

- All-in-One Maintenance and Network Analysis Tool with Channel Plan Auto Discovery
- DOCSIS 3.1 Cable Modem & 1.25 GHz RF Measurement Range with Gigabit Ethernet and 802.11 b/g/n (2.4/5 GHz) Wi-Fi Testing
- Intuitive, Color Touchscreen with Simple Pass/Fail Indicators Reduces Installer Entry Errors and Improves Decision Making
- Optional Optical Power Meter and Visible Fault Locator (VFL)
- Powerful Troubleshooting Tools to Improve the Overall Health of the System



**All of the troubleshooting tools you need in one device to maintain your entire HFC plant**

#### **All-In-One Maintenance Meter**

Trilithic's 1G DSP™ conveniently combines CATV, DOCSIS 3.1 Cable Modem, Gigabit Ethernet, and Optical testing in a single meter for troubleshooting and maintenance of your entire HFC plant.

Maintaining the health of your plant can now be achieved with one instrument, including everything needed for system-wide testing. Eliminate the need for multiple instruments with CATV, DOCSIS 3.1 Cable Modem, Gigabit Ethernet, and Optical testing, and save capital expenses at the same time.

Tailored for the challenges faced by maintenance technicians, this meter comes equipped with all of the powerful troubleshooting tools for the experienced tech, yet helps simplify decision making and streamlines standard processes and procedures for the more novice tech. This results in more efficient technicians, greater overall system health, and allows techs to continue using the same meter as they become more experienced.

#### **Gigabit Ethernet Testing**

Used in combination with other 720 DSP or 1G DSP field analyzers or the 2401 TLB headend Ethernet loopback device, the 1G DSP can achieve throughput testing speeds of up to 1 GbE using a dedicated test port.

The 1G DSP can perform either roundtrip or one-way measurements of Key Parameter Index (KPI) for full Ethernet service testing. With constant payload testing for Layer 2 through Layer 4, the 1G DSP is built for verification of both Ethernet Service Level Agreement (SLA) and Quality of Service (QoS) metrics with support for BERT, RFC 2544, Y.1564, and Y.1731 testing standards.

#### **Optical Power Measurement**

The 1G DSP includes a single input port for measurement of single mode (1310 nm, 1490 nm, and 1550 nm) wavelengths with interchangeable FC, SC, and ST style adapters.

#### **Next-Gen Features**

The 1G DSP features a large, high-resolution, ultra-bright, color touchscreen interface, simple pass/fail indicators, and powerful autotest apps to streamline troubleshooting and make the technician's job easier.

Everything about this next-gen meter was built with the technician in mind—from the included Bluetooth adapter for remote control of the meter via an iPad, to the long battery life, quick charge time, and glow in the dark keypad for those dark, cramped spaces. This meter also includes a visual fault locator (VFL) that makes it easy for the technician to locate and identify loss points in patch cords, patch panels, and enclosures.

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**AVAILABLE MODELS:**

- 1G DSP  
P/N 2011760XXX
- 1G DSP w/ OPM & VFL)  
P/N 2011761XXX

**STANDARD INTERFACES:**

- Dual RF Test Ports (F-Type)
- DOCSIS 3.1 modem (1/2.5 Gbps)
- RJ45 Management Port (10/100 Mbps)
- Cable Modem Thru RJ45
- RJ45 Electrical Ethernet & SFP Optical Ethernet Test Ports (10/100/1000 Mbps)
- 802.11 "b/g/n" 2.4/5 GHz Wi-Fi
- USB 2.0 Flash Drive Port

**OPTIONAL HARDWARE:**

- Optical Power Meter & VLF Software & Hardware Package
- DI-1000 Optical Inspection Scope Software & Hardware Package

**EXCLUSIVE MEASUREMENTS:**

- Forward Passive Sweep
- Forward Active Sweep for 8300A FST
- RSA High-Resolution Return Sweep for 8310 RSA
- SSR High-Speed Return Sweep for 9581 SST
- SST Compare for 9581 SST

**The 1G DSP supports a variety of functions, including:**

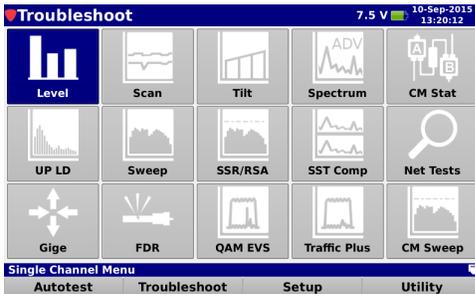
- Auto discovery of channel plans
- Multi-user and multi-language support
- Create jobs right on the meter
- Built-in web browser, real-time data transmission
- Interactive autotesting apps

**STANDARD TESTING FEATURES:**

- Level Measurement
- C/N Measurement
- QAM Measurement (MER/BER/Constellation/EQ)
- Complete Channel Plan Scan with Tilt Measurement
- Analog & Digital HUM Measurement
- Return Spectrum Analysis (4 to 110 MHz)
- Forward Spectrum Analysis (5 to 1250 MHz)
- Cable Modem Statistics
- Ping, Trace Route, VoIP & Throughput Measurements
- Ethernet Service Testing (BERT, RF 2544, Y.1564 & Y.1731)
- Frequency Domain Reflectometer
- Upstream Linear Distortions Measurement
- Bluetooth Communications Adapter
- QAM Error Vector Spectrum Analysis
- Source Generator (CW, QAM & OFDM)
- Upstream TrafficControl Plus
- Cable Modem Sweep

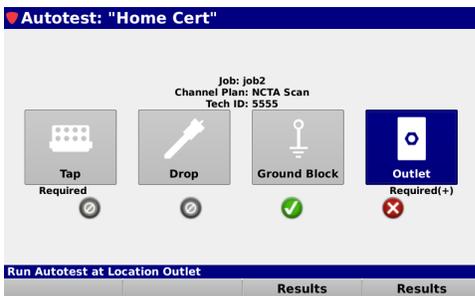
## Simple Yet Powerful

Providing the widest range of standard functions for a maintenance technician available today, the 1G DSP includes virtually all the testing options a maintenance technician needs to verify plant quality and easily identify and fix problems in the headend or hub sites.



## Autotest Apps

The 1G 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 custom 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.

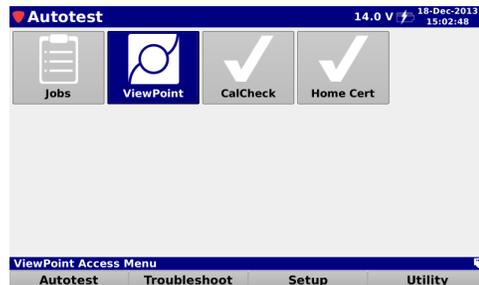


Multi-user support allows technicians that work in various territories to easily switch channel plans and standardized autotest apps and test limits or login as a completely different user. Connecting to ViewPoint allows techs to upload job data in near real-time as well as transmit and receive channel 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 1G DSP comes equipped with all of the required troubleshooting tools for an advanced maintenance 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 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 plant-wide 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
		1000122558	1357
Receive (30)		Send (7)	
Channel Plans	5/5	Jobs	1
Limit Sets	7/7	Data Logs	3
Autotests	3/3	Screen Shots	3
Ethernet Limit Sets	1/1		
Ethernet Frames	6/6		
Ethernet Streams	8/8		
Ethernet Targets	0/0		
Settings	0/0		
Ready		Sync	

Combining 1G 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 maintenance management.

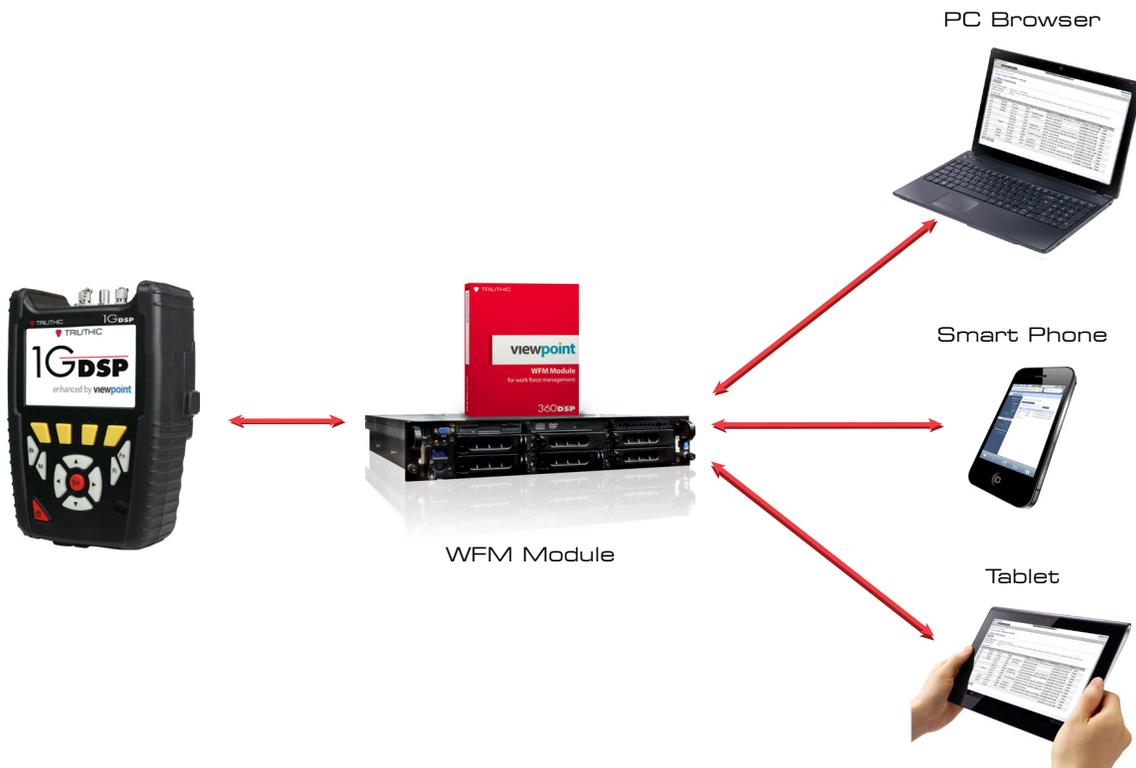
**TOTAL SYSTEM MANAGEMENT**

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.

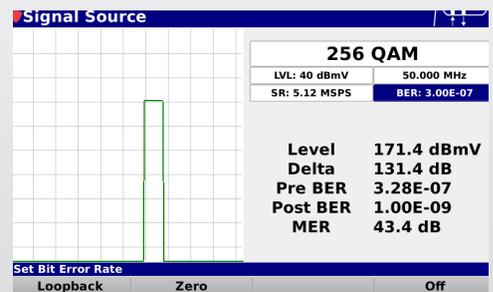
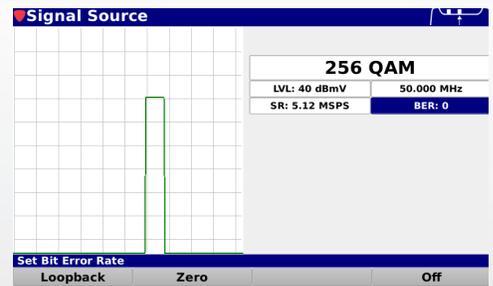
This simple and completely customizable integrated system of field analysis and reporting tools allows managers to watch over their entire field operations in one dashboard, comparing each location in the system, analyzing the overall health of their entire organization, and addressing concerns in near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



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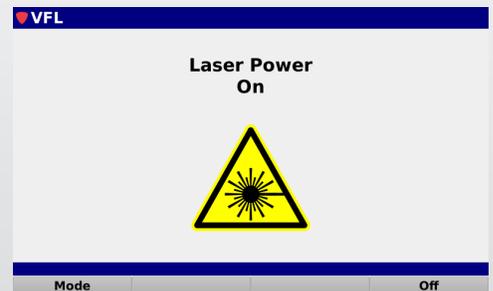
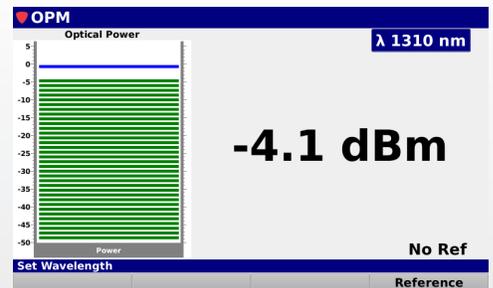
## DUAL RF TEST PORTS & SOURCE GENERATOR

- The meter features two (2) built-in test ports 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 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



## OPTICAL POWER METER & VFL (OPTIONAL)

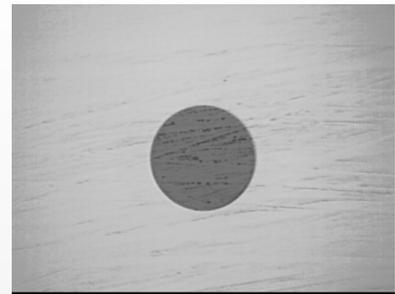
- This optional hardware package and measurement suite includes both a built-in FTTx ready Optical Power Meter (OPM) for testing of passive optical networks and a Visual Fault Locator (VFL) to identify loss points in patch cords, patch panels, and enclosures
- The optical power meter provides the ability to perform both absolute and relative measurements of ITU-T G983.3 recommended wavelengths of 1310 nm, 1490 nm, and 1550 nm. Additionally, the VFL emits a Class III visible red light laser beam with 3 mW of power that allows you to quickly and easily locate light escaping from damaged single-mode and multi-mode fiber cables



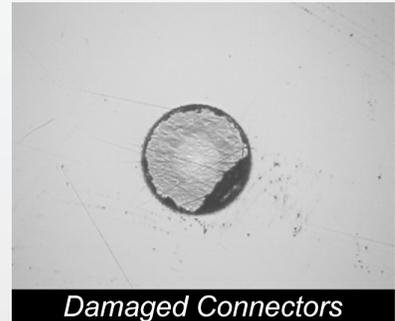
innovative technology to keep you a *step ahead*

## DI-1000 OPTICAL INSPECTION SCOPE SOFTWARE & HARDWARE PACKAGE (OPTIONAL)

- This package is designed to find connector end-face contamination and damage that cause insertion losses and reflections that can lead to poor optical communications. This is a software and hardware package that includes a Lightel DI-1000 all-digital optical inspection scope and software activation key for the Optical Inspection Scope Option (OIS) on the 1G DSP. The DI-1000 all-digital optical inspection scope combined with the 1G DSP allows you to fully inspect fiber optic connector end-faces during installation and maintenance to prevent contamination to bulkheads and other fiber optic equipment
- The scope works by connecting directly to the USB port of the 1G DSP and features single-finger focus and detectable resolution to 0.5  $\mu$ m. The scope also includes the standard ConnectorView PC software from Lightel, which features digital zoom, image display, image capture with built-in freeze/capture button on scope, auto-calibration, and basic analysis tools
- The complete kit includes the software activation key (P/N 0930207010), DI-1000 Optical Inspection Scope (P/N 2011749000), Protective Carrying Case, One (1) Universal Tip for 2.5 mm male APC Type Connectors, One (1) Tip for SC and FC female APC Type Connectors, Tip Case, ConnectorView (standard) Software CD, and Manual



**Dirty Connectors**



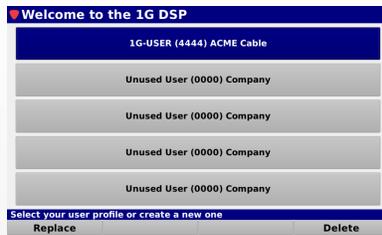
**Damaged Connectors**



### BASIC OPERATIONAL FEATURES

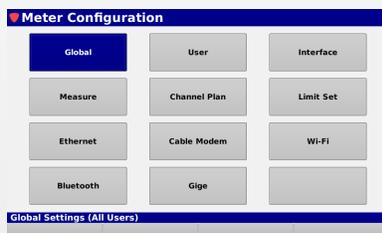
#### Multiple User Profiles

- Allows up to 5 technicians to share a 1G DSP
- Each technician has his or her own profile, which loads in completely different sets of channel plans, autotests, etc.



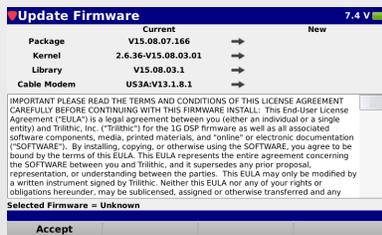
#### Easy Setup & Configuration

- 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



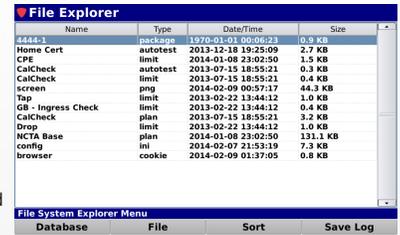
#### Bluetooth Communications Adapter

- 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



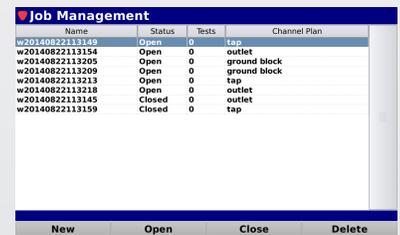
#### Simple Network Management

- Choose between Ethernet, Wi-Fi, GigE, cable modem, 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

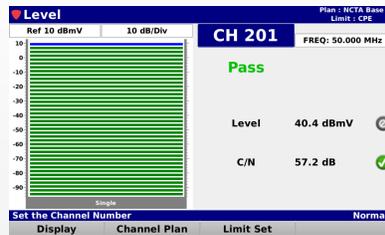
- Remotely access the meter using any active network connection
- Control and monitor almost any function of the meter from your PC, smart phone, or tablet



LEVEL MEASUREMENTS

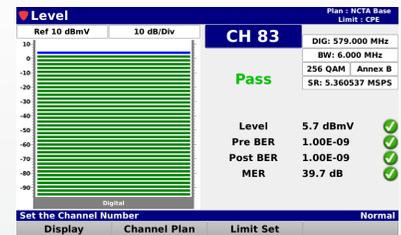
Single Frequency Pilot Carriers

- 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



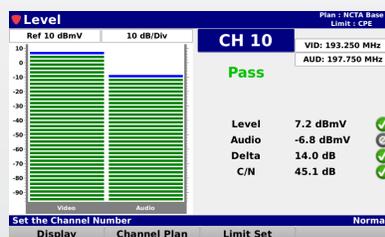
SQ-QAM Carriers

- 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



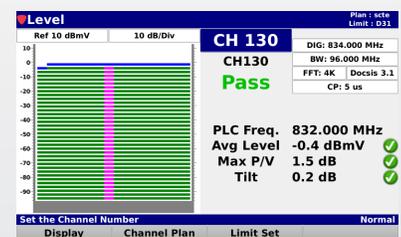
NTSC/PAL/SECAM Carriers

- 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



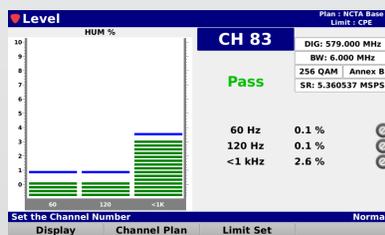
OFDM Carriers

- 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



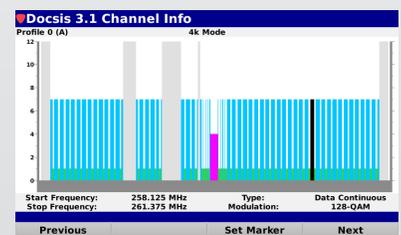
Analog & Digital HUM Measurement

- 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

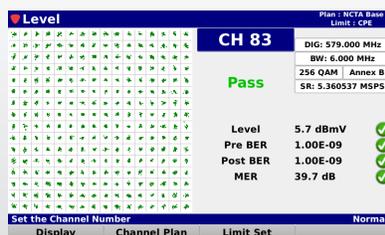
- Displays the PLC, BPSK Sub-Carriers, Blocks of QAM Sub-Carriers, and Exclusion Zones defined within Profile A of the DOCSIS 3.1 OFDM Channel
- Provides Markers for closer inspection of individual carriers, which include the start/stop frequency of the carrier as well as its type and modulation.



CONSTELLATION MEASUREMENTS

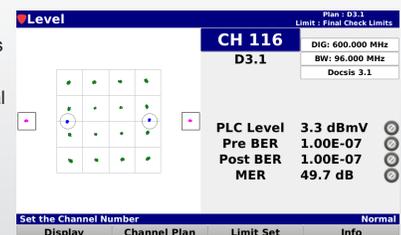
SC-QAM

- 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)

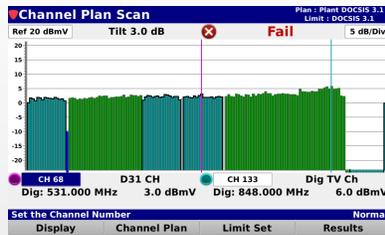
- Shows the constellation diagram for the PLC continuous pilots, BPSK symbols, and 16 QAM data of the selected digital OFDM channel
- Provides Pass/Fail results for PLC Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



## MULTI-CHANNEL MEASUREMENTS

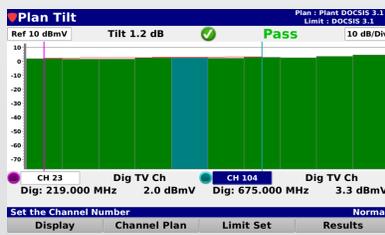
### Channel Plan Scan

- 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

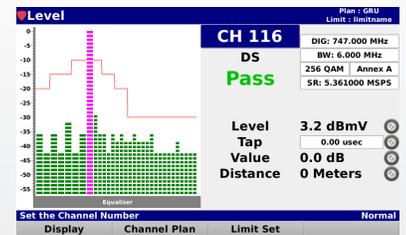
- Full channel plan scan displays the frequency response of the entire channel lineup
- Provides Pass/Fail results for limit sets and color-coded channels; green for digital and blue for analog
- Tilt shows the level difference between two selectable channels



## DIGITAL TROUBLESHOOTING

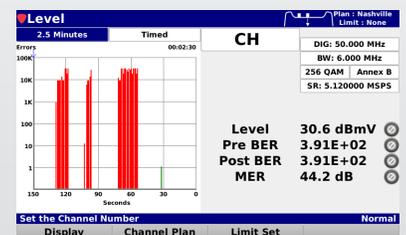
### Equalizer Tap Display

- 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

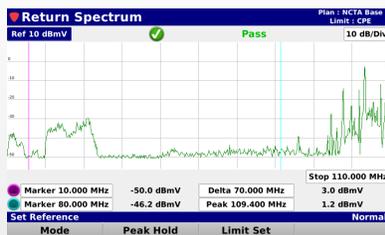
- Shows the BER measurement of the selected digital SC-QAM channel over a user-defined time period
- The graph displays green lines for Pre-BER and red lines for Post-BER and provides Pass/Fail results for Level, Pre-BER, Post-BER, and MER measurements when compared against user-defined limit sets



## SPECTRUM MEASUREMENTS

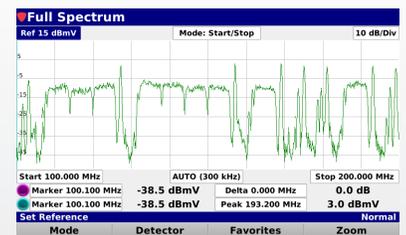
### Return Spectrum Measurement

- 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



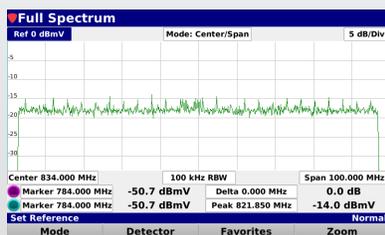
### Full Spectrum Measurement

- 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



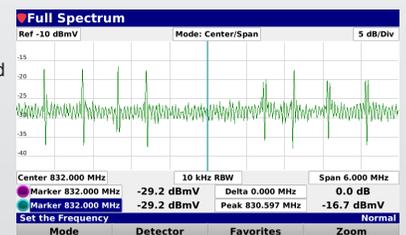
### OFDM Channel Spectrum

- 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)

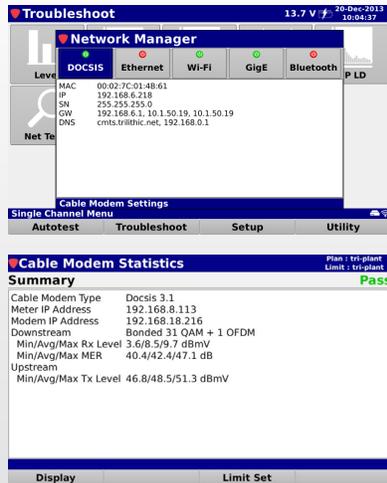
- Provides the ability to view raw spectrum traces of the continuous pilot carriers needed for locking onto an OFDM signal
- Identify locations of ingress or interference that could potentially affect the PLC



CABLE MODEM MEASUREMENTS

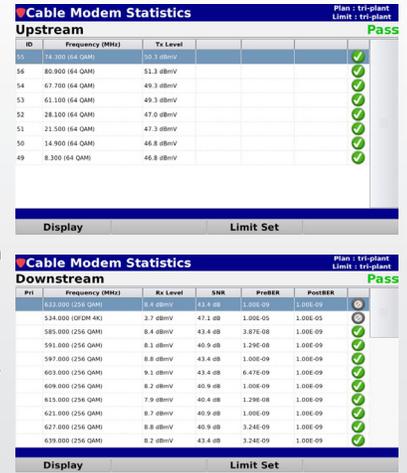
Cable Modem Network Connectivity & Status

- The Network Manager view allows users to quickly and easily use the internal cable modem for network connectivity and performance testing
- Upon connecting, the Network Manager displays the MAC address, IP address, subnet, gateway, and DNS information for the cable modem network connection
- The Cable Modem Statistics view provides a summary that displays the type of Cable Modem being used, meter IP address, and modem IP address
- This view also displays the current channel bonding along with the min/max/avg Rx Level & BER of the downstream channels and the min/max/avg Tx Level of the downstream channels



Upstream & Downstream Cable Modem Statistics

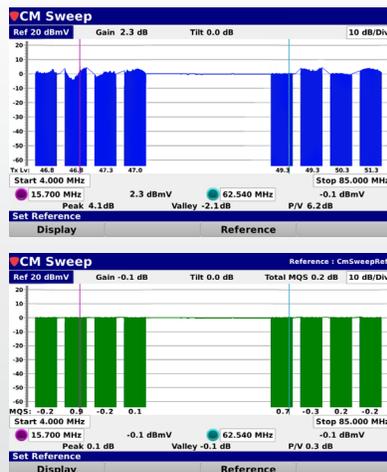
- Internal DOCSIS 3.1 modem that operates in both DOCSIS 3.0 (32x8) and DOCSIS 3.1 modes
- Measure up to eight (8) upstream SC-QAM channels
- Displays the ID, channel frequency, Tx Level, SNR, PreBER, and Post BER of each upstream channel
- Measure up to 32 downstream SC-QAM channels when operating in a DOCSIS 3.0 only environment
- Measure up to two (2) downstream OFDM channels and 30 downstream SC-QAM channels when operating in a mixed DOCSIS 3.0 & DOCSIS 3.1 environment
- Displays the primary status, channel frequency, Rx Level, SNR, PreBER, and Post BER of each downstream channel



IN-BAND RETURN SWEEP

Cable Modem (CM) Sweep

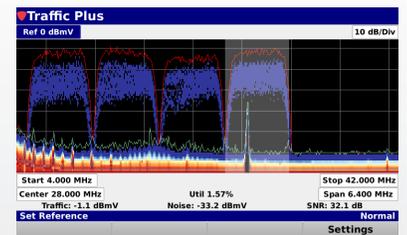
- The *CM Sweep* feature is a first of its kind, patent pending sweep that uses the cable modem built into the meter to perform in-band sweeps within your modem carriers
- This feature not only allows operators to balance the upstream, but also allows them to see the percentage of pre-equalizer effort and isolate problems between active components without causing any issues with upstream modem performance
- When this function is selected, the meter injects up to four upstream modem carriers to talk back to the CMTS and use the pre-equalized data for each of the upstream carriers to plot a frequency response of what your upstream sweep would look like with injected carriers
- This feature doesn't require any expensive headend sweep gear and works with any DOCSIS 3.0 or DOCSIS 3.1 compatible CMTS with pre-EQ enabled



INGRESS UNDER CARRIER MEASUREMENTS

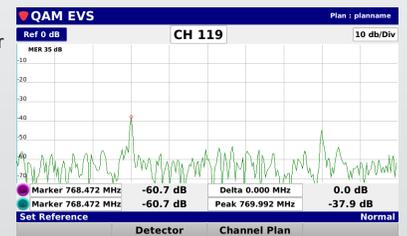
Upstream Traffic Control Plus

- 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 the shortest cable modem bursts and ingress even under the busiest upstream



Downstream QAM Error Vector Spectrum

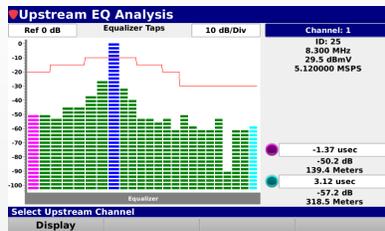
- Tune to downstream QAM channels to display Error Vector Spectrum (EVS)
- Display the ingress that is present "underneath" an upstream cable modem channel, or any bursty signal



UPSTREAM LINEAR DISTORTIONS TESTING

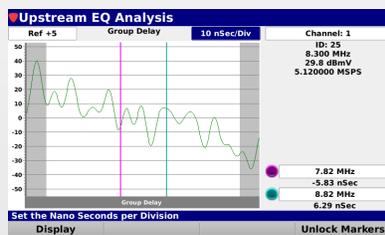
Equalizer Taps Measurement

- Used to determine if equalization is hiding potential problems within the upstream
- View the pre-equalization of the upstream channel and the distance to the EQ taps



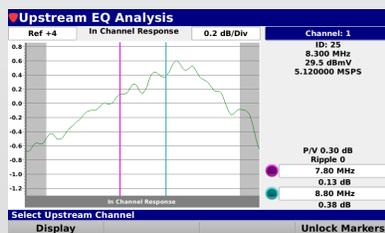
Group Delay Measurement

- Used to determine if equalization is hiding potential problems within the upstream
- View the pre-equalization of the upstream channel and group delay



In-Channel Response Measurement

- Used to determine if equalization is hiding potential problems within the upstream
- View the pre-equalization of the upstream channel and the in-channel frequency response



NETWORK CONNECTIVITY TESTING

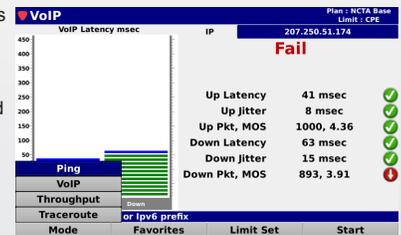
Web Browser

- 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



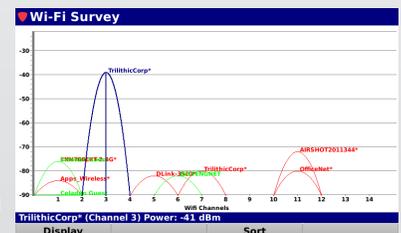
Network Test Suite

- 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



N-Speed Wi-Fi with Survey Test Mode

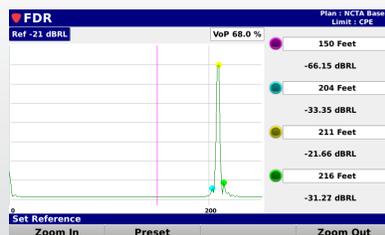
- Built-in 802.11 "b/g/n" 2.4/5 GHz wireless adapter
- Actively view live signal strengths of Wi-Fi networks in the area
- Provides Wi-Fi details such as SSID, channel, and power level



CABLE CONTINUITY TESTING

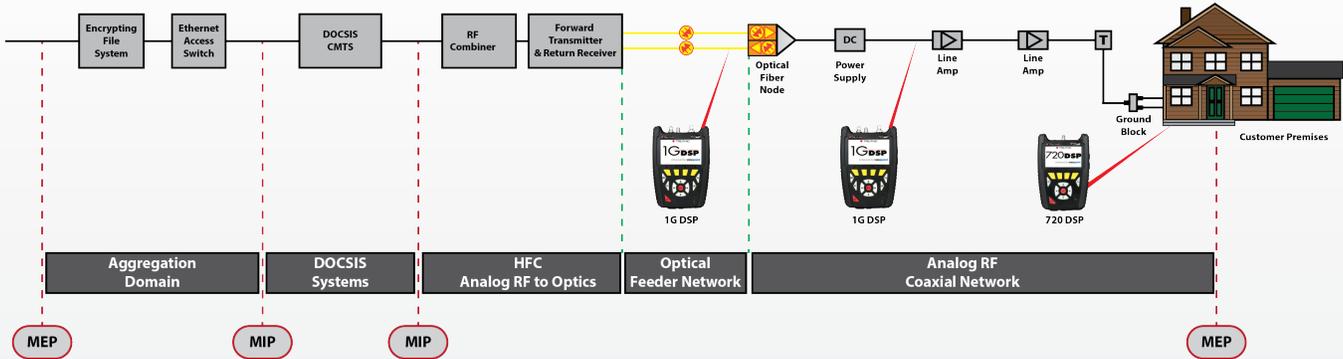
Frequency Domain Reflectometer

- 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



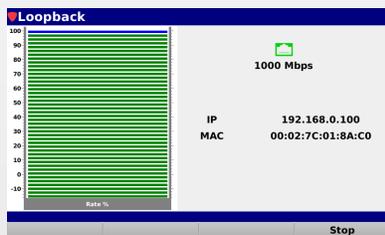
ETHERNET SERVICE TESTING

The 1G DSP offers comprehensive test and monitoring functions to isolate and solve problems in the network core, edge, NOC, and data center. Designed for construction, customer turn-up, and maintenance applications, the 1G DSP offers numerous built-in tests for complete Ethernet, IP, and LAN testing. The Gigabit Ethernet testing feature works in combination with the TLB-GbE loopback device to perform BERT loopback measurements of Key Parameter Index (KPI) for full Ethernet service testing.



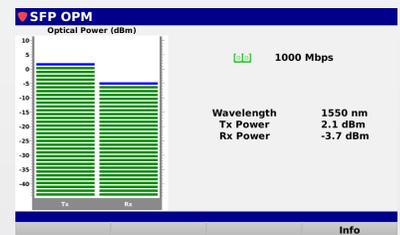
Ethernet Loopback Functionality

- Provides the ability to measure the optical power through the optical transceiver
- Provides link speed, wavelength, Tx power, and Rx power measurements of active SFP connection



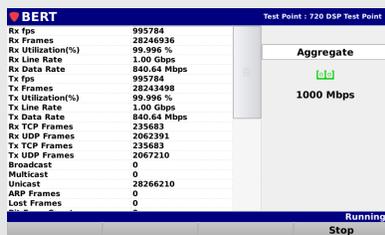
SFP Optical Power Measurement

- Provides the ability to measure the optical power through the optical transceiver
- Provides link speed, wavelength, Tx power, and Rx power measurements of active SFP connection



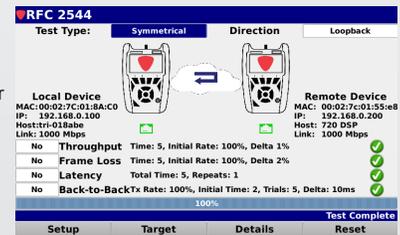
Gigabit Bit-Error-Rate Testing

- Throughput testing speeds of up to 1 GbE using a dedicated test port
- Roundtrip or one-way constant payload testing for Layer 2-4 for verification of Ethernet SLA and QoS metrics



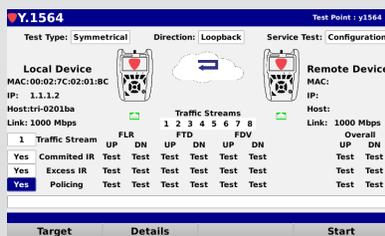
RFC 2544 Tests for Benchmarking Network Interconnect Devices

- 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



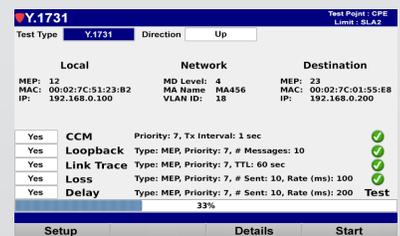
ITU-T Y.1564 Ethernet Service Activation Testing

- Provides standards-based testing for turning up, installing, and troubleshooting Ethernet-based services
- Allows for complete validation of Ethernet service level agreements (SLAs) in a single test



ITU-T Y.1731 Connectivity Fault Management & Link Performance

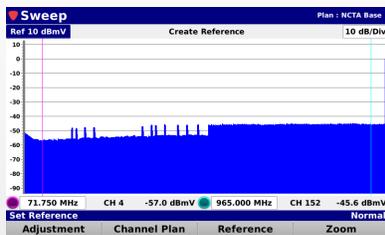
- Standardized performance monitoring that includes continuity, loopback, link trace, frame loss, and frame delay
- Allows for complete validation of Ethernet service level agreements (SLAs) in a single test



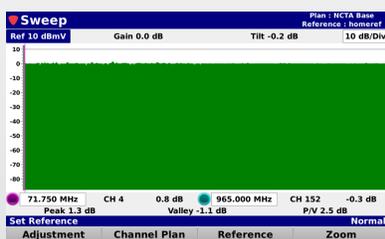
## FORWARD SWEEP

### Passive & Active Forward Sweep

- The *Forward Passive Sweep* feature is a stand-alone test that doesn't use injected carriers but instead passively uses the live carriers in the HFC distribution system to test and set the tilt and gain of distribution amplifiers without the need for any dedicated headend gear



- The *Forward Active Sweep* feature uses carriers injected into non-active channel spaces by the 8300A FST Forward SpeedSweep Transmitter in the headend to test and set the tilt and gain of distribution amplifiers over frequency bands where there aren't any active carriers

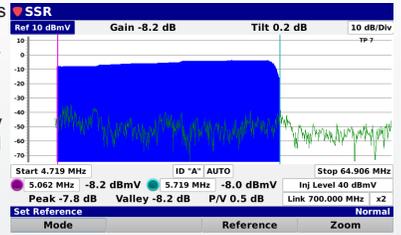


- The instrument compensates for differences in the amplitudes of the carriers by comparing two sweeps, a reference scan saved to the 1G DSP (typically at the node or first active component of the network) and a test point in the field

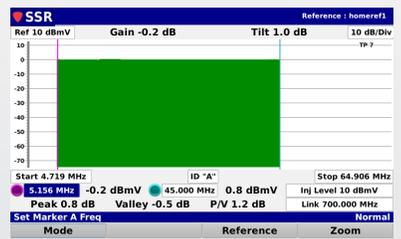
## HIGH-SPEED RETURN SWEEP

### SSR Sweep

- The *SSR Sweep* feature enables the 1G DSP to function as a return path spectrum transmitter to catch bursty ingress and impulse noise interference to voice services with an extremely high spectrum acquisition speed



- When this function is selected, the 1G DSP injects up to eight user-selectable test carriers into the upstream that the 9581 SST automatically measures in the headend



- The 9581 SST then analyzes the test signals from the 1G DSP and the return spectrum separately to compute the gain and tilt of the return path before packaging the measurement results into a data stream for transmission back to the 1G DSP

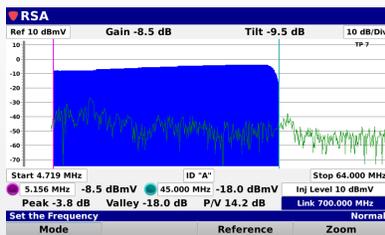
- When the 1G DSP receives its data, the response of the return path is displayed as a line graph with numeric values for gain and tilt. The ingress and noise are also displayed as spectrum analyzer traces

- The instrument compensates for differences in the amplitudes of the carriers by comparing two sweeps, a reference scan saved to the 1G DSP (typically at the node or first active component of the network) and a test point in the field

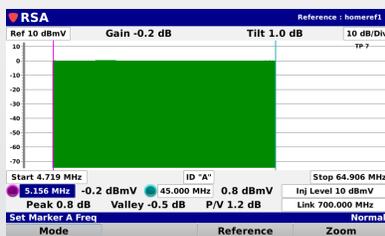
## HIGH-RESOLUTION RETURN SWEEP

### RSA Sweep

- The *RSA Sweep* feature enables the 1G DSP to function as an upstream return path sweep transmitter for troubleshooting micro-reflections and instances of narrow suck-outs between the test point and the headend, while also stepping around active channels in order to avoid interference



- When this function is selected, the 1G DSP transmits the return sweep from a test point in the field to the 8310 RSA Return SpeedSweep Analyzer in the headend for analysis



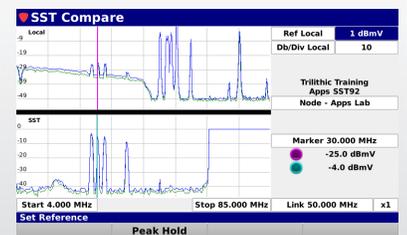
- The channel plan on the 8310 RSA and the sweep response information are then sent back to the 1G DSP via a telemetry signal which allows the 1G DSP to track up to 643 individual sweep points and display a full sweep on the screen every four seconds

- The instrument compensates for differences in the amplitudes of the carriers by comparing two sweeps, a reference scan saved to the 1G DSP (typically at the node or first active component of the network) and a test point in the field

## LOCAL & REMOTE RETURN PATH SPECTRUM

### SST Compare

- The *SST Compare* feature simultaneously displays the return path spectrum measured locally and the spectrum as scanned from the headend by the 9581 SST



- This feature is used to determine if disrupting ingress detected by the 9581 SST is coming from the leg of the system to which the meter is currently connected

**MEASUREMENT SPECIFICATIONS**
**Level Measurement**

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

**Spectrum Measurement**

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

### Digital Channel Measurement

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

### Cable Modem Measurement

Protocol Support	DOCSIS 1.1 / 2.0 / 3.0 / 3.1 SNMP V1, V2c, V3
Compliance Certificates	FCC
Dual CM Diplexers	<b>85 MHz:</b> 5 to 85 MHz <b>200 MHz:</b> 5 to 200 MHz
Receiver Demodulation	<b>Frequency (edge to edge):</b> 108 to 1002 MHz <b>Channel Bandwidth:</b> 6 MHz <b>Signal Level:</b> -15 to 15 dBmV <b>DOCSIS 3.0 Demodulation:</b> 64 QAM, 256 QAM <b>DOCSIS 3.0 Data Rate:</b> Up to 1.2 Gbps with 32 downstream channel bonding (DOCSIS 32x8) <b>DOCSIS 3.1 Demodulation:</b> Multi-Carrier OFDM 16 to 4096 QAM <b>DOCSIS 3.1 Data Rate:</b> Up to 2.5 Gbps with 2 OFDM 196 MHz Downstream Channels
Transmitter Modulation	<b>Frequency (edge to edge):</b> 5 to 85 MHz <b>Signal Level:</b> Controlled by CMTS through power ranging function <b>DOCSIS 3.0 Modulation:</b> QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, and 128 QAM (SCDMA only) <b>DOCSIS 3.0 Data Rate:</b> Up to 320 Mbps with 8 upstream channels bonding <b>DOCSIS 3.1 Modulation:</b> Multi-Carrier OFDMA BPSK to 4096 QAM <b>DOCSIS 3.1 Data Rate:</b> Up to 1 Gbps with 2 OFDMA 96 MHz Upstream Channels

### 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**

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

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

<b>Minimum Input Level</b>	0 dBmV
<b>Range</b>	0 to 5%
<b>Resolution</b>	0.1%
<b>Accuracy</b>	±0.5%

**Frequency Domain Reflectometer**

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

**Source Generator**

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

### Optical Power Meter Specifications

<b>Finish</b>	UPC and APC
<b>Additional Connectors</b>	FC/SC/ST
<b>Measurement Range</b>	-50 dBm to +26 dBm
<b>Display Resolution</b>	0.01
<b>Tone Detection Range</b>	-30 dBm to +6 dBm
<b>Tone Detection</b>	270 Hz, 330 Hz, 1 kHz, 2 kHz
<b>Wavelengths</b>	1310 nm, 1490 nm, 1550 nm
<b>Accuracy</b>	+/-0.5dB > -40 dBm @ 25C +/- 1dB < -40 dBm @ 25C

### Visual Fault Locator (VFL) Specifications

<b>Port Style</b>	FC Style Adapter	
<b>Fiber Size</b>	9/125 μm	
<b>Wavelength</b>	650 nm	
<b>Output Power</b>	3 mW	
<b>Pulse Duration</b>	CW (always on) or 2 Hz (0.25 sec pulse)	
<b>Maximum Radiant Power</b>	< 5 mW	
<b>Turn-On Safety Delay</b>	2 seconds	

## PHYSICAL & ENVIRONMENTAL SPECIFICATIONS

### Physical Specifications

<b>Construction</b>	Rubber overmolded plastic housing
<b>Control</b>	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
<b>Display</b>	Color LCD touchscreen 800 x 480 pixels (approx 4.5" x 2.75")
<b>Annunciators</b>	Audible annunciator for key strokes
<b>Antenna</b>	Internal Wi-Fi antenna, 2 dB gain
<b>Dimensions w/o Case (H x W x D)</b>	8.6 x 6.1 x 2.75 in (21.84 x 15.94 x 6.99 cm)
<b>Dimensions w/ Case (H x W x D)</b>	9.6 x 7.1 x 3.75 in (24.38 x 18.03 x 9.53 cm)
<b>Weight w/o Case</b>	3.75 lbs (1.70 Kg)
<b>Weight w/ Case</b>	4.75 lbs (2.15 Kg)

### Available Interface Types

<b>Tx Test Port</b>	75 Ohm Replaceable F-Type Connector Source Generator Output Transmission Only
<b>Tx/Rx Test Port</b>	75 Ohm Replaceable F-Type Connector Upstream & Downstream RF Measurements DOCSIS 3.1 Modem
<b>Ethernet</b>	RJ45 Management Port (10/100 Mbps) RJ45 Electrical Test Port (10/100/1000Base-T) SFP Optical Test Port (100/1000Base-X)
<b>Wi-Fi</b>	802.11 b/g/n 2.4/5 GHz Wi-Fi Adapter
<b>USB</b>	USB 2.0 Type-A Standard Port
<b>Bluetooth (Optional)</b>	Class II Mini Bluetooth USB Adapter (v2.1) with a 10 meter range for speeds up to 3 Mbps

### Battery & Power Specifications

<b>Operating Time</b>	12 hours plus, dependent on use
<b>Charge Time</b>	4 hours
<b>Battery</b>	Three 2600 mAh @ 7.4V Li-Ion internal batteries, factory replaceable
<b>Power Adapter</b>	<b>Input:</b> 100 to 240 VAC ~ 47 to 63 Hz, 1.1A Max <b>Output:</b> 15 VDC, 4.4A

### Environmental Specifications

<b>Storage &amp; Operating Temperature</b>	-18° to +50° C (0° to 122° F)
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## INCLUDES THE FOLLOWING:

- 1G DSP Meter
- Protective Carrying Case
- Shoulder Strap
- AC to DC Power Adapter & Battery Charger
- AC Power Cable
- Touchscreen Stylus
- FC, SC and ST Style Optical Adapters (OPM & VFL Models)
- I-Stop 1 GHz Test Probe
- Strand Hook

## AVAILABLE SOFTWARE:

ViewPoint Express Configuration Software for the 1G DSP  
**P/N 0930215000**

ViewPoint Integrated Server with WFM Module for the 1G DSP  
**P/N 2011656002**

ACTS™ Software  
**P/N 0930144000**

## RELATED PRODUCTS:

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

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