PRELIMINARY DATA SHEET

VSE-1100

Digital Spectrum & Video Analyzer

Key Benefits

- The industry's first ground-up integrated spectrum and video platform for service-layer to physical-layer testing designed specifically for cable applications
- The fastest and most powerful upstream verification and troubleshooting capabilities found in an analyzer platform
- Makes every technician an expert—solves complex problems with the most intuitive user interface available
- The industry's smallest and lightest digital spectrum video analyzer platform—for the headend/hubsite and the field

Applications

- Rapid and consistent rollout and troubleshooting verification of CCAP and RemotePHY applications
- Fast troubleshooting as technicians work across network segments, solving issues quickly and completely—the first time
- Collaborative MPEG and RF analysis—reducing MTTR by letting techs track issues through the network
- Objective and quick segmentation of service-impacting upstream issues that affect end-customer experience
- Clearly-indicated impulse noise and ingress to significantly speed resolving intermittent issues

The VSE-1100 Video Spectrum Expert is the industry's first converged digital spectrum video analyzer and noise-troubleshooting platform designed for the challenges of the converged cable access platform (CCAP) and remote PHY evolution.

The VSE-1100 helps cable service providers maintain optimal network performance with video and spectrum analysis for fast and easy preventive maintenance and troubleshooting. Innovative upstream test modes speed troubleshooting to shorten mean time to repair. A tablet user interface and measurement engine simplify operation and remote test capabilities.

New technologies that are driving the need for new test capabilities include the following:

CCAP – (Converged Cable Access Platform) systems are moving toward a more complete spectrum of carriers on single output and channel line-ups change on the fly.

Crowded upstream spectrum – this means there is no empty spectrum available for out of band spectrum tests. Noise under QAM, min-hold and other traffic identifying techniques are not feasible because when multiple signals are time-shared and traffic is dense, the signal frequency is rarely unoccupied.

Video on demand and video streaming – means there is even more content to be monitored, and stronger competition with more contenders increases the need to assure quality.

Better problem isolation means fewer truck rolls and quicker resolution of problems that require dispatching a technician. With a powerful, truly portable measurement tool that includes both digital and analog spectrum and video analysis, the headend and the field can use the same instrument to verify the problem source and eliminate finger-pointing.

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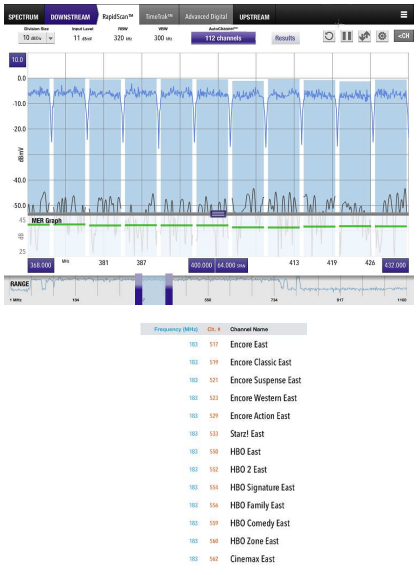
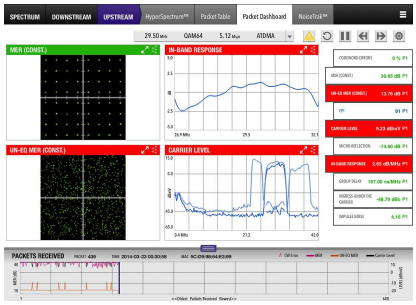
Essential, Innovative Test Modes



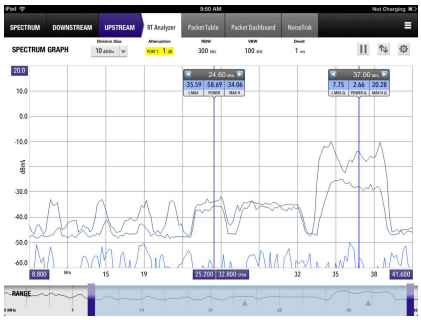
Downstream Analysis - The VSE-1100 performs all of the downstream RF analysis you would expect from an instrument designed for cable network testing, and more.

RapidScan™ - Unlike traditional analyzers, the VSE-1100s RapidScan™ provides the user with a big picture view of their cable network. With RapidScan, power level, MER and Ingress Under the Carrier can be compared across the full range of adjacent channels. QAM level modulation and MER levels are highlighted to make potential issues standout.

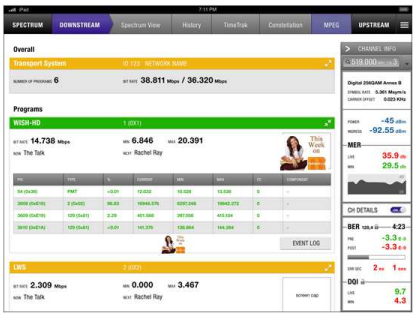
AutoChannel™ - One of the challenges that technicians face in the field is to determine which signal is carrying a particular channel. When a customer complains about tiling on a particular program, the tech must then find out which signal is carrying that program in order to do signal quality analysis. The VSE-1100 has content intelligent tuning through an innovative method of automatic channel program detection and plan building. This simplifies instrument configuration, speeds problem identification and shortens repair time.



MACTrak Local™ - PathTrak with MACTrak is a dynamic return path troubleshooting tool, but the VSE-1100 makes this test capability portable to enable moving the receiver from point to point in the return path to test and track codeword errors. As in the PathTrak version, the VSE-1100's MACTrak display shows multiple measurement results on one screen for quicker determination of the problematic parameter. MACTrak demodulates upstream signals to detect codeword errors and linear distortions. The technician can make a direct comparison of the result at his location with the result at the headend or hub site (PathTrak location) to identify laser clipping issues. This unprecedented analytical tool shortens time to repair thereby cutting operations cost.



Hyper-Spectrum™ - It is challenging to sort noise and interference from system signals in an upstream spectrum that is loaded with service signals. The VSE-1100's real-time no-gap FFT analysis and hyper-speed enables discernment of noise/interference vs. service signals. The real-time analyzer has a variable persistence in an 85 MHz band and spectral histogram that makes interfering signals stand out and be noticed. The innovative overlapping FFT analysis means that no transient interfering signals will go undetected. This unique perspective leads to quicker repair, which improves operations profitability.



MPEG Analysis - In addition to content-intelligent tuning, VSE-1100 gives the technician insight into the actual customer experience with MPEG signal analysis – an unprecedented test capability for a field instrument. Technicians are able to track issues with the ability to see MPEG errors with live transport stream display and post capture analysis. Thumbnail displays provide a quick content indicator.

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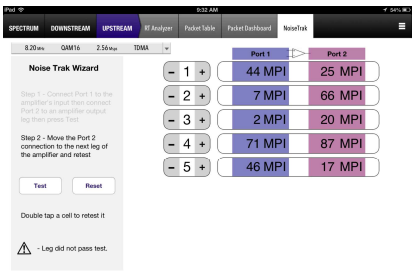

NoiseTrak™ - Impulse noise and ingress can be very difficult and time consuming to troubleshoot, as a technician uses his best subjective discernment to determine which leg of the return path contains the noise source. The VSE-1100's innovative dual-input NoiseTrak mode enables simultaneous viewing of spectrum and demodulated signals from both legs with an objective analysis to expose the problem leg. Another innovation is overlapping FFT analysis that ensures that no transient interference will be undetected. This unique test capability dramatically shortens repair time.

Teamwork & Remote Access - In some cases a problem shows itself only over an extended period of testing. It is impractical to expect a technician to sit and monitor the analyzer screen for an extended period, so it makes sense to enable remote testing. The VSE-1100 is perfectly suited for this application as the user interface can be separated from the measurement engine, enabling the tech to locate the engine at a remote network location and run tests from any network accessible location. The instrument without a user interface appears less interesting to potential thief. In other instances there may be a need to position analyzers in strategic locations in the network and access them remotely for synchronized measurements, opening a completely new method of troubleshooting. Another application for remote testing is when the technician needs a little expert assistance – in which case, the local tablet can establish an IP connection with a remote tablet and allow the remote tablet to take control.

Key Features

- Real-time JDSU Hyper-Spectrum™ overlapping FFT analysis instantly detects any transient interference and noise
- Portable MACTrak™ demodulates upstream signals to detect code word errors and linear distortions
- AutoChannel™ delivers content-intelligent tuning through an innovative method of automatic channel program detection and channel plan building.
- MPEG error visibility with live transport-stream display and post-capture analysis helps troubleshoot difficult video issues
- One-screen display shows all spectrum, level, and MER measurements of all channels (the world's first)
- In-band and in-service fault measurements that standard spectrum analysis tools frequently miss, reducing repeat rates

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Specifications

Frequency

Range: 0.5 to 1,100 MHz
Accuracy: 1 ppm
RBW: 10 kHz to 3 MHz 1/3 steps
Spectrum Update Rate:
- 10 frames/second on full scan

Level

Max Input Level: 65 dBmV
Min detectable level:
-58 dBmV (300 kHz RBW)
Amplitude Accuracy:
±1.5 dB @ 25°C, 2.0/T

Upstream Analysis (Real-Time)

Dual Inputs for Comparisons
- Demod and spectrum

Max and Min Hold for Zero Dead Time
- Overlapping FFTs
- No time gaps – 100% coverage

MacTrak Demod
- Codeword Errors
- Synchronized Spectrum with demodulation
- In-channel response

RBW: 1 to 100 kHz in 1/3 steps
Variable Persistence in 85 MHz Band
Min detectable level upstream: -60dBmV (300kHz RBW)

Downstream Analysis

Simultaneous display of carriers (with min and max), noise and MER for any number of channels
Fast level measurement - SA scan
- 10 updates per second

Auto detection of channel parameters
(Analog/Digital, Symbols, QAM) – no channel plan
- Spectral estimation of channel parameters
- Channel information compare to system channel data

Analog Channel Measurement

Video and Audio levels
Standards: NTSC, PAL and SECAM

Digital Channel Analysis

Modulation(s): Q64, Q128, Q256
Annex A, B and C
Regional Demods: DVB-C, ISDB-T
Full Span MER
MER
- Range > 40 dB
- Resolution 0.1 dB
- Accuracy +/- 2 dB

Ingress Under Carrier – full span ingress noise trace
BER down to 1E-10 (Pre and Post FEC)
Group Delay and ICR
DQI (including strip charts)
Constellation
Errored/severely errored seconds
Digital Hum
Level, measured symbol rate, carrier offset, modulation, interleaver depth

DOCSIS

Support for 1.0, 1.1, 2.0 and 3.0 (8x4) versions
Cable Modem functionality
Dual MAC addresses
IPv6 capability/support

Display

Easy to use
Color touch screen
Tablet
- Apple iPad (4th Generation or newer)/iOS 7

Detachable remote use via WiFi or Bluetooth

Usability

Battery Life: > 6hrs
Boot time: less than 15sec

Environmental

Hard Rain
Temperature Range: -20°C to 50°C
(iPad' operating temperature: 0° to 35° C)

Input/Outputs

RF (2) – F connectors
USB Host (thick and thin client)
USB OTG
Ethernet
Power

Asset and Data Management

StrataSync™

Reporting Capability

File export to CVS file
Screen capture to jpeg file
Access with or without StrataSync

Remote Access/Connectivity

Measurement unit can be left behind for longer term measurements/recording
Addressable via thin client via Name and IP address
Remote file access
Bluetooth, WiFi and DOCSIS connections
Cellular connection through tablet or PC

Digital Video/MPEG Features

Transport Stream Verification
- TR101-290
- SCTE-142
- ATSC A/78

Thumbnail video (I-frames- non encrypted)
PID information
Program information
PSI/SI tables
Network information
Transport Stream Capture
DSG Channel Data

Ordering Information

VSE-1100-BASE-PKG-65MHZ
VSE-1100-BASE-PKG-42MHZ