

- Tailored to Simplify Installation and Troubleshooting of RF Signals
- 1.25 GHz RF Measurement Range with Channel Plan Auto Discovery
- Intuitive, Color Touchscreen with Simple Pass/Fail Indicators Reduces Installer Entry Errors and Improves Decision Making
- Multiple Tests in a Single Autotest App Provide a Convenient way to Standardize Tech Processes & Procedures
- Powerful Troubleshooting Tools to Improve the Overall Health of the System
- High-Intensity LED Flashlight Designed for Working in Cramped, Dark Spaces



Provides cable installers and field technicians a full complement of RF measurement functions

The Standardization Solution

Trilithic's 180 DSP™ is a signal level meter specifically tailored for installation and troubleshooting of RF signals. Featuring fast measurements and powerful troubleshooting tools, the 180 DSP comes equipped with all the tests an installer needs to measure both Analog and Digital signals to ensure the highest quality installation—and includes a price point that makes it feasible for system operators to outfit their entire fleet.

Tailored for the challenges faced by installers, contractors, and service techs, the 180 DSP helps simplify decision making and streamlines standardization processes and procedures, while improving tech efficiencies and the overall health of the entire system.

Next-Gen Features

The 180 DSP features an intuitive, color touchscreen interface, simple pass/fail indicators, and autotest apps to streamline basic RF installation and make the installer's job easier.

Everything about this next-gen meter was built with the technician in mind—from the quickest charge time of any signal level meter, to its unique, built-in LED flashlight and glow in the dark keypad for those dark, cramped spaces.

Comprehensive Testing

The 180 DSP makes basic RF installation a breeze for installers and contractors. Techs will appreciate the advantages of a quick and efficient device at their disposal, featuring a flexible and easy-to-operate interface inspired by modern smart devices.

With its built-in Ethernet port, all testing results can be easily forwarded to the ViewPoint management software in the back office for near real-time views of measurement data.

innovative technology to keep you a *step ahead*

AVAILABLE MODELS:

- 180 DSP w/ 1.2 GHz RF
P/N 2011755XXX

STANDARD INTERFACES:

- Dual RF Test Ports (F-Type)
- RJ45 Management Port (10/100 Mbps)
- USB 2.0 Flash Drive Port

The 180 DSP supports a variety of functions, including:

- Auto Discovery of Channel Plans
- Multi-user and multi-language support
- Create jobs right on the meter
- Built-in web browser, real-time data transmission
- Interactive basic RF installation process

STANDARD TESTING FEATURES:

- Level Measurement
- C/N Measurement
- QAM Measurement (MER/BER/Constellation/EQ)
- Complete Channel Plan Scan with Tilt Measurement
- Return Spectrum Analysis (4 to 110 MHz)
- Ping, Trace Route, VoIP & Throughput Measurements

OPTIONAL TESTING FEATURES:

- Analog & Digital HUM Measurement
- Forward Spectrum Analysis (5 to 1250 MHz)
- Bluetooth Communications Adapter
- Frequency Domain Reflectometer
- QAM Error Vector Spectrum Analysis
- Source Generator (CW, QAM & OFDM)
- Upstream TrafficControl Plus

Simple Yet Powerful

Providing the widest range of functions for an installer available today (as standard options), the 180 DSP includes virtually all the testing options an installer or service technician needs to verify service quality and easily identify and fix problems in the field.



Autotest Apps

The 180 DSP features next-generation autotest applications that practically walk the technician through a job. By performing standardized measurement tests at various required locations on the job site using user set test plans, channel plans, and limit sets, the meter very clearly indicates (using color and symbols) what areas still need attention, before the technician leaves the job site.

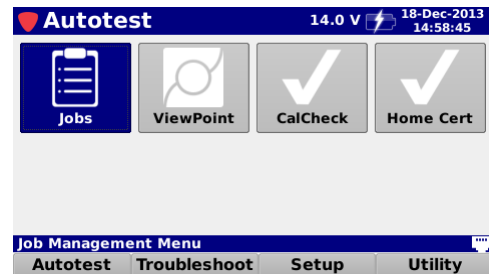


Multi-user support allows technicians that work in various territories to easily switch channel plans, standardized autotest apps, and test limits or login as a completely different user. Connecting to ViewPoint allows techs to upload job data in near real-time as well as transmit and receive channel plans, autotests, and firmware.

Leaving less room for entry error, this new simple user interface can translate into less training and more efficient time in the field for techs. The 180 DSP comes equipped with all of the required troubleshooting tools for the advanced technician, it also offers a higher comfort factor for novice technicians, reducing decision making in the field, which can ultimately result in more productive work days and more satisfied customers.

Justify ROI

Field operations managers can now easily verify that all of their technicians are performing the proper tests and are doing so at the right place and time—in near-real time. The potential benefits include identifying techs who need additional training, improving team performance, reducing truck rolls, and cutting operating costs.



At a higher level, ViewPoint can deliver simple, standardized, system-wide reports and dashboards that can help a director or VP of technical operations view the entire operation at a glance to gain information that can be used to reduce service and repeat trouble calls.

Essentially, this integrated system approach allows cable operators to see much more of their certification operations and use the information in practical ways. The insights can enable them to identify both localized problems and high-level system issues to make decisions based on a clearer understanding of their overall operations and the associated ROI.

viewpoint		Meter	Tech ID
		360133722	9710
Receive (28)		Send (24)	
Channel Plans	4/4	Jobs	0
Limit Sets	6/6	Data Logs	14
Autotests	3/3	Screen Shots	10
Ethernet Limit Sets	1/1		
Ethernet Frames	6/6		
Ethernet Streams	8/8		
Ethernet Targets	0/0		
Settings	0/0		
Ready		Sync	

Combining 180 DSPs in the field with the new ViewPoint WFM Module in the back office, managers can view the health of their entire system—in near real-time, for total RF installation management.

180DSP with 1.25GHz RF

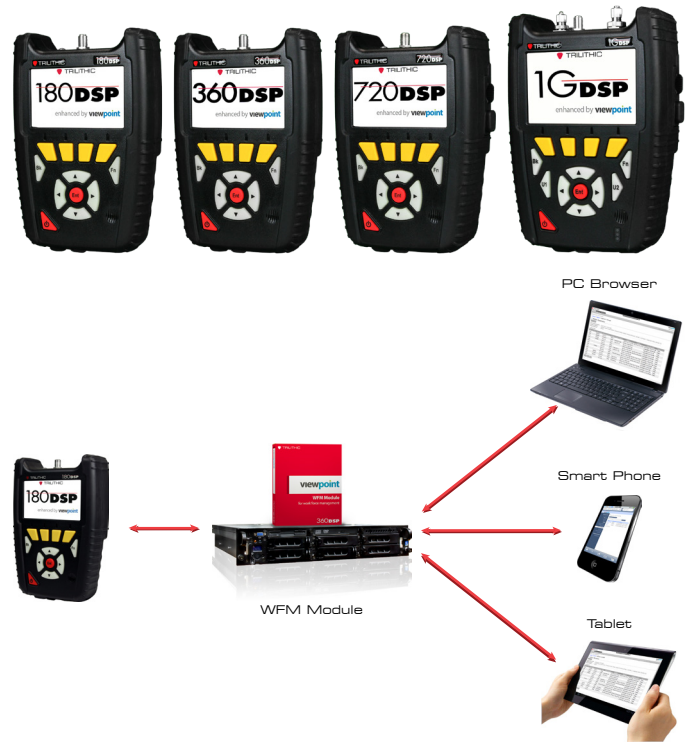
Signal Level Meter

TOTAL SYSTEM MANAGEMENT

Combining the 180 DSP, 360 DSP, 720 DSP & 1G DSP meters in the field with the new ViewPoint Integrated Server in the back office, managers now have simplified access to intelligent management tools for monitoring, assessing, and improving the efficiency of their total operation, while making it even easier to obtain consistent, repeatable results that give supervisors that birds-eye view of the field for Total System Management.

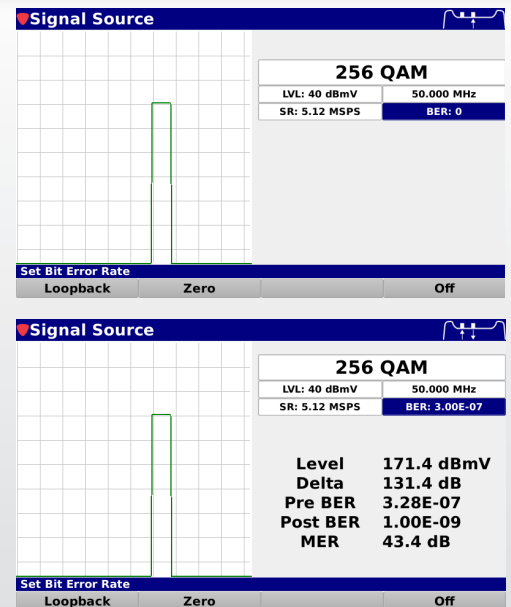
By unifying an entire MSO's field operations in one convenient dashboard, managers can easily verify compliance and quality throughout the entire plant, either by home, system, region, division, or any other attribute from a billing system.

This simple and completely customizable integrated system of field analysis and reporting tools allows managers to watch over their entire field operations in one dashboard, comparing each location in the system, analyzing the overall health of their entire organization, and addressing concerns in near real-time.



DUAL RF TEST PORTS & SOURCE GENERATOR (OPTIONAL)

- The meter features two (2) built-in test ports (standard) for RF loopback testing that allow for the simultaneous transmission of a source signal from the TX Port and the measurement of the same signal using the TX/RX Port
- The Source Generator Option provides the ability to transmit continuous wave (CW), 16 to 256 QAM, or 4K/8K OFDM carriers within the return band from 5 to 85 MHz with user-adjustable bit error injection
- When combined, these features allow maintenance techs to use a single field analyzer to identify issues with active and passive devices, such as amplifiers, nodes, pads, and cables

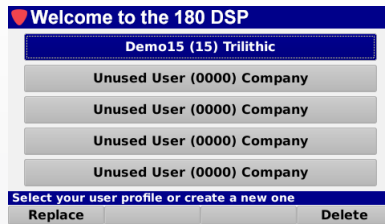


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BASIC OPERATIONAL FEATURES

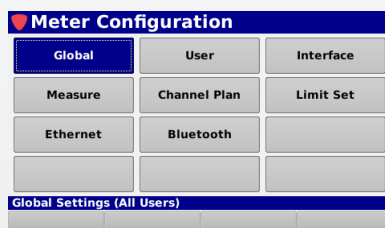
Multiple User Profiles

- Allows up to 5 technicians to share a 180 DSP
- Each technician has his or her own profile, which loads in completely different sets of channel plans, autotests, etc.



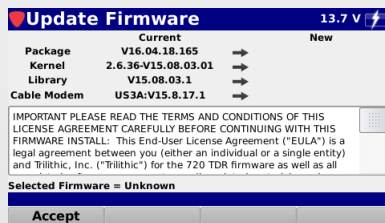
Easy Setup & Configuration

- Global configuration settings can be applied to all users of the device, while other settings can be tailored to suit each user
- Setting adjustments can be locked out using the ViewPoint software



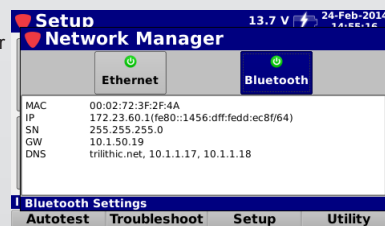
Convenient Firmware Updates

- Easily update the meter firmware through the web or via USB to ensure you always have the latest features



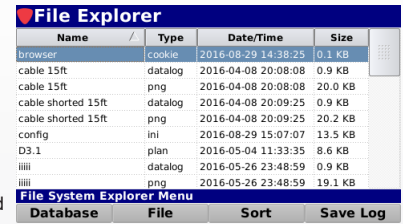
Bluetooth Communications Adapter (OPTIONAL)

- Remote control of the meter via a Class II Mini Bluetooth Adapter (v2.1) with a 10 meter range
- Connect to an iPad that has device tethering enabled by the service provider



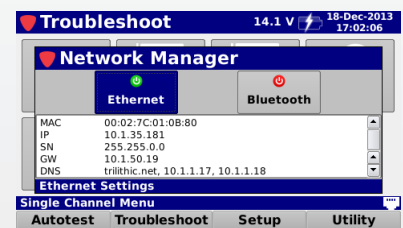
Intuitive File Management

- Intuitive File Explorer that displays the files that are stored in the meter
- View and sort files by; name, type, size and date/time saved
- Export files to USB, delete files, database backup & restore, and save system logs



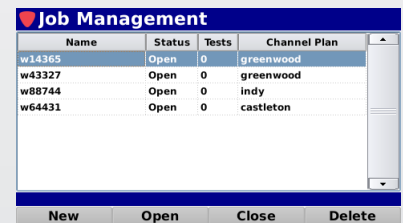
Simple Network Management

- Choose between Ethernet or Bluetooth connection methods
- Provides connection details such as MAC, IP, gateway and DNS



Job Management

- Create and close out your jobs from this screen
- Shows what channel plan and how many tests have been run on a particular job



Remote Access

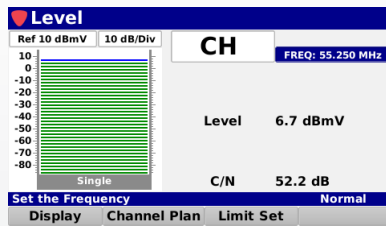
- Remotely access the meter using any active network connection
- Control and monitor almost any function of the meter from your PC, smart phone, or tablet



LEVEL MEASUREMENTS

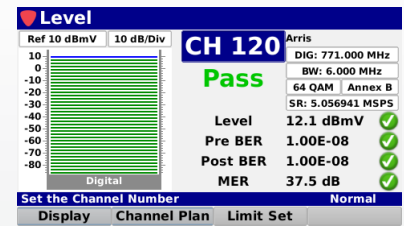
Single Frequency Pilot Carriers

- Shows a bar graph for the level of the selected single frequency carrier channel
- Provides Pass/Fail results for Level and Carrier-to-Noise measurements when compared against user-defined limit sets



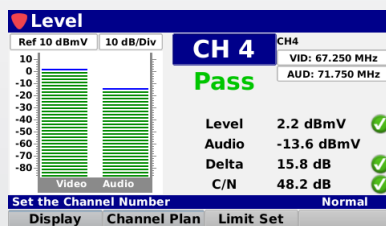
SQ-QAM Carriers

- Shows a bar graph for the level of the selected digital SC-QAM channel
- Provides Pass/Fail results for Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



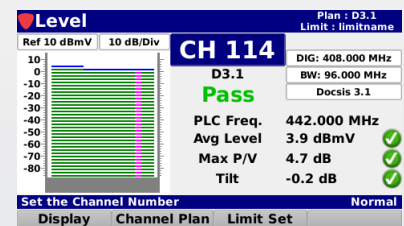
NTSC/PAL/SECAM Carriers

- Shows a bar graph for the video and audio levels of the selected analog channel
- Provides Pass/Fail results for Video Level, Audio Level, Delta V/A, and Carrier-to-Noise measurements when compared against user-defined limit sets



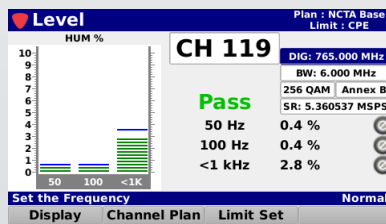
OFDM Carriers

- Shows the Physical Link Channel (PLC) frequency and a bar graph for the level of the selected digital OFDM channel
- Provides Pass/Fail results for Average Level, Max P/V, and Tilt measurements when compared against user-defined limit sets



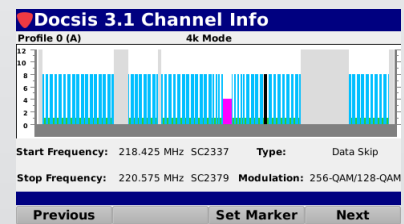
Analog & Digital HUM Measurement (OPTIONAL)

- Measure the amplitude of 50/60 Hz, 100/120 Hz, and low frequency interference present on analog or digital channels
- Provides Pass/Fail results for limit sets



DOCSIS 3.1 Channel Information

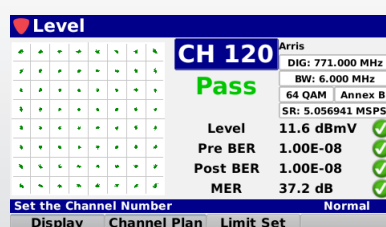
- Displays the PLC, BPSK Sub-Carriers, Blocks of QAM Sub-Carriers, and Exclusion Zones defined within Profile A of the DOCSIS 3.1 OFDM Channel
- Provides Markers for closer inspection of individual carriers, which include the start/stop frequency of the carrier as well as its type and modulation



CONSTELLATION MEASUREMENTS

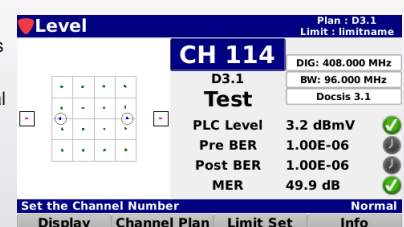
SC-QAM

- Shows the constellation diagram of the selected digital SC-QAM channel
- Provides Pass/Fail results for Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



OFDM Physical Link Channels (PLC)

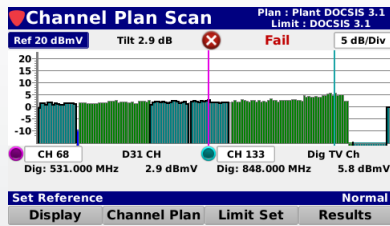
- Shows the constellation diagram for the PLC continuous pilots, BPSK symbols, and 16 QAM data of the selected digital OFDM channel
- Provides Pass/Fail results for PLC Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



MULTI-CHANNEL MEASUREMENTS

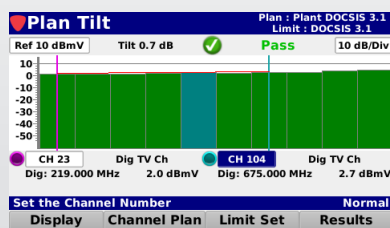
Channel Plan Scan

- Full channel plan scan displays the frequency response of the entire channel lineup
- Provides Pass/Fail results for limit sets and color-coded channels; blue for analog, green for SC-QAM digital, and aqua for OFDM digital



Tilt Measurement

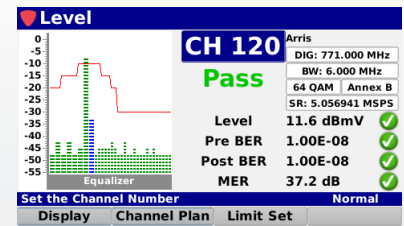
- Full channel plan scan displays the frequency response of the entire channel lineup
- Provides Pass/Fail results for limit sets and color-coded channels; green for digital and blue for analog
- Tilt shows the level difference between two selectable channels



DIGITAL TROUBLESHOOTING

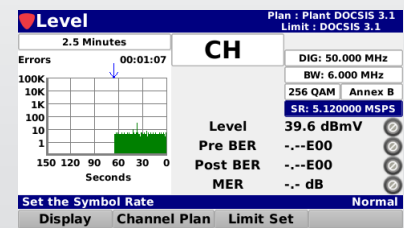
Equalizer Tap Display

- Shows the equalizer tap levels of the selected digital SC-QAM channel in comparison to the DOCSIS specification for allowable correction
- Easy identification with Pass/Fail results for RF issues and impairments related to group-delay and microreflections



BER-Over-Time Display

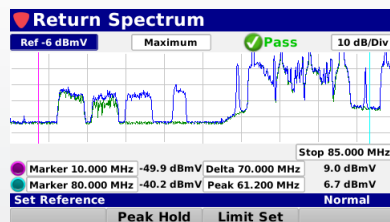
- Shows the BER measurement of the selected digital SC-QAM channel over a user-defined time period
- The graph displays green lines for Pre-BER and red lines for Post-BER and provides Pass/Fail results for Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



SPECTRUM MEASUREMENTS

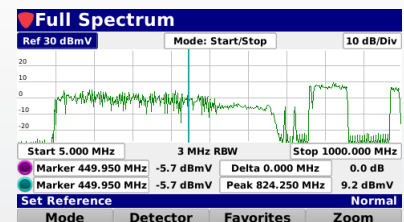
Return Spectrum Measurement

- Provides the ability to view raw return spectrum traces from 4 to 110 MHz
- Fast DSP spectrum snapshots give the user extreme speed to capture fast transients on the upstream



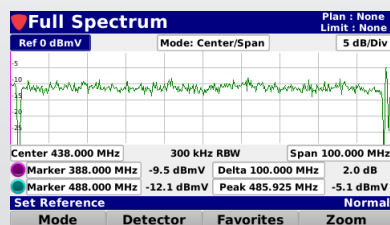
Full Spectrum Measurement (OPTIONAL)

- Provides the ability to view raw forward spectrum traces from 5 to 1250 MHz
- Fast DSP spectrum snapshots give the user extreme speed to capture fast transients on the downstream



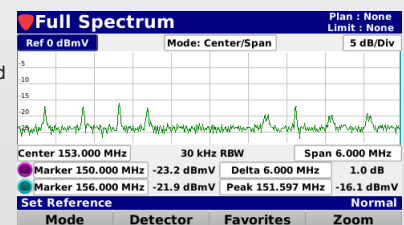
OFDM Channel Spectrum

- Provides the ability to view raw forward and return spectrum traces of full 24 to 192 MHz OFDM channels
- Fast DSP spectrum snapshots give the user extreme speed to capture fast transients on the upstream and downstream



OFDM Physical Link Channels (PLC)

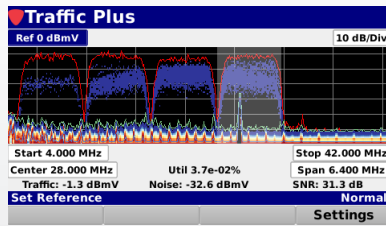
- Provides the ability to view raw spectrum traces of the continuous pilot carriers needed for locking onto an OFDM signal
- Identify locations of ingress or interference that could potentially affect the PLC



INGRESS UNDER CARRIER MEASUREMENTS

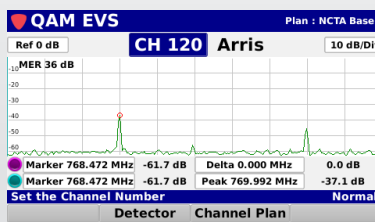
Upstream Traffic Control Plus (OPTIONAL)

- Allows for a high-speed real-time view of ingress in the upstream
- Heat map allows for simplified view of ingress hotspots
- 100% coverage so technicians can see even the shortest cable modem bursts and ingress even under the busiest upstream



Downstream QAM Error Vector Spectrum (OPTIONAL)

- Tune to downstream QAM channels to display Error Vector Spectrum (EVS)
- Display the ingress that is present "underneath" an upstream cable modem channel, or any bursty signal



NETWORK CONNECTIVITY TESTING

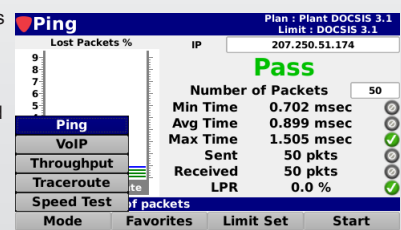
Web Browser

- The web browser allows you to view your favorite websites
- The web browser displays a default home page which includes a list of six favorite websites. These favorites can be set to any IP address or URL using the ViewPoint WFM Module software



Network Test Suite

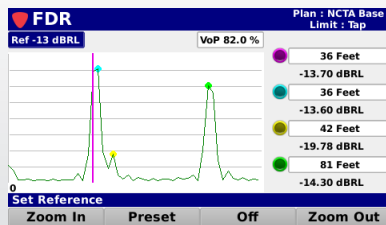
- The Network Test Suite includes Ping, VoIP, Throughput, and Traceroute tests
- These tests provide a quick and simple connectivity test to your favorite testing sites or to the Trilithic ACTS software



CABLE CONTINUITY TESTING

Frequency Domain Reflectometer (OPTIONAL)

- Determine the distance to cable faults (opens, shorts, splitters, etc.)
- Events shown on a distance versus amplitude display
- Markers to identify the distance and loss at the source of the reflection



MEASUREMENT SPECIFICATIONS

Level Measurement

Channel Bandwidth	6 MHz and 8 MHz
Amplitude Range	-40 dBmV to +50 dBmV
Modulation Types	Analog: NTSC, PAL B/D/G/H/I/K/N & SECAM B/D/G/H/I/K Digital: 16/32/64/128/256 QAM Annex A, 64/256 QAM Annex B, OFDM 4K/8K
Analog Measurement Accuracy	±0.75 dB @ 77 °F (25 °C) ±2.0 dB from 0 to 122 °F (-18 to 50 °C)
Digital Measurement Accuracy	±0.75 dB @ 77 °F (25 °C) ±2.5 dB from 0 to 122 °F (-18 to 50 °C)
Resolution	0.1 dB

Spectrum Measurement

Frequency Range	Return Path: 4 to 110 MHz Forward Path (Optional): 5 to 1250 MHz
Dual Return Path Diplexers	42 MHz: 4 to 42 MHz 85 MHz: 4 to 85 MHz
Manually Adjustable Resolution Bandwidth	Return Path: 300 kHz Forward Path (Optional): 10, 30, 100, and 300 kHz 1 and 3 MHz
Auto Ranging Resolution Bandwidth	10 kHz: Span \leq 3.5 MHz 30 kHz: Span \leq 12.0 MHz 100 kHz: Span \leq 35.9 MHz 300 kHz: Span \leq 300 MHz 1 MHz: Span \leq 259.2 MHz 3 MHz: Span \geq 359.3 MHz
Display Spans	Return Path: 4 to 42 MHz, 4 to 65 MHz, 4 to 85 MHz or 4 to 110 MHz Forward Path (Optional): User-selectable in 1 kHz steps
Display Scale	1, 2, 5, or 10 dB/division
Display Range	8 vertical divisions (when marker bar is hidden)
Spurious Free Dynamic Range	60 dB @ 25° C (77° F) (+50 dBmV)
Sensitivity	Return Path: -30 dBmV (4 MHz to 110 MHz) Forward Path (Optional): -40 dBmV (50 MHz to 1 GHz)

Digital Channel Measurement

Deep Interleave Compatibility	Yes
Downstream MER	40 \pm 2 dB @ +6 dBmV RF Input Level 34 \pm 2 dB @ -6 dBmV RF Input Level
Downstream BER	Method: True BER, derived from code words not from MER Standard: ITU J.83 annex A, B, C Range: 1 E-7 to 1 E-9 @ -6 dBmV RF Input Level
Symbol Rates	\geq 2 msp/s; \leq 6.952 msp/s

Carrier-to-Noise Measurement (In-service, non-scrambled standard channels only)

Minimum Input Level for Full Range	+10 dBmV
Dynamic Range	50 dB
Resolution	< 0.5 dB

Tilt Measurement

Max Number of Carriers	14 (dependent on favorite channel setup)
High/Low Delta Resolution	0.1 dB
Scan	Video, audio, pilot, and digital carriers

Analog & Digital HUM (Optional) - In-service, non-scrambled standard channels only

Minimum Input Level	0 dBmV
Range	0 to 5%
Resolution	0.1%
Accuracy	±0.5%

Frequency Domain Reflectometer (Optional)

Velocity of Propagation	Adjustable from 60.0 to 99.0% in 0.1% increments
Working Distance	Minimum: 755 feet (230 meters) @ VoP of 60.0% Maximum: 1247 feet (380 meters) @ VoP of 99.0%
Amplitude Range	0 to -80 dBRL
Distance Accuracy	5 feet

Source Generator (Optional)

Modulation	CW, 16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM, OFDM (4K/8K)
OFDM Subcarrier Modulation	16 to 4096 QAM, PLC Configurable
Frequency Range	5 to 85 MHz
Source Width	CW: 50 kHz QAM: 6 MHz OFDM: 6 to 24 MHz
Amplitude	CW: Adjustable from 10 to 55 dBmV QAM: Adjustable from 10 to 45 dBmV OFDM: Adjustable from 10 to 40 dBmV
QAM Symbol Rates	0.64, 1.28, 2.56, 5.12 MSPS
QAM Error Rates	BER: Adjustable from 0 to 1.00E-2 MER: > 38 dB
CW Source Accuracy	±2 dB

PHYSICAL & ENVIRONMENTAL SPECIFICATIONS

Physical Specifications

Construction	Rubber overmolded plastic housing
Control	Glow in the dark keypad and LCD touchscreen and/or via a wireless connection to a mobile device such as a laptop, tablet, iPad® or iPhone®, or Android® handset
Display	Color LCD touchscreen 480 x 272 pixels (approx 4" x 2.25")
Annunciators	Audible annunciator for key strokes
Flashlight	High intensity LED (0.25W)
Dimensions w/o Case (H x W x D)	8.6 x 6.1 x 2.00 in (21.84 x 15.94 x 5.08 cm)
Dimensions w/ Case (H x W x D)	9.6 x 7.1 x 3.00 in (24.38 x 18.03 x 7.62 cm)
Weight w/o Case	2.5 lbs (1.13 Kg)
Weight w/ Case	3.5 lbs (1.59 Kg)

Available Interface Types

Tx Test Port	75 Ohm Replaceable F-Type Connector Source Generator Output Transmission Only
Tx/Rx Test Port	75 Ohm Replaceable F-Type Connector Upstream & Downstream RF Measurements DOCSIS 3.1 Modem
Ethernet	RJ45 Ethernet Port (10/100 Mbps)
USB	USB 2.0 Type-A Standard Port
Bluetooth (Optional)	Class II Mini Bluetooth USB Adapter (v2.1) with a 10 meter range for speeds up to 3 Mbps

Battery & Power Specifications

Operating Time	4 to 5 hours, dependent on use
Charge Time	4 hours
Battery	One 2600 mAh @ 7.4V Li-Ion internal battery, factory replaceable
Power Adapter	Input: 100 to 240 VAC ~ 47 to 63 Hz, 1.1A Max Output: 15 VDC, 3.3A

Environmental Specifications

Storage & Operating Temperature	-18° to +50° C (0° to 122° F)
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INCLUDES THE FOLLOWING:

- 180 DSP Meter
- Protective carrying case
- Shoulder strap
- AC to DC Power Adapter & Battery Charger
- AC Power Cable
- Touchscreen Stylus

SOFTWARE:

ViewPoint Express Configuration Software for the 180 DSP
P/N 0930215000

ViewPoint Integrated Server with WFM Module for the 180 DSP
P/N 2011656002

ACTS™ Software
P/N 0930144000

RELATED PRODUCTS:

Precision RF Coaxial Test Cable (I/O-15)
P/N 2071527048

I-Stop 1 GHz Test Probe
P/N 2011728000

TLB-46 Return Measurement Low-Pass Filter
P/N 2011640000