CX280X
VeSion® Advanced CATV Monitoring

All-in-One RF Monitoring
- QAM and DOCSIS 3.1 Monitoring and Analysis
- Fast MPEG Monitoring and Analysis
- ISDB-T Monitoring and Analysis

VeSion Platform Highlights

- Complete web-based solution compatible with any web browser
- Flexible distributed architecture for easy expansion, increased reliability, and reduced system down time
- Email, SMS, SNMP, Syslog notifications
- Secured access from any location with Internet connection via the web, Android™, and iOS® devices

Key Features

- Space efficient 1U rackmount unit with built-in 16 port matrix switch
- Fast VeCheck downstream performance scan for QAM, DOCSIS, OFDM, and Analog channels
- MPEG-TS ETR 101 290 Priority 1 and 2 monitoring with encryption detection
- Powerful DOCSIS 3.1 OFDM Analyzer
- On Demand Spectrum Analysis
- ISDB-T OFDM Digital Channel Measurements
- Monitors up to 256 nodes with AT1702-3G/AT1602-3G series switches
- Modular architecture enabling multiple unique configurations

MPEG Explorer

Cable Operators nowadays have to ensure that both the RF characteristics and digital payload of their QAM carriers are within defined limits, and simply viewing the QAM carrier "hay stack" is not enough to evaluate the protocol layer. The CX280X MPEG Explorer option extracts MPEG Transport Stream payloads from the QAM carrier and decodes them to check transport and programming content.
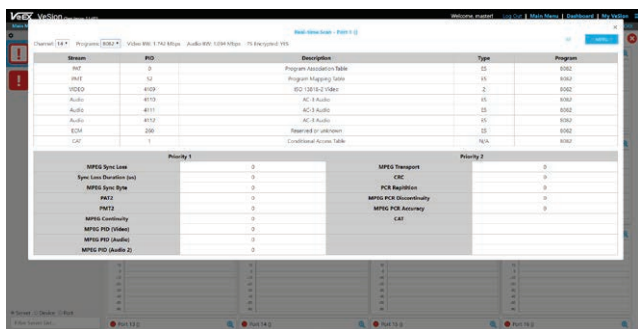
TR 101 290 Support

The ETSI TR 101 290 recommendation is a very good indicator of when a MPEG Transport Stream has been transported error-free across a network. The MPEG Explorer option features a dedicated measurement tab displaying Priority 1 alarms which are key indications of synchronization, continuity errors and major table errors. Also supported are Priority 2 impairments which include transport error indicators, Cyclic Redundancy Check (CRC), errors in elementary streams and PCR timing impairments.
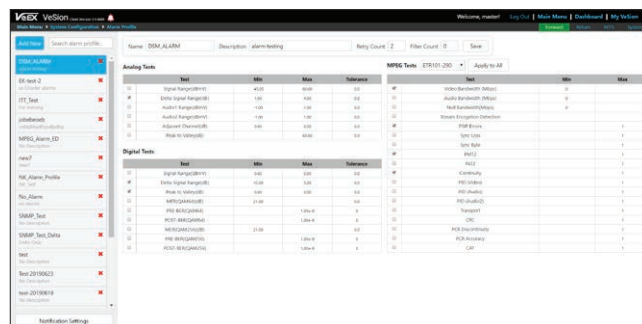
MPEG-TS Measurement and Analysis

- Detects the number of MPEG programs per channel.
- Provides PID MAP and streams information.
- Per program video, audio, and data streams rates and received packets count.
- Per steam PID numbers and Codec information.
- Detects the encryption status of each stream (video and audio).
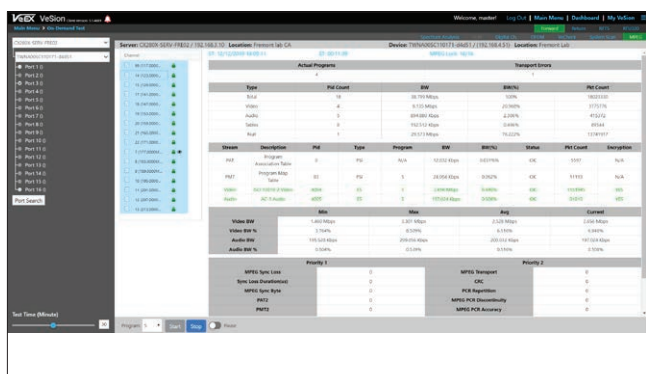
MPEG Transport System Analysis Summary	
Test Result	**Definition and Description**
PMT PID	Represents PID for the PMT inside the MPEG stream
#PIDs	Number of PIDs inside the MPEG stream
Video Packet Statistics	Includes video bandwidth and video packet statistics inside the program
Audio Packet Statistics	Includes audio bandwidth and audio packet statistics inside the program
TR 101 290	Includes result parameters per TR 101 290, such as Sync loss and Sync byte, PAT, CC, PMT, PCR and CRC errors, etc.
PID Map	Detail description for each PID inside the MPEG TS
Encryption Status	Detection of scrambling status for each Video and Audio stream

DOCSIS© 3.1/OFDM

Powerful Built-in OFDM Analyzer

- The fundamental DOCSIS 3.1 OFDM test pertains to locking to the PLC. Key PLC measurements include Level, MER performance, Corrected CW and Uncorrected CW.
- NCP based tests include verification for lock status, MER, Corrected and Uncorrected CW.
- Modulation Profile analysis, for the Boot Profile A and higher modulation profiles, are done to check for Lock status, MER, and Corrected/Uncorrected CW.
- OFDM Channel status for actual bandwidth, subcarrier bandwidth, and the active number of subcarriers.
- An overall OFDM channel performance assessment, including average overall MER, and the worst performing subcarriers based on a user settable MER Percentile setting.


OFDM Analysis

The OFDM Check, an extremely helpful feature if the DOCSIS signal is impaired or is unavailable, allows for true OFDM Signal Analysis providing all OFDM measurements including the Subcarrier Power, MER, and Noise scans. The OFDM PLC Search removes the guesswork of finding the PHY Link Channel frequency, proving to be a powerful and valuable tool.

OFDM Subcarrier Scans

In depth OFDM analysis is made possible with detailed subcarrier scans, which are presented in intuitive, graphical format.
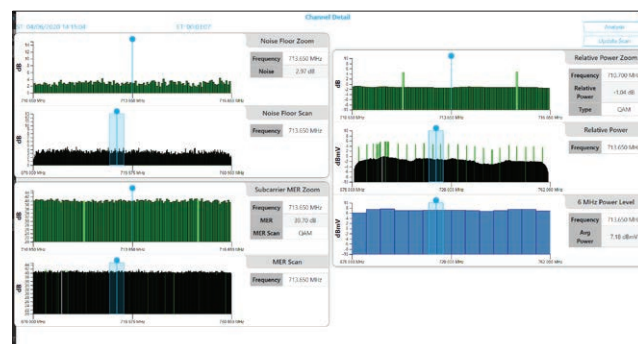
Subcarrier Power Scan

More precise OFDM power levels can be measured using the Power Scan. The OFDM channel is sectionalized to provide 6 MHz power measurements. Color coding clearly identifies the QAM modulated subcarriers, PLC subcarriers, and continuous pilots.

Subcarrier MER Scan

The full MER scan is presented on a per subcarrier basis.

Subcarrier Noise Scan

A full OFDM noise floor scan provides insightful indications of disturbers that may be present.

Detect Noise Under the OFDM Channel

The MER and Noise subcarrier scans can be overlayed in a MER and Noise graphical view, which ultimately can help identify service impacting plant impairment issues, namely hidden noise under the OFDM Channel.

SLM Features

Real Time Monitoring

Continuously scan up to 16 ports for Digital Video, QAM, OFDM, and Analog.
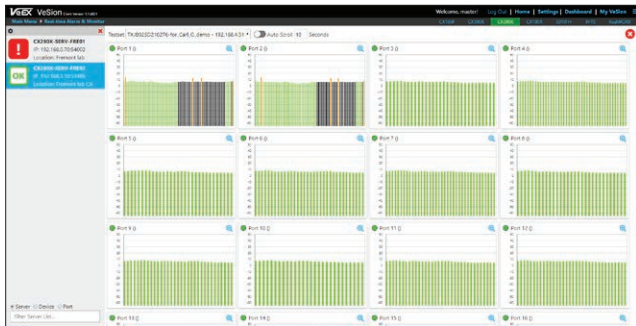
VeCheck On Demand

VeCheck is a fast and powerful Full Band Scan for the Forward Path, covering up to 1218 MHz. It is a 'One-Button Test' for verifying QAM, Single-Carrier DOCSIS QAM, and D3.1 OFDM. Key metrics include Level, Modulation Type, MER and BER, presented in an easy to view graphical format.
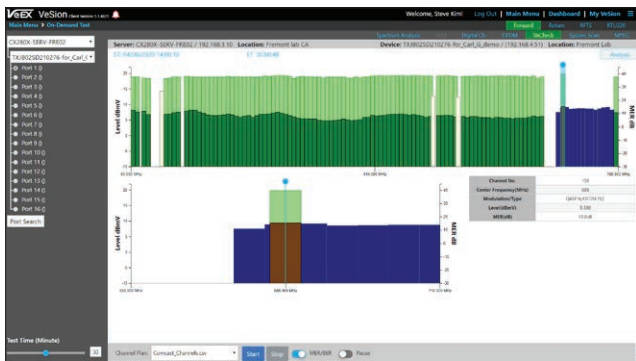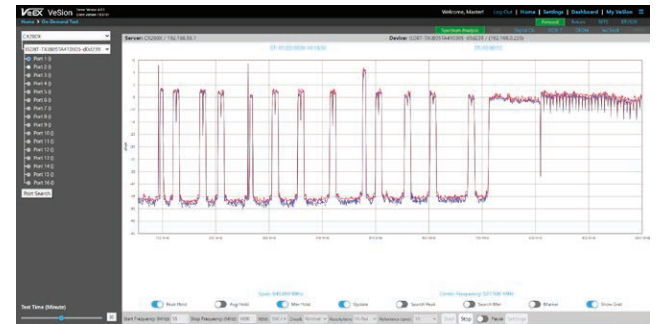

Single Channel On Demand

In digital mode, average power, MER, Pre-BER, Post-BER, Error seconds, and constellation diagram are displayed.
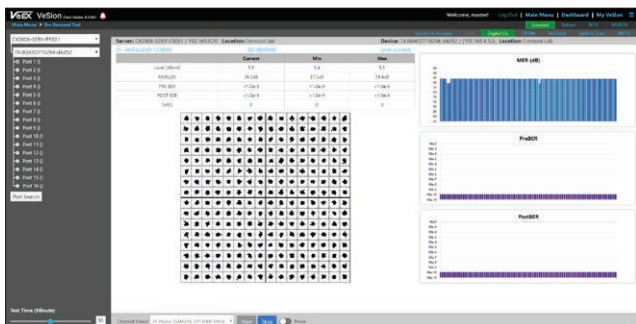
Spectrum Analysis On Demand

Spectrum Analysis for Forward Path signals for a range from 55 MHz to 1.8 GHz
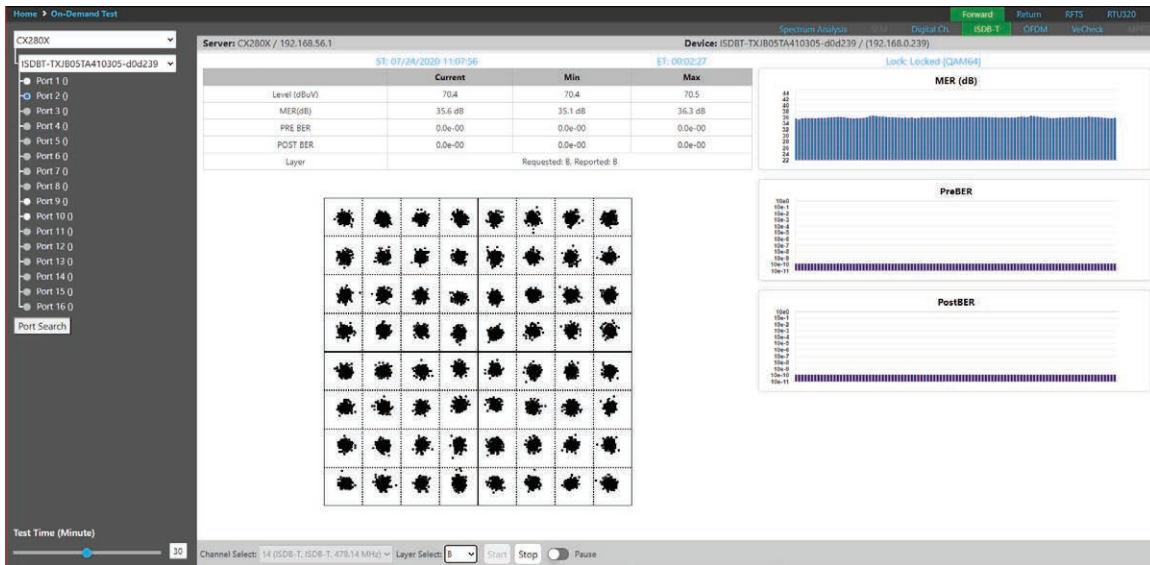

Data Logging and Alarm Reporting

Alarm types, test thresholds, and reporting method can be easily defined by the system engineer in VeSion. Trouble tickets and status updates can be viewed remotely and updated by maintenance personnel using web connection to the VeSion system. Supports RF, MPEG, and OFDM alarms. Provides a quick shortcut to On-Demand test for immediate troubleshooting.
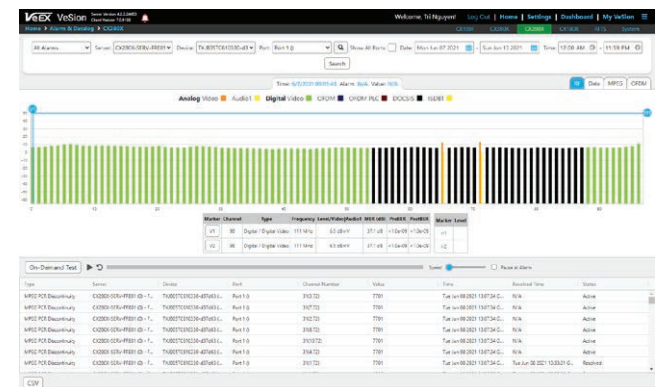
Measured data is stored in the VeSion sytem database for an extended period of up to 200 days, depending on the capacity of hard disk which can be configured by the system administrator. Archived data can be recalled and correlated with current alarm condition in live play back mode.
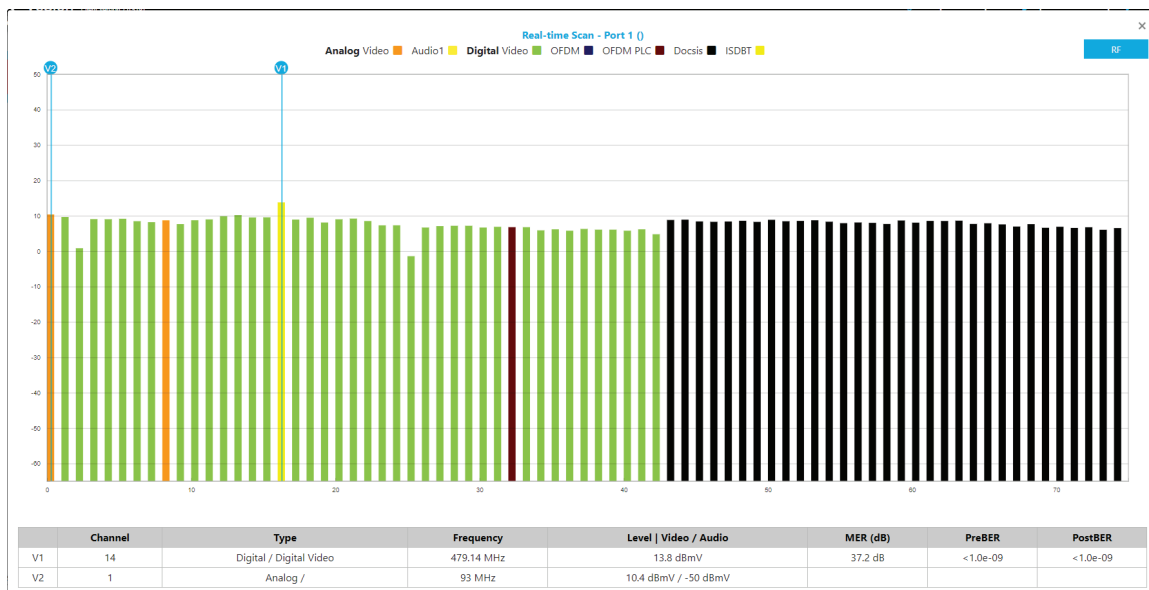
ISDB-T OFDM (Japan Standard Terrestrial Digital)

The ISDB-T OFDM option supports real time monitoring and on demand test for ISDB-T channels, reporting signal level, MER, BER, and constellation with user programmable thresholds and layer selection for a fast, simple, and accurate real-time testing.

	Channel	Type	Frequency	Level | Video / Audio	MER (dB)	PreBER	PostBER
V1	14	Digital / Digital Video	479.14 MHz	13.8 dBmV	37.2 dB	<1.0e-09	<1.0e-09
V2	1	Analog /	93 MHz	10.4 dBmV / -50 dBmV			

Specifications

General

Input Impedance: 75Ω
Maximum Input Level: +45 dBmV

OFDM Analysis

- Frequency Range: 108 MHz to 1218 MHz
- OFDM input range: -20 dBmV to +30 dBmV
- OFDM MER range: 20 dB to > 45 dB
- Bandwidths: 24 MHz to 192 MHz
- FFT size
  – FFT size = 4k (50 kHz carrier spacing)
  – FFT size = 8k (25 kHz carrier spacing)
- Profiles: Supports up to 5

Digital QAM Channel Measurements

- Frequency Range: 5 MHz to 1008 MHz
- Level Range: -40 dBmV to +40 dBmV
- Level Accuracy: ±2 dB
- Level Resolution: 0.1 dB
- Demodulation: standard QAM64 & QAM256 Annex A/B/C
- Symbol Rate: 1-7 MSPS, automatically detected
- Constellation Display: QAM64 & QAM256
- Minimum QAM Locking Level: -13 dBmV
- MER Range: Up to 45 dB

Spectrum Analysis

- Frequency Range: 5 MHz to 1.8 GHz
- Resolution Bandwidth: 3 MHz, 1 MHz, 300 kHz, 100 kHz
- Noise level (sensitivity): -48 dBmV @ 300 kHz RBW @ 500 MHz
- Attenuation: 0 to 50 dB in 10 dB steps
- Dynamic Range: 60 dB
- Display Range: 70 dB
- Frequency Reference: ±10 ppm typical @ 25ºC
- Forward Band Minimum Sweep Time: 250 ms (Low resolution sweep)
- Return Band Minimum Sweep Time: 35 ms

MPEG-TS Measurement and Analysis

MPEG PID and PMT mapping monitoring
Encryption status
MPEG TR 101 290
  1st Priority
  - Loss of synchronization
  - Sync byte error
  - PAT error
  - PMT error
  - Continuity error

  2nd Priority
  - Transport error indicator detection
  - CRC error
  - PCR error
  - PCR accuracy error
  - CAT error
PID Bandwidth monitoring
Video/Audio Packet statistics

Analog Channel Measurement

- Level Range: -40 dBmV to +60 dBmV
- Level Accuracy: ±1.5 dB
- Level Resolution: 0.1 dB
- Standards: NTSC, PAL, SECAM

Modular Architecture

Supports multiple unique configurations:
- MPEG Analyzer only
- Spectrum Analyzer and Advanced SLM only
- Spectrum Analyzer and Advanced SLM + MPEG Analyzer
- Spectrum Analyzer and Advanced SLM + MPEG Analyzer + ISDB-T Analyzer
- DOCSIS 3.1/OFDM + MPEG Analyzer
- DOCSIS 3.1/OFDM + Spectrum Analyzer and Advanced SLM
- DOCSIS 3.1/OFDM + Spectrum Analyzer and Advanced SLM + MPEG Analyzer
- DOCSIS 3.1/OFDM + Spectrum Analyzer and Advanced SLM + ISDB-T Analyzer

General Specifications

Size	17 x 1.75 x 15 in (W x H x D)
Weight	4.54 kg (10 lb)
AC Adaptor	Input: 100-240 VAC, 50-60 Hz
	Output: 12 VDC, 7A
-48 VDC Power Option	DC Input range: -40 VDC to -60 VDC
	Max current: 2A @ -48 VDC
Operating Temperature	-10˚C to 50˚C (14˚F to 122˚F)
Storage Temperature	-20˚C to 70˚C (-4˚F to 158˚F)
Humidity	5% to 95% non-condensing

VeEX
The Verification Experts