

# FX81 10G PON Optical Power Meter

## PON Meter Setup

The VeEX FX81 optical power meter performs 10G PON measurement testing and service activation of PON fiber networks.

### Required Supplies

- **FX81 10G PON meter (1):** 10G PON level test unit. *[Provided by VeEX with purchase.]*
- **1x2 50/50 splitter SC-APC connector on single ended (2):** Couples the GPON and XPON signals for OLT port and ONT port. *[Provided by user.]*
- **Mobile device (Android)/Windows PC (1):** Use VeEX software [Fiberizer LTSync for Desktops/Fiberizer OLTS (FMOLTS) for Android] to transfer measurement results to .oxlts file. *[Mobile device provided by user; free software download from VeEX Apps/Fiberizer webpages.]*
- **USB OTG cable (1):** Micro-B USB(m) or USB-C (m) [device port] to Micro-B (m) [to FX81]. Transfers results to FMOLTS and controls meter functions on non-Bluetooth purchased PON meters. *[Provided by user.]*
- **Miscellaneous patchcords:** Any necessary conversion cables to match inputs/outputs of system under test. *[Provided by user.]*

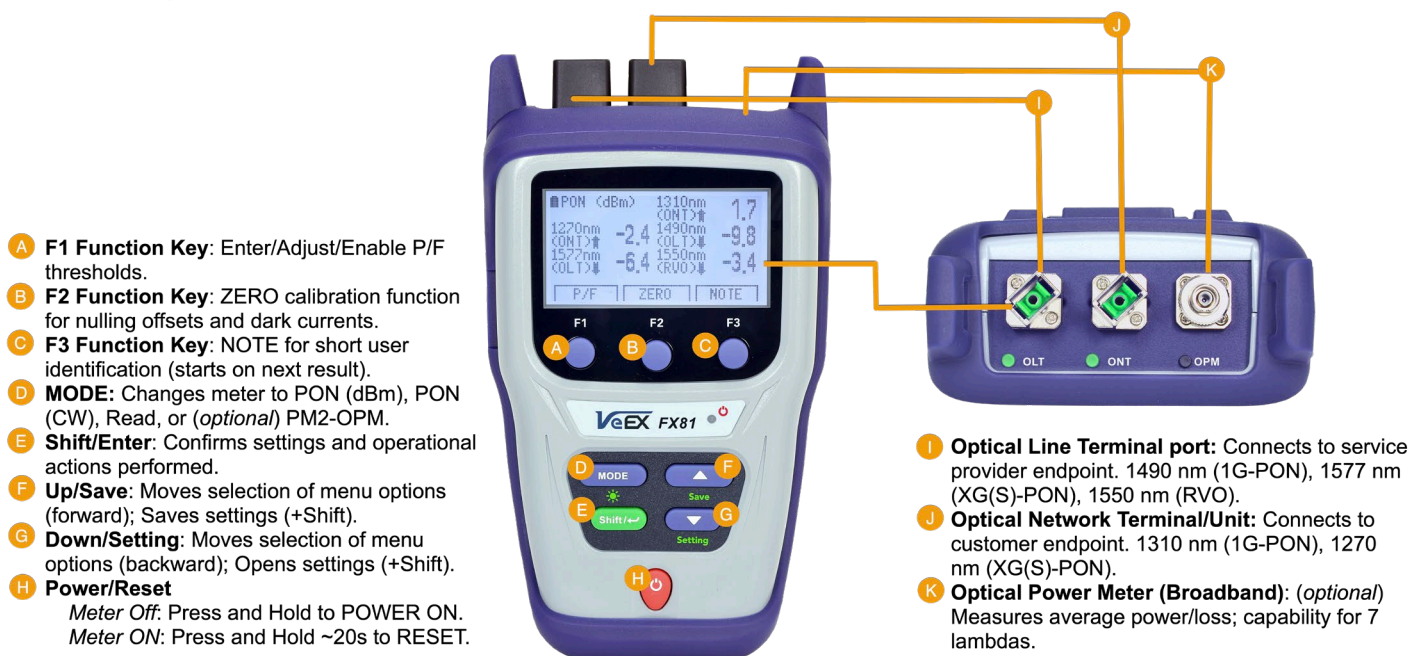


Figure 1: Function Labels/Descriptions

### Pre-Measurement Settings

Power on the meter by pressing and holding the red power button.

1. Press **Shift + Down** to define the correct time stamp, auto-shut off time, and sound profile (**OFF** for no beeping for every button press). Press **MODE** to advance to the next setting group and **Up/Down** buttons to adjust the correct setting.
2. Press **Shift** again to exit out of the **Settings** mode.
3. Press **NOTE [F3]** in PON mode and define the seven-letter comment using the **Up/Down** and **Shift/Enter** buttons.  
 \*For every new project/service activation, rename the **NOTE [F3]** for identification and organizational purposes.
4. After inputting the NOTE, press **EXIT [F3]** to save the comment for the next measurement.

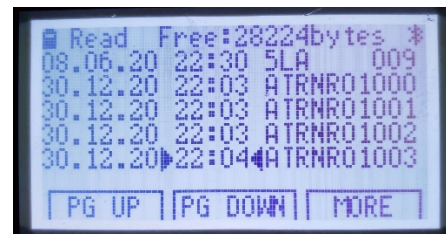


Figure 2: FX81 Settings menu, NOTE, and Read mode

## PON (Burst) Mode Measurements

Regular PON mode is **the primary test setting** for performing PON optical power measurements on an active network. This mode is optimized for in-test service activation of ONU/ONTs.

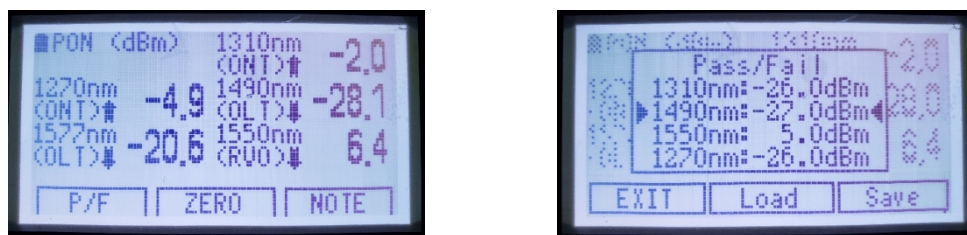


Figure 3: PON (burst) mode with all signals active, Pass/Fail threshold criteria

1. Stay on the screen displayed here during tests. To make accurate measurements, For each fiber, perform the ZERO calibration indicated by the **ZERO [F2]** function button when both dust caps closed in order to make accurate measurements.
2. Press the **P/F** function on the **[F1]** key. The user will see a list of dBm threshold level values. Selecting the **Pass/Fail** option will enable pass/fail thresholds in respect to the dBm values currently defined

### How to use PASS/FAIL

On the **Pass/Fail** menu (Figure 3, right), use the **Up** and **Down** buttons to select the wavelength **> XXXXnm:±NN.NdBm <** to change the threshold value, then press **Shift/Enter** to confirm the value. The selected value will *blink*, allowing the value to be adjusted using the **Up** and **Down** buttons. Press **Shift/Enter** again to set the value.

If the displayed power reading level from an active signal is greater than the threshold level defined, the result is a **PASS**.

**For example:** Threshold → 1310 nm : 1.0 dBm.

If the displayed power reading level is 1.1 dBm for 1310, which exceeds 1.0 dBm, the analysis returns a **PASS** result.

Active power meter measurement (dBm) > defined threshold value → **PASS**

1.1 dBm > 1.0 dBm → **PASS**

Active power meter measurement (dBm) ≤ defined threshold value → **FAIL**

0.9 dBm ≤ 1.0 dBm → **FAIL**

When the defined threshold value and the current wavelength power reading are the same, the PASS or FAIL result is calculated using the value of the next decimal place of the measurement. To view the measurement, use the **Up/Down** buttons, then press and hold **Shift/Enter**. (The second decimal place number can be viewed in **Read** mode.)



Saving the measurement **[Shift/Enter]+[Up/Save]** in Pass/Fail mode saves the Pass/Fail threshold values along with the absolute measurement values (the desired outcome), which then can be used in the test report.



Figure 4: Saving measurements in Pass/Fail mode

Press **Save [F3]** to save one threshold profile (see Figure 3, far right image). To recover the last saved threshold values, and press **Load [F2]**. The limits for PASS/FAIL threshold values depends on customer service activation requirements. Relevant IEC standards cover different optics classes and transmit power level limits. In practice, this is addressed through formal network planning requirements.



## PON CW Mode Measurements

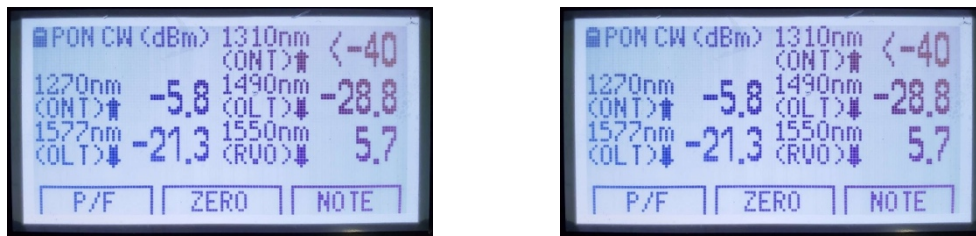


Figure 5: PON (CW) mode with most signals active, Pass/Fail threshold criteria

Use PON CW mode on inactive (**offline**) networks, such as when prequalifying fiber with a known, standalone test (light) source. Average power measurements and/or insertion loss measurements of optical network components (co-existence filters and PLC splitter) would be taken prior to deployment.

The device functions in PON CW mode are identical to PON (Burst) mode, with the exception of the setup, when a test light source is used to perform measurements.

## Insertion Loss Measurements using FMOLTS

Loss measurements can be performed when tethered to an Android tablet using the FMOLTS application.

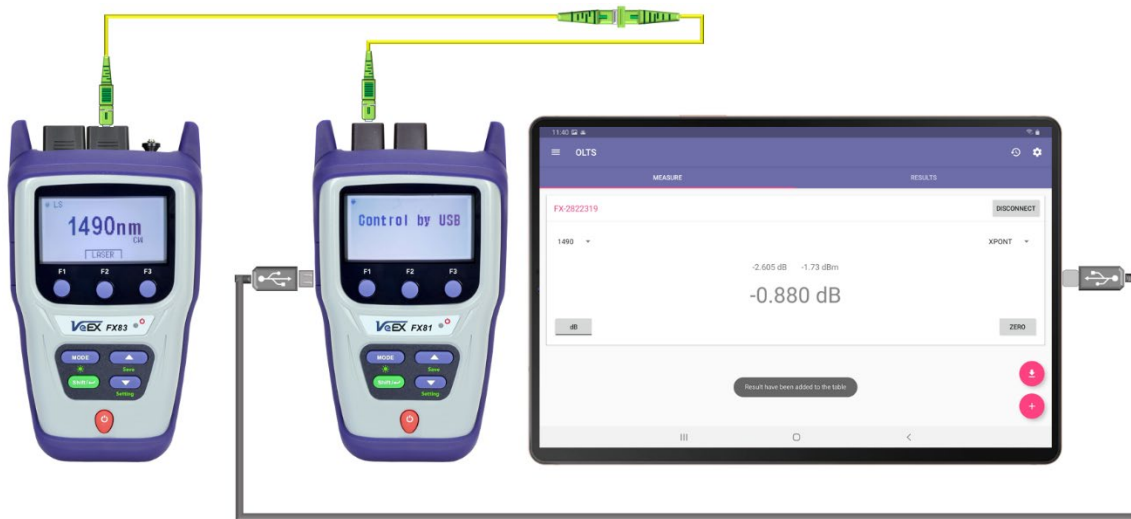


Figure 6: FMOLTS tethering application with FX81

\*Requires OLS, PON meter, and mobile device (with user supplied accessories)

1. Connect a micro-B USB (m) to a USB Type C (m)/micro-B USB (m) OTG cable from the FX81 micro-B USB port to the Android mobile device. This will activate the live power meter option on the installed FMOLTS application.
2. The meter should read "**Control by USB**" if successful. The meter's measurement functions can now only use the mobile device's GUI to control.
3. Connect an initial patch cord directly from the test source to the **OLT** or **ONT** port of the FX81 meter (depending on the wavelength) to obtain the first power reference.
4. In the FMOLTS application, press the **ZERO** button to set the 0 dB reference, then press the **dB** button to change to relative (loss testing) mode. The first reference is updated on the abbreviated 2<sup>nd</sup> entry of the row.
5. Connect the fiber under test (FUT) to the initial patch cord reference (free) end and to the FX81 port. The new current (dBm) value should update on the 1st entry of the row, allowing for the loss measurement (dB) (larger font display value) to be calculated (rounded up).
6. Press the (+) button to add the live measurement to the **Results** tab, then press **Save** to permanently save the live measurement result(s).

## 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.

2827 Lakeview Court, Fremont, CA 94538, USA | Tel.: +1 (510) 651-0500 | Fax: +1 (510) 651-0505 | info@veexinc.com | [www.veexinc.com](http://www.veexinc.com)

