PX92 & PX92T

PON Analyzer & Multi-Gigabit Service QoE Test Set With Wi-Fi Testing

The PX92 and PX92T are PON analyzers with RJ45 and SFP+ Ethernet interfaces for Layer 4+ testing. PX92 supports in-service activation with pass-through power levels and OLT/ONT IDs, while PX92T focuses on construction-phase testing with dual 1490/1577 PON meters. Both models offer PON ONT emulation, Quality of Experience (QoE) validation using Speed Test and V-PERF at speeds up to 10 Gbps, as well as Wi-Fi performance verification.

Product Highlights

- Compatible with GPON and XG(S)-PON networks
- Pass/fail ITU-T/IEEE thresholds enable fast, efficient, and consistent turn-up of services
- Available in Terminated PON meter (PX92T) and Advanced Pass-through PON Analyzer (PX92) configurations
- Simple and intuitive user interface (GUI)
- Flow® for efficient testing and report compilation process
- NoApp® QR code capability for faster result transfer
- Built-in Near Field Communication (NFC) transceiver, compatible with NoApp® cloud service, for immediate test results transfer and sharing
- Easy report generation and data transfer using R-Server for workflow and results management
- USB-C PD interface for charging, memory sticks and LAN adapters
- Remote access/control via web browser and VNC® client. Compatible with VeEX EZ Remote collaboration services.
- Field upgradeable using USB stick
- Fast boot up time (20 seconds)
- Rechargeable Li-Ion battery includes a low voltage alarm and auto-off function, providing one full day of typical operation and testing
- Built-in Wi-Fi connectivity
- High resolution 5-inch color capacitive touch screen with gesture support
- Rugged and compact form factor

Key Features

Selective PON OPM

- Wavelength support:
  - **PX92**: 1490/1577//1270/1310 nm (pass through)
  - **PX92T**: 1490/1577 nm
- Low pass-through insertion loss: ≤1.5 dB typ (PX92 only)

GPON/XG(S)-PON

- PON-ID detection including OLT-ID, ODN class, OLT TX power level and ODN link pass/fail (both models)
- PON ONT Emulation (both models)
- ONT ID, serial number and status (PX92 only)

Ethernet

- IPv4/IPv6 and PPPoE, DHCP and static IP
- Ping
- Complete Layer 4+ test suite: V-TEST (Ookla® Speedtest®, VeEX Managed and Manual Modes), V-PERF (RFC6349)
- PPPoE support

Wi-Fi Testing

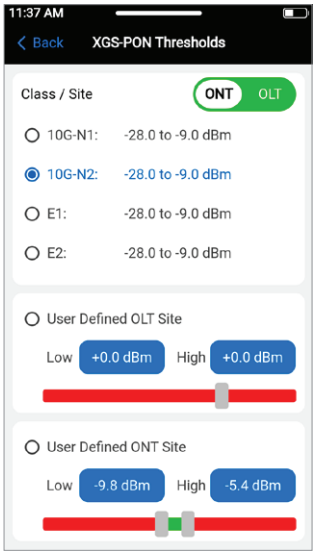
- IPv4/IPv6, DHCP, and static IP
- Complete Layer 4+ test suite: V-TEST (Ookla® Speedtest®), V-PERF (RFC6349)
- Wi-Fi (802.11 a/b/g/n/ac/ax) 2.4 GHz, 5 GHz and 6 GHz scan, coverage verification and speed test up to 2 Gbit/s

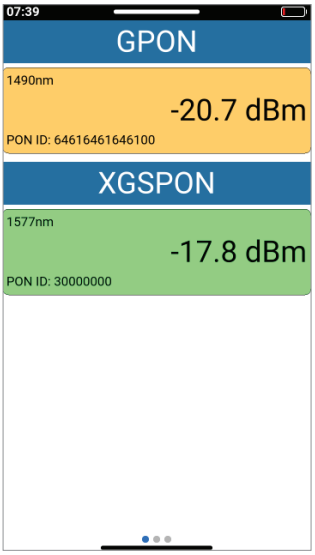
Optical PON Testing

GPON and XG(S)-PON

Basic In-Service Qualification Mode

Service activation should be EASY. Simply insert the PX92 PON test set at the customer premises between the ONU/ONT and the last splitter in the ODN. In the OPM Summary view, PON-ID information such as OLT-ID, OLT TX power and PON class are shown. The technician can verify the ONU-ID and Serial Number and ONT status upon completion of ONU activation. 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 graph to verify signal stability over time.





- Terminated and pass-through modes (depending on model)
- Dual Wavelength Selective Optical Power Meter (OPM)
- Pass/Fail validations based on Industry standard and customizable thresholds, according to ODN class and location
- OLT TX power level and ODN link loss
- OLT PON ID[1], Serial Number and class detection
- Advanced PON analysis: Active ONU list

PON ONT Emulation[2]

PX92 and PX92T support PON ONT emulation, allowing technicians to emulate the behavior of an actual ONT without needing on-site customer equipment. This enables verification of OLT provisioning, power levels, PON ID, and service readiness prior to customer service requests. By emulating ONT functions such as authentication and response to network commands, technicians can confirm connectivity, run speed tests, and streamline activation workflows, making the tools ideal for both deployment and training environments.

PON Connectivity Validation

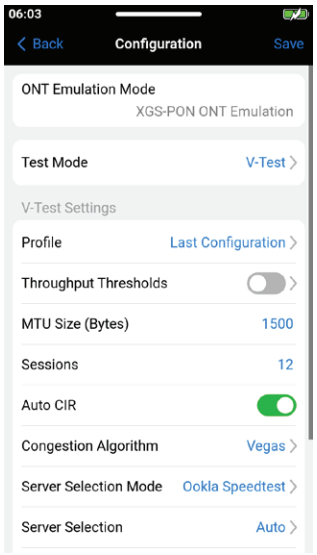
- Verify correct OLT provisioning
- Troubleshooting

Internet Service Access Validation

- V-TEST speed test
- VPERF (part of RFC6349)

[1]Assumes OLT PON-ID feature has been enabled and broadcasting by OLT

[2]Requires optional PON ONT SFP+ transceiver



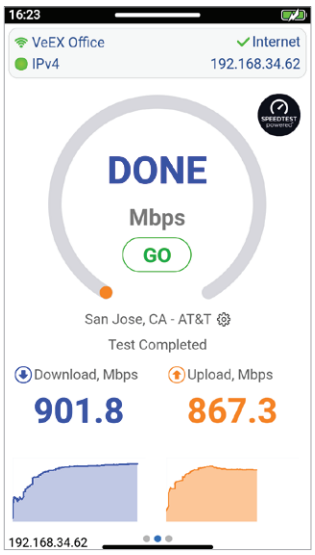
Internet Access QoE Validation

Test Interfaces

- RJ45: 10/100/1000BASE-T, 2.5/5/10GBASE-T
- SFP+: 1GE, 10GE, PON ONT Emulation with GPON/XGSPON SFP
- Wi-Fi 802.11 a/b/g/n/ac/ax with 2.4 GHz, 5 GHz and 6 GHz[1], up to 2 Gbit/s

V-TEST Internet Speed Test

This multi-gigabit high-speed test feature provides additional Layer 4-7 verification and troubleshooting. The V-TEST feature qualifies network TCP/HTTP protocol performance by testing against a V-TEST or Ookla® Speedtest® HTTP server. It can test up to the full line rate depending on the server's specifications and limitations. Connection time to the server, data transfer time, line rate throughput rates, and protocol throughput rates key metrics are reported during the tests.



The V-TEST application is flexible enough to operate in different modes depending on user preference:

- 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. 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.

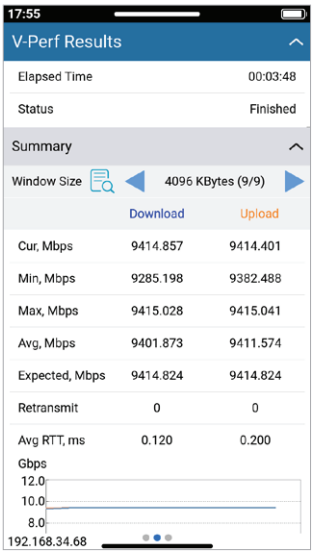
Hardware-based HTTP Throughput rate test (Internet speed test) helps verify quality of service (QoS) and assure quality of experience (QoE)

- Full HTTP line rate
- HTTP client mode
- Connection time to server
- Total Data Transfer time
- Requires V-TEST Server Speedtest Compatible Mode
- Compatible with Ookla's network of Netgauge servers
- Speedtest Powered

[1]*Optional factory-installed built-in hardware*

V-PERF TCP/UDP Test (RFC6349)

A common source of customer complaints come from file transfer speeds not matching the throughput rates guaranteed in the SLA. While many factors affect TCP applications performance, including customer's operating system hardware performance and settings (TCP window size), service providers need to prove SLA with hardware-based test tools that can show maximum TCP performance, independent of Operating System or Server limitations, and present repeatable reliable results.



The V-PERF test feature uses RFC6349 test methodology and metrics for qualifying TCP or UDP network performance. It offers a full line rate stateful TCP test with configurable window sizes, client and server modes as well as compatibility with third-party iPerf/iPerf3 servers. For best performance, multiple field test set can test against centralized hardware-based RTU-300 test heads, for guaranteed availability and repeatability.

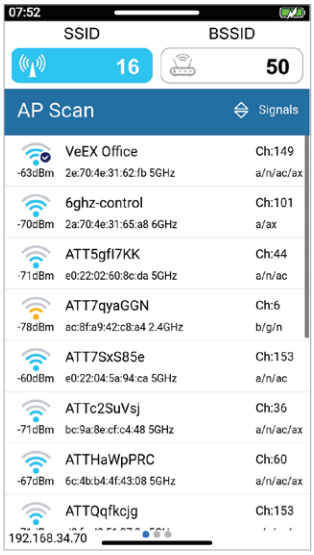
V-PERF is a hardware-based benchmarking test for network performance at different TCP window sizes, to verify stateful TCP/UDP throughput at full line rate, understand KPIs that may be causing network congestion and speed degradation, optimize window sizes, and assure the link meets the required quality of service (QoS).

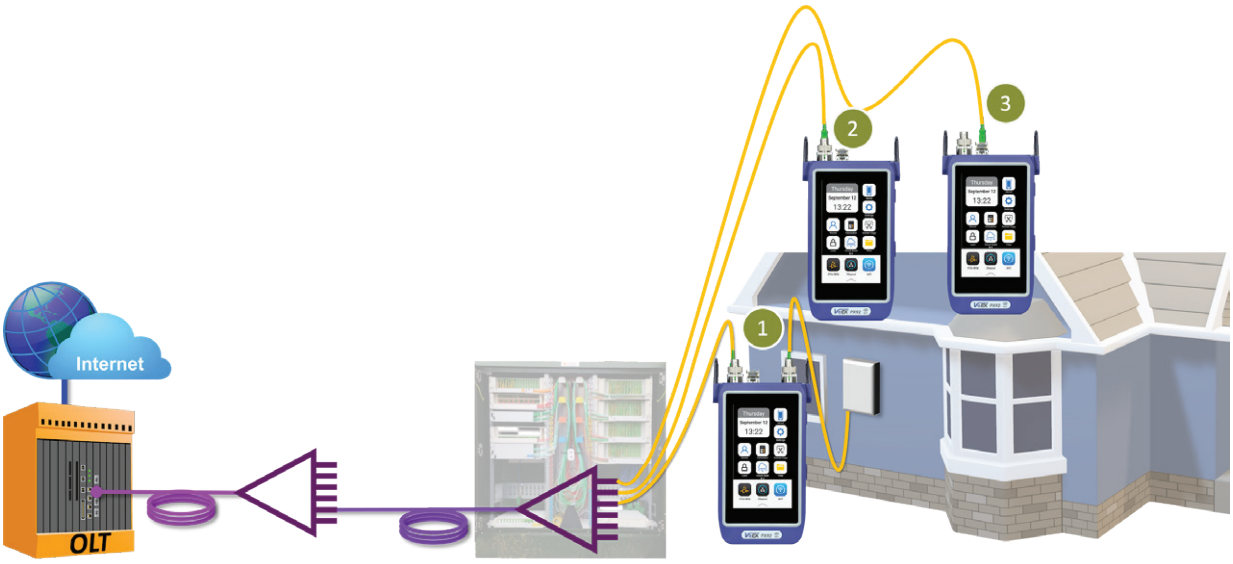
- TCP/UDP Throughput Compliant with RFC6349
- Stateful TCP/UDP Test at full line rate
- TCP/UDP Client and Server modes
- Compatible with iPerf and iPerf3 Client/Server
- Up to 64 parallel streams
- MTU search per RFC4821
- Round Trip Time Measurement
- Configurable TCP Window sizes, with Manual and Auto window sizing
- Multi-Window size tests
- Measurements: TCP Throughput rate (min, max, average), Transfer file size and duration, Transfer time ratio, TCP Efficiency %, Buffer Delay %
- Test duration: By time or file size

Wi-Fi Channel Scan

Scans for available networks and view all access points' (AP) detailed information along with SSID, signal strength, channel allocation, supported Wi-Fi types, Max PHY Rates. It can also connect to Access Points with WEP/WPA, WPA2 and WPA3 encryption and run Ookla Speedtest or iPerf to verify the wireless network's speed test performance and confirm that it is properly installed and configured.

- Access Points scan with signal level and additional AP details
- Supports WEP/WPA1/WPA2/WPA3 encryptions
- Provides Wi-Fi WLAN management access to the test set (e.g. R-Server, Web Remote Access, EZ-Remote Control)





1. PX92 Pass-through between OLT and ONT
2. PX92T (downstream measurements) connected before ONT
3. PX92T ONT Emulation via SFP+
4. PX92/PX92T Wi-Fi Speed Test
5. PX92/PX92T Speed Test via SFP+ Port
6. PX92/PX92T Speed Test via Native RJ45 Port

Platform Features & Options

VeSion® R-Server Client

VeEX's R-Server enhances and streamlines job workflows to achieve the highest level of quality and repeatability required by telecom service providers, MSOs and their contractors. The centralized Workflow and Asset Management architecture provides important tools to manage teams of technicians, test equipment, standardized test profiles, test results collection, reporting functions, including jobs/ticketing resulting in a more disciplined and improved test process.

Key Features

- Cloud-based: One system platform
- Seamless integration: Single system for job ticketing and work order management
- Visibility: Comprehensive overview of field test equipment assets and field technician activity
- Tamper-proof: Lock profiles, registration, date/time on tester for a consistent test environment

Web Remote & Web Access

The test set offers multiple ways for remote control and provides remote access to its information from a PC, tablet, or smartphone (e.g. test results, test profiles, etc.). The test set can be reached via:

- Standard web browser
- VNC® Client
- EZ Remote™ cloud service
- Connectivity: Optional Wi-Fi 802.11 a/b/g/n/ac/ax (requires a USB Wi-Fi adapter), 100/1000BASE-T (requires a USB-C to Ethernet adapter)

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 – Provides full control of remote test sets (screen mirroring and touch/mouse control)
- Remote Access – Allows users to View, Download, Rename, Delete, Convert to PDF the test results
- No VPN setup required
- Works through firewalls, no ports to open
- Web browser based
- Multi-platform (OS) support
- No software to install
- Service included with test set

NoApp® Test Results Transfer

NoApp uses NFC (US patent 12321807) and QR Code (US patent 12190199) technologies to quickly transfer test results from devices to smartphones or tablets for cloud processing, streamlining workflows, and reporting. It's a web- based solution that works on any screen size, requires no separate application installation or updates, and is always up to date, eliminating the need for constant IT approvals. It's compatible with any modern smartphone or tablet that supports NFC and QR Code reader.

- Geotagging test results
- Generate PDF reports
- Upload results to R-Server
- Compile different test results into a single job report
- Add pictures and files
- Effective job closing, maintenance, and birth certificates
- Share test results via SMS and/or email
- Export to JSON format
- Access quick guides and resources
- Secure
- No registration required

NoApp Using QR Code

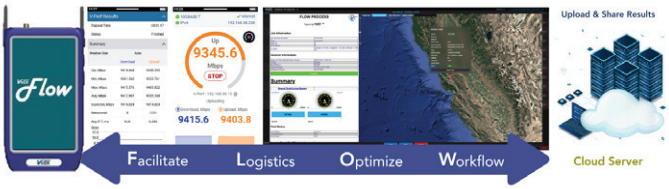
NoApp Using NFC

FLOW® Workflow

The FLOW application streamlines complex workflows, enhances task optimization, and expedites result-sharing in the field.

Technicians execute a batch of tests based on predefined system configurations and signal thresholds, eliminating setup errors and ensuring tests are performed consistently.

Detailed test reports are uploaded to a cloud-based server, allowing valuable results to be shared and ensuring compliance to company requirements.



Optical Connector Protector (Hardware Option)

Optical Connector Protector

Replaceable Ferrule

Optical Protector Cover (optional)

1 Patent pending
2 Spare ferrules available in pack of 4 for APC or UPC

The innovative, patent pending field-replaceable optical ferrule system[1] adds an extra layer of protection to the internal end-face of calibrated optical test ports, preventing contamination and accidental damage.

Users can quickly replace the ferrule[2] without the need for any tool while maintaining the integrity of the instrument's factory calibration. This novel approach eliminates the downtime, logistical hurdles and high cost associated with sending test sets to a service center for repair and recalibration.

All components in the system are reusable, with the exception of the small replaceable ferrule, helping to reduce environmental waste.

Field-Replaceable Optical Ferrule System

Universal Adapter

The universal connector adapter allows users to change the optical connector type conveniently whenever needed. Available in FC, SC, ST and LC.

Locking Ring

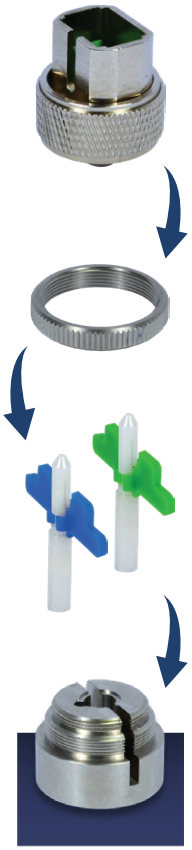
To secure the replaceable ferrule at its optimum location for the best performance.

Replaceable Ferrule with APC or UPC End-face

The self-aligned field-replaceable ferrule can be changed out in seconds. Users can select between APC or UPC end-face, ensuring compatibility with any test application requirement.

Optical Connector Protector Base

The panel mount protector base is made from high-grade stainless steel using a precision CNC process. This achieves proper alignment of the replaceable ferrule, minimizing insertion loss.



Model Comparison

Test Interfaces	PX92	PX92T
Optical Port 1	1/10G Pass-Through OPM	1/10G Pass-Through OPM
Optical Port 2	1G/10G PON Pass-Through	-
RJ45	10/100/1000BASE-T, 2.5.G/5G/10GBASE-T, PoE detect	10/100/1000BASE-T, 2.5.G/5G/10GBASE-T, PoE detect
SFP+	1000BASE-X, 10G, ONT Emulation	1000BASE-X, 10G, ONT Emulation
Wi-Fi	802.11 a/b/g/n/ac/ax	802.11 a/b/g/n/ac/ax
Optical & PON Features		
Wavelength	DS: 1490/1577 nm US: 1270/1310 nm (pass-through)	DS: 1490/1577 nm
Signal LEDs	Downstream + Upstream	Downstream only
Low Insertion Loss	Yes (≤1.5 dB)	-
Automatic PON-ID Detection[1]	Yes	Yes
PON ONT Emulation (SW option)	Yes (Requires SFP)	Yes (Requires SFP)
ONU/ONT ID + Serial Number	Yes	-
PON Pass-through Monitor	Yes	-
Ethernet Test Features		
V-TEST	Up to 10 Gbit/s	Up to 10 Gbit/s
V-PERF (RFC6349)	Up to 10 Gbit/s	Up to 10 Gbit/s
V-FTP	Up to 10 Gbit/s	Up to 10 Gbit/s
Wi-Fi Test Features		
V-TEST	Up to 2 Gbit/s	Up to 2 Gbit/s
V-PERF (RFC6349)	Up to 2 Gbit/s	Up to 2 Gbit/s

[1]*When enabled*

Optical Specifications[1]

FTTx Specifications	Wavelength	Spectral passband (nm)
OLT	1490	1470-1510
	1577	1572-1582
ONT/ONU	1270	1260-1280
	1310	1300-1320
Isolation (dB)	40	
ORL (dB)	50	
Pass-through insertion loss (dB)[2]	≤1.5	
Power uncertainty (dB)[3]	0.5	
Auto Pass/Fail levels by Class or user threshold	ITU-T or user specified	

PX92 Pass-Through			PX92T Terminated		
Power measurement range (dBm)[4]	Calibrated wavelength (nm)	Max power (dBm)	Power measurement range (dBm)	Calibrated wavelength (nm)	Max power (dBm)
-35 to 2	1490	2	-40 to -5	1490	-5
-35 to 2	1577	2	-40 to -5	1577	-5
-27 to 12	1270	13	--		
-28 to 12	1310	13			

ITU-T PON Data Analysis	
ONT serial numbers identification	Standard offering
PON identification[5] (OLT-ID, OLT-Class, OLT-Tx, ONU/ONT SN)	Standard offering
Active ONU/ONT List	Standard offering
Downstream PLOAM Decoder	Standard offering

Notes:

1. At 23°C ± 3°C using SC/APC
2. Measured at 2 dBm. PX92 only.
3. Measured at -10 dBm
4. Data detection level limit is ~ 7 dB above received optical signal level per ITU-T standards
5. Requires activation of PON-ID functionality in PON system per ITU-T G.984.3 Amd 3

Ordering Information

P/N	Description
PON Analyzer Models	
Z06-09-003P	PX92T GPON and XG(S)-PON Analyzer and Multi-Gig Service Test Set, 1490/1577nm RJ45 for 1G/2.5G/5G/10GBase-T and Wi-Fi (optional); Throughput Testing SFP slot for ONT Emulation (optional)
Z06-09-004P	PX92 GPON and XG(S)-PON Analyzer and Multi-Gig Service Test Set, 1490/1577//1270/1310 nm RJ45 for 1G/2.5G/5G/10GBase-T and Wi-Fi (optional); Throughput Testing SFP slot for ONT Emulation (optional)
Hardware Options	
Z66-00-183G	Wi-Fi and Bluetooth for Communication/Management
Z66-00-362P	RJ45 for 1G/2.5G/5G/10GBase-T and SFP+ Slot for V-Test/V-PERF Line Rate HTTP Throughput up to 10GE
Z66-00-184G	Wi-Fi Testing and Wi-Fi and Bluetooth for Communication/Management
Ethernet Options	
499-05-949	ONT Emulation – requires Z66-00-362P (must use with SFP xPON ONT, 301-01-026G/027G/028G)
499-05-997	Ookla Speed Test, applied to all V-Test rates purchased
Pluggable Optics	
301-01-026G	SFP - GPON (requires 499-05-949 ONT Emulation)
301-01-027G	SFP - 10G EPON ONT (requires 499-05-949 ONT Emulation)
301-01-028G	SFP - XG(S)-PON ONT (requires 499-05-949 ONT Emulation)

General Specifications

Display (LCD)	5” TFT color screen, 720x1280px Capacitive multi-touch
Data Storage	
Internal Flash	18 GB (built-in)
External	USB-C memory stick (not included)
Remote	Upload via VeSion® R-Server (optional)
Connectivity/Management	
Wi-Fi	Optional Wi-Fi 802.11 a/b/g/n/ac/ax (requires a USB Wi-Fi adapter)
Ethernet	100/1000BASE-T (requires a USB-C to Ethernet adapter)
NFC	Built-in NFC transceiver
USB	USB Type-C PD

Battery	
Capacity	24 Wh, 3.3 VDC, 7200 mAh
Type	Rechargeable Lithium-Ion
Autonomy	More than one day worth of typical use and testing
AC/DC Adapter	45W, 15 VDC, 3.0A max
AC Input	100-240 VAC 50/60 Hz, 1.3A max
DC Output	15 VDC, USB-C Power Delivery (PD)
Dimensions	107 x 202 x 44 mm
(W x H x D)	4.21 x 7.95 x 1.73 in.
Weight	PX92: 687g (1.51 lb) PX92T: 618g (1.36 lb)
Environmental	
Operating Temperature	-5˚C to 50˚C (23˚F to 122˚F)
Storage Temperature	-40˚C to 60˚C (-40˚F to 140˚F)
Humidity	5% to 85%, non-condensing
Compliance	CE, WEEE, ROHS

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