MTTplus-410+ OTDR Module
500,000 Data Points with 3 cm Resolution

VeEX

2017
5.0 LIGHTWAVE INNOVATION REVIEWS
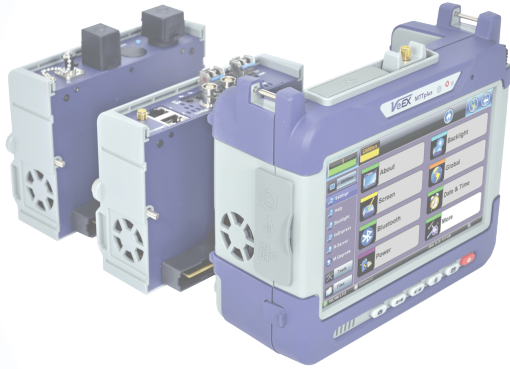
MTTplus
Modular Test Platform

The MTTplus-410+ Fiber Optics test module for the VeEX® MTTplus platform now has up to 500,000 data points with 3 cm resolution. The MTTplus-410+ supports a full range of test functions including OTDR, OPM, Light Source and VFL. Geo Tagging of optical test data and picture capture allows technicians to fully document any test location.
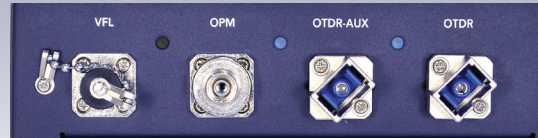
Module Highlights

Optical Time Domain Reflectometer (OTDR)
- Multimode Wavelength options - 850 & 1300 nm
- Singlemode Wavelength options - 1310, 1490, 1550, 1625 & 1650 nm
- Filtered 1625 or 1650 nm port for in-service measurements
- Live fiber detection to avoid service disruption of active subscribers
- Dynamic range up to 50 dB for long haul fibers and PON splitters
- Event dead zone < 1 m, Attenuation dead zone[5] < 4 m
- Optional V-Scout/V-Profile - Intelligent Link Mapping
- Fixed or Universal optical connectors with UPC or APC interface options

Optical Power Meter (OPM)
- Optional OPM for LAN, Telco, FTTx and CATV networks
- Multiple calibrated wavelengths
- InGaAs detector for standard and high power levels
- Absolute (dBm, Watts) and Relative (dB) power measurements
- Optional PONT Wavelength-selective power meter for GPON testing
- WaveID detection of incoming wavelength from compatible VeEX light source
- Industry standard optical adaptors available

Optical Light Source (OLS)
- Optional OLS function based on OTDR laser fitted
- Stabilized output for insertion loss testing
- WaveID/Loop mode to support multi-wavelength testing in a single operation
- CW or modulation modes for use with fiber identifiers
- Auto Off feature to conserve battery power

Visual Fault Locator (VFL)
- Visible laser for patch-panel troubleshooting or localized fault finding
- CW and 1 Hz operating modes

Modular Expert
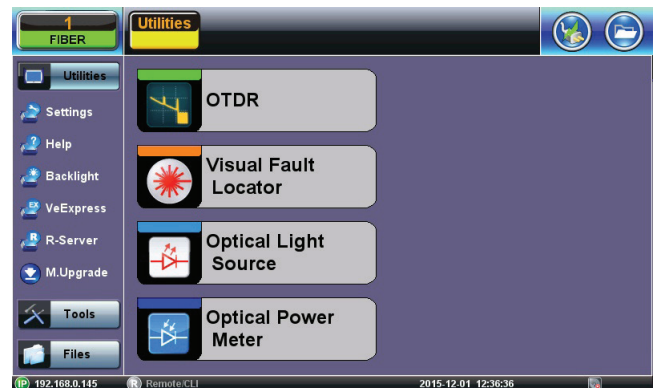
Optical Time Domain Reflectometer (OTDR)

Intuitive Test Setup

An intuitive menu structure offers simple test setup for Novice and Expert users alike. Test parameters can be configured manually by the user or set automatically by the unit.

Several wavelength combinations covering both multimode and singlemode applications are available, including short haul FTTX, Metro and Long Haul networks.
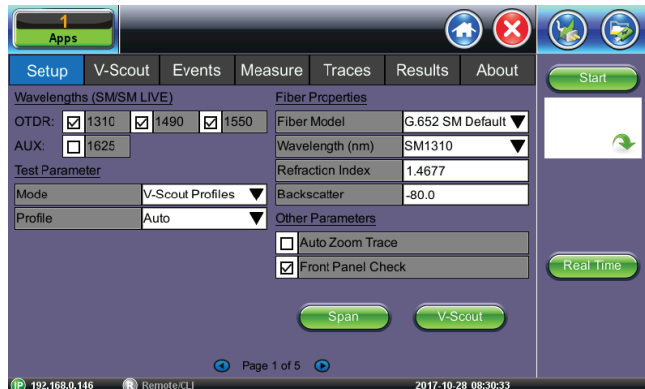

Live Fiber Check

The OTDR port also functions as an integrated power meter to detect optical power levels. This feature warns the user when the OTDR is connected to a fiber carrying live traffic thus preventing any possible service interruption.

This safety mechanism also prevents accidental overload and potential receiver damage. The unit automatically checks if light is present at the test interface prior to making measurement and will disable the transmitter if an active fiber is detected.

Analysis Thresholds

User defined thresholds for splice loss, connector loss, fiber lengths and reflectance can be preset to assess a fiber's condition. Color coding used in the event table will display events exceeding Pass/Fail thresholds and alert technicians of a potential problem.
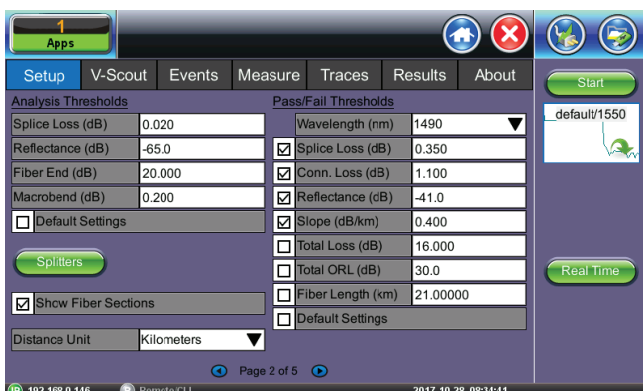

Latency Measurement

VeEX OTDRs can be used to measure latency in a fiber span. Latency is the time it takes for the signal to travel from point A to point B. Within the optical fiber itself, latency is dependent upon the refractive index and remains relatively constant at a specific optical wavelength.

These fiber properties allow data center operators, especially those providing co-location services to the financial sector, to "calibrate" and optimize optical links to ensure uniform latency among all customers.

V-Scout Link Mapping

Advanced algorithms evaluate separate acquisitions and characterize the fiber span using intuitive symbols. Each individual acquisition can be customized and user defined as a test profile depending on network type or application. This optional feature eliminates event interpretation and provides greater analysis confidence to the user, regardless of OTDR skill set.
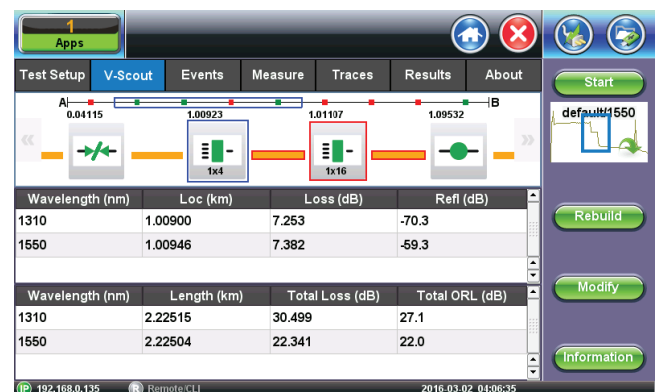
V-Scout Profiles

V-Scout Profiles put the operator back into the driver seat. Users can now build their own custom V-Scout test Plan and optimize it for their specific project using the automated V-Scout Profiles test mode. Select a maximum test range and V-Scout Profiles will list available pulse widths.
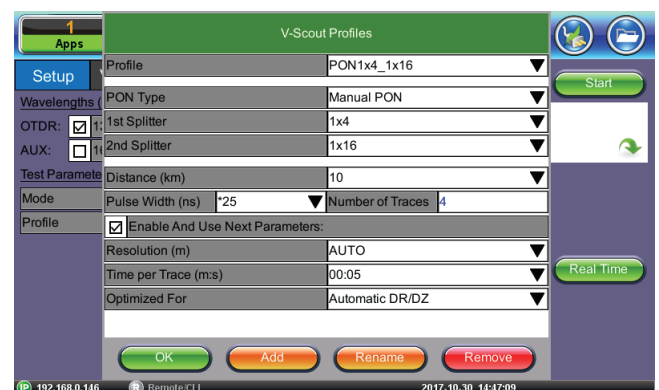
Accurate Event Analysis

Reliable event detection and accurate analysis are crucial to document fiber links properly at the time of installation. These baseline records are essential to troubleshooting faulty fiber networks and reducing system downtime afterwards.
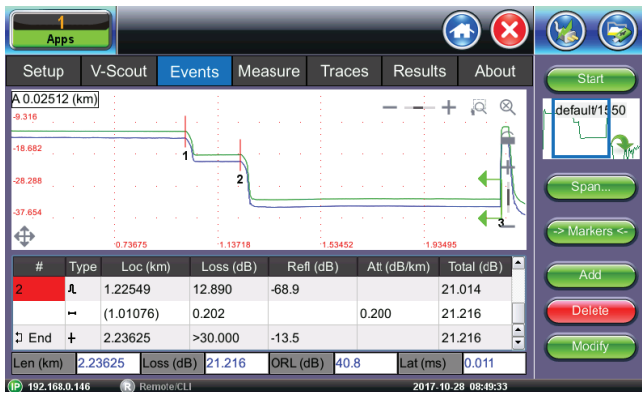
The MTTplus-410+ OTDR employs specialized techniques developed from decades of experience to locate and measure connectors, splices, optical splitters, and macro-bend.

Internal Launch Fiber

Near end fiber analysis is greatly improved thanks to the optional built-in G.657 launch fiber. Excellent dead zone performance and 3 cm sampling resolution allows the OTDR to evaluate loss and reflectance of the first connection and short fiber spans common in FTTA applications.

OTDR Results

Traces in the Telcordia SR-4731 sor format are saved in a logical hierarchy for easy sorting and archiving. Trace files can be pushed directly to Fiberizer Cloud from the tester using an Internet connection so that work supervisors have immediate access to test data being measured on site. Reference trace files can also be "pulled" from Fiberizer Cloud server for troubleshooting and restoration purposes.
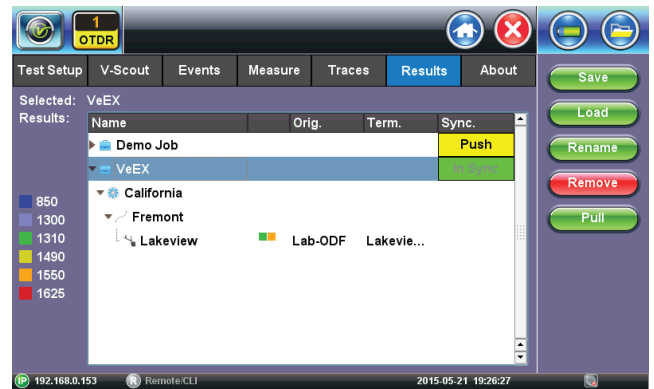
Visual Fault Locator (VFL)

The optional Visual Fault Locator is a useful tool to identify poor connections, bad fusion splices and macrobends in fiber management closures. Operating at 650 nm, this visible source offers up to 5 km (3 miles) of range.

Optical Light Source (OLS)

The OTDR port can operate as a stable light source for loss testing. The output supports WaveID which automatically sets the wavelength when paired with compatible VeEX optical power meters. The source output can also be modulated for use with industry standard fiber identifiers.
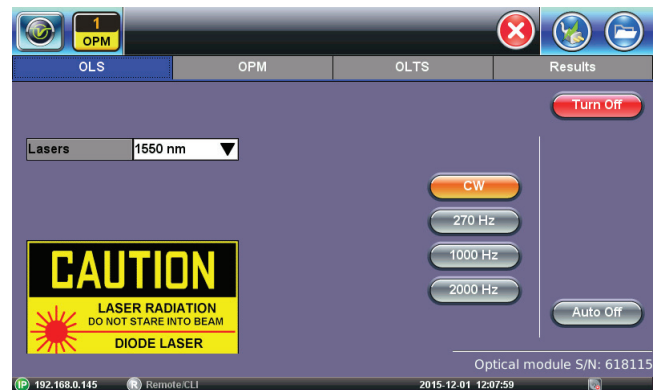
ReVeal RXTS PC software

ReVeal RXTS is an all-in-one software tool included with every RXT-4100 OTDR. The Windows compatible software enables the transfer of test data and other setup criteria between the tester and a PC.

Features include:
• Create test profiles and Pass/Fail thresholds offline to eliminate setup errors
• Archive test results and related installation information
• Generate professional acceptance reports
  - OTDR traces
  - Certification loss results/OPM loss results
  - Connector end-face images from Fiber Inspection scope
• Batch editing of OTDR traces using embedded Fiberizer utility
• Multi-language support including English, French, German, Spanish, Portuguese, and Russian

Optical Power Meter (OPM)

An optional Optical Power Meter (OPM) can be fitted to measure absolute or relative optical power levels. The OPM incorporates a highly sensitive and stable InGaAs detector with six calibrated wavelengths providing accurate level measurements from +10 to -65 dBm. A high power version is available for DWDM or CATV applications for levels ranging from + 25 to - 50 dBm.

WaveID

The OPM employs WaveID, a unique wavelength detection system common to most VeEX optical test products. The OPM automatically recognizes a single or multi-wavelength signal transmitted by another VeEX optical tester connected to the far end of the link under test. The OPM measures the level at the corresponding wavelength automatically, eliminating setup errors and saving test time.

Test Results

OPM and OLTS test data can be saved to internal memory using the same file-naming convention applied to OTDR traces. Saved results can be printed directly to pdf, exported to a PC for offline report generation or uploaded to Fiberizer Cloud depending on User documentation requirements.
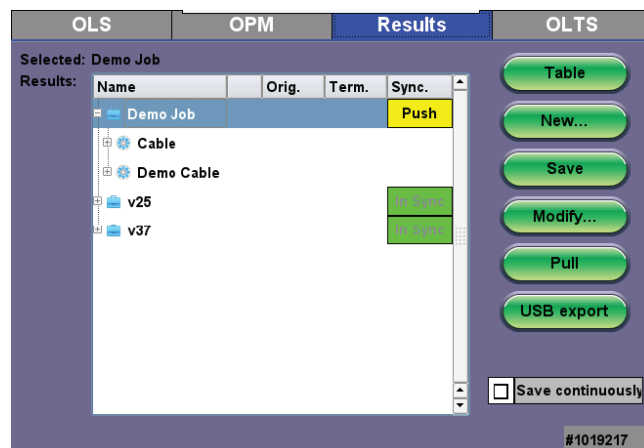
Switchable Adapters

The OTDR and OPM interfaces accept VeEX thread-on adapters, which can be swapped out in a matter of seconds. The UCI (Universal Connector Interface) and removable adapters interface with a variety of industry standard connector styles fitted with either angled or non-angled connector versions. A protective dust cap to protect the adapter from dirt and other contaminates is also included.

OTDR Trace Analysis and Documentation

Fiberizer™ Desktop

Fiberizer Desktop is a standalone PC software application to analyze traces acquired by the MTTplus OTDR. Users can edit traces manually, create event tables, generate reports using built-in templates and much more. This viewer displays trace files conforming to Telcordia (Bellcore) GR-196 & SR-4731 *.sor formats, and offers both 2-point and 5-point loss measurement modes. It also supports batch processing, a very useful feature for analyzing multiple fibers in a single cable. The software does not require Internet access to operate, but it can be interfaced with Fiberizer Cloud OTDR trace viewer at any time.

Work from Anywhere, Anytime

Fiberizer™ Cloud

Fiberizer Cloud, powered by Optixsoft, not only empowers the OTDR, but also the Workforce. Going way beyond traditional OTDR reporting methods or concepts, this cloud-based solution provides superior centralized test data management capabilities including powerful web based trace analyses. You can work from almost anywhere, at anytime because Fiberizer Cloud is a full online web service.

Streamlining onsite data reporting

Fiber technicians and contractors tasked to validate new fiber installations or restoring cable routes after an outage are generally obliged to submit measured data (.sor files) and related documentation to the network operator as proof of delivery before being paid. Valuable time however is often wasted after the onsite work is completed, because critical test files are usually first stored to some local storage media before being transferred to a colleague via email for verification and further reporting.

Fiberizer Cloud streamlines this information exchange, eliminating costly paper, e-mail or other time consuming communication methods - instead, time wastage can be avoided by transferring traces of jobs completed directly from the OTDR to Fiberizer Cloud. Professional PDF or MS Excel reporting functionality is also available, and users can create their own templates for reports. Bi-directional analysis of OTDR traces, tested from both ends of the optical fiber, can also be performed.

Fiberizer Cloud Connectivity

Pair the MTTplus OTDR Multiservice tester via Bluetooth to a mobile Smartphone, Laptop or Tablet PC and efficiently upload OTDR test data directly to the Cloud server using any available wireless technology (3G, WiFi).

Total Compatibility

Fiberizer Cloud is compatible with both Windows and MacOS browsers, not limiting users to PC platforms only. OTDR trace files in Telcordia (Bellcore) GR-196 & SR-4731 *.sor formats are securely transferred via HTTPS connection, a fast reliable communication protocol commonly used in today's Internet applications.

Optical Specifications[1]

OTDR	Multimode	Singlemode
Wavelength (± 20 nm)	850/1300	1310/1490/1550//1625//1650[2]
Laser safety class (21 CFR)	Class 1	
Display Range (dB)	0.1 to 54.165	
Dynamic Range (db)[3,12]	Refer to Ordering Guide	
Event dead zone (m)[4]	≤1.5	<1
Attenuation dead zone (m)[5]	≤5	<4
PON dead zone (m)[6]	25	N/A
Reflectance accuracy (dB)	±2.0	
Pulse width (ns)	10, 25, 30, 100 ,300 500, 1000	3, 10, 25, 30, 100 ,300 500, 1000, 3000, 10000, 20000 (where applicable)
Distance range (km)[7]	0.1 to 80	0.1 to 400
Distance Units	Kilometer, Meter, Mile, Kilofeet, or Feet	
Readout resolution (m)	0.01	
Sampling resolution (m)	Auto, High or Low (0.03 to 16 depending on module and distance range)	
Sampling points	Up to 500,000	
Distance uncertainty (m)[8]	$\pm(0.5 + \text{resolution} + 5 \times 10{-5} \times L)$	
Group Index Range	1.2000 to 1.8000 in 0.0001 steps	
Launch condition[9]	EF compliant	N/A
Linearity (dB/dB)	0.03	
Loss threshold (dB)	0.0001 to 100.0000 in 0.0001 step	
Loss resolution (dB)	0.01	
Measurement time	Realtime, auto or user defined presets (5s, 15s, 30s, 1 min, 2 min, 3 min, 10 min)	
Measurement modes	Loss (2-PT or LSA, dB/km), Reflectance, ORL, Latency	
Reflectance threshold (dB)	-0.10 to -99.9 dB in 0.1 dB step	
Typical real-time refresh (sec)	0.2	
Optical Interface	Fixed connector or optional universal interface with interchangeable adapters	
Optical Test Options	**Multimode**	**Singlemode**
Visual Fault Locator (VFL)	Optional	
-Wavelength (nm)	650 ± 10 nm	
-Output (mW)	1 mW output into 50/125 µm MM fiber	
-Laser Safety	IEC 60825-1, Class II	
-Optical connector	Universal 2.5 mm interface; Optional 2.5 mm or 1.25 mm converter	
Optical Light Source[10]	Optional	
-Wavelengths (nm)	850/1300	1310/1490/1550//1625/1650
-Output power (dBm)	>-6	>-4
Level Stability	±0.03 (15 min)	±0.05 (15 min)
-Source mode	CW, 270, 1000, 2000 Hz	
-WaveID	Standard feature; Auto detection of OLS wavelength	
Optical Power Meter (OPM)[11]	Optional	
-Calibrated wavelengths (nm)	650, 850, 1300, 1310, 1490, 1550, 1625, 1650	
-Power level range (dBm) - PM1, PM2	-65 to +10 (PM1) / -50 to +25 (PM2)	
-Accuracy, % (dB)	±8 (0.36 dB)	±5 (0.22 dB)
-Linearity, % (dB)	±6 (0.27 dB)	±2.5 (0.11 dB)
Optical connectors adaptor	Universal FC/SC/ST/LC	

Notes

1. Unless noted, all specifications are valid at 23°C ± 2°C (73.4°F ± 3.6°F) using FC-UPC connectors
2. 1625/1650 nm SM live-port built-in filter highpass > isolation > 30 dB from 1270 nm to 1585 nm
3. Typical dynamic range with longest pulse and three-minute averaging is the difference between extrapolated backscatter level at the start of test fiber to SNR = 1
4. Typical for reflection; -45 to -55 dB in singlemode and -45 dB to -30 dB in multimode, using 3 ns pulse measured 1.5 dB down from either side of the peak of an unsaturated reflective event
5. Typical 1310 nm attenuation deadzone < 4m; reflectance below -45 dB at 1310 nm and 0.5 dB above linear regression for dynamic range < 45 dB; 4.5 dB for dynamic range 45 dB or higher (module dependent)
6. Non-reflective FUT, non-reflective splitter, 13-dB loss, 25-nsec pulse, typical value using 39 dB OTDR
7. Distance Display auto-scale setting for FUT

Optical Test Functions

Optical Specifications			
Multimode OTDR			
Wavelength (nm)	Dynamic Range (dB)	Dead Zone	
		Event Dead Zone (m)	Loss Dead Zone (m)
850/1300	26/27	≤1.5	≤5
850/1300	27/27	≤1.5	≤5
Multimode/Singlemode			
850//1310	22//27	≤1.5 MM / <1 SM	≤5 MM / <4 SM
850/1300//1310/1550	27/27//38/35	≤1.5 MM / <1 SM	≤5 MM / <4 SM
Singlemode OTDR			
Wavelength (nm)	Dynamic Range (dB)	Dead Zone	
		Event Dead Zone (m)	Loss Dead Zone (m)
1310/1550	36/34	<1	<4
1550	36	<1	<4
1625 (F)	39	<1	<4
1625 (F)	41	<1	<5
1650 (F)	32	<1	<4
1650 (F)	41	<1	<5
Medium Range			
1310/1550	39/36	<1	<4
1310/1490/1550	39/35/36	<1	<4
1310/1550/1625	39/36/39	<1	<4
1310/1550//1625 (F)	39/36//39	<1	<4
1310/1550//1650(F)	39/36//39	<1	<4
1310/1550	43/43	<1	<5
Long Range			
1310/1550//1625(F)	43/43//39	<1	<5
1310/1550//1650(F)	43/43//39	<1	<5
Ultra Long Range			
1310/1550	45/44	<1	<5
1550	50	<1	<5

Notes *cont'd*

8. Does not include uncertainty due to fiber index

9. Compliant with Encircled Flux TIA-526-14-B and IEC 61280-4-1 Ed. 2.0 using an external EF conditioner

10. OLS shares the same test port as the OTDR

11. MM specifications are improved if EF conditioner used in measurements

12. 50 dB using 20 μs pulse width 16 meter res 10 min. on G.655; the difference between extrapolated backscatter level at the start of test fiber to SNR = 1.

Additional optical configurations available upon request with a maximum dynamic range of 45 dB for single mode lasers. Consult factory.

Hardware Options
Standard OPM (+10 dBm)
High Power OPM (+25 dBm)
Visual Fault Locator (650 nm)
Light Source (per OTDR laser fitted)
Built-in G.657 Launch Fiber (~40 m)

MTTplus General Specifications

Size	188 x 168 x 80 mm (W x H x D)
	7.4 x 6.61 x 3.15 in
Weight (module only)	0.466kg (< 1.03 lb)
Battery	Li-ion smart battery, 5800 mAh 10.8 VDC
Power Supply (AC Adaptor)	Input: 100-240 VAC, 50-60 Hz, Output: 15 VDC, 5.33 A
Operating Temperature	-10˚C to 50˚C (14˚F to 122˚F)
Storage Temperature	-20˚C to 70˚C (-4˚F to 158˚F)
Humidity	5% to 95% non-condensing
Display	TFT 7" full color touch-screen display
Ruggedness	Survives 1m drop to concrete on all sides
Management Interfaces	4 x USB Ports (3x USB A and 1x micro-USB B)
	1 x 10/100
	Base-T Ethernet (RJ45)
	Bluetooth (optional)
	Cellular Data Card (optional)
	WiFi 802.11a, b, g, n and/or ac (optional)
	Data Card/GPS (optional), WiFi (optional)
Languages	Multiple languages can be supported
System Memory	Dedicated 8GB USB flash storage

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