360 DSP

- ■ Advanced Home Certification Capabilities Simplify Installation and Troubleshooting

- ■ Intuitive Color Touch Screen with Simple Pass/Fail Indicators Reduce Installer Entry Errors and Improves Decision Making

- ■ Next-Generation Autotest Apps Streamline Certification

- ■ Convenient Multiple Standard Tests in a Single Autotest App Help to Standardize Tech Processes & Procedures

- ■ Powerful Troubleshooting Tools Improve the Overall Health of the System

The precision of a field analyzer with the power of a smart device.

The Standardization Solution

Trilithic's 360 DSP™ is the first meter designed specifically to simplify Home Certifications. Built from the ground up, tailored specifically for the needs of fulfillment, this meter is ideal for standardizing processes and procedures for installation and service. The 360 DSP also 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, this go-to next-gen meter comes equipped with all of the powerful troubleshooting tools for the advanced tech, yet helps simplify decision making and streamlines standard processes and procedures for the more novice tech. This improves tech efficiencies, the overall health of the entire system, and allows techs to grow with the meter.

Next Gen Features

The 360 DSP features an intuitive color touch screen interface, simple pass/fail indicators, and autotest apps to streamline certification and make the installer's job easier.

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

With its next-generation smart device technology the 360 DSP is the easiest to use, most feature-rich, best-performing meter available for installation and troubleshooting of residential customer accounts.

Comprehensive Testing

The 360 DSP makes Home Certification a breeze for technicians at all levels including installation, service, and contractors. Techs will appreciate the advantages of a quick and efficient device at their disposal that features a flexible and easy-to-operate interface that is inspired by modern smart devices.

This next gen fulfillment tool comes equipped with powerful troubleshooting tools and simplified autotest apps to perform triple play tests, set Home Certifications standards and measure both Analog and Digital signals. With its built-in CableLabs Certified® DOCSIS 3.0 (8x4) Modem, Ethernet and Wi-Fi communications capabilities, all testing results can be easily forwarded to the ViewPoint management software in the back office for near real-time views of measurement data.

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360 DSP
Installation & Service Meter

AVAILABLE MODELS:

- 360 DSP - US (6 MHz)
  with b/g Wi-Fi
  P/N 2011614XXX

- 360 DSP - EURO (6/8 MHz)
  with b/g Wi-Fi
  P/N 2011695XXX

- 360 DSP - US (6 MHz)
  with b/g/n Wi-Fi
  P/N 2011718XXX

- 360 DSP - EURO (6/8 MHz)
  with b/g/n Wi-Fi
  P/N 2011719XXX

OPTIONS:

- Frequency Domain
  Reflectometer (FDR)
  P/N 0930207002

- Bluetooth Communications
  Adapter (BCA)
  P/N 2011670002

- Forward Spectrum Analysis
  (FSA)
  P/N 0930207004

- Analog & Digital HUM
  P/N 0930207005

- Source Generator (SRC)
  P/N 0930207007

- Linear Distortions Testing
  (LDT)
  P/N 0930207003

- QAM Ingress Spectrum
  (QIS) Analysis
  P/N 0930207006

The 360 DSP supports a variety of functions, including:

- Multi-user support
- Multi-language support
- Create work orders right on the meter
- Built-in web browser, real-time data transmission
- Interactive home certification process

Simple Yet Powerful

Providing the widest range of functions for an installer available today (as standard options), the 360 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.
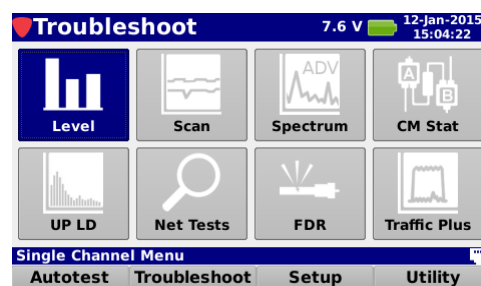
STANDARD TESTING FEATURES:

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

STANDARD INTERFACES:

- RF Test Port (F-Type)
- DOCSIS 3.0 modem 8x4 (100/304 Mbps)
- RJ45 Management Port (10/100 Mbps)
- Cable Modem Thru RJ45
- 802.11 "b/g" 2.4 GHz Wi-Fi
- USB 2.0 Flash Drive Port

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Autotest Apps

The 360 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. The built-in web browser allows techs to upload job data in near real-time as well as transmit and receive channel plans, autotests, work orders, 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 360 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.
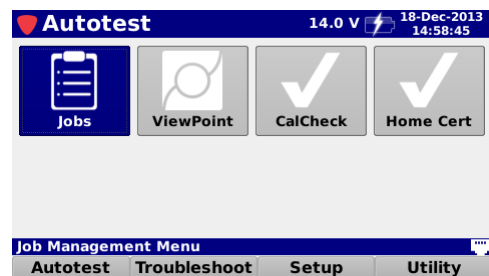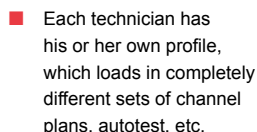

Essentially, this integrated system approach allows cable operators to see much more of their certification operations and use the information in practical ways. The insights can enable them to identify both localized problems and high-level system issues to make decisions based on a clearer understanding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

Combining 360 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.
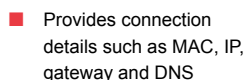
360 DSP

STANDARD FEATURES

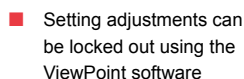The 360 DSP includes all of the following features standard.

Multiple User Profiles

■ Allows up to 5 technicians to share a 360 DSP

■ Each technician has his or her own profile, which loads in completely different sets of channel plans, autotest, etc.

Welcome to the 360 DSP

360-USER (2222) ACME Cable

Unused User (0000) Company

Unused User (0000) Company

Unused User (0000) Company

Unused User (0000) Company

Select your user profile or create a new one

Replace   Delete

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

Job Management

Name	Status	Tests	Channel Plan
w14365	Open	0	greenwood
w43327	Open	0	greenwood
w88744	Open	0	indy
w64431	Open	0	castleton

New   Open   Close   Delete

Simple Network Management

■ Choose between Ethernet or Bluetooth connection methods

■ Provides connection details such as MAC, IP, gateway and DNS

Navigation   13.9 V   30-Jul-2012 19:07:30

Network Manager

DOCSIS   Ethernet   Wi-Fi   Bluetooth

MAC	00:02:7C:00:05:A0
IP	10.1.29.44
SN	255.255.0.0
GW	10.1.1.1
DNS	trilithic.net, 10.1.1.18, 10.1.1.17, 10.1.1.21

Ethernet Settings

Web Browser Menu

Autotest   Troubleshoot   Setup   Utility

LED Flashlight

■ High intensity LED for working in dark spaces

■ Control is provided through the Fuction menu for quick access from any screen

Navigation   14.0 V   30-Jul-2012 19:04:10

Browser

Pause Meter

Toggle Flashlight

Screen Capture

Network Manager

Log Off User

Web Browser Menu

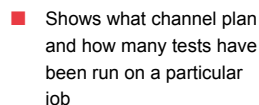Autotest   Troubleshoot   Setup   Utility

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

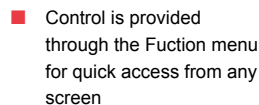■ Setting adjustments can be locked out using the ViewPoint software

Meter Configuration

Global	User	Interface
Measure	Channel Plan	Limit Set
Ethernet	Cable Modem	Wi-Fi
Bluetooth		

Global Settings (All Users)

Cable Modem Statistics

■ Shows up to 8 downstream channels and 4 upstream channels

■ Provides performance metrics for all downstream and upstream channels

Cable Modem Statistics

Downstream   **Pass**

Pri	Frequency (MHz)	Rx Level	SNR	PreBER	PostBER
✓	819.000 (256 QAM)	16.74 dBmV	39.9 dB	1.00E-08	1.00E-08 ✓
✓	807.000 (256 QAM)	17.30 dBmV	39.0 dB	1.00E-08	1.00E-08 ✓
✓	813.000 (256 QAM)	16.79 dBmV	39.4 dB	1.00E-08	1.00E-08 ✓
✓	801.000 (256 QAM)	18.13 dBmV	39.4 dB	1.00E-08	1.00E-08 ✓

Press Up for Upstream Information

Limit Set

G-Speed or N-Speed Wi-Fi with Survey Test Mode

■ Built-In 802.11 "b/g" 2.4 GHz or "b/g/n" 2.4/5 GHz wireless adapter

■ Actively view live signal strengths of Wi-Fi networks in the area

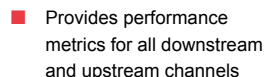■ Provides Wi-Fi details such as SSID, channel and power level

Wi-Fi Survey

SPEEDY* (Channel 11) Power: -48 dBm

Display   Sort

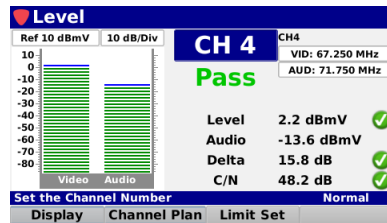**TRILITHIC**

INCLUDED MEASUREMENT FUNCTIONS

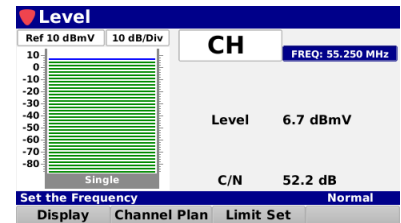The 360 DSP includes all of the following measurement functions standard.

Analog Level Measurement

■ Shows the analog channel and its associated measurements
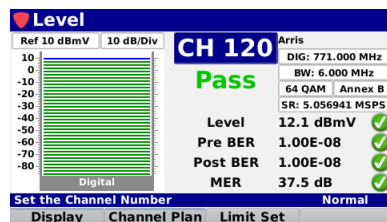
■ Provides Pass/Fail results for limit sets

Single Frequency Level Measurement

■ Shows the level of the analog carrier

■ Displays the Carrier to Noise ratio of the analog carrier

Digital Level Measurement

■ Shows the level, MER and BER of a QAM channel

■ Users can change the display to view BER over time, Equalizer Tap and Constellation

QAM Constellation

■ Shows the constellation diagram of the specified QAM channel

■ Shows the level, MER and BER and provides Pass/Fail results for limit sets
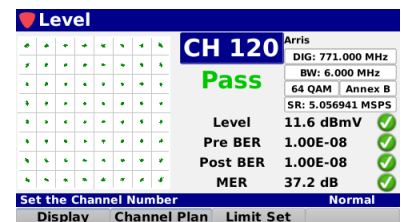
Equalizer Tap Display

■ Displays the equalizer stress and whether the DOCSIS specification is being broken

■ Shows the level, MER and BER and provides Pass/Fail results for limit sets
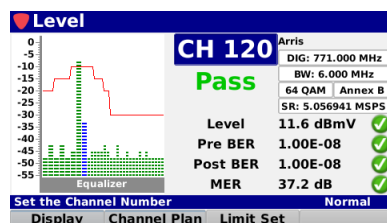
Bit-Error Rate Display

■ Shows the BER on a graph with a 150 second measurement period

■ Shows solid green lines for pre-errors and solid red lines for post-errors
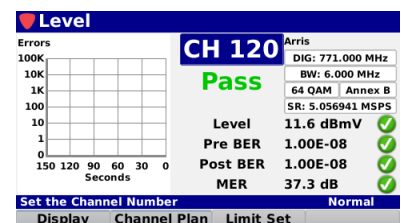
Return Spectrum Measurement

■ 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
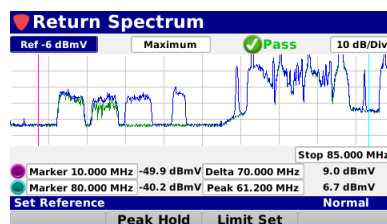
Scan & Tilt Measurement

■ 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
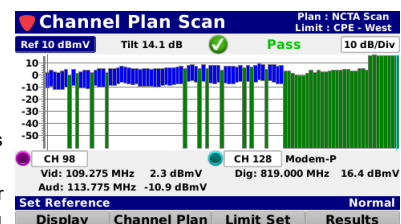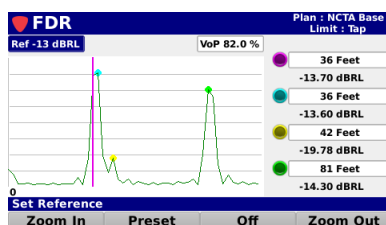
OPTIONAL FEATURES

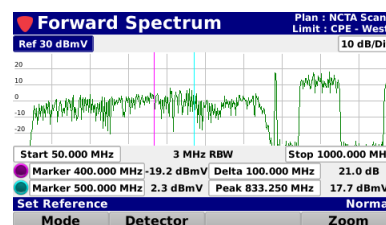The following optional features are available for the 360 DSP.

Frequency Domain Reflectometer

- 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.
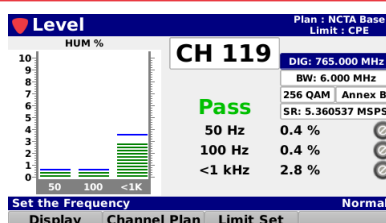
Analog & Digital HUM Measurement

- 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

Upstream Linear Distortions Measurement

- Used to determine if equalization is hiding potential problems within the upstream
- View the pre-equalization of the upstream channel, along with the in-channel frequency response and group delay and adaptive equalizer

QAM Ingress Spectrum (QIS) Analysis

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

Forward Spectrum Measurement

- Provides the ability to view raw forward spectrum traces from 50 to 1000 MHz
- Fast DSP spectrum snapshots give the user extreme speed to capture fast transients on the downstream
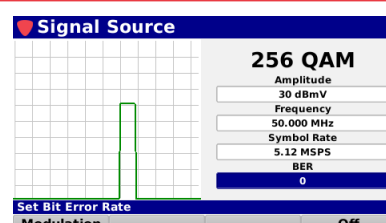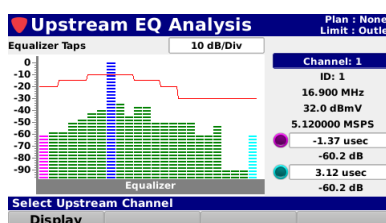
Source Generator

- Generate signals in the return path from 5 to 85 MHz
- Continuous wave (CW) or 16/32/64/128/256 QAM signal
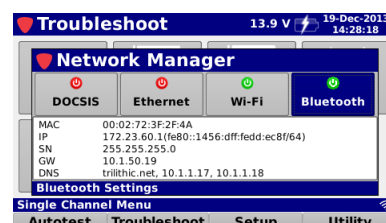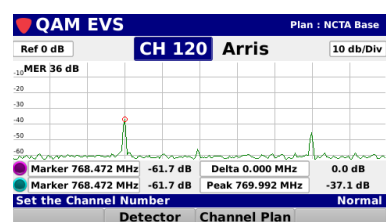- BER error injection for checking the bit stream

Bluetooth Communications Adapter

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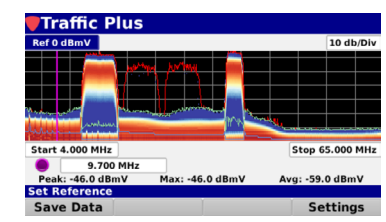- Connect to an iPad that has device tethering enabled by the service provider

Traffic Control Plus

- Allows for a high-speed view of ingress in the upstream
- Heat map allows for simplified view of ingress hotspots

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.

PC Browser

Smart Phone

WFM Module

Tablet

TRILITHIC
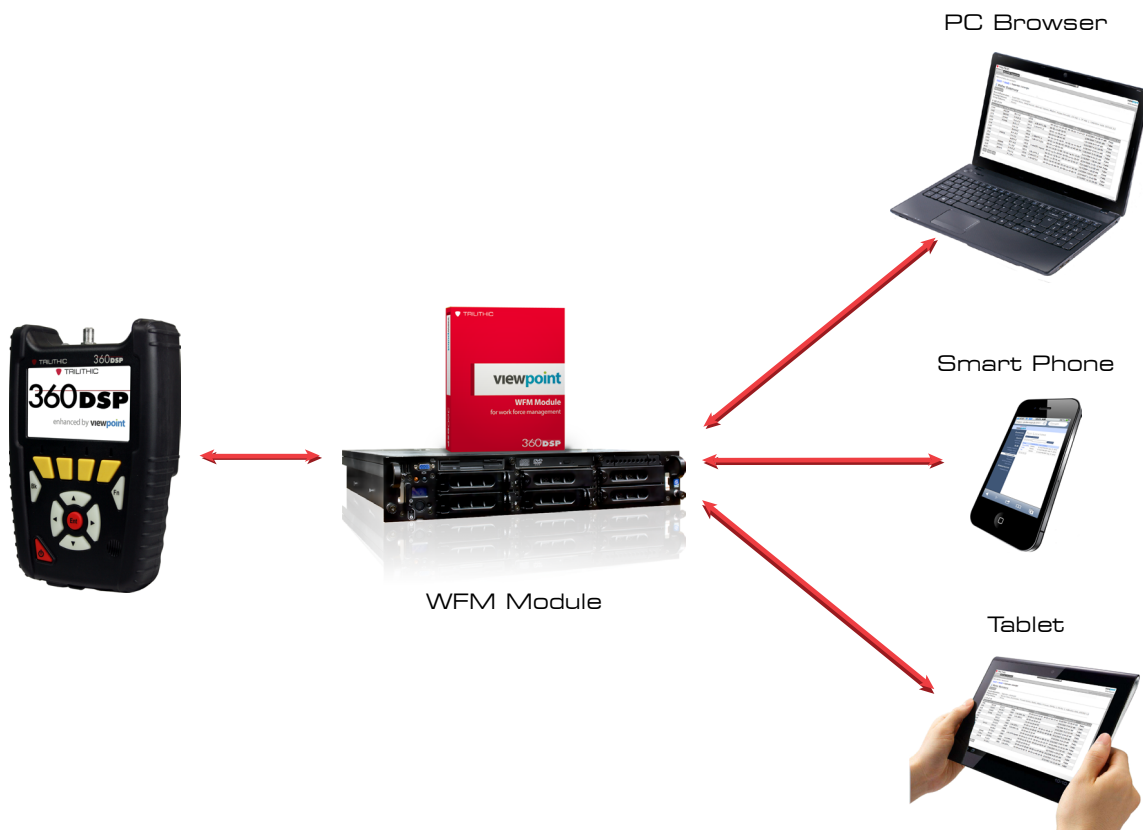
STANDARD MEASUREMENT SPECIFICATIONS

Level Measurement

Channel Bandwidth	**US Models:** 6 MHz **EURO Models:** 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
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

Return Spectrum Measurement

Frequency Range	4 to 110 MHz
Resolution Bandwidth	300 kHz
Display Spans	4 to 42 MHz, 4 to 65 MHz, 4 to 85 MHz or 4 to 110 MHz
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	-40 dBmV (4 MHz to 1 GHz)

Digital Channel Measurement

Deep Interleave Compatibility	Yes
Downstream MER	40 dB @ +6 dBmV RF Input Level 34 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	≥ 2 msps; ≤ 6.952 msps

Cable Modem Measurement

Protocol Support	DOCSIS 1.1 / 2.0 / 3.0 compliant (US & Euro DOCSIS 8x4) SNMP V1, V2c, V3 IEEE 802.3, 802.3u
Compliance Certificates	CE mark RoHS compliant CableLabs® wave 80 (DOCSIS 8x4)

Receiver Demodulation	**Demodulation:** 64 QAM, 256 QAM
	Data rate:
	  Up to 304 Mbps with 8 downstream channel bonding (DOCSIS 8x4)
	  Up to 400 Mbps with 8 downstream channel bonding (EuroDOCSIS 8x4)
	Channel bandwidth:
	  6 MHz (DOCSIS)
	  6/8 MHz (Dual mode 8x4)
	Maximum modem input signal level: 17 dBmV

Transmitter Modulation	**Modulation:** QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, and 128 QAM (SCDMA only)
	Data rate: Up to 108 Mbps with 4 upstream channels bonding
	Frequency (edge to edge):
	  5 to 42 MHz (DOCSIS)
	  5 to 65 MHz (EuroDOCSIS)
	Output level of CM can be controlled by CMTS though power ranging function
	Step: 1 dB

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	10
High/Low Delta Resolution	0.1 dB
Scan	Video, audio, pilot, and digital carriers

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OPTIONAL MEASUREMENT SPECIFICATIONS

Forward Spectrum Measurement

Frequency Range	50 to 1000 MHz
Resolution Bandwidth	300 kHz
Display Spans	User-selectable in 1 MHz 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	-40 dBmV (4 MHz to 1 GHz)

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

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

Source Generator

Modulation	CW, 16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM
Frequency Range	5 to 85 MHz
Amplitude	**CW:** Adjustable from 10 to 40 dBmV **16/32/64/128/256 QAM:** Fixed 30 dBmV
QAM Symbol Rates	0.64, 1.28, 2.56, 5.12 MSPS
QAM Source Error Rates	**BER:** Adjustable from 0 to 1.00E-2 **MER:** > 38 dB
CW Source Accuracy	±2 dB

Frequency Domain Reflectometer

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

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PHYSICAL & ENVIRONMENTAL SPECIFICATIONS

Physical Specifications

Construction	Rubber overmolded plastic housing
Control	Glow in the dark keypad and LCD touch screen and/or via a wireless connection to a mobile device such as a laptop, tablet, iPad® or iPhone®, or Android® handset
Display	Color LCD touch screen 480 x 272 pixels (approx 4" x 2.25")
Annunciators	Audible annunciator for key strokes
Antenna	Internal Wi-Fi antenna, 2 dB gain
Flashlight	High intensity LED (0.25W)
Dimensions w/o Case (H x W x D)	8.0 x 5.5 x 2.0 in (20.32 x 13.97 x 5.08 cm)
Dimensions w/ Case (H x W x D)	9.0 x 6.5 x 3.0 in (22.86 x 16.51 x 7.62 cm)
Weight w/o Case	2.4 lbs (1.09 Kg)
Weight w/ Case	3.4 lbs (1.54 Kg)

Available Interface Types

RF Test Port	Replaceable F-Type connector DOCSIS 3.0 Modem (8x4)
Ethernet	RJ45 Ethernet Port (10/100 Mbps)
USB	USB 2.0 Type-A Standard Port
Wi-Fi (Optional)	802.11 b/g 2.4 GHz Wi-Fi Adapter (Up to 60 Mbps) *OR* 802.11 b/g/n 2.4/5 GHz Wi-Fi Adapter (Up to 60 Mbps)
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	8 to 10 hours, dependent on use
Charge Time	4 hours
Battery	Two 2600 mAh @ 7.2V Li-Ion internal batteries, 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)

INCLUDES THE FOLLOWING:

360 DSP Meter

Protective carrying case

Shoulder strap

AC to DC Power Adapter & Battery Charger

US AC Power Cable (US Models)

Euro AC Power Cable (Euro Models)

Touchscreen Stylus

SOFTWARE:

ViewPoint Express Configuration Software for the 360 DSP
P/N 0930215000

ViewPoint Integrated Server with WFM-I Module for the 360 DSP
P/N 2011656002

ACTS™ Software
P/N 0930144000

RELATED PRODUCTS:

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

I-Stop 1 GHz Test Probe
P/N 2010838002

TLB-60 Return Measurement Low-Pass Filter
P/N 20110666000