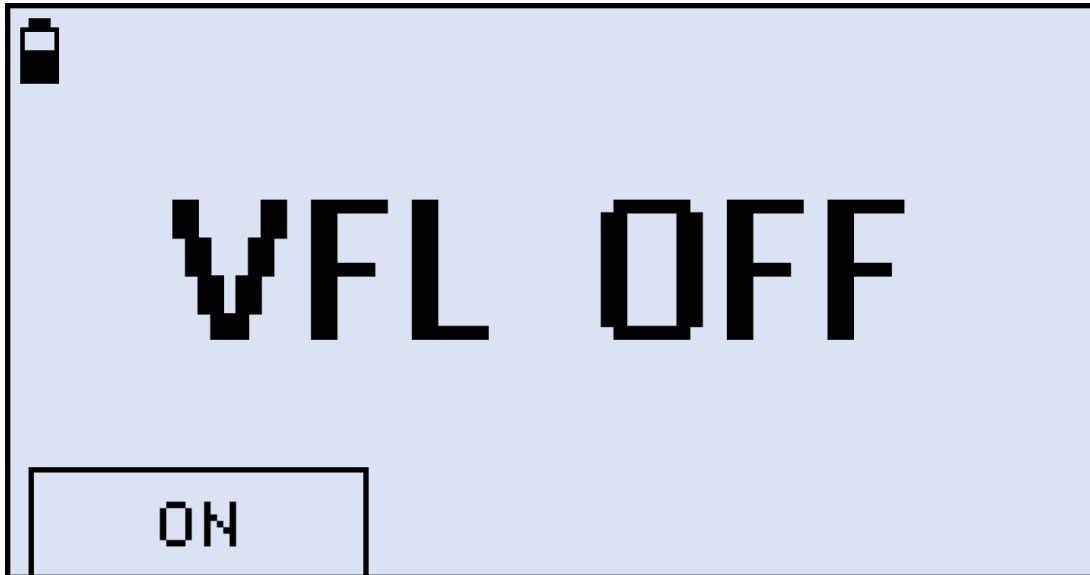


*If the **[ AUTO ]** option for a signal without WaveID or modulated is selected, the  $\lambda$  value goes blank and the measurement results are NOT valid.*

## 8.0 Visual Fault Locator (FX80)

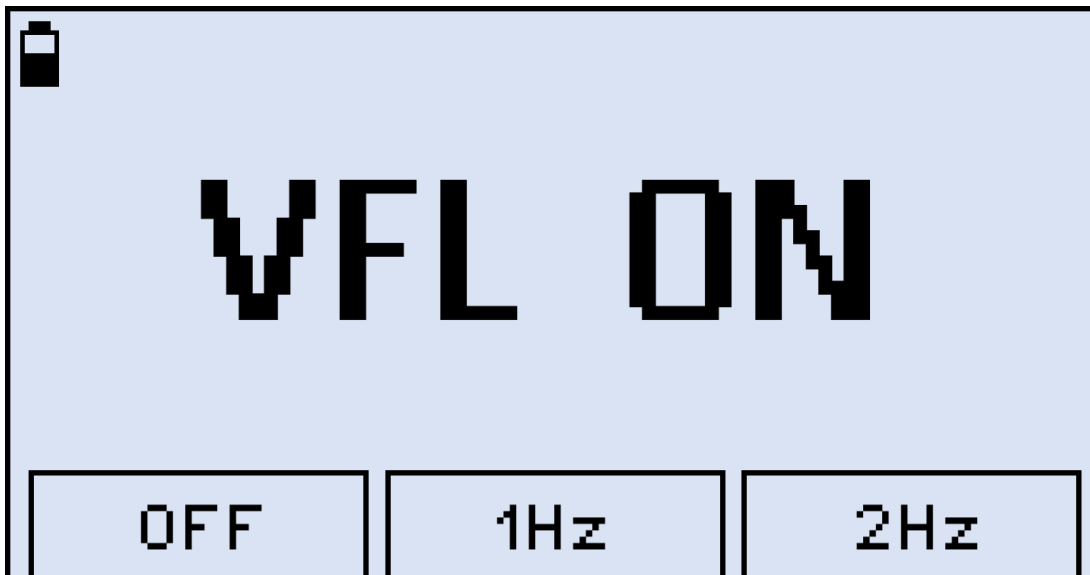
The FX80 can be equipped with a Visual Fault Locator (VFL). To test fiber continuity:

1. Connect the fiber to the VFL port.
2. Press the **|MODE|** button until get the VFL mode appears (see the Figure below).



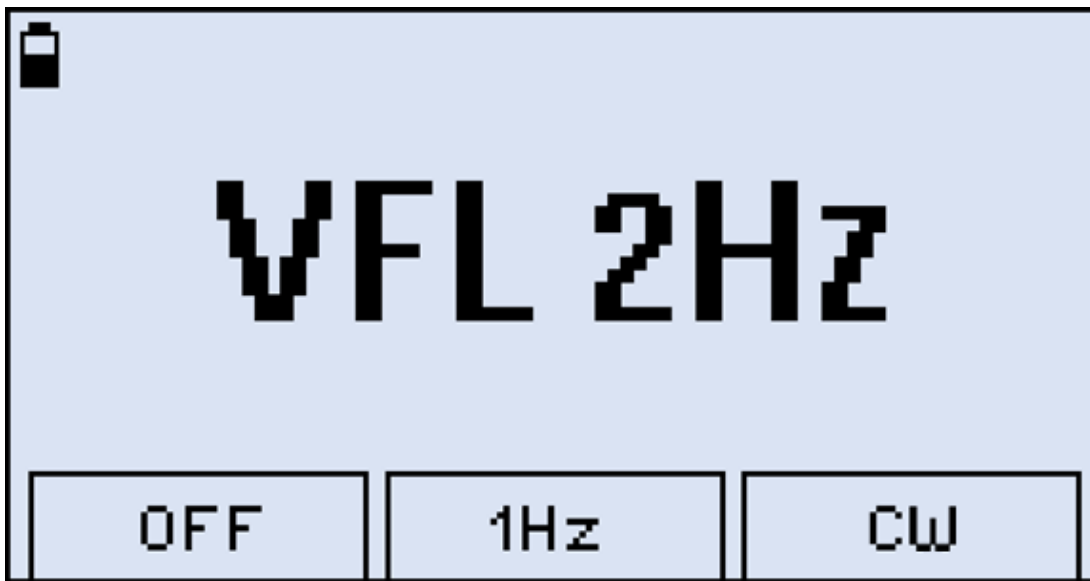
*Starting VFL mode*

3. Press the **|F1| (ON)** button to begin the test.



*Starting VFL testing, continuous light*

4. To modulate the light (1 or 2 Hz), press **[F2] (1Hz)** or **[F3] (2Hz)**, respectively. The pressed button then changes to continuous wave mode (**CW**).



*VFL testing, modulated light*

5. To switch from the VFL mode to another mode, press the **[MODE]** button.

## 9.0 Viewing Measurement Results (Read Mode)

To view measurement results, press the **[MODE]** button until the **Read** mode is displayed in the upper left corner of the display. Scroll up or down the records using the **[Up]** and **[Down]** buttons or go page up and page down by pressing **[F1]** and **[F2]**.



*Viewing Measurement Results (Read mode)*



*The FX80 can be optionally equipped with Bluetooth. If so, the Bluetooth sign appears in the top right corner in the **Read** mode.*

## 9.1 Editing Notes to Measurement Results

Upon initial use, every measurement is appended with the 'COMMENT###' note, where ### is the index incremented by "1" with every measurement. This note formatting is convenient when measuring several fibers within one batch or one splitter.

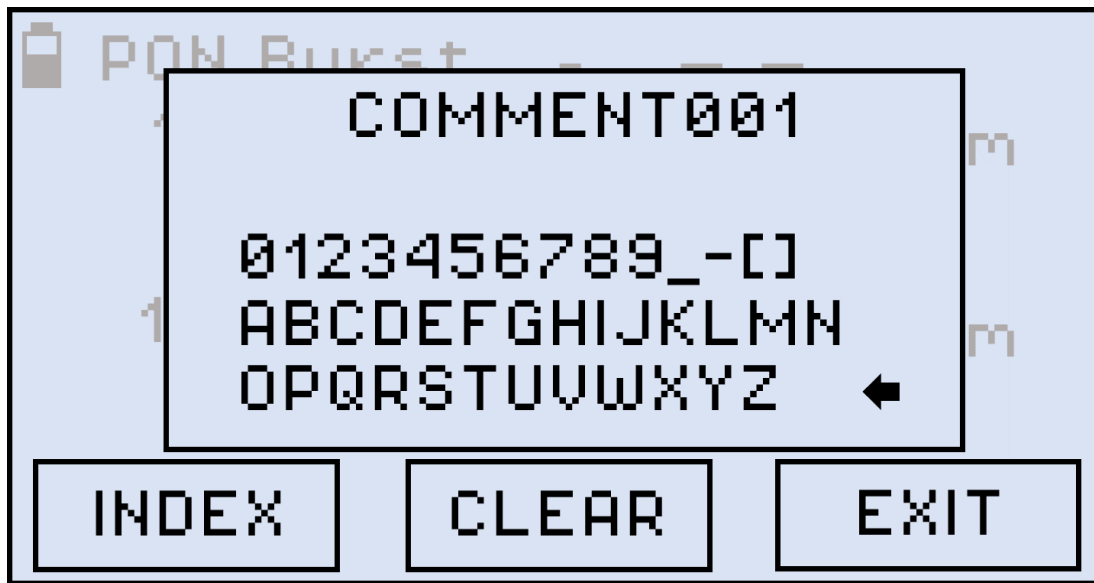


*After editing a note, the updated text will apply to the next measurement.*


### To edit a note:

1. From the **Read** mode screen, press the **[F3] (MORE)** button and then **[F1] (NOTE)** button. The screen shown below then appears.





*Editing comments to future measurement results*

2. Press **|INDEX|** until the cursor in the top line starts flashing - then use **|Up|** and **|Down|** buttons to select the index number position.
3. Press **|COMMENT|** again to go to the list of symbols in the lower section. The active symbol then gets highlighted. Use the **|Up|** and **|Down|** buttons to select another symbol if necessary.
4. Press the **|Shift/Enter|** button to insert the selected symbol into the required position on the top line. The comment can include up to 10 symbols in total, with 7 symbols reserved for the comment text and 3 numbers for the comment number.
5. Press **|CLEAR|** to reset the index position to "000" when **|INDEX|** is selected or erase the whole note when **|COMMENT|** is selected.
6. To erase a symbol in the note, place the cursor after that symbol, then select the left arrow  and execute the command by pressing the **|Shift/Enter|** button.
7. To save the note for the next measurement and exit the **NOTE** mode, press the **|F3| (EXIT)** button.

To save the current measurement results with the current note, press the **|Shift/Enter| + |Up|** button combination (**Save**). The **Saved** notification is briefly displayed onscreen, and current measurement results with the current note are saved in the device's memory.



*Once the note is saved with measurement results, it cannot be edited.*

# 10.0 Downloading Test Results to a PC

1. To transfer test results and create a report, download and install LTSync PC software from the VeEX website. Please visit <https://www.veexinc.com/products/ltsync> for details.

VePAL TX/MTX/WX	VePAL UX400	VePAL UX400plus	MTT Family	MTTplus Family	RXT-1200 Family	AT & CM Families	VX1000 VoIP Server	e-Tools
VePAL BX Family	VePAL CX Family		CX180 R & F Family		Optics Family	<b>Fiberizer</b>	VePAL LX Family	VePAL MX Family

Fiberizer Desktop			
Release	Platform	Documents	Date
<a href="#">Release 10.10.78.8293</a>	All	<a href="#">Release Notes</a>	27-Aug-2019

Fiberizer Desktop Plus			
Release	Platform	Documents	Date
<a href="#">Release 1.3.1</a>	All	<a href="#">Release Notes</a>	19-Sep-2019

Fiberizer Scope			
Release	Platform	Documents	Date
<a href="#">Release 1.0.121.5927</a>	All	<a href="#">Release Notes</a>	29-Nov-2019

Fiberizer LTSync			
Release	Platform	Documents	Date
<a href="#">Release 1.0.829.8295</a>	LTSync for FX40/FX45/FX50/FX80	<a href="#">Release Notes</a>	27-Aug-2019

VeEX Customer Portal Software Releases Webpage

2. For detailed operating instructions, please refer to the corresponding manuals. More information on Fiberizer Cloud and LTSync can be found at the VeEX website (<https://www.veexinc.com>).

## 10.1 Installing the FX-8x USB Driver

A digitally signed Windows USB driver is required for connecting to the FX8x series. The driver is embedded in the LTSync software and will install automatically in the background when the software is installed. If for any reason, the USB driver installation fails, it may be necessary to install the driver manually. In such event, please follow the procedure below.



*If the operator has used FX-4x series and FX-8x series optical power meter with LTSync to download results on the current PC system in the past, then this step can be **ignored**.*

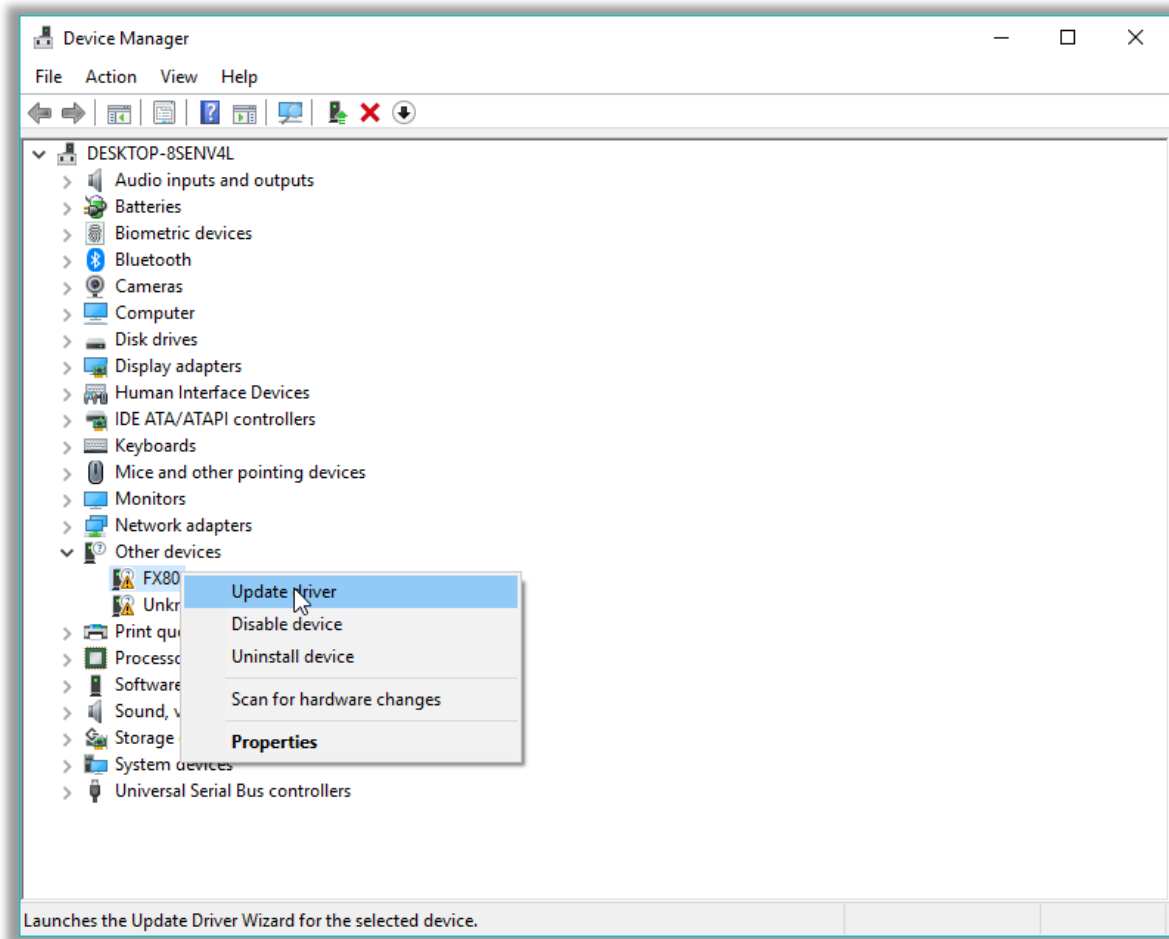
### To install the USB driver:

1. Connect the VeEX power meter to the PC using a USB-A to micro-USB cable.
2. Launch Windows Device Manager and check for FX8x in the Other devices list.



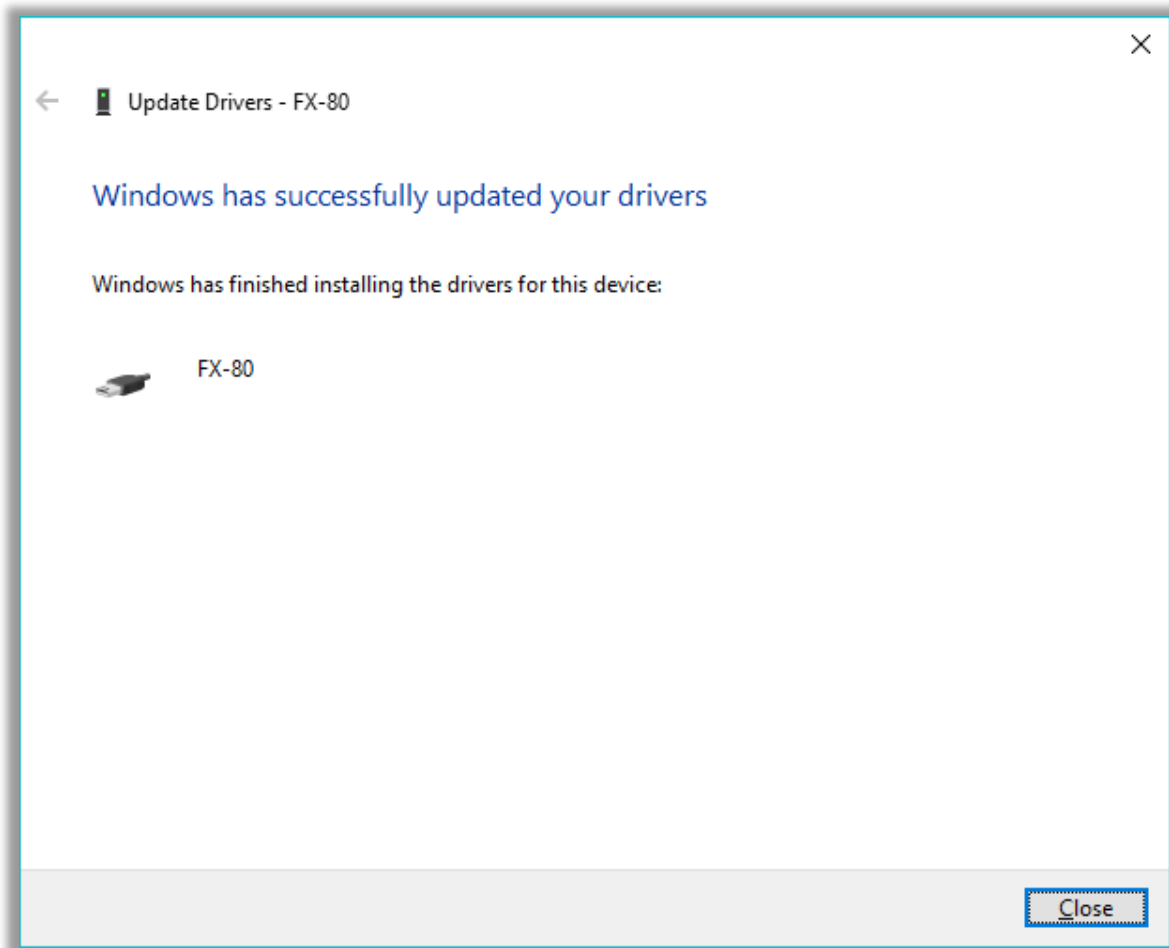
*FX8x will be flagged with exclamation mark if the device driver is not installed.*

3. Download the driver from <https://www.veexinc.com/ProductCategory/FiberOptics>, the VeEX website.
4. In the Windows Device Manager, right-click the FX8x item, then select **Update driver**.



*Installing the driver for FX8x*

5. Select **Browse my computer for driver** software, define the path where the downloaded driver is to be saved, and then click **Next**. The driver installation begins, A new window appears when the driver has been updated successfully.



*The driver for FX8x successfully installed*

## 10.2 Transferring Measurement Results to a PC

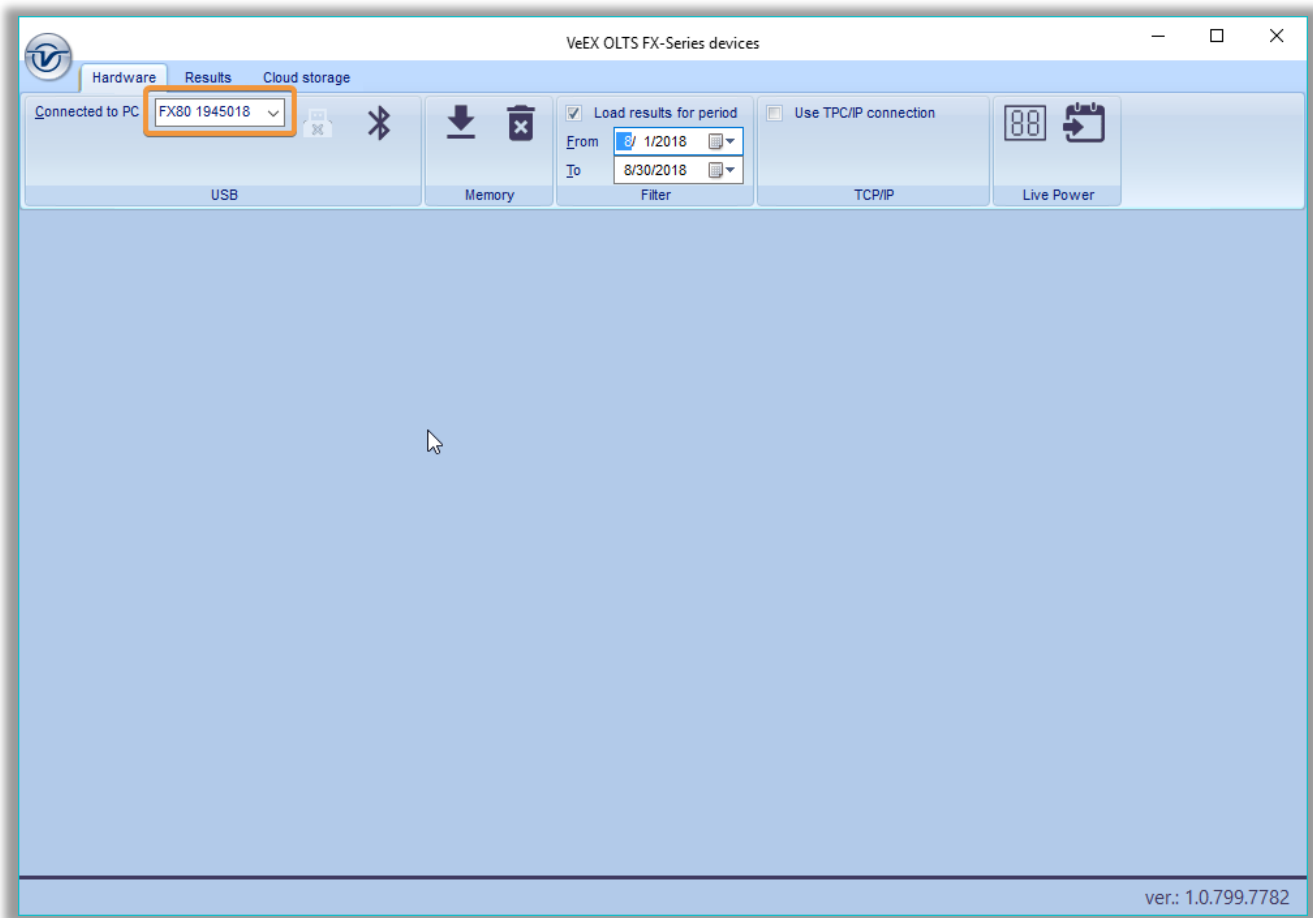
To create a report, first transfer test results to a Windows PC using LTSync software. This can be done using a micro-USB cable or via optional Bluetooth connection.




*To transfer the measurement results via the micro-USB cable, install the USB driver (see [Section 10.1. Installing the FX-8x USB Driver](#)). For Bluetooth transfer, no driver is needed.*

### 10.2.1 Transfer Results Using Micro-USB Cable

To transfer measurement results to the PC using the micro-USB cable, connect the provided cable to a compatible power meter and to the PC. The figure below shows that a device is connected and the unique product ID.



*FX80 is connected to PC in LTSync, its serial number is recognized by the program*

To view the measurement results onscreen, click the [ **Download** ] button . Results will appear in a table, as shown in the figure below. Use the scroll bar to view all results.



*For more information on using LTSync, see the LTSync User Manual at [www.veexinc.com](http://www.veexinc.com).*

VeEX OLTS FX40/45/50 - FX80_318617_2017-11-15 19_12							
Attributes		Selection		Operations			
Job ID	Tuesday	Cable length	28 km	<input type="checkbox"/> 850 nm	<input type="checkbox"/> 1550 nm		
Cable ID	TwinPeaks			<input type="checkbox"/> 1310 nm	<input type="checkbox"/> 1625 nm		
Fiber ID	012-XYZ			<input type="checkbox"/> 1490 nm	<input type="checkbox"/> 1650 nm		
PON (burst) 3CM 18 2017-11-15 18:14							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:14	A-B	-54.43 dBm	1310 nm	
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:14	A-B	-113.13 dBm	1490 nm	
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:14	A-B	-76.10 dBm	1550 nm	
PON (CW) 03CM 19 2017-11-15 18:24							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-54.43 dBm	1310 nm	FAIL
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-113.13 dBm	1490 nm	FAIL
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-100.35 dBm	1550 nm	FAIL
PON (burst) 03CM 20 2017-11-15 18:24							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-54.43 dBm	1310 nm	FAIL
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-113.13 dBm	1490 nm	FAIL
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:24	A-B	-88.48 dBm	1550 nm	FAIL
PON (burst) 03CM 21 2017-11-15 18:58							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:58	A-B	-26.95 dBm	1310 nm	FAIL
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:58	A-B	-8.43 dBm	1490 nm	PASS
	<input checked="" type="checkbox"/>	PWR	2017-11-15 18:58	A-B	-70.46 dBm	1550 nm	FAIL

**FX80 Measurement results table**

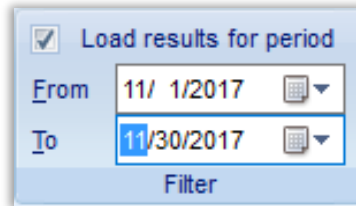
VeEX OLTS FX-Series devices - FX80_2822319_2020-03-31 15_47_36							
Attributes		Selection		Operations			
Job ID	INPRSP12444	Test ID	FX81_2822319_21	<input type="checkbox"/> 850 nm	<input type="checkbox"/> 1550 nm		
Cable ID	001	Cable length, km	0.000	<input type="checkbox"/> 1310 nm	<input type="checkbox"/> 1625 nm		
Fiber ID	001ptcd	Use VeEX workspace	FX-80_#2822319	<input type="checkbox"/> 1490 nm	<input type="checkbox"/> 1650 nm		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-29.39 dBm	1310 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	2.23 dBm	1490 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-21.47 dBm	1550 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-6.28 dBm	1270 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	2.35 dBm	1577 nm	
XGPON (burst) 10GPON 014 2020-03-17 03:42							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-41.15 dBm	1310 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	2.23 dBm	1490 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-34.22 dBm	1550 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-6.51 dBm	1270 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	2.35 dBm	1577 nm	
XGPON (burst) 10GPON 015 2020-03-17 03:42							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-29.69 dBm	1310 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	2.23 dBm	1490 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-21.52 dBm	1550 nm	
	<input checked="" type="checkbox"/>	PWR	2020-03-17 03:42	A-B	-6.25 dBm	1270 nm	

**FX81 Measurement results table**

To prepare measurement results for a report, enter the relevant information into the fields in the **Attributes** section (see, for example, the Figure above).

The displayed results can be filtered by the test group and/or wavelength by selecting the desired results to be worked with, in the main viewing area (see, for example, the Figure above).

To download results of a certain period, go to the **Hardware** tab and select the **[Load results for period]** checkbox. This brings the date range form (see the Figure below).



*Filtering measurement results by time*

To delete a row of results, select its checkbox, then click the **[Delete row]** button (🗑️, see it, for example, in the Figure above). Several rows of test results can be selected and deleted at the same time.

To move a row to another group, highlight the row by clicking it, after which the border around the row will turn orange. Drag-and-drop this row to another group if needed. Alternatively, highlight the row, click the **[Move row]** button (📁, see it, for example, in the Figure above), then highlight the desired group.



*Only one row at a time can be moved.*

*A row can be moved to another group only if there is no measurement with that wavelength in the group*

To save the measurement results to a PC, click the **[ Save to PC]** button (💾).

To erase all test results from the FX80/FX81/FX81T memory, select the **Hardware** tab and click the **[ Erase all memory]** button (✖).

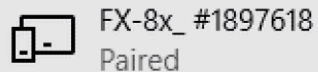
## 10.2.2 Transferring Measurement Results via Bluetooth

To transfer measurement results to the PC or mobile device via Bluetooth, the FX80/FX81 must be equipped with Bluetooth option.

For instructions on pairing the unit via Bluetooth, see the [FX8x Test Results Transfer LTSync Quick Guide](http://www.veexinc.com) available from the FX80/81/FX81T product page on the website at [www.veexinc.com](http://www.veexinc.com).

### To transfer results via Bluetooth:

1. Pair the devices with the standard Bluetooth pairing procedure. If paired, the FX80/FX81 should appear in the **Bluetooth & Other Devices** list in the Windows X **Device Manager**. See the icon example below, taken in Win10:

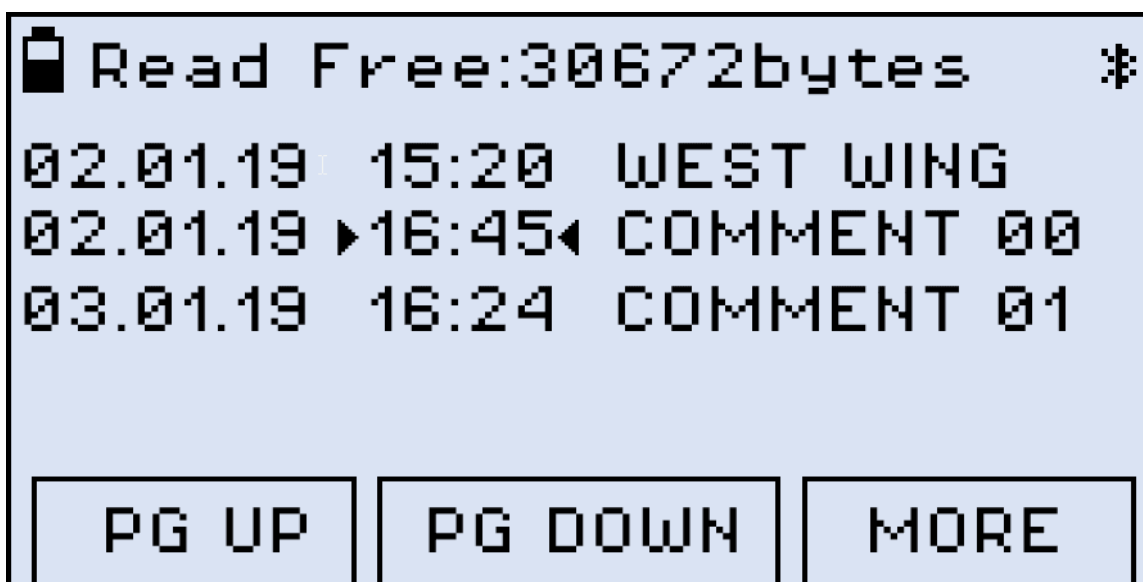


*FX-80 paired and displayed in Bluetooth & Other Devices list (Win10)*




**Please note that every FX8x series (FX80, FX82, FX84, FX85, etc.) are shown as FX8x; however, their serial numbers are different.**

2. Launch **LTSync** on the PC.
3. Power on the FX80/FX81/FX81T and enter the **[Read]** mode. The Bluetooth sign appears at the top right corner of the screen (see below).



*Read mode with Bluetooth*

4. In LTSync, select the Hardware tab and click the Bluetooth button . The FX80/FX81 serial number appears in the **Connected to PC** field. If there are several devices connected to the PC via Bluetooth, select the desired device in the drop-down list. After the FX80/FX81/FX81T and PC are connected, the Bluetooth sign inverts its colors (see below).





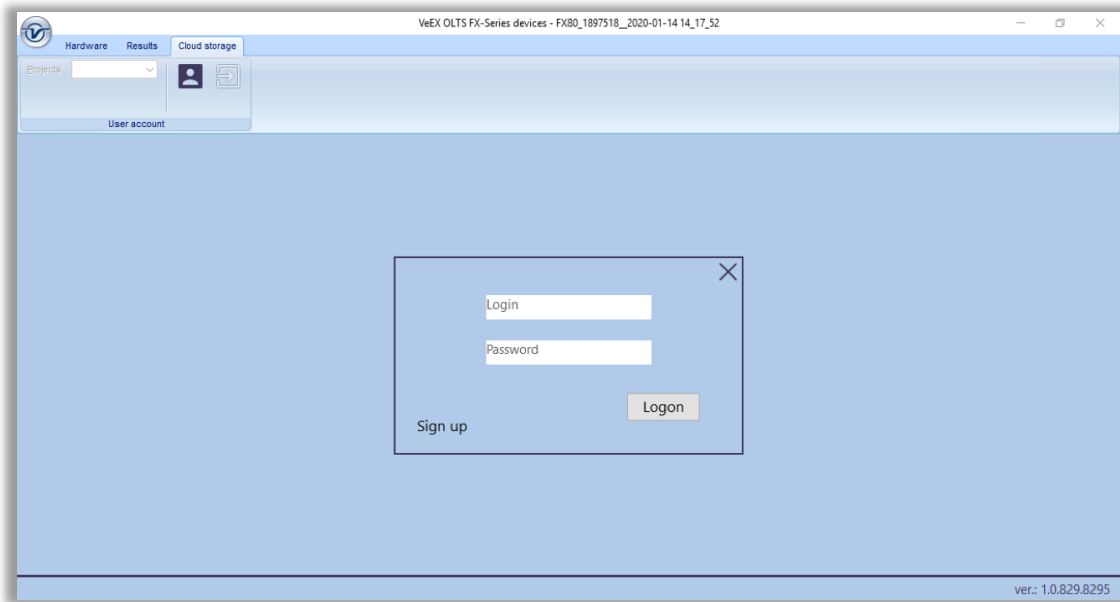
*FX80 and PC connected, shows Bluetooth sign with inverted colors*

5. To transfer measurement results from the FX80/FX81/FX81T to the PC, click the **Download** button (📶) in the **Memory** section of LTSync.

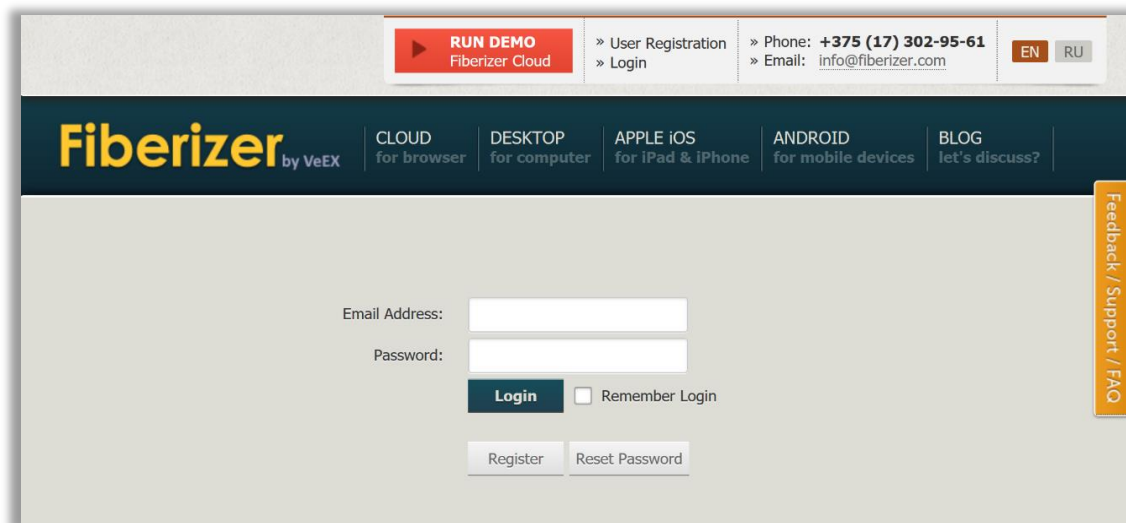
The time it takes to transfer results depends on the amount of data that is saved.

# 11.0 Uploading Measurement Results to Fiberizer Cloud

The Fiberizer Cloud account can be accessed within the LTSync program. To do this, go to the Cloud storage tab and click the **Log in to Fiberizer Cloud** button (👤), then enter credentials in the resulting form.



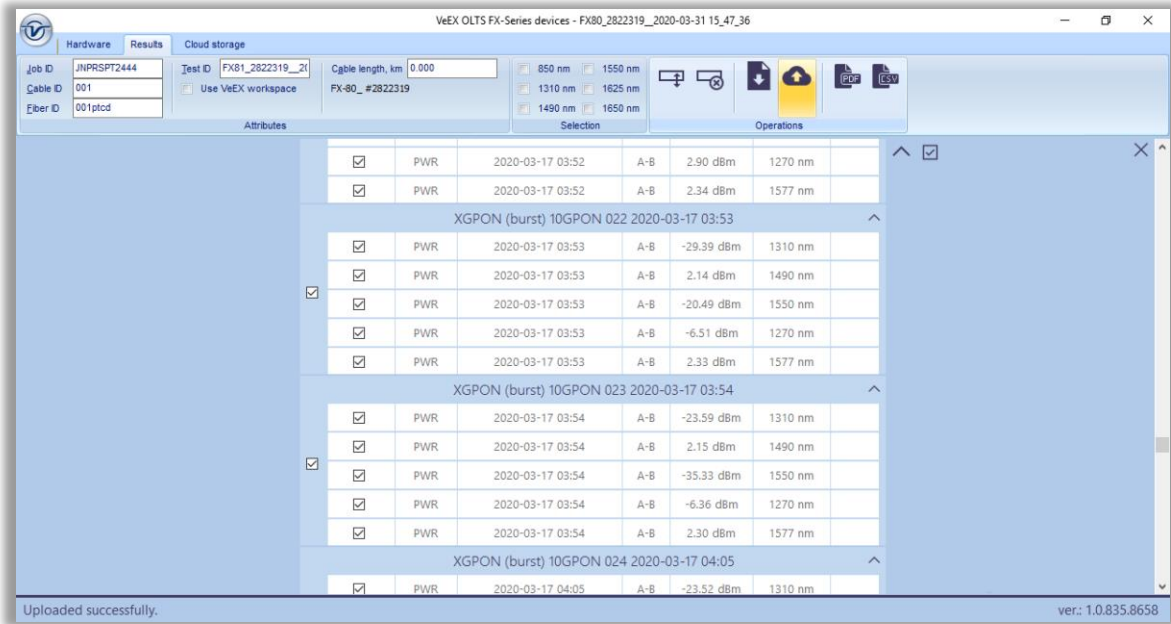
*LTSync Fiberizer Cloud Login Profile*



*Fiberizer Main website registration window after clicking "Sign Up"*

If no Fiberizer Cloud account exists, click the **User Register in Fiberizer Cloud** button (👤), then register there.

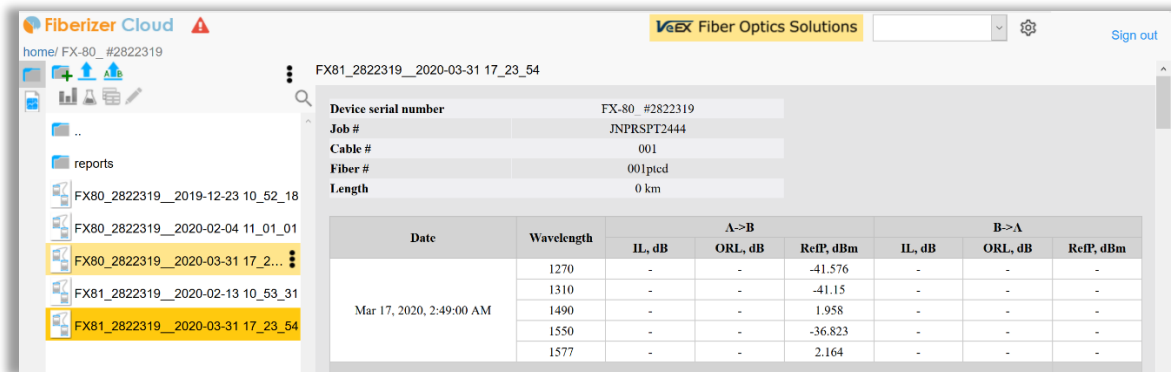
To upload measurement results to Fiberizer Cloud, go to the **Results** tab and click the **Upload to Fiberizer Cloud** button (📁). Then **LTSync** creates a folder in the Fiberizer Cloud account named after the connected device (for example, **FX8x 2822319**) and uploads measurement results into this folder.



*Fiberizer Cloud Upload button (highlighted in orange) with previous successful upload*



The status bar at the bottom left shows the status of the current operation. The measurement results are saved as an **.oxtls** file.



*Measurement results uploaded to Fiberizer Cloud*

To log out from the Fiberizer Cloud account, go to the **Cloud storage** tab and click the **[Log out from Fiberizer Cloud]** button (🚪).

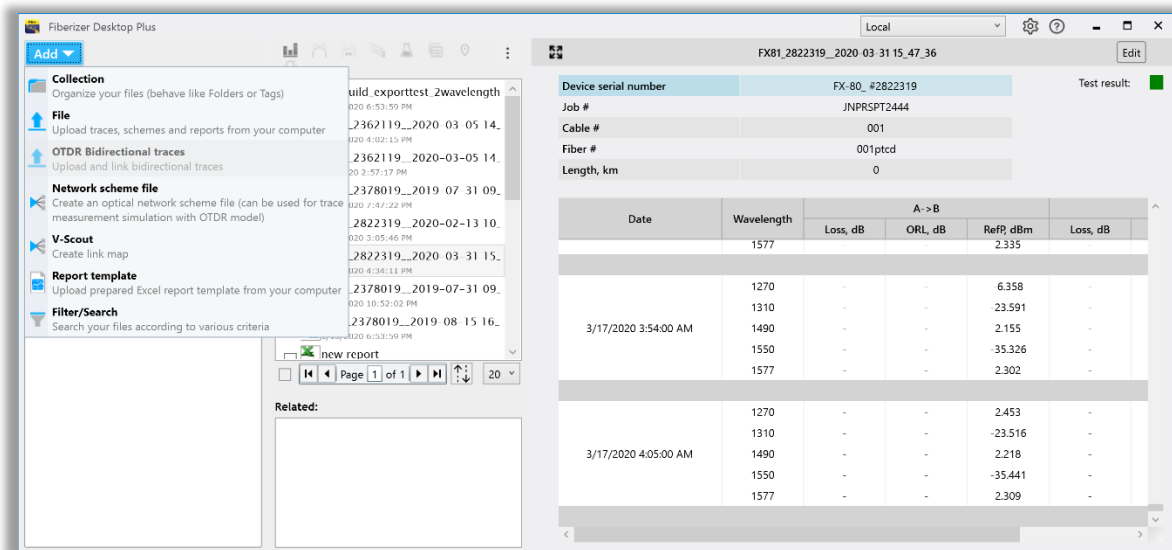
# 12.0 Uploading Measurement Results to Fiberizer Desktop Plus



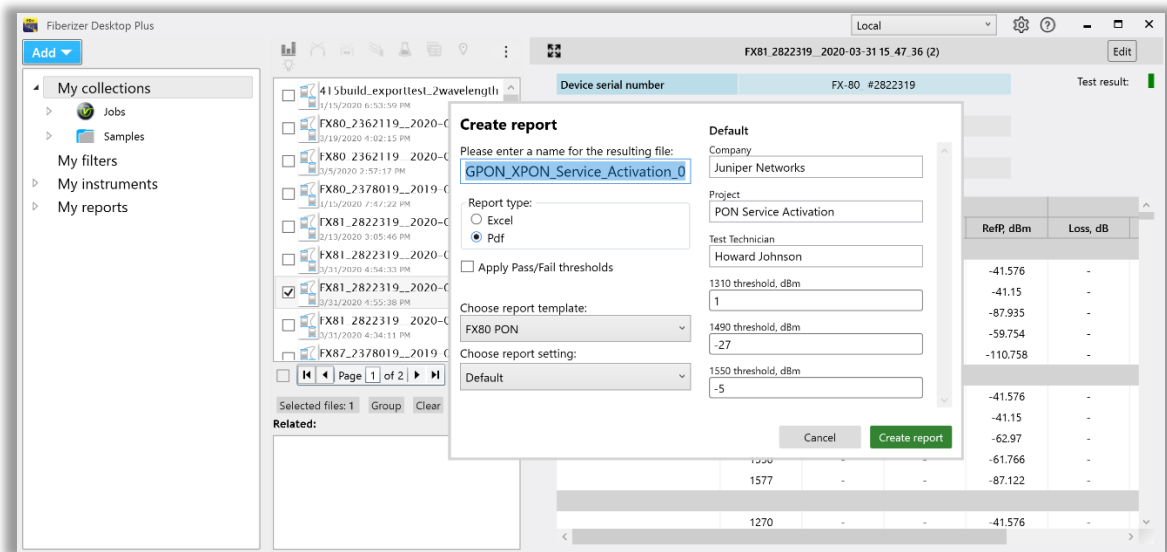
Refer to Section [10.0. Downloading Test Results to a PC](#) for the VeEX Customer Portal Software Releases Webpage instructions to download the latest Fiberizer Desktop Plus version.

Use Fiberizer Desktop Plus software to upload measurement files from oxlts, sor, etc formats and perform advanced post-processing results: managing and merging results, generate pdfs/excel files, and other functionalities explained more in detail in its dedicated manual.

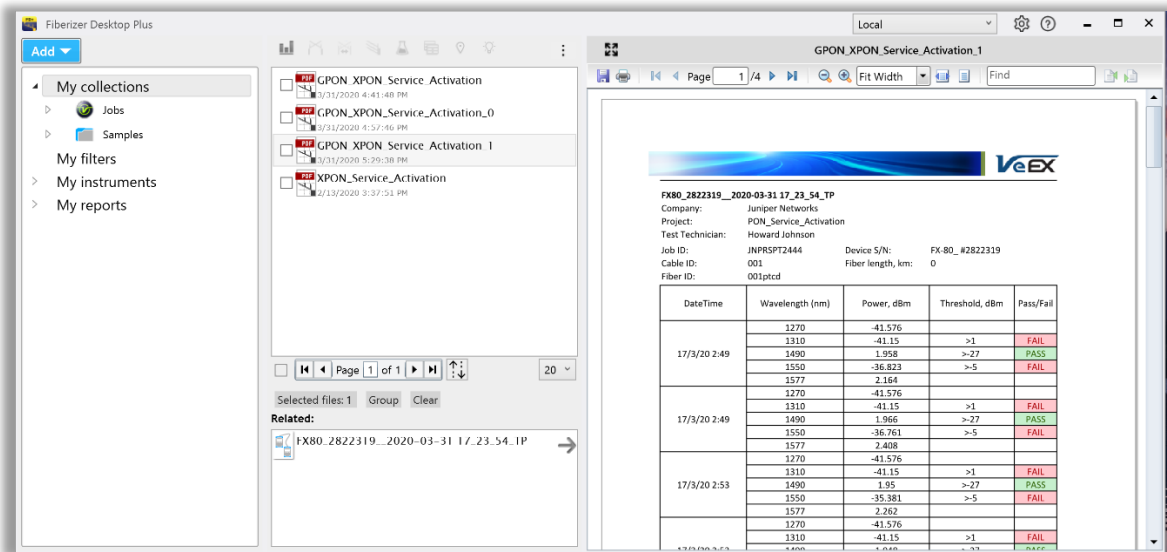
The screenshots below show the procedure to upload measurement files to Fiberizer Desktop Plus repository window and generate PDF/Excel reports.



*Measurement results uploaded to Fiberizer Desktop Plus – File Upload*



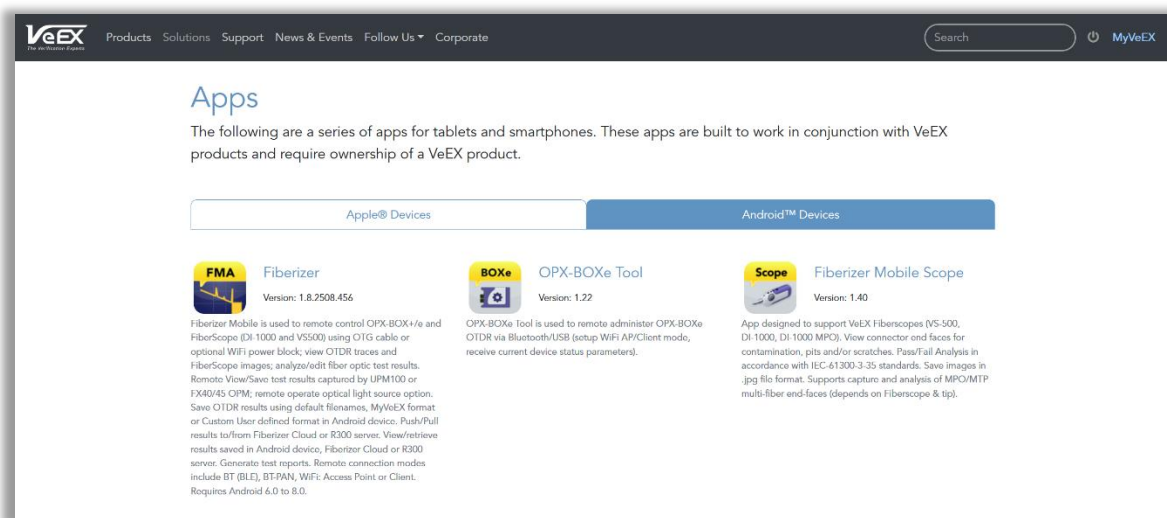
**PDF/CSV Report Generation**



**PDF Report Generated**

## 12.1 Downloading Measurement Results to Fiberizer Mobile OLTS (FMOLTS) for Android

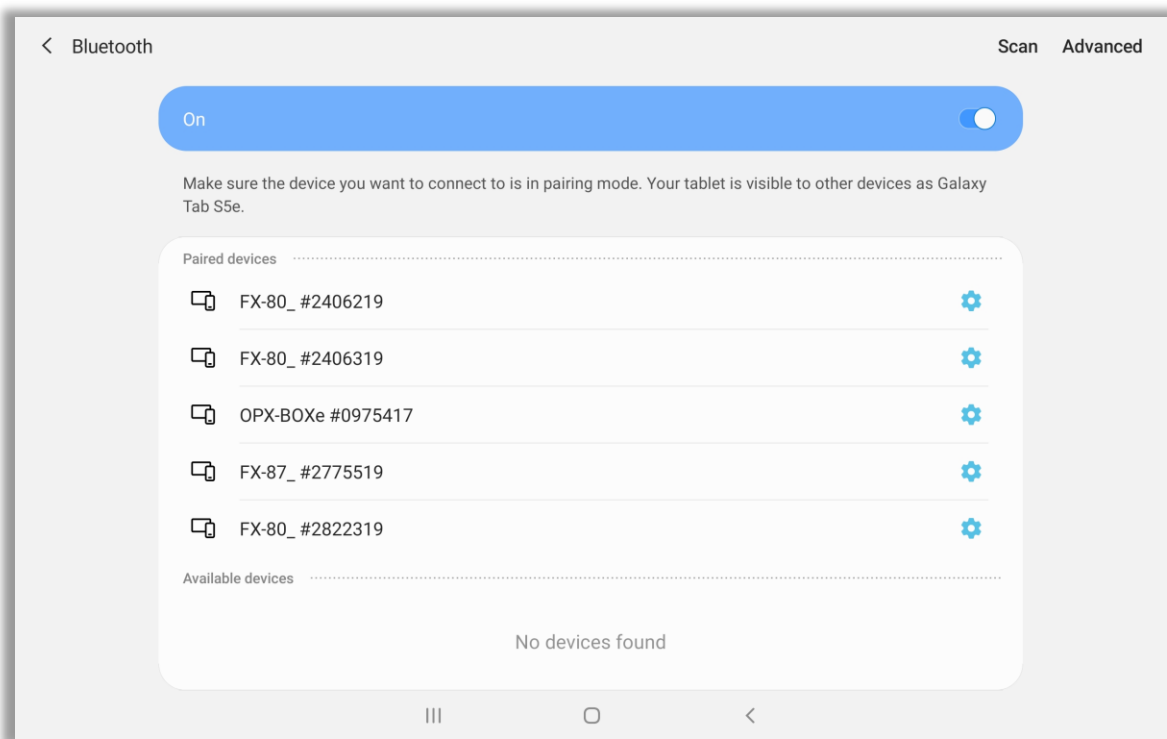
The Fiberizer Mobile OLTS Android app is available on Google Play and the VeEX Apps page at <https://www.veexinc.com/Apps> under Android devices.



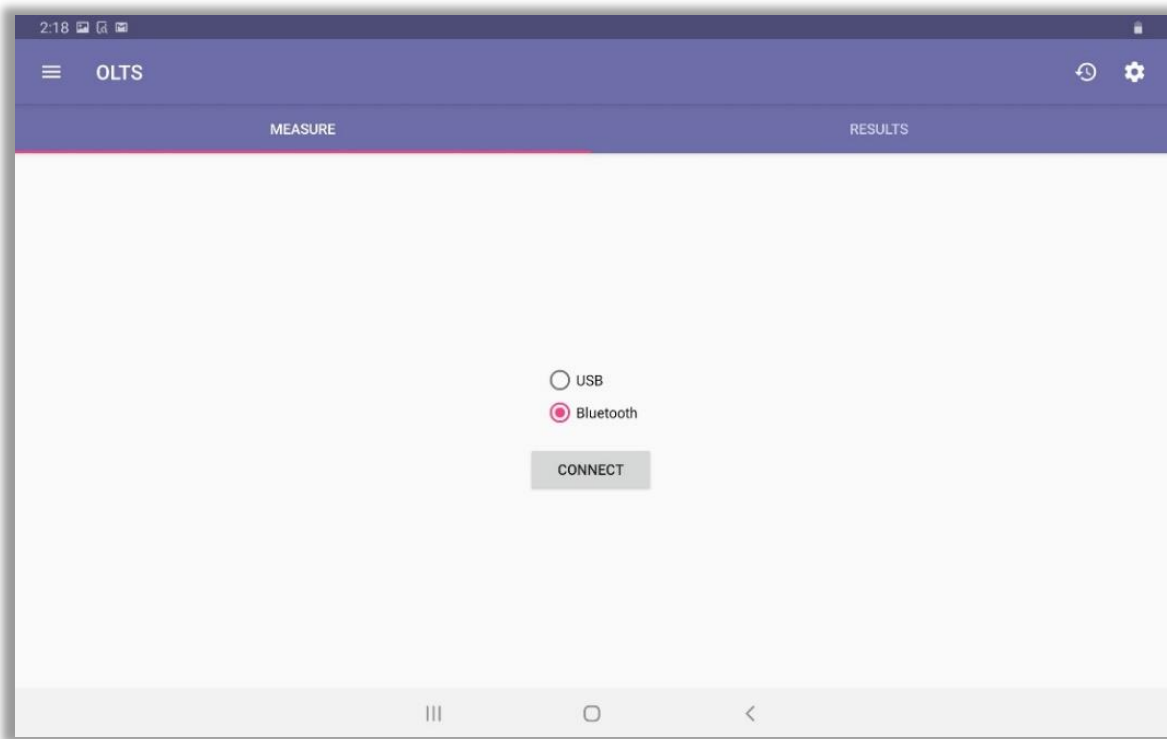
### VeEX Apps Home Page

Use the FMOLTS Android application to transfer test results from FX-4x and FX-8x series OPMs via Bluetooth or USB connection (using VeEX compatible OTG cable).

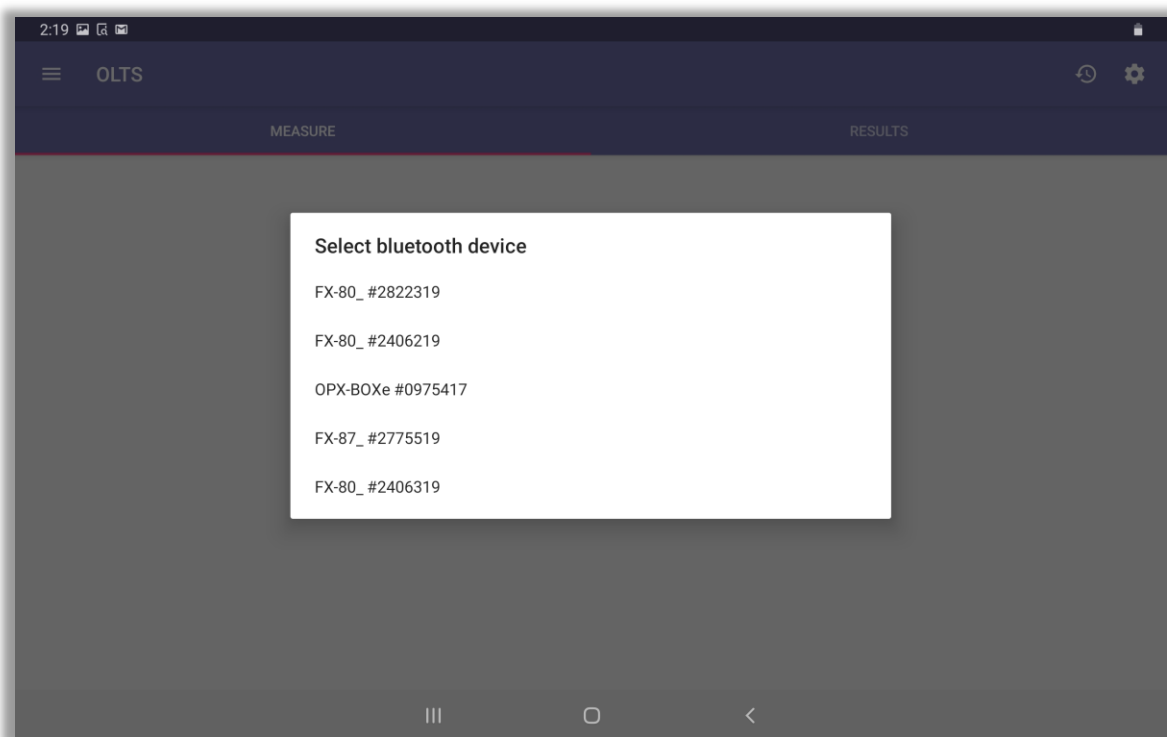
The screenshots below show the procedure to transfer results from FX80/FX81 to the Android mobile device to be saved to mobile device's storage and/or uploaded to Fiberizer Cloud.



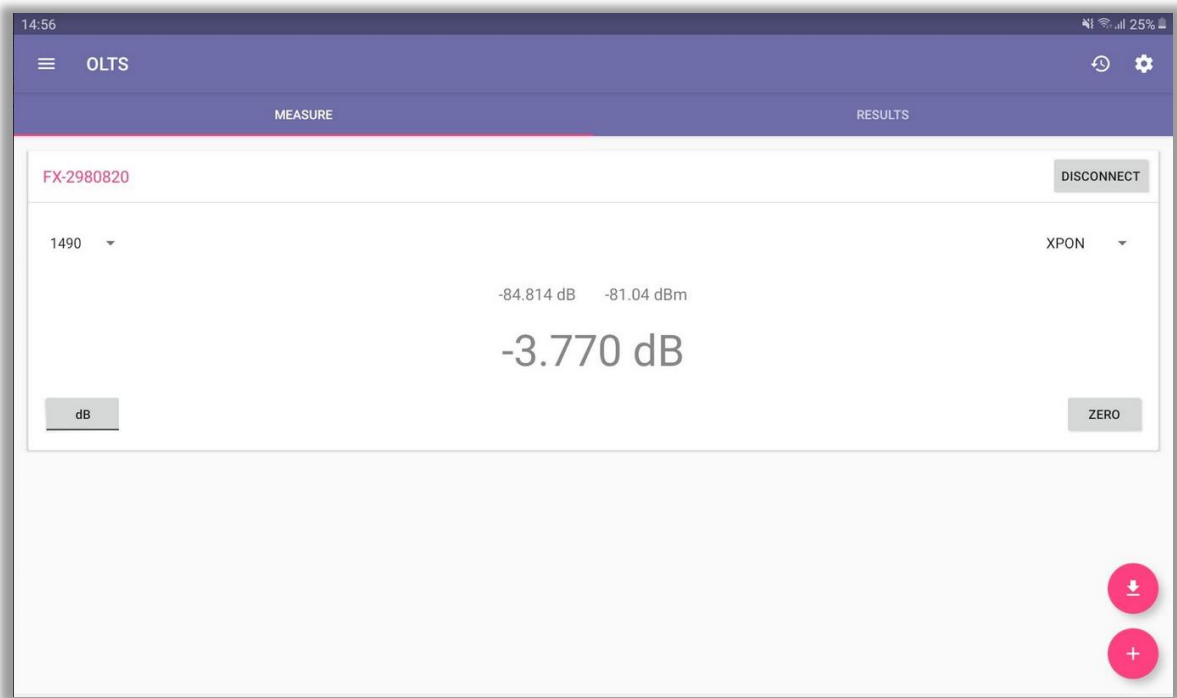
### Android OS Settings -> Bluetooth Pairing



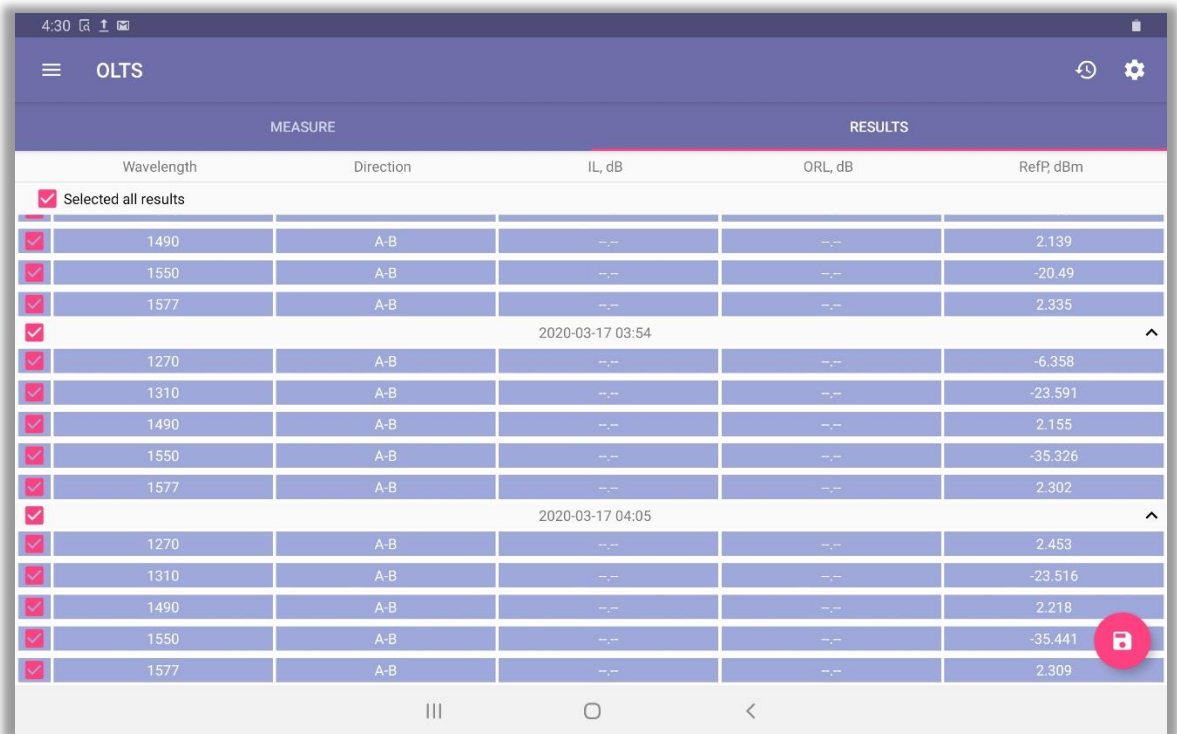
*Bluetooth device connection menu*



*Bluetooth device pairing selection in app*



**Test result shown on the main screen**



**Downloaded FX81 results**

For more information, see the *FMOLTS User Manual*.



# 13.0 Certifications and Declarations



Declaration of Conformity

## What is CE?

The CE marking is a mandatory European marking for certain product groups to indicate conformity with the essential health and safety requirements set out in European Directives. To permit the use of a CE mark on a product, proof that the item meets the relevant requirements must be documented.

Use of this logo implies that the unit conforms to requirements of European Union and European Free Trade Association (EFTA). EN61010-1

**For a copy of the CE Declaration of Conformity relating to VeEX products, please contact VeEX customer service.**



ROHS Statement

## RoHS Compliance

### VeEX QUALITY AND ENVIRONMENTAL POLICY

Our quality and environmental policy is to limit and progressively eliminate the use of hazardous substances and chemicals in the design and manufacture of our products.

VeEX products are classified as Monitoring and Control Instruments under Article 2, Section (1), Category 9 of the WEEE 2002/96/EC Directive.

### RoHS and WEEE Position Statement

The Council of the European Union and the European Parliament adopted Directive 2002/95/EC (January 27, 2003), to Reduce the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment, and Directive 2002/96/EC on Waste Electrical and Electronics Equipment (WEEE), with the purpose of reducing the environmental impact of waste electrical and electronic equipment. Both were later recast by Directives 2011/65/EU and 2012/19/EU respectively. All VeEX products being placed on the EU market conform with these directives.

Additional RoHS substance restrictions for the Monitoring and Control Instruments were adopted by EU Directive 2015/863 (March 31, 2015). These new restrictions will take effect from July 22, 2021. VeEX has established a program to ensure that from July 22, 2021, all its products to be sold and shipped into the EU market will conform with (EU) 2015/863.

VeEX Inc. is committed to comply with RoHS and WEEE Directives to minimize the environmental impact of our products.

For more information about RoHS as it relates to VeEX Inc, go to the VeEX web site at [www.veexinc.com/ROHS](http://www.veexinc.com/ROHS).

# 14.0 About VeEX

VeEX Inc., a customer-oriented communications test and measurement company, develops innovative test and monitoring solutions for next generation telecommunication networks and services. With a blend of advanced technologies and vast technical expertise, VeEX products address all stages of network deployment, maintenance, field service turn-up, and integrate service verification features across copper, fiber optics, CATV/DOCSIS, mobile 4G/5G backhaul and fronthaul, next generation transport network, Fibre Channel, carrier & metro Ethernet technologies, WLAN and synchronization.

Visit us online at [www.veexinc.com](http://www.veexinc.com) for the latest updates and additional documentation.

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## Customer Care

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