

# FX120

## XG(S)-PON Analyzer



The FX120 is an advanced PON analyzer that is the ideal tool for service technicians tasked with service activation and resolving service complaints at customer premises by identifying root cause of service issues. Real time data analysis provides downstream/upstream power levels, PON-ID including OLT-ID, ODN class and Tx power, ONU/ONT-ID as well as rogue ONUs that can cause service disruptions to all subscribers sharing a PON-ID.

### Platform Highlights

- Optimized for activating, verifying/troubleshooting PON business/residential services
- Compatible with GPON and XG(S)-PON networks
- Robust, handheld chassis packed with powerful and flexible features
- 5-inch LCD touch screen with ambient light sensor
- SFP+ cage to support 1G/2.5G/5G/10G Ethernet throughput, ping, and trace route
- V-TEST Speedtest
- Field upgradeable or result transfer using USB stick
- Field replaceable, rechargeable Li-ion battery pack lasts for up to 12 hours of continuous use
- Test set connectivity via micro-B USB and optional built-in WiFi and Bluetooth® wireless interfaces; USB-A and 10/100BASE-T are also available via OTG cables
- Easy report generation and data transfer using R-Server for workflow and results management
- Fiber tool accessory options: OPX-BOXe OTDR, DI-1000/1000MPO/3000 Fiber Scope and FX40/45/80 series OPM
- Remote access/control via web browser and VNC® client. Compatible with VeEX EZ Remote collaboration services. User defined test profiles and Pass/Fail ITU-T thresholds enable fast, efficient, and consistent turn-up of services.

### Complimentary Products



DI-1000/1000MPO/3000 Fiberscopes



OPX-BOXe



FX150+ OTDR

### Fiber Optic/PON Expert

### Key Features

#### Basic OPM Mode

- Dual port wavelength filtered, through-meter for simultaneous 1G and 10G ONT/ONU service verification
- Upstream/downstream LED status indicators for signal and frame
- TC Sync per ITU-T
- Automatic PON-ID detection\* including OLT-ID, ODN class, Tx power, power level and ODN link pass/fail per ITU-T
- ONU/ONT ID and serial number; rogue and alien ONU detection
- Low insertion loss:  $\leq 1.5$  dB typ.

#### Advanced Function Mode

- Track/manage active ONT IDs and serial numbers
- PLOAM Capture/Decode

#### PON Standard Compliance

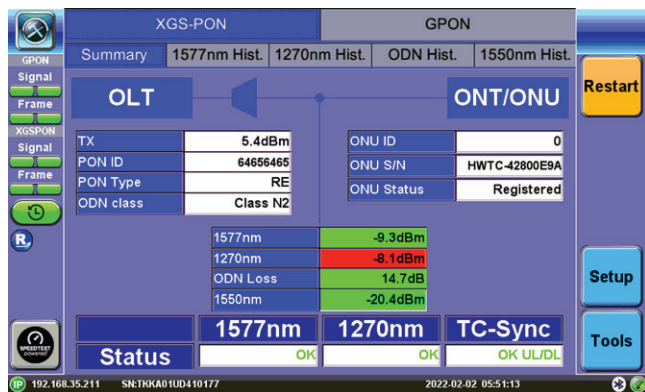
- G-PON (ITU-T G984.2)
- XG(S)-PON (ITU-T G.9807.1)
- RF video signals 1550 nm (ANSI/SCTE 174 2010)

\* Requires activation of PON-ID functionality in PON system per ITU-T G.984.3 Amd 3

## Passive Optical Network Test Set GPON and XG(S)-PON

### Basic In-Service Qualification Mode

Service activation should be EASY. Simply insert the FX120 PON test set at the customer premises between the ONU/ONT and the last splitter in the ODN. In the OPM Summary view, LEDs indicate if upstream/downstream signals are present and frame quality. PON-ID information such as OLT-ID, TX power and class are shown. When TC-Sync is achieved, the technician can verify the ONU-ID and Serial Number and ONT status including rogue. Signal levels and ODN Loss will indicate Pass/Fail per ITU-T or user defined limits. If laser instability is suspected, the technician can also monitor signal/ ODN loss budget history to verify signal stability over time.



### Quality of Experience (QoE) Verification Tests

The V-TEST features provides Layer 4-7 testing that allows to qualify network TCP/HTTP protocol performance by testing against a V-TEST HTTP server. V-TEST can test up to full line rate depending on the server specifications and limitations. Connection time to the server, data transfer time, line rate throughput rates, and protocol (TCP/HTTP) data rates are reported during the tests.

The V-TEST application is flexible enough to operate in different modes depending on user preference; VeEX Managed mode, Speedtest Powered™ mode based on Ookla® technology, and User Managed mode.

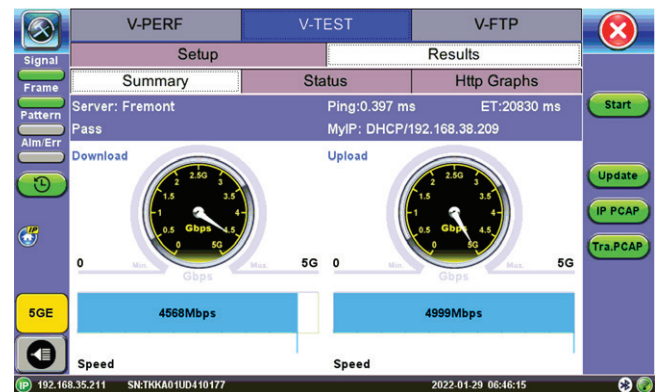
In VeEX Managed mode, the customer's servers are added to a customer server list that is maintained and managed by VeEX for the end-user's ease of use and convenience. The full list of server IP addresses or URLs are provided to VeEX by the customer. Once added, all the user has to do is select the server from their company list and initiate the test to the selected server.

In Speedtest Powered mode, the test follows Ookla's methodology and tests to the Speedtest® Server Network. In this mode, the test is compatible with Ookla's protocol/methodology; it will scan nearby servers in the local market and test to the server with the fastest (lowest Latency) response.

In User Managed mode, the user is allowed to enter the server IP/URL and save it to a server list that they can maintain and manage on their own.

### V-TEST HTTP Speed Test

- TCP/HTTP Throughput
- Full line rate, up to 10 Gbps
- TCP/HTTP client mode
- Connection time to server
- Total Data Transfer time
- Download and upload TCP/HTTP Throughput rates
- Requires V-TEST Server or Ookla® Netgauge Server



### Advanced PON Functions

Even when signal levels are good, service quality may still be poor. A Tier2 technician/engineer can remotely connect into a test set to assist the local technician by using advanced features.

- Active PON and XG(S)-PON ONU listing
- PLOAM and XG(S)-PON PLOAM decoder

### PLOAM Capture/Decode

The PON tester captures and decodes PLOAM messages. PLOAM will display the activation process showing the message exchange from OLT to ONT. The PLOAM messaging can also be used to determine OLT commands to ONT including ONT disconnect commands.

Dir	Time	Id	Message
Down	21/09/16 00:09:45.104750	Broad	PON-ID
Down	21/09/16 00:09:48.812625	Broad	Upstream Overhead
Down	21/09/16 00:09:48.812750	Broad	Upstream Overhead
Down	21/09/16 00:09:48.812875	Broad	Upstream Overhead
Down	21/09/16 00:09:49.712625	Broad	Assign ONU ID
Down	21/09/16 00:09:49.712750	Broad	Assign ONU ID
Down	21/09/16 00:09:49.712875	Broad	Assign ONU ID
Down	21/09/16 00:09:49.913625	3	Ranging Time
Down	21/09/16 00:09:49.913750	3	Ranging Time
Down	21/09/16 00:09:49.913875	3	Ranging Time
Down	21/09/16 00:09:49.972875	3	Configure Port ID
Down	21/09/16 00:09:49.973000	3	Configure Port ID
Down	21/09/16 00:09:49.973125	3	Configure Port ID
Down	21/09/16 00:09:49.981750	3	Encrypted Port ID

## Fiber Optic Tools

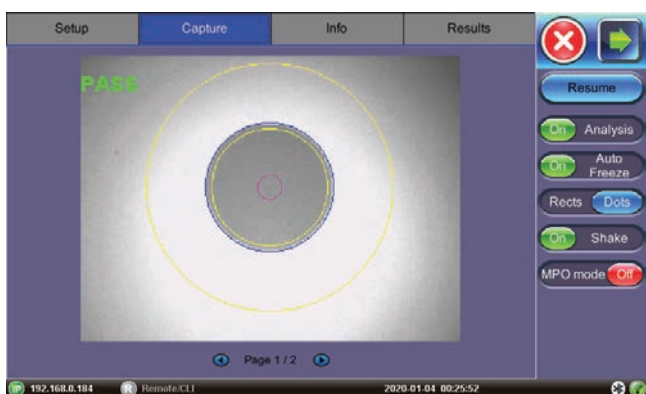
### Digital Fiber Inspection Scope

End-face contamination is the leading cause of fiber link failures. Dirty/damaged connectors can increase loss and return loss resulting in poor service quality. Contamination can transfer and damage other connectors through mating. Inspecting and cleaning patch cords and pluggable optics connectors before mating them is always recommended.

This option allows digital video microscope probes to be connected directly to the test set through a USB port or WiFi. Featuring live video feed on the screen for visual analysis, it offers clear image capture, compare (before and after), IEC 61300-3-3 Sect 5.4 Pass/Fail templates for SMF and MMF, save, export and generate report to USB flash drives.

- Auto-focus detection and analysis option
- Analysis per IEC 61300-3-3
- SMF and MMF templates (core, cladding, adhesive and contact areas)
- Dots or square to highlight contamination, debris, and scratches
- Report generation

*\*Fiberscope sold separately. See datasheet for details.*



### OTDR Viewer

Built-in OTDR Viewer and Client application provides full post-analysis of SOR traces, as well as control of an ultra-compact OPX-BOX OTDR via direct USB connection, WiFi or Bluetooth®. Once paired or connected to the micro OTDR, the test set displays a virtual OTDR user interface that is used to control the OPX-BOXe and perform measurements.

- Traces and Events table view
- Loss calculations
- V-Scout Link Mapper option
- Compatible with Fiberizer Cloud (upload and download)
- Controls external OPX-BOXe OTDR

Since fibers are commonly placed in access, metro, and transport networks, having a companion add-on OTDR to inspect drop fiber reduces dependence on specialized fiber construction crews troubleshooting fiber related problems.

### VeSion® R-Server™ Client

Part of VeEX's VeSion centralized monitoring and management solutions, the R-Server Workflow and Asset Management system provides crucial tools to manage fleets of technicians, test equipment, standardized test profiles, thresholds, centralized test results collection, reporting, jobs/ticketing, and software update delivery to create coordinated and efficient disciplined workforce and test procedures. R-Server enhances the workflow to achieve the level of quality and repeatability required by telecommunications service providers, MSOs and their contractors. The flexible R-Server can be deployed in cloud, hosted, and corporate networks, on physical or virtualized servers.

Makes the job simpler for field technicians as they can download test profiles and upload test results. Supervisors can preset and upload test parameters which are provided to the test sets as profiles. Technicians can simply download profiles, run tests, and upload results to a centralized system that stores and secures the data.

## Platform Features & Options

### Remote Access

The test set offers multiple ways to Remote Control it or access the information remotely (e.g. test results, test profiles, etc.). The test set can be reached via:

- Built-in web browser software (Web Remote Control)
- EZ Remote
- VNC® Client
- Connectivity: Optional 10/100Base-T, WiFi 802.11 b/g/n

### EZ Remote

The EZ Remote functionality allows users to quickly connect to VeEX test sets all over the world, without the need for VPN, port forwarding or public IP addresses. This VeEX hosted cloud service takes care of all the complex tasks required, and presents users with a simple application. Connect online anytime, anywhere, with any computer, tablet, or smartphone, using standard web browsers for screen-sharing, remote control and access to test results. Use it for remote control, collaboration, technical support or training purposes.

- Remote Control functionality gives users full control of remote test sets (screen mirroring and control)
- Remote Access functionality allows users to View, Download, Rename, Delete, Convert to PDF the test results
- No VPN required
- Works through firewalls, no ports to open
- Web browser based
- Multi-platform support
- No software to install
- Service included with test set (no extra charge)

### File Manager

- Saves results to internal SD card view, rename, delete and lock result files
- Filter and sort by Name, Test Mode, Test Type, Port, Date and Result/Profile
- Report generation: Test results generate in PDF format export test results and profiles via USB memory, Bluetooth, web browser, and retrieve to/from USB
- Screen capture: Screen shots in PNG format

## Optical Specifications<sup>1</sup>

FTTx Specifications		Spectral passband (nm)	Power measurement range (dBm) <sup>6</sup>	Calibrated wavelength (nm)	Max power (dBm)
OLT	Downstream 1490 nm	1470-1510	-35 to 5	1490	9
	Downstream 1550 nm <sup>5</sup>	1540-1560	-49 to 20	1550	27
	Downstream 1577-1578 nm	1572-1582	-35 to 5	1577	9
ONT/ONU	Upstream 1270 nm, burst mode	1260-1280	-27 to 11 <sup>2</sup>	1270	17
	Upstream 1310 nm, burst mode	1300-1320	-28 to 10 <sup>2</sup>	1310	
Isolation (dB)		40			
ORL (dB)		50			
Pass-through insertion loss (dB) <sup>3</sup>		≤1.5			
Power uncertainty (dB) <sup>4</sup>		0.5			
Auto Pass/Fail levels by Class or user threshold		ITU-T or user specified			
Fiber Inspection		Optional fiberscope via OTG cable			

ITU-T PON Data Analysis	
ONT serial numbers identification	Standard offering
PON identification <sup>7</sup> (OLT-ID, OLT-Class, OLT-Tx, ONU/ONT SN)	Standard offering
Active ONU/ONT List	Standard offering
PLOAM Decoder	Standard offering

Broadband Optical Power Meter (Optional)	
Wavelength range (nm)	800 to 1700
Calibrated wavelengths (nm)	Standard - 850/1300/1310/1490/1550/1625/1650
Detector type	InGaAs
Measurement range (dBm)	-46 to +23
Power Accuracy, % (dB) <sup>3</sup>	±5 (±0.22)
Linearity, % (dB)	±2.5 (±0.11)
Readout Resolution (dB)	±0.01
Tone detection (Hz)	270/330/1000/2000
Wave ID (Auto)	Compatible with VeEX Light Source
Optional Adaptors (interchangeable)	ST/SC/FC/LC, Universal, 2.5/1.25 mm

### Notes:

1. At 23°C ± 3°C using SC/APC
2. Burst mode -35 dBm to 13 dBm
3. Measured at 2 dBm
4. Measured at -10 dBm
5. 1550 nm only displays signal level
6. Data recovery range is reduced but meets ITU-T standards
7. Requires activation of PON-ID functionality in PON system per ITU-T G.984.3 Amd 3

## General Specifications

Display	5" WVGA 800x480 TFT color LCD touch-screen
Storage	Internal 16 GB flash
Connectivity	Built-in: WiFi 802.11b/g/n (optional), Bluetooth® (optional) micro-B USB 2.0 OTG USB A 2.0 via OTG cable 10/100Base-T via OTG adapter (optional)
Languages	Multiple languages supported
Size (H x W x D )	150 x 150 x 80 mm (5.9 x 5.9 x 3.15")
Weight	1.0 kg (2.2 lb)
Battery	56 Wh smart Li-Ion battery
Battery Autonomy	Application dependent (>12h idle)
AC Adaptor	Input: 100-240 VAC, 50/60 Hz, 1.5A Output: 15 VDC, 4A
Operating Temperature	-5°C to 45°C (23°F to 113°F)
Storage Temperature	-25°C to 55°C (-13°F to 131°F)
Humidity	0% to 95% non-condensing
Certifications	CE & ROHS compliant

## Ordering Information

XG(S)-PON Analyzer Models	
P/N	Description
Z06-05-054P	FX120 XG(S)-PON Analyzer, 1270/1310//1490/1550/1577 nm, Fixed SC/APC
Z06-05-055P	FX120 XG(S)-PON Analyzer, 1270/1310//1490/1577 nm, Fixed SC/APC



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