



# CX280X

## VeSion™ Advanced CATV Monitoring

Please direct all questions to your local VeEX® Sales Office, Representative, or Distributor. Or, contact VeEX technical support at [www.veexinc.com](http://www.veexinc.com).

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# 1.0 General Information

This user manual is suitable for novice, intermediate, and experienced users and is intended to help use the features and capabilities of VeEX products successfully. It is assumed that the user has basic computer experience and skills, and is familiar with telecommunication and other concepts related to VeEX product usage, terminology, and safety.

Every effort was made to ensure that the information contained in this user manual is accurate. Information is subject to change without notice and we accept no responsibility for any errors or omissions. In case of discrepancy, the web version takes precedence over any printed literature. The content in this manual may vary from the software version installed in the unit. For condition of use and permission to use these materials for publication in other than the English language, contact VeEX, Inc.

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## 1.1 Customer Support

For more technical resources, visit [www.veexinc.com](http://www.veexinc.com).

For assistance or questions related to the use of this product, call or e-mail our customer care department for customer support. Before contacting our customer care department, have the product model, serial number, and software version ready. Please locate the serial number on the back of the chassis. Please provide this number when contacting VeEX, Inc. customer care.

Support hours may vary depending on the product.

### Product Technical Support

Support is generally available 8:00 AM to 8:00 PM, Eastern Standard Time, Monday to Friday.

**Phone:** +1 510 651 0500

**E-mail:** [customercare@veexinc.com](mailto:customercare@veexinc.com)

### MPA Product Technical Support

Support is generally available 8:30 AM to 5:30 PM, Eastern Standard Time, Monday to Friday.

**Phone:** +1 877 929 4357

**International:** +1 727 475 1206

**E-mail:** [serviceandsupport@veexinc.com](mailto:serviceandsupport@veexinc.com)

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## 1.2 Warranty

For warranty information on VeEX products, go to <https://www.veexinc.com/Support/Warranty>.

To activate the warranty, please register your product at <https://www.veexinc.com/Support/ProductRegistration>.

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## 1.3 Patent Information

VeEX product hardware and software may be protected by one or more patents on file with the United States Patent Office.

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## 1.4 Documentation Conventions

Icons used in this manual:

	Marks a helpful tip (action or method), which can save time and improve usability of the product.
	Provides important information needed to use this product and avoid missteps.
	Cautions against an action or inactivity, which can hinder productivity.
	Strongly warns against a condition, an action, or inactivity which can lead to a health hazard, injury, equipment damage, data loss, and/or financial losses.
	Stop and read before continuing.

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## 2.0 Safety Information



Safety precautions should be observed during all phases of operation of this instrument. The instrument has been designed to ensure safe operation; however, please observe all safety markings and instructions. Do not operate the instrument in the presence of flammable gases or fumes or any other combustible environment. VeEX Inc. assumes no liability for the customer's failure to comply with safety precautions and requirements.

### Electrical Connectors

Telephone lines may carry dangerous voltages. Always connect the electrical test ports to known test interfaces which carry low level signals.

### ESD: Electrostatic Discharge Sensitive Equipment

The chassis could be affected by electrostatic discharge. To minimize the risk of damage when replacing or handling chassis, make sure to follow proper ESD procedures. Dissipate any electrostatic charge from your body and tools. Use proper grounding gear.



- Perform all work at a workplace that is protected against electrostatic build-up and discharging.
- Never touch any exposed contacts, printed circuit boards or electronic components.
- Always store chassis in ESD protected packaging.
- Wear ESD protection and grounding gear when:
  - Installing, uninstalling, or handling chassis.
  - Connecting or disconnecting cables from chassis.

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## 3.0 CX280X Introduction

The CX280X with VeSion is an all-in-one RF monitoring probe that performs QAM and DOCSIS 3.1 monitoring and analysis, and fast MPEG monitoring and analysis. It uses configured parameters to scan continuously and non-intrusively.

The CX280X probe checks the performance of analog and digital channels being transmitted downstream or toward customers across a CATV HFC network. It is a 1U rack-mounted Headend probe with a built-in matrix switch consisting of 16 RF input ports, each 3 GHz rated. It includes one RF system expansion port that can be used with the AT-1602-3G or AT1702-3G broadband RF multiplexer switch to monitor up to 256 nodes simultaneously. The CX280X probes are placed in the headend and get a direct signal for RF monitoring before it gets to laser.

The probe adds MPEG monitoring for Priority 1 and 2 as per ETSI TR 101 290 standards, as well as troubleshooting and auditing the performance of analog and digital channels being transmitted downstream across the CATV HFC network. The CX280X features a powerful DOCSIS 3.1 OFDM Analyzer and On Demand Full Band Capture.

It can be assigned a secure IP connection for access from any location with an Internet connection via remote terminals or mobile devices. Its modular architecture enables future expansion throughout the network.

The notification engine can automatically notify NOC and users via SNMP and/or email when an alarm is triggered, when the threshold is being exceeded, internal system faults or any system changes are made in VeSion.

The CX280X is compatible with AT1600/AT1700 series broadband RF switching solution. The AT1600 offers a switch gain of 0 dB and 10 dB with AT1700 series. The CX280X has 16 ports and can be employed as a direct stand-alone or combined with AT1600/AT1700 series for monitoring, troubleshooting, non-blocking on-demand tests, and auditing needs.

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### 3.1 CX280X Key Features

- HFC test and Monitoring for RF Forward system up to 1218 MHz
- Fast VeCheck downstream performance scan for QAM, DOCSIS, OFDM, ISDB-T, and Analog channels
- DOCSIS 3.1 OFDM Analyzer
- On Demand Full Band Capture
- MPEG On-Demand and Monitoring (Encryption, Priority 1 and 2 as per ETSI TR 101 290 (DVB and Measurement Guidelines for DVB systems)
- MPEG Scan for 150 QAM channels in under 2 minutes
- Subcarrier Scan (Power, Un-Equalized MER, Noise Scan)
- Carrier Class Ethernet testing and monitoring
- Sweep Return and Forward (DOCSIS 3.1 full range)
- Monitors up to 256 nodes with AT1702-3G/AT1602-3G series switches
- Modular architecture enabling feature expansion

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### 3.2 CX280X Package Contents

The following items are included in the box:

- CX280X rack mount chassis
- Rack mounting brackets (2)
- AC/DC Power adaptor with power cord (12 VDC option)
- Getting Started Guide



**CX280X Shipment items**

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## 4.0 Hardware Installation

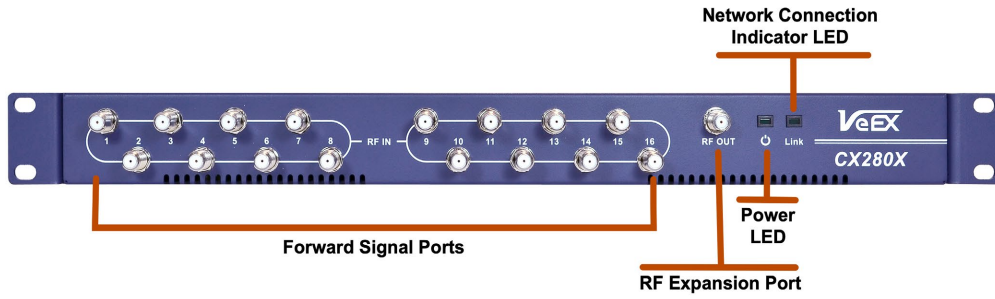


Users should be familiar not only with the CX280X hardware and cabling, but also with electronic circuitry, wiring practices, and safety precautions.

### 4.1 CX280X Hardware Layout

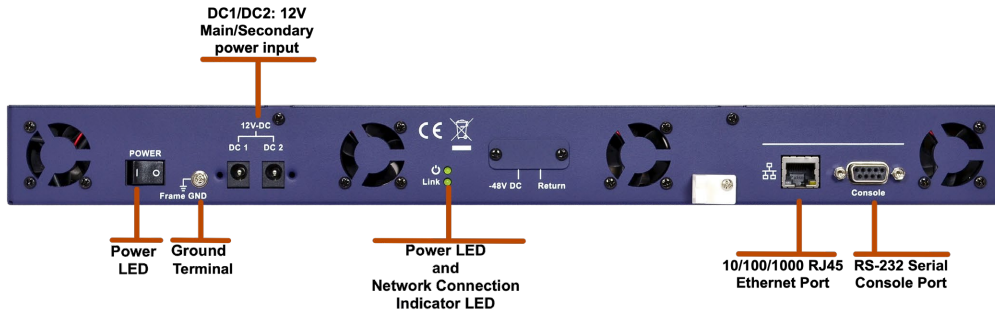
#### 4.1.1 Front Panel

Each CX280X probe has 16 RF input ports and can monitor up to 256 nodes with AT1602-3G/AT1702-3G switches. It is recommended to terminate unused RF ports with 75 Ohm termination.



*CX280X Front Panel*

#### 4.1.2 Back Panel



*CX280X Back Panel - DC 12V via AC/DC adapter*



*CX280X Back Panel - DC 48VDC*

## 4.2 Electrical Equipment Safety Guidelines

When working with electrical equipment, follow these guidelines.

- Always unplug the power cable before installing or removing a chassis.
- Locate the emergency power-off switch for the room in which you are working. If an electrical accident occurs, turn off the power immediately.
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- If an electrical accident occurs, proceed as follows:
  - Use caution. Do not become a victim yourself.
  - Turn off power to the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
  - Determine whether the person needs rescue breathing or external cardiac compressions, and then take appropriate action.



*Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Improper or unsafe use can cause physical harm and damage equipment. Read the [Safety Information](#) and [Electrical Equipment Safety Guidelines](#) sections before beginning installation.*

### **WARNING!**



*The connection interfaces of the CX280X are for intra-building connection only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and must be isolated from exposed OSP cabling. All the connection ports should be connected to unexposed wiring/cabling within a single building ONLY. Do NOT metallically connect the equipment interface ports to OSP or its wiring. Adding Primary Protectors is NOT sufficient to connect these equipment interfaces metallically to OSP or its wiring.*

## 4.3 Tools/Items Required

- Number 2 Philips screwdriver
- 18-gauge copper grounding wire with listed lug. If crimp connections are needed, make sure that bare conductors are coated with antioxidant and cleaned before making the connection.
- 1 each #8 internal tooth lock washer for chassis frame ground connection.

## 4.4 Equipment Placement

The CX280 should be installed at a Central Office or Headend facility in a restricted access location.

With the appropriate rack mounting kit, the CX280X can be mounted to a standard 19-inch, 21-inch or 23-inch equipment rack.



*To meet safety and electromagnetic interference (EMI) requirements, the CX280X **MUST** be rack mounted with proper grounding connection.*

*Make sure the rack is properly anchored to the relevant specification and the CX280X is securely fastened to the rack.*

## 4.5 Chassis Lifting Guidelines

A fully configured CX280X is not intended to be moved frequently. Before installing, plan chassis placement and ensure that your site is properly prepared so you can avoid having to move the chassis later to accommodate power sources and network connections.

When lifting the chassis, follow these guidelines:

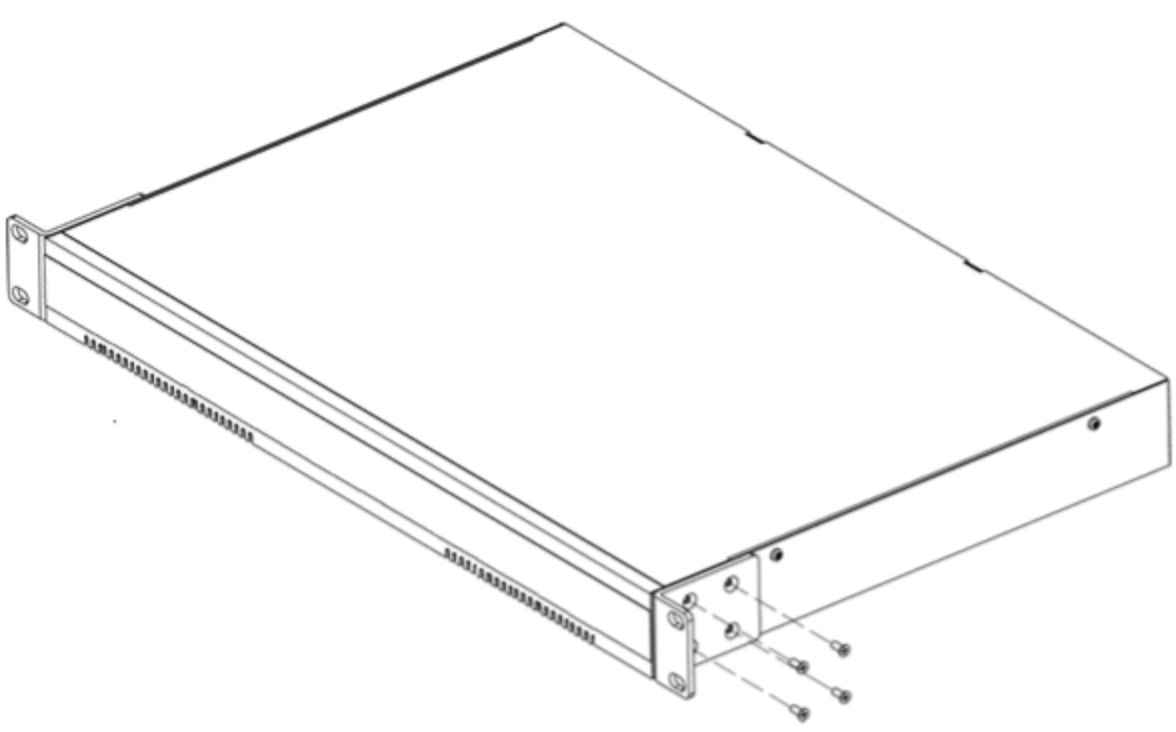
- Always disconnect ALL external cables before lifting or moving the chassis.
- Ensure that your footing is solid and balance the weight of the object between your feet.
- Lift the chassis slowly; never move suddenly or twist your body as you lift.
- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist. This reduces the strain on your lower back muscles.
- Lift the chassis from the bottom by grasping the underside of the chassis exterior with both hands.

## 4.6 Rack Mounting the Chassis

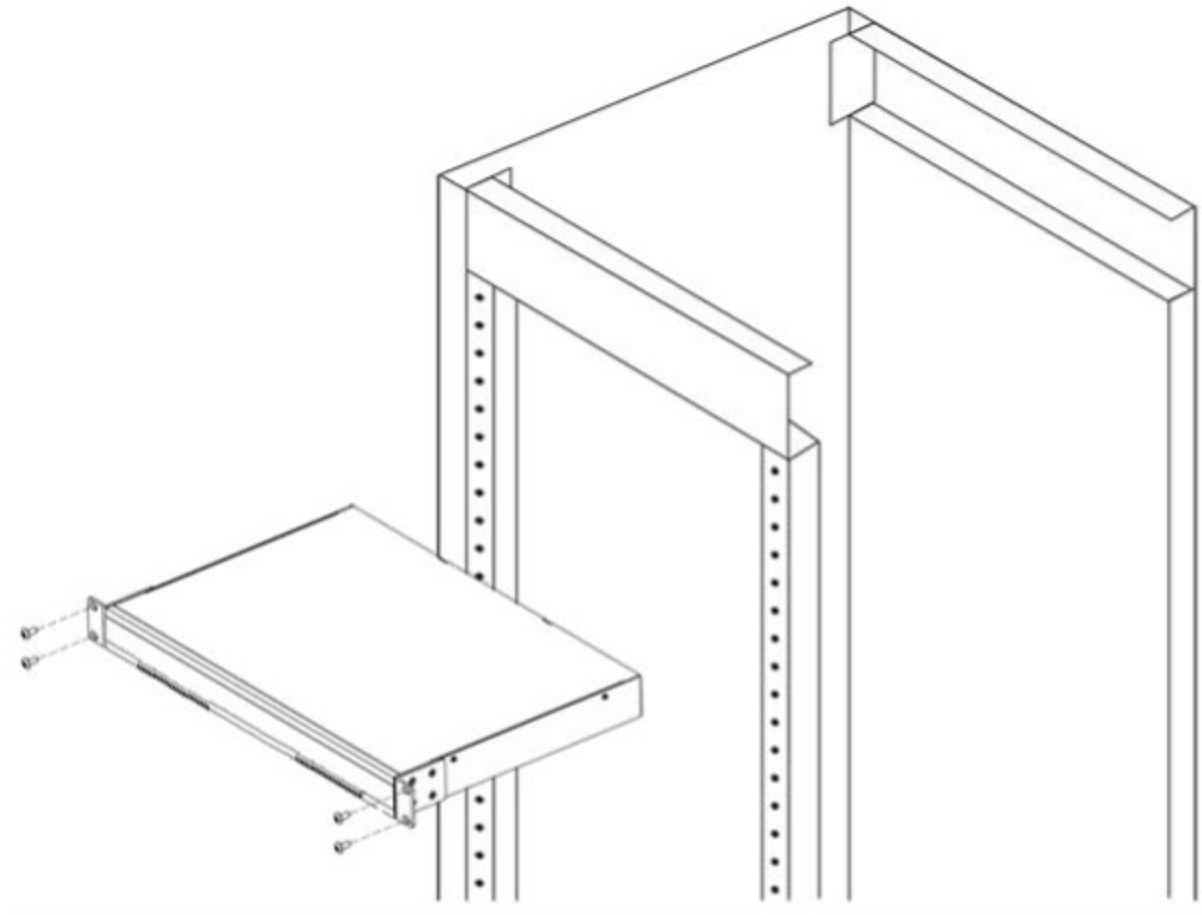
Exercise caution when rack mounting this or any other type of equipment. Ensure that all equipment is properly secured along the specified hardware. Equipment must be installed in a safe manner to prevent overloading, tipping over, or other unsafe conditions.

**To rack mount the chassis:**

1. Remove the eight (8) mounting screws on the left and right front sides of the equipment to install the rack mounting brackets.
2. Install rack mounting brackets to the left and the right sides of the equipment using the eight mounting screws. Depending on the cabling arrangement and the placement of the unit in the rack, the mounting brackets can be installed at the front side or at the rear side of the equipment.



3. Install the equipment to rack and securely fastened with the appropriate mounting screws for the rack system.



#### 4.6.1 Ventilation

When installing equipment, make sure that adequate ventilation is available. Inadequate ventilation will result in higher than normal operating temperatures and may result in degraded operation. Additional care must be used when installing enclosed racks or when racks are located near other equipment that may increase ambient temperatures.

There are ventilation openings in this equipment. Do not block or cover any of the ventilation openings. Always ensure the equipment receives sufficient airflow such that it will operate within the specified operating temperature range.

#### 4.6.2 Connect Equipment to Ground

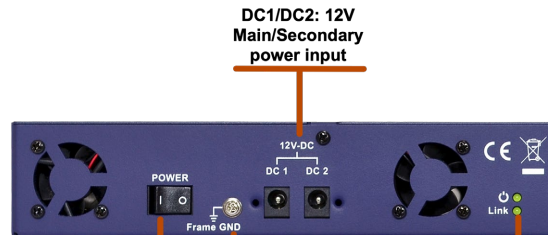
This equipment will be connected to the Common Bonding Network (CBN) of the facility. Remove the Frame Ground screw at the rear of the CX280X. Insert a lock washer then the lug of the grounding wire into the screw. Install and tighten the Frame Ground screw. Check that the ground wire lug is secured and does not move.



## 4.7 Connecting Power

Set the Power switch at the back of the equipment to the OFF position.

For the AC power adapter option, use only the AC power adapter provided by VeEX. Make sure that the AC power adapter is securely mounted on the rack, connect the 12VDC output plug to the DC input port of the equipment. The AC input of the AC power adapter should be connected to an AC power source with surge protection to protect the equipment from voltage spikes.



### Connecting Power to CX280X

For -48VDC powered CX280X, check and confirm that the DC supply breaker is turned off. Connect the Return wire of the power cable from the DC power source to the Return terminal of the -48V DC termination block of the equipment, and the -48V DC wire of the DC power cable to the -48V DC terminal on the equipment. Check that the termination screws are tightened, the power wires are properly routed and secured.

#### 4.7.1 Powering On/Off the unit

##### To power on the unit:

- On the back of the device, press the Power switch to the ON position. The green power LED turns on to indicate the device is powered on.

The unit begins to boot up as soon as the power switch is turned on.

##### To safely power off the unit:

1. Stop monitoring.
2. Press the Power switch to the OFF position. The green power LED turns off to indicate the device is powered off.

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## 5.0 Basic Overview

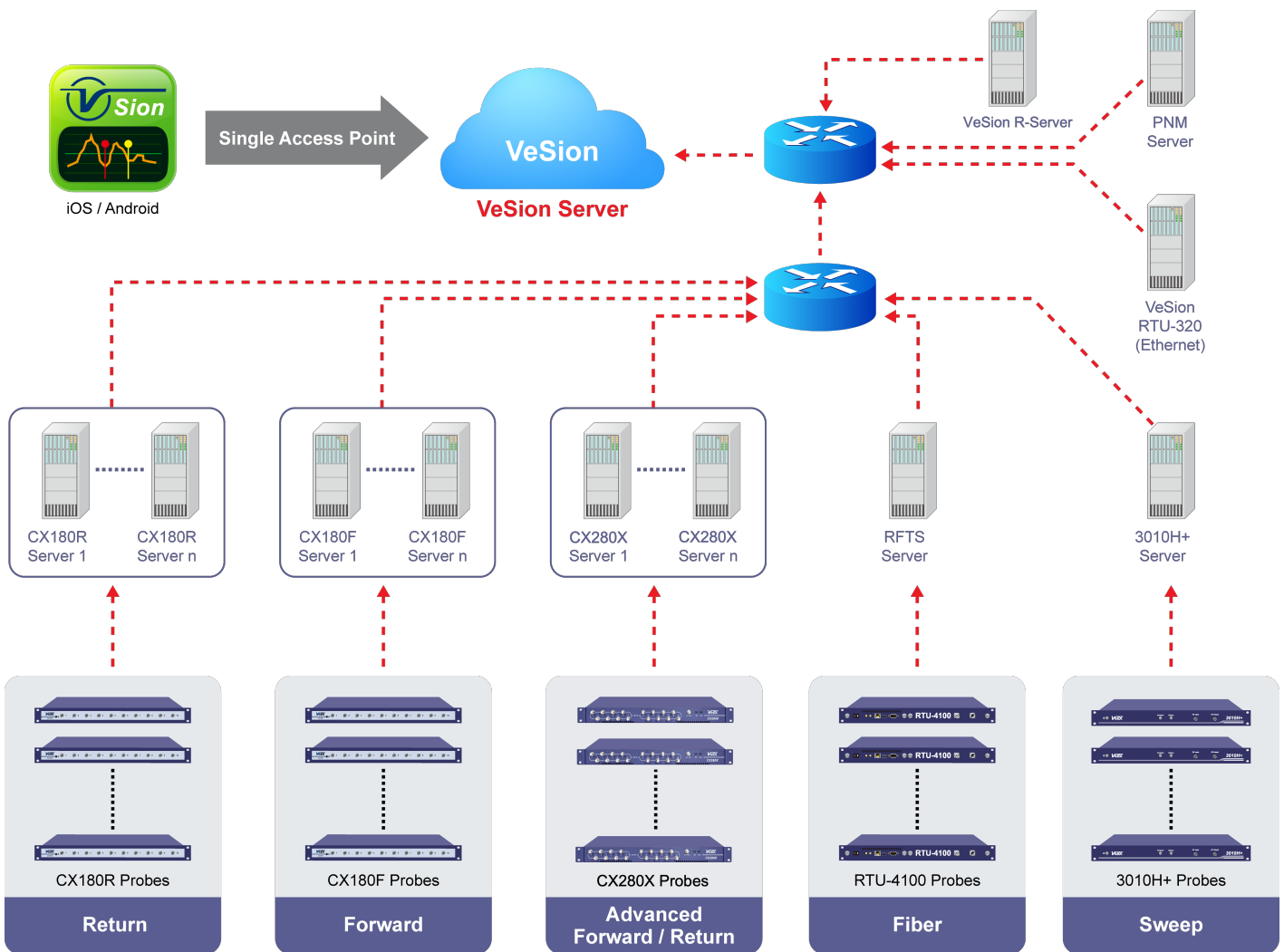
### 5.1 VeSion Interface

The CX280X Probe works with the VeSion monitoring system to reduce network troubleshooting and problem resolution time, thereby reducing operational costs. VeSion is modular, so as the network expands the system can be upgraded by adding available hardware and/or software solutions.

#### 5.1.1 About VeSion

VeEX's VeSion cloud-based one system platform integrates VeEX's Preventive RF monitoring (Return and Forward), Fiber, MPEG, Fiber monitoring (RFTS), Ethernet, Advanced DOCSIS Monitoring, DOCSIS Burst Demodulation, Sweep, PNM (Return and Forward), Workflow and Asset Management (R-Server) all in one modular architecture. This provides MSO's complete network visibility (VeSion) and reduces unnecessary Truck Rolls by alerting key personnel via SMS and/or emails to alarm conditions and location. In addition, VeSion links directly with an MSO's billing system, allowing them to pin-point the exact location of the DOCSIS cable modem problem.

Using the Internet, or mobile applications to VeSion, access to results can be made anywhere, anytime and at any location.



*VeSion Architecture*

#### 5.1.2 Platform Highlights


- Complete web-based solution compatible with any web browser
- Flexible distributed architecture

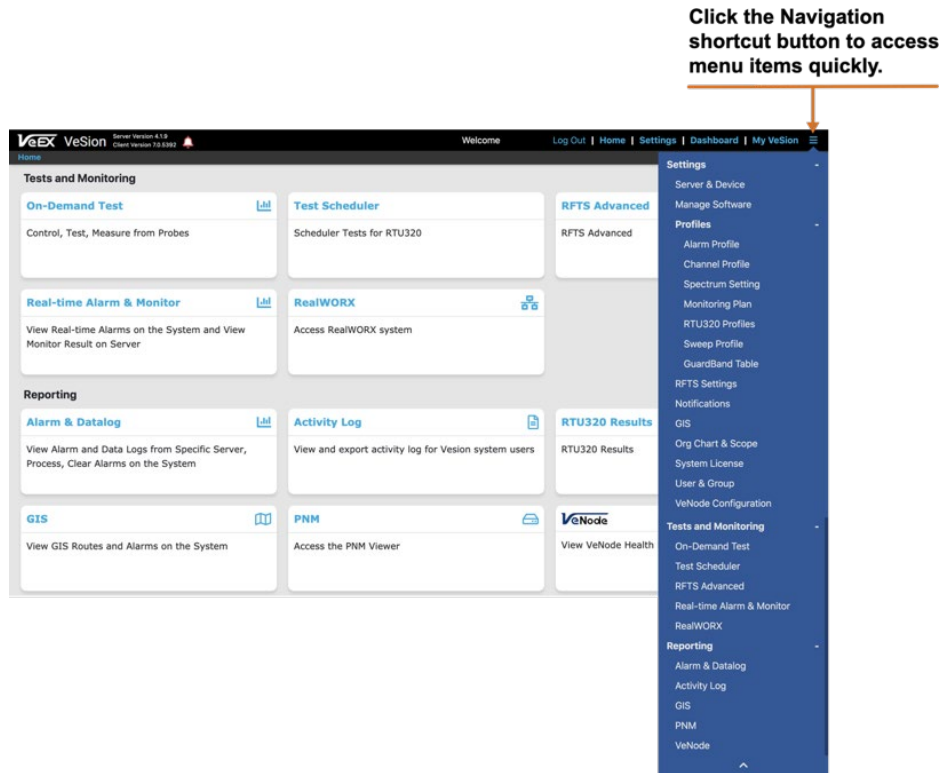


- Email, SMS, SNMP, Syslog notifications
- Secured IP connection for access from any location with Internet connection via Android and iOS mobile devices, web access
- Options include:
  - Workflow, configuration, Asset and Test Data Management, Dispatch and Data enrichment system using R-Server
  - GIS support to capture, store, manipulate, analyze, and manage geographic data
  - PNM (Return and Forward)

### 5.1.3 General Settings

The VeSion System IP address and login information can be provided by the System Administrator.

After logging in, the **Home** page appears. A description for each function item is provided on the screen. Use the shortcut **Navigate** button  on the top right menu bar to select screens options.



*VeSion Screen Navigation*

### 5.1.4 User Permissions and Groups

User permissions are determined by their Group. User Groups are preconfigured by VeEX. Each group is assigned specific permissions depending on their role (e.g. District Supervisor, Region Manager, NOC Operator). The maximum number of users that can be assigned to each group can be updated, as needed.

To view the groups and permissions or update the maximum number of users allowed for a group, go to **Settings < User & Group < Group**.



Contact [Customer Care](#) if additional updating of User Groups is needed.

#### To set up or edit users:

- Go to **Settings < User & Group < User**. A table displaying all users appears.
- Select **Add New** on the top blank row of the user table. Enter the following information.

**Name:** Employee name of user

**User ID:** ID used to log into VeSion

**Group and Org Chart:** Assigns permissions by adding the user to a Group. Depending on the Group, an Org (Organization) and Server may also be assigned.

**Status:** Checkbox to indicate if the user is active and allowed to access VeSion.

**Password:** Password used to log into VeSion.

**Email:** User's email. Notifications will be sent to this email address if enabled.

**Employee ID:** Employee ID of user.

**Phone Number:** User's phone number. If enabled, text notifications will be sent via the SMS Provider to this number.

**SMS Provider:** User's SMS provider.

3. Select **Create**. The new user is created and can now log into VeSion (if marked as active during setup). To cancel the creation of the new user, select **Cancel**.

#### To assign a user to a specific probe:

1. Go to **Settings < User & Group < User**. A table displaying all users appears.
2. Select **Edit** next to the user to assign to the probe.
3. In the **Group and Org Chart** column, select a group that has "-Server" appended to the name. This activates the **Server Assignment** link.

Actions	Name	User ID	Group and Org Chart	Status
<a href="#">Add New</a>	<input type="text" value="Find Name"/>	<input type="text" value="Find User ID"/>		
<a href="#">Update</a> <a href="#">Cancel</a>	<input type="text" value="John Doe"/>	<input type="text" value="123"/>	Group: ORG: <a href="#">Server</a>	••
<a href="#">Edit</a> <a href="#">Delete</a>	Bob	12312321321321	NC	
<a href="#">Edit</a> <a href="#">Delete</a>	Sama	1321312	Dis	
<a href="#">Edit</a> <a href="#">Delete</a>	test	8-6-distsup2	District	

#### VeSion: Assigning Users

4. Select the **Server Assignment** link. The **Server Assignment** box appears.
5. Select the checkbox to place a checkmark next to the probe to assign to the user and close the box.

Number	Name	Location	
<input checked="" type="checkbox"/>	5	ATL-MPEG-TWNA00SC	testa

#### VeSion: Server Assignment

6. Select **Update**. The user is assigned to the designated probe.

### 5.1.5 User Reports

System administrators configured with "Manager" permissions can see who is logged onto the VeSion system.

Name	User ID	Group	Time Logged In	IP Address	Client Type	Actions
Find Name	Find User ID	Find Group	Find Time Logged In	Find IP Address	Find Client Type	
John Doe	jdoe	Manager	9/23/2020 10:06:28	192.168.0.100	WEB	Log Out

*Logged User screen*

Managers can also view usage reports to see access history.

Click the calendar icons to select the date range, then Search.

Name	User ID	Group	Time Logged In	Time Logged Out	IP Address	Client Type
John Doe	jdoe	Manager	9/25/2019 11:03:17		76.1748.176.50956	Web
Jimmy John	jjohn	Supervisor	9/25/2019 10:53:19		192.168.0.100	Web
Jane Too	jtoo	Manager	9/25/2019 09:23:34	9/25/2019 10:29:53	192.168.0.100	Web
Tommie Long	tlong	Supervisor2	9/24/2019 18:37:26	9/24/2019 18:38:11	192.168.0.100	Web
John Doe	jdoe	Manager	9/24/2019 15:11:04	9/24/2019 18:24:35	192.168.0.100	Web
John Doe	jdoe	Manager	9/24/2019 14:26:30	9/24/2019 18:24:39	192.168.0.100	Web
Mike Smith	msmith	District Supervisor	9/24/2019 13:22:00	9/24/2019 13:53:10	192.168.0.100	Web

*Usage Report*

### 5.1.6 Activity Logs

While the User Usage Report shows only when the user logs in and out of the system, the Activity Log gives more specific information about what the user performs in the system. It can also show information about all users in one report.

To access the log, go to **Home < Activity Log**. Select the server, profile, activity type, user, and date range, and then select **Search**.

Time	User	Activity Type	Operation Type	Server	Cycle	Device	Port	Name
9/27/2019 08:29:08	tjones	User	Add	All	All	All	All	22/2019
9/27/2019 08:30:17	tjones	User	Update	All	All	All	All	22/2019
9/27/2019 12:54:31	tjones	Channel Table Profile	Update	All	All	All	All	ATL280xOFDM.csv
9/27/2019 13:00:21	tjones	Channel Table Profile	Update	All	All	All	All	ATL280xOFDM.csv
9/27/2019 13:03:00	tjones	Channel Table Profile	Add	All	All	All	All	clone-ATL280xOFDM-bkup.csv
9/27/2019 13:04:34	tjones	Channel Table Profile	Update	All	All	All	All	ATL280xOFDM.csv

*User Activity Log*

### 5.1.7 SMS Providers

SMS Provider information must be configured in VeSion for users to receive SMS text notifications.

Actions	Name	Email Root
<a href="#">Add New</a>	Find Name	Find Email Root
<a href="#">Edit</a> <a href="#">Delete</a>	Sam	12abc
<a href="#">Edit</a> <a href="#">Delete</a>	Test	apple
<a href="#">Edit</a> <a href="#">Delete</a>	Docomoe	docomo.ne.jp
	US Cellular	email.uscc.net
	Alltel	message.alltel.com
	CenturyTel	messaging.centurytel.net
	Sprint	messaging.sprintpcs.com
	Cellular One	mobile.celloneusa.com
	Surewest Communicaitons	mobile.surewest.com
	Telus	msg.telus.com
	Boost Mobile	myboostmobile.com
	Rogers Canada	pcs.rogers.com
	Qwest	qwestmp.com
	T-Mobile	tmomail.net
	AT&T	txt.att.net
	Bell Canada	txt.bellmobility.ca
	US West	uswestdatamail.com
	Virgin Mobile	vmobl.com

SMS Providers

### 5.1.8 VeSion Dashboard

The Dashboard captures data at a glance. It displays each category as a data block that can be moved around the screen (if not anchored).

Access the Dashboard by clicking the **Dashboard** link on the top menu bar.

The screenshot shows the VeSion Dashboard with the following components:

- Header:** VeSion logo, Server Version 4.1.9, Client Version 7.0.5392, Welcome, and navigation links (Log Out, Home, Settings, Dashboard, My VeSion).
- Sub-headers:** Home > Dashboard, Setup, User, Group, SMS Provider List, Logged User, User Usage Report.
- Time Range:** 24 hours (selected), 7 days, 30 days.
- Settings & Scope Filter:** A gear icon on the left side.
- VeEX News:** A list of news items with dates and titles.
- Alarm Trends RFTS:** A line graph showing alarm trends over time, with a legend for Minor (yellow), Major (orange), Critical (red), and FiberBreak (black).
- Alarm Summary:** A donut chart and a table showing the distribution of alarm types.
- GIS Map:** A map showing the geographical location of nodes, with coordinates 33.13755, -94.79004.
- Return Node Health:** A table showing the health status of various nodes.
- Alarm Trends:** A line graph showing alarm trends over time, with a legend for Level Low (blue), Level High (orange), Port Baseline Mismatch (yellow), Channel Table Mismatch (green), MER (purple), and BER (cyan).

VeSion Dashboard

It can be configured also by selecting **Settings & Scope Filter** on the far left.

## To customize the Dashboard:

1. On the top menu bar, click the **Dashboard** link.
2. On the left edge of the screen, click **Settings & Scope Filter**. The **Settings/Scope Filter** left panel displays.
3. Select the configuration options, click the red X to close the left panel.

## Scope Filter

Select the Region and District for which to show data.

## Settings

- **Small/Medium/Large:** Select the size of the data block for the dashboard. The size can also be adjusted by clicking an edge of a data block and dragging it.
- **Widgets Unlocked/Locked:** Click the padlock icon to lock or unlock the widgets. When locked, they cannot be resized.

## 5.4 System Notifications

Use the Notifications page to configure global notification settings applicable to all probes (even those other than the CX280X) for SNMP and Email. These settings apply when a Probe Server goes offline. Access the **Notifications** page by clicking **Settings** on the top menu bar, then selecting **Notifications**.



The CX280X Probe Server handles system log and SNMP/Email notifications when a CX280X probe associated to it goes online. To configure these settings, go to the **CX280X Probe Server Settings** page. For more details on configuring probe settings, see [Section 6.1 CX280X Server Settings](#).

VeSion System Notifications screen

VeSion System Notifications screen

## SNMP Configuration

- **SNMP Enable:** Turns on to enable SNMP alarms.
- **Enterprise:** Select the OID used to report the alarm.
- **Community:** Enter the community string/password for the SNMP. The default is public.
- **HOST (IP:Port; IP:Port):** Enter the host IP address and port for each SNMP trap receiver. Separate multiple addresses by

semi-colons.

## Email Configuration

- **Email Enable:** To enable email alarm notifications from probe server if option was selected in My VeSion and email provided.
- **SMS Enable:** To enable mobile device alarm notifications if option was selected in My VeSion and phone number/mobile provider selected.
- **Smtp Server:** Enter server that VeSion accesses to send email notifications.
- **Email Address:** Email address from which notifications are received.
- **Username:** Username VeSion uses to connect to the SMTP Server.
- **Password:** Password VeSion uses to connect to the SMTP Server.
- **BCC:** Email addresses to which blind copies of notifications are sent.
- **SSL/TLS:** Security protocol used to connect to the SMTP Server.
- **Check:** Runs a test with the current configuration settings to validate they are correct.

Use the **Check** button to run a test and validate the current configuration settings are correct.



*Global SysLog configurations are not needed, as the VeSion Server maintains a usage System Log automatically. To access this log, a third party tool compatible with the OS is needed. For more information, contact [VeEX Customer Care](#).*

## 5.5 Alarm Notifications (My VeSion)

Assign user permissions to receive alarm email notifications in the My VeSion window. To access My VeSion, select **My VeSion** in the top right menu bar.



Click **My VeSion** on the top right of the menu bar to quickly access configuration options for the user login and password, as well as alarm email notifications.

My VeSion

My Email:

My Password:   
Requires upper,lower,digit,'#'\* and 8 characters long

My Phone Number:

My Provider:

RF Probes Unit Settings dBmV

**Forward**  SMS

Email notification for Alarms

Email notification for change in Settings for Probe Server and Device

Email notification for Maintenance

**Return**  SMS

Email notification for Alarms

Email notification for change in Settings for Probe Server and Device

Email notification for Maintenance

**RFTS**  SMS

Email notification for Alarms

Email notification for change in Settings for Probe Server and Device

Email notification for Maintenance

**MyVeSion: menu and screen**

In addition to configuring user permissions for alarm notifications, user information can also be quickly set without going to **Settings < User & Group < User**.

- **My Email:** View or change the email address for notifications.
- **My Password:** Change the login password.
- **My Phone Number:** View or change the telephone number for SMS text notifications.
- **My Provider:** View or select the mobile provider for SMS text notifications.
- **RF Probes Unit Settings:** View or change the measurement units by selecting the link, dBmV or dBuV.

#### **Forward/Return/RFTS notification settings**

For each section (Forward/Return/RFTS), select the radio button to turn ON/OFF alarm notifications.

After making changes, select **Save** at the bottom of the screen to save changes.

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## 6.0 Getting Started

### Before using the CX280X:

1. Rack mount the chassis.
2. Connect the cables.
3. Power on the probe.
4. Assign an IP address to the probe using the Probe Configuration Tool.



**Do NOT connect the Ethernet cable until AFTER configuring the probe's IP address.**

### 6.1 CX280X Setup

The following information is needed to setup the CX280X Probe:

- CX280X Probe Local IP Address
- Subnet Mask
- Gateway
- CX280X Server IP Address

#### After rack mounting the chassis:

1. Use a Serial-to-USB cable to make a serial connection between the DB9 Serial port on the back of the CX280X Probe and the PC's USB port.



*The appropriate RS232 driver must be installed on the PC or the COM port connected to the probe will not appear.*

2. Power on the probe before using the configuration tool to configure the probe.

### 6.2 Configure Probes

After rack mounting the chassis, connecting the required cables, and powering on the probe, install and use the configuration tool to complete the installation.

#### 6.2.1 Installing the Probe Configuration Tool

##### To install the configuration tool:

1. Download the **Probe Configuration Tool** software from the CX280X software downloads page at [www.veexinc.com](http://www.veexinc.com).
2. Decompress the download file, then double-click **ProbeConfigurationTool.exe** to launch the application.

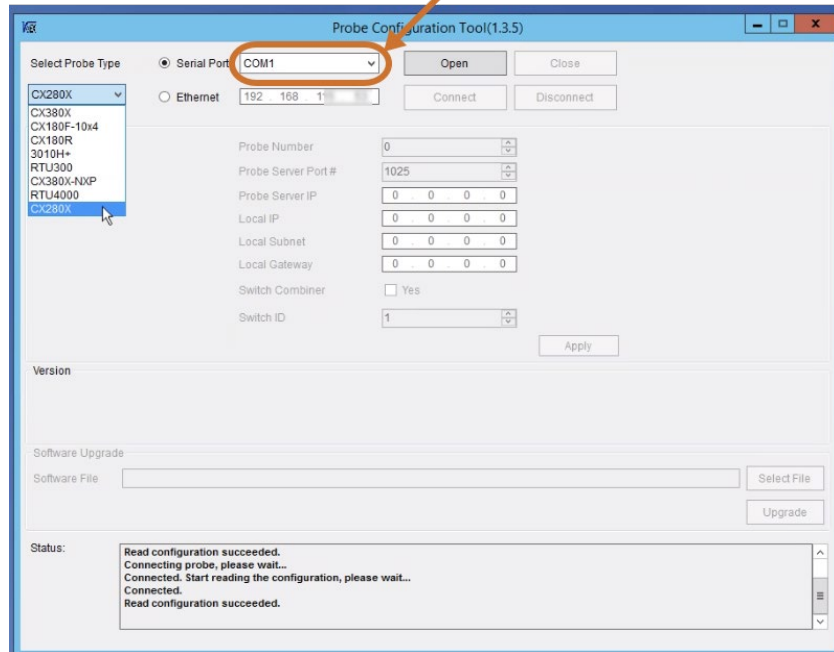


## 6.2.2 Connecting to the probe

### To connect the CX Probe Configuration Tool to the probe:

1. Select the **Select Probe Type** drop-down list box arrow, and then select CX280X.
2. Select the **Serial Port** radio button, and then select the COM port on the PC that is assigned to the RS232 to USB cable connecting the probe to the PC.

**If the COM port connected to the probe does not appear, check to ensure the cables are properly connected between the probe and serial port and that the RS232 driver provided with the probe is installed.**

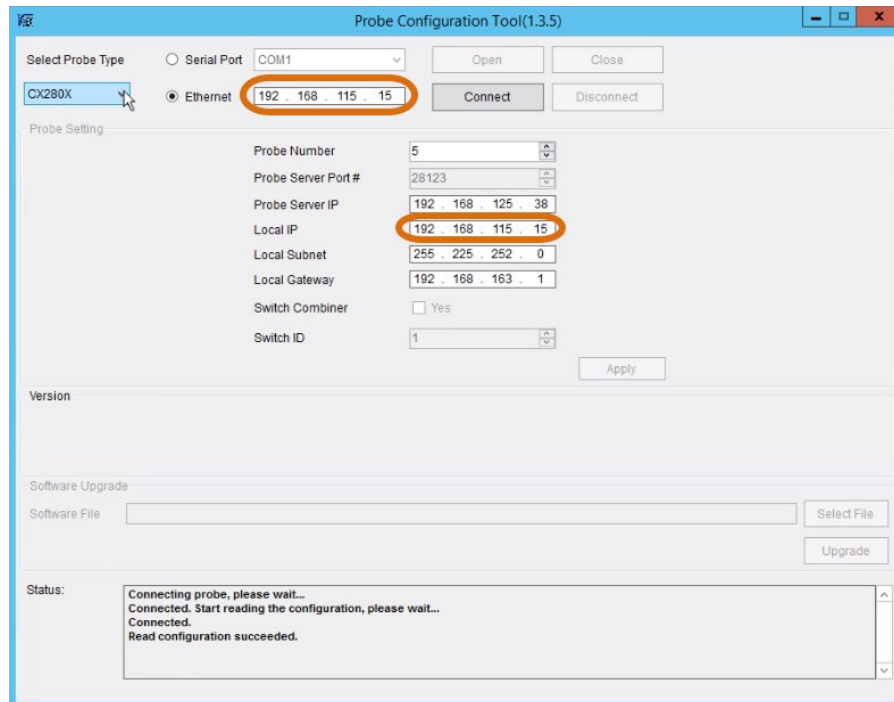


*Probe Configuration Tool: Connecting to Probe*

3. Select **Open** to open the COM port, and then select **Connect**.
4. In the **Status** box, follow the instructions to correctly power down the probe and power it up again.
5. In the **Status** box, "Connection succeeded" appears to indicate the CX Probe Configuration Tool is connected.

After opening the serial port and connecting the probe to the CX Probe Configuration Tool, follow the instructions below to assign a static IP address to establish a connection to VeSion, as well as perform probe software updates, as needed.

## 6.3 Assign IP and Probe Number



*Probe Configuration Tool: Assigning static IP*

#### To assign a static IP address to the probe:

1. In the **Probe Setting** group box, use the field definitions listed below to enter the information requested.
2. Select **Apply**. The IP address is now assigned to the probe.

- **Probe Number:** Number that uniquely identifies the probe. This number will correspond to the probe number in VeSion. This number cannot be changed once it is assigned here.
- **Probe Server Port #:** Port number for the probe.
- **Probe Server IP:** VeSion server IP address that the probe will be associated with.
- **Local IP:** IP address assigned to the probe.
- **Local Subnet:** Subnet mask number for probe (local IP network).
- **Local Gateway:** Gateway IP for the probe (local IP network).
- **Switch Combiner:** Not currently used.
- **Switch ID:** Not currently used.




*After assigning the IP address(es) to the probe, label the IP on the probe itself.*

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## 7.0 Probe Servers

Probes are uniquely identified by static IP addresses, as is the probe server.

### To access probes in VeSion:


1. From the VeSion top menu bar, click **Settings**, and then select **Server & Device**. The **Server & Device** page appears showing tabs for each probe installed. The **CX280X** tab appears at the top, indicating a successful installation and connection to the probe.
2. Select the **CX280X** tab. On the left panel, click the probe server icon  to view all probes associated with that probe server. Probes appearing in red indicate they are currently offline.



The probe server names contain the model name ("CX280X Server") by default. Probe names contain the number designated in the configuration tool, by default. Change probe and probe server names using the **Name** field in the right panel.

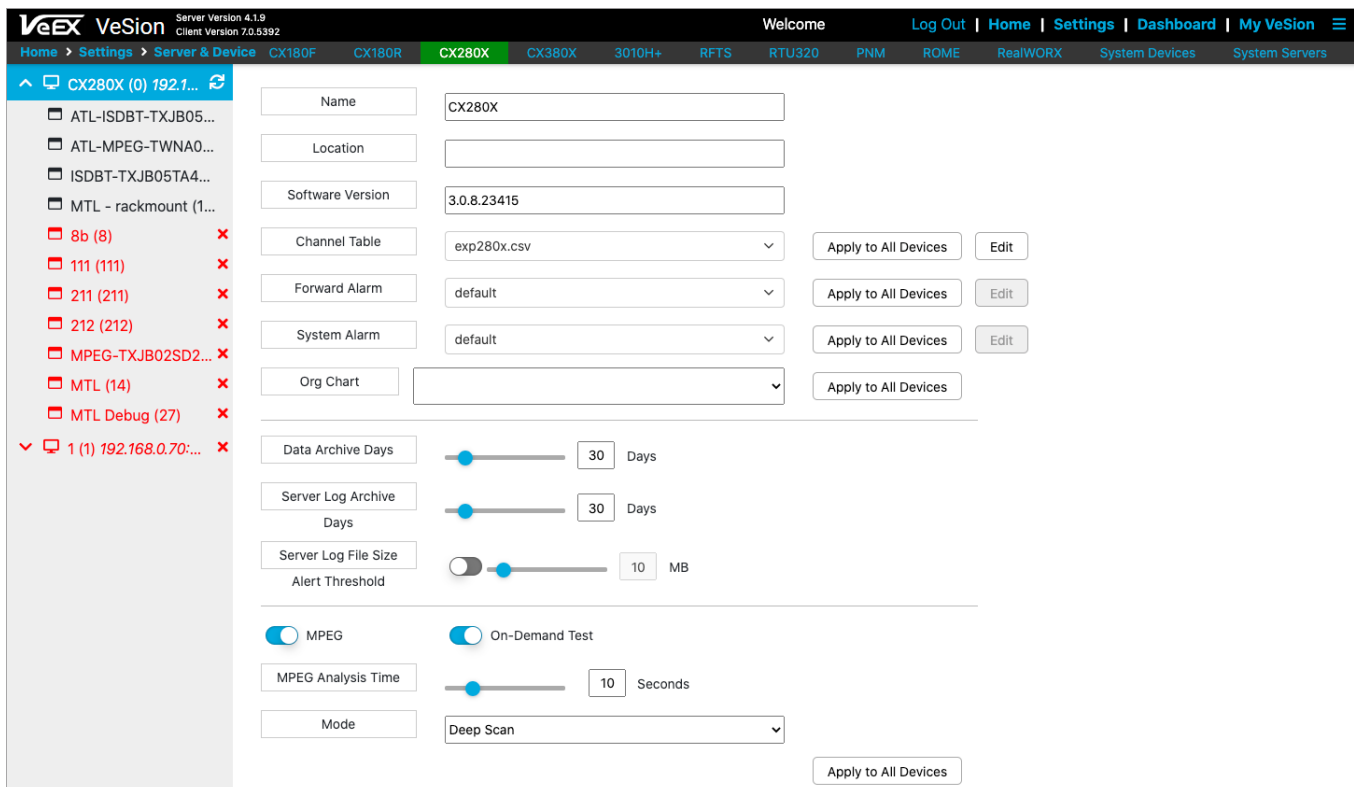
3. Click the probe icon  to view details about that probe.



Click the Refresh icon  to update measurement data for all probes associated with the probe server.

On the **Probe Server** details page, view details for the probe installed, assign default profiles, enable messaging, and configure the log.

### 7.1 CX280X Server Settings



The screenshot displays the VeSion interface for the CX280X Probe Server. The top navigation bar includes 'Home', 'Settings', 'Server & Device', and various probe tabs. The left sidebar shows a list of probe servers, with the selected one highlighted. The main content area contains configuration fields for the selected probe server, including Name, Location, Software Version, Channel Table, Forward Alarm, System Alarm, and Org Chart. Below these fields are sliders for Data Archive Days (30), Server Log Archive Days (30), and Server Log File Size (10 MB). There are also checkboxes for MPEG and On-Demand Test, a slider for MPEG Analysis Time (10 seconds), and a dropdown for Mode (Deep Scan). An 'Apply to All Devices' button is located at the bottom right.

*CX280X Probe Server details*

- **Name:** Enter the name of the server (up to 99 characters).



*It is recommended the probes names correspond to the Hub/Headend that it resides in.*

- **Location:** Enter the physical location of the server (up to 199 characters).
- **Software Version:** Displays software version installed on probe.
- **Channel Table:** Assigns default Channel Table to probe. To apply this Channel Table to all probes associated with the Probe Server, click **Apply to All Devices**.
- **Forward Alarm:** Assigns default Alarm Profile to probe. To apply this Forward Alarm Profile to all probes associated with the Probe Server, click **Apply to All Devices**.
- **System Alarm:** Assigns default System Alarm Profile to probe. To apply this System Alarm Profile to all probes associated with the Probe Server, click **Apply to All Devices**.
- **Org Chart:** Assigns the organization (e.g. hub, district) to which the probe server belongs. To apply this Org Chart to all probes associated with the Probe Server, click **Apply to All Devices**. To set up and configure Org Charts, go to **Settings > Org Chart & Scope**.
- **Data Archive Days:** Designates the number of days (5 – 200) to keep historical measurement data.
- **Server Log Archive:** Designates the number of days (5 – 200) to keep a historical log record of system events, such probes going on or offline.
- **Server Log File Size Alert Threshold:** Designates the amount of data (1 – 99 MB) kept in the log before an alert is triggered. If no alert is needed, toggle the radio button to the left.



*The Log File Alert is useful because the log file may increase in size quickly and send alerts unnecessarily. Incorporating the standard operating procedure of Resolving/Deleting Alarms, thus emptying the data log, at certain intervals should be considered.*

- **MPEG:** Turn ON for the CX280X to measure MPEG.
- **On-Demand Test:** Turn ON to use the CX280X to perform On-Demand testing.



*On-Demand, Monitoring, and Measurements must be turned ON in the Probe Settings, as well as the Probe Server Settings.*

- **MPEG Analysis Time:** Use slide bar to set the amount of time to collect signal data (up to 30 seconds).
- **Apply to All Devices:** Applies the selected measurements and on-demand testing to all probes associated with the probe server.

## 7.2 SNMP Configuration

Use this section to configure settings for SNMP alarms/messages to the SNMP server. This applies to ALL CX280X probes associated with the CX280X Probe Server.

**SNMP Configuration**

SNMP Enable

SNMP Resolved

SNMP Version

v1

Enterprise

VeEX OID (1.3.6.1.4.1.36290)
  Custom OID

Community

public

HOST (IP:Port)

192.168.115.38:162


### **SNMP Configuration**

- **SNMP Enable:** Turn ON to enable SNMP alarms.
- **SNMP Resolved:** Turn ON to enable resolved SNMP alarms.
- **SNMP Version:** Select the version of SNMP to use; v1 is selected by default.
- **Enterprise:** Select the OID used to report the alarm.
- **Community:** Enter the community string/password for the SNMP. The default is public.

- **HOST (IP:Port; IP:Port):** Enter the host IP address and port for each SNMP trap receiver. Separate multiple addresses by semi-colons.

### 7.3 Email Configuration

Use this section to configure settings for email alarms. This applies to ALL CX280X probes associated with the CX280X Probe Server.

The emails will be sent to the email provided in **My VeSion**. To access the **My VeSion** screen, click the  icon on the menu bar at the top right. For more details on My VeSion, see [Alarm Notifications \(My VeSion\)](#).

**Email Configuration**

Email Enable    
  Email Resolved Notification    
  SMS Enable    
  SMS Resolved Notification

BCC    
  SSL/TLS

#### *Email Configuration*

- **Email Enable:** To enable email alarm notifications from probe server if option was selected in My VeSion and email provided.
- **Email Resolved Notification:** To enable email alarm resolved notifications if option was selected in My VeSion and email provided.
- **SMS Enable:** To enable mobile device alarm notifications if option was selected in My VeSion and phone number/mobile provider selected.
- **SMS Resolved Notification:** Sends mobile device alarm resolved notifications if option was selected in My VeSion and phone number/mobile provider selected.
- **SmtP Server:** Enter server that VeSion accesses to send email notifications.
- **Port:** Enter server SMTP port that VeSion accesses to send email notifications.
- **Email Address:** Email address from which notifications are received.
- **Username:** Username VeSion uses to connect to the SMTP Server.
- **Password:** Password VeSion uses to connect to the SMTP Server
- **BCC:** Email addresses to which blind copies of notifications are sent.
- **SSL/TLS:** Security protocol used to connect to the SMTP Server.
- **Check:** Runs a test with the current configuration settings to validate they are correct.

### 7.4 System Log Configuration

Use this section to configure how alarms are sent to the system server's log.

**SysLog Configuration**

SysLog Enable    
  SysLog Resolved Notification

VeEX OID (1.3.6.1.4.1.36290)    
 Custom OID

## SysLog Configuration

- **SysLog Enable:** Turn on to write alarm messages to the SysLog.
- **SysLog Resolved Notification:** Turn on to write resolved alarm messages to the SysLog.
- **Enterprise:** Select the SysLog software: VeEX or Custom.
- **Version:** Select the version of the SysLog protocol.
- **Transport:** Select the type of data packet sent to the SysLog.
- **HOST (IP:Port; IP:Port):** Enter the host IP address and port for each SysLog server. Separate multiple addresses by semi-colons.

### 7.5 Save Settings/Clear Alarms

---

---

#### *Saving/Clearing Alarms*

- **Clear all Active Alarms:** Click to clear active alarms on ALL probes associated with the probe server.
- **Delete all Resolved/Cleared Alarms:** Click to resolve/delete alarms on ALL probes associated with the probe server.
- **Save:** Click to save all configuration settings on this page.

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# 8.0 CX280X Probe Settings

On the **Probe** details page, view details for the probe installed, assign default profiles, enable messaging, and configure the log. Access a probe's settings by selecting the probe under the probe server in the left panel.

Server Version 4.1.9  
Client Version 7.0.5392

Welcome | Log Out | Home | Settings | Dashboard | My VeSion

Home > Settings > Server & Device

CX180F CX180R **CX280X** CX380X 3010H+ RFTS RTU320 PNM RealWORX System Devices System Servers

CX280X (0) 192.1...  
 ATL-ISDBT-TXJB0...  
**ATL-MPEG-TWNA...**  
 ISDBT-TXJB05TA4...  
 MTL - rackmount (...)  
 8b (8) x  
 111 (111) x  
 211 (211) x  
 212 (212) x  
 MPEG-TXJB02SD2... x  
 MTL (14) x  
 MTL Debug (27) x  
 1 (1) 192.168.0.70... x

CX280X Number: 5  
 Name: ATL-MPEG-TWNA@BSC10072  
 IP Address: 192.168.16.53  
 MAC Address: 00-18-83-02-8D-78  
 Location:   
 Rack:   
 Shelf:   
 Software Version: 01.01.0003-39  
 Type: Type 1 | CMD31-B | MPEG16

MPEG  
 MPEG Analysis Time: 10 Seconds  
 Mode: Deep Scan  
 On-Demand Test  Service Group  
 System Alarm: default  
 Org Chart:

Port	Node ID	Service Group	Alarm & Delta	Channel Table	MER, BER	Dur (sec)	TP Comp (dB)	On/Off	Maintenance	Needs Cert.
Port 1 AT: a	default	default	default	bAAAdefault.csi		3	0.00			
Port 2 AT: trav2	default	default	default	bAAAdefault.csi		3	0.00			
Port 3 AT: trav3	default	default	default	bAAAdefault.csi		3	0.00			
Port 4 AT: trav4	default	default	default	bAAAdefault.csi		3	0.00			
Port 5 AT: trav5	default	default	MPEG-alarm	exp280x.csv		3	0.00			
Port 6 AT: trav6	default	default	TL_analog-d	isdbt.csv		3	0.00			
Port 7 AT: trav7	default	default	default	bAAAdefault.csi		3	0.00			
Port 8 AT: trav8	default	default	default	bAAAdefault.csi		3	0.00			
Port 9 AT: trav9	default	default	default	bAAAdefault.csi		3	0.00			
Port 10 AT: trav10	default	default	default	bAAAdefault.csi		3	0.00			
Port 11 AT: trav11	default	default	default	bAAAdefault.csi		3	0.00			
Port 12 AT: trav12	default	default	default	bAAAdefault.csi		3	0.00			
Port 13 AT: trav13	default	default	default	bAAAdefault.csi		3	0.00			
Port 14 AT: trav14	default	default	default	bAAAdefault.csi		3	0.00			
Port 15 AT: trav15	default	default	default	bAAAdefault.csi		3	0.00			
Port 16 AT: trav16	default	default	default	bAAAdefault.csi		3	0.00			

Server  Device  Port  
 Search...  
 Reboot Clear all Active Alarms Delete all Resolved/Cleared Alarms Save  All Ports Setting

**CX280X Probe Settings**

CX280X Number	5
Name	ATL-MPEG-TWNA00SC110172
IP Address	192.168.115.53
MAC Address	00-18-63-02-8D-79
Location	
Rack	
Shelf	
Software Version	01.01.0003-39
Type	Type 1   CMD31-B   MPEG16
<input checked="" type="checkbox"/> MPEG	MPEG Analysis Time <input type="range" value="10"/> 10 Seconds
Mode	Deep Scan <input checked="" type="checkbox"/> On-Demand Test <input checked="" type="checkbox"/> Service Group
System Alarm	default
Org Chart	

### C280X Probe: General/Mode/Alarm Information

- **CX280X Number:** Probe/Device ID, as identified in the Probe Configuration Tool. For more information about the Probe Configuration Tool, see [Configure Probes](#).
- **Name:** Enter a name for the probe (up to 99 characters).
- **IP Address:** Displays the IP address as assigned using the Probe Configuration Tool software.
- **MAC Address:** Displays the MAC Address as assigned using the Probe Configuration Tool software.
- **Location:** Type the geographical location of the probe. If using the VeSion GIS Mapping System, select the geographical location of the probe from the drop-down.
- **Rack:** Enter the Rack identification to which the probe is physically installed.
- **Shelf:** Enter the Shelf identification to which the probe is physically installed on the rack.
- **Software Version:** Displays the software version installed on the probe. For more information on upgrading the probe software, see [Upgrading Probe Software](#).
- **Type:** Displays the model type of the probe. The type corresponds to the measurement engine.
  - **Type 1** - CMD31-B, MPEG16 (Cale Modem with Annex B Support / Downstream measurements with MPEG analysis)
  - **Type 2** - CMD31-B, MAXSLM,ISDB-T (Cale Modem with Annex B Support / Downstream measurements with Advanced Spectrum analysis / ISDB-T)
  - **Type 3** - CMD31-B, MPEG16, MAXSLM (Cale Modem with Annex B Support / Downstream measurements with MPEG analysis / Advanced Spectrum analysis)
  - **Type 4** - MPEG16 (Downstream measurements with MPEG analysis)
- **MPEG:** Turn ON for the CX280X probe to measure MPEG. Set the MPEG alarm profile on the **Alarms Profile** page (**Settings > Alarm Profiles > Forward**).
- **MPEG Analysis Time:** Use slide bar to set the amount of time to collect signal data (up to 30 seconds). This is how long the system will monitor each channel before moving to the next in sequence. This applies to all 16 ports. *It is recommended that the **MPEG Analysis time** be at least 10 seconds.*
- **Service Group:** Turn ON for the CX280X probe to have service groups assigned to the ports.
- **System Alarm:** Select system alarm profile to assign to the probe. System alarms are for when the probe or network goes offline. To set up system alarm profiles, go to **Settings > Alarm Profiles** and click the **System** tab at the top.
- **Org Chart:** Select the Org Chart (e.g. hub, district) that applies to the probe. To set up Org Charts, go to **Settings > Org Chart & Scope**.

## 8.1 CX280X Port Table

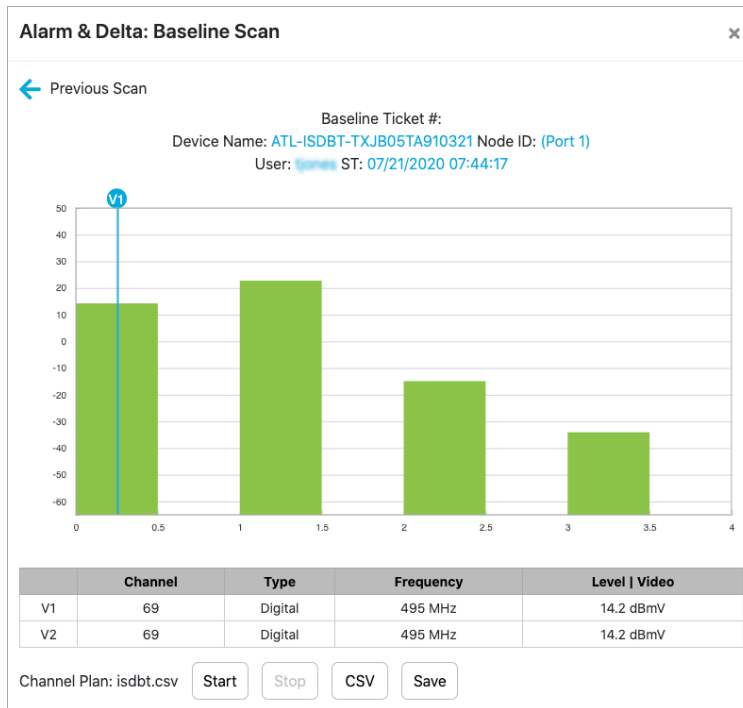
Each CX280X has 16 ports and can be associated with a node.



Port	Node ID	Service Group	Alarm & Delta	Channel Table	MER, BER	Dur (sec)	TP Comp (dB)	On/Off	Maintenance	Needs Cert.
Port 1 AT: <input type="checkbox"/>	a <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 2 AT: <input type="checkbox"/>	trav2 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 3 AT: <input type="checkbox"/>	trav3 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 4 AT: <input type="checkbox"/>	trav4 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 5 AT: <input type="checkbox"/>	trav5 <input type="text"/>	default <input type="text"/>	MPEG-alarm <input type="text"/>	exp280x.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 6 AT: <input type="checkbox"/>	trav6 <input type="text"/>	default <input type="text"/>	TL_analog-d <input type="text"/>	isdbt.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Port 7 AT: <input type="checkbox"/>	trav7 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 8 AT: <input type="checkbox"/>	trav8 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 9 AT: <input type="checkbox"/>	trav9 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Port 10 AT: <input type="checkbox"/>	trav10 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 11 AT: <input type="checkbox"/>	trav11 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 12 AT: <input type="checkbox"/>	trav12 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 13 AT: <input type="checkbox"/>	trav13 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 14 AT: <input type="checkbox"/>	trav14 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 15 AT: <input type="checkbox"/>	trav15 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 16 AT: <input type="checkbox"/>	trav16 <input type="text"/>	default <input type="text"/>	default <input type="text"/>	bAAAdefault.csv <input type="text"/>	<input checked="" type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Probe Port Table**

- **Node ID:** Type the node to associate with the port. If using the VeSion GIS Mapping option, select a node from the drop-down box. Click the icon to view the node information or to create a new node.
- **Service Group:** Select the Service Group to assign to the port or click the plus icon to create a new node.
- **Alarm & Delta:** Select the alarm profile and test to assign to the port. Click the graph icon to perform a baseline measurement. For more information on how to take a baseline, see [Alarm Delta Baseline](#).



### Baseline Measurement

- **Channel Table:** Select the channel plan the port is to use when taking measurements.



When the channel plan is changed, reset the Deltas in the alarm profile. A new baseline should then be taken.

- **MER/BER Alarm:** Turn ON to use the CX280X to measure MER/BER.
- **Duration:** Enter the number of seconds to run MER/BER.
- **TP Comp (dB) (Test Point Compensation):** Enter the value to compensate for the signal loss of the test point.
- **On/Off:** Turns ON/OFF port measurements.
- **Maintenance:** Turn ON to stop measurements temporarily. Click **Enable All** to turn off maintenance for all ports.
- **Needs Cert.: (Needs Certification)** A checkmark appears automatically when port maintenance is turned on. This indicates a new baseline is needed for the port since it was temporarily put in maintenance mode.

### 8.1.1 Save Settings/Clear Alarms

All Ports Setting

### Saving/Clearing Alarms and All Ports Setting

- **Clear all Active Alarms:** Click to clear active alarms on **ALL** ports associated with the probe.
- **Delete all Resolved/Cleared Alarms:** Click to resolve/delete alarms on **ALL** ports associated with the probe.
- **Save:** Click to save all configuration settings on this page.
- **All Ports Setting:** Turns ON the All Ports row to configure settings and baseline for **ALL** ports.

### 8.1.2 Configure settings for all ports at once

To configure settings and set baseline for all ports at one time:

1. Toggle the **All Ports Settings** to ON. A new **All Port:** row appears at the bottom of the port table.
2. Configure the settings for **All Port** as outline in this section.

3. Click **Save**. The port table refreshes and the settings from All Ports appear for each port.

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## 9.0 Org Chart and Scope

Use Org Charts to segment and organize the cable network into geographical locations in a hierarchal "tree" structure, named Areas, Districts, and Systems. This organizational chart can be used to segment a traditional HFC network structure, e.g. Headends, Hubs, Nodes. It can also be used to fit other types of network structures, such as named geographical locations, e.g. Cities, Districts, Neighborhoods.

After setting up the chart, Users, Devices/Probes, and Profiles (Channel and Alarm) can be assigned to each "tree branch" (Area, District, System).

Users, probes, profiles, and settings assigned to a specific **Area**, **District**, and **System** can be viewed when clicked on in the left panel.

Areas are segmented into **Districts**, then further into **Systems**. This allows users and probes to be tied to specific Hubs and geographical locations.

The screenshot shows the VeSion interface with the 'Orgchart Scope' page. The left panel displays a hierarchical tree structure of the Org Chart. The right panel shows a table of users assigned to the selected system.

Name	User ID	Group	Employee ID
jhmtest	test	System Supervisor2	1223456
Terence Loring	tls	System Supervisor	

*VeSion: Org Chart*

To assign users to an Org Chart, go to **Settings < User & Group < User**. In the **Group and Org Chart** column, select the Org Chart to apply, in the **Org** field.

To assign probes to an Org Chart, select it in the **Org Chart** field on the **Probe Server** details page. Click **Apply to All Devices** to apply the Org Chart to all probes under the Probe Server.

Profiles and Settings configured and assigned to the device, will appear in the Org Chart when assigned to the same device.

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# 10.0 System License

To view which probes are enabled in VeSion, go to **Settings > System License**.

VeEX VeSion Server Version 4.1.9 Client Version 7.0.5392

Welcome Log Out | Home | Settings | Dashboard | My VeSion

Home > Settings > System License

Mac address: 54:9F:35:25:32:08

License Expiration: 1638211711 (29 Nov 2021)

Upload New License File: Choose File | No file chosen

**VeEX Contact Information**  
2827 Lakeview Court Fremont, CA 94538, USA  
Customer Service: +1-510-651-0500  
Email: sales@veexinc.com

DSM (CX180F Server)	enabled
RPM (CX180R Server)	enabled
Sweep (3010H+ Server)	enabled
RFTS (RTU410/4100 Server)	enabled
Ethernet (RTU320 Server)	enabled
CX380X (CX380X Server)	enabled
CX280X (CX280X Server)	enabled
ROME (ROME Server)	enabled
PNM (PNM Server)	enabled
GIS (Mapping)	enabled
RealWORX Server Count	3
VeSion WEB	enabled
VeSion Controller	enabled
Data Forwarder	enabled
Maintenance Package	enabled
Support Services	Tier III
License Note	ATL VeSion Dev
Service Tag	

## Probe Licensing

Before the probes are active, click **Choose File** to upload the License File received from [VeEX Customer Care](#).

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## 11.0 Alarm Delta Baseline

Each active monitoring port requires a unique signal reference baseline to be captured and saved. This saved baseline will allow the Signal Level Delta Alarm to report an out of limits condition properly. Prior to acquiring a new baseline, put the port in maintenance mode and click Save at the bottom of the screen.

### 11.1 New Baselines

To establish a baseline in maintenance:

1. Use the default Alarm Profile already configured or set up an Alarm Profile in **Home > Settings > Alarm Profiles > Forward**, if needed.  
For more information on how to set up an Alarm Profile, see [System Alarm Profiles](#).
2. In the CX280X probe screen port table (**Home > Settings > Server & Device**), ensure the correct Alarm Profile is assigned to the port in the **Alarm & Delta** column. Use the drop-down menu to select the correct profile, if needed.

1. Make sure the correct Alarm Profile is assigned to the port. Click the drop-down arrow to select a new Alarm Profile, if needed.

Port	Node ID	Service Group	Alarm & Delta	Channel Table	MER, BER	Dur (sec)	TP Comp (dB)	On/OFF	Maintenance	Needs Cert.
Port 1 AT: <input type="checkbox"/>	a	default	default	bAAAdefault.cs	<input checked="" type="checkbox"/>	3	0.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port 2 AT: <input type="checkbox"/>	trav2	default	default	bAAAdefault.cs	<input checked="" type="checkbox"/>	3	0.00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Port 3 AT: <input type="checkbox"/>	trav3	default	default	bAAAdefault.cs	<input type="checkbox"/>	3	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Turn Maintenance OFF for the individual port or click Enable All to run a baseline automatically for the individual port or all ports, respectively.

*Establishing Baseline for Ports in Maintenance*

3. On the port screen port table, turn off Maintenance mode by clicking the **Maintenance** radio button.
  - o When one port is turned off Maintenance, a **Bulk Scan** window appears running the baseline for that port automatically.
  - o When **Enable All** is selected, a **Bulk Scan** window appears running the baseline for all ports automatically, one at a time.

After the baseline is finished, a "Port scan successful" message appears. Click **Close**.

4. Below the port screen port table, click **Save** to apply the baseline.



**Don't Forget to Click Save**


If click **Save** is not clicked, all changes and the new baseline will not be applied, and the system will revert to previous settings.

To establish a baseline not in maintenance:

1. Use the default Alarm Profile already configured or set up an Alarm Profile in **Home > Settings > Alarm Profiles > Forward**, if needed. For more information on how to set up an Alarm Profile, see [System Alarm Profiles](#).
2. In the CX280X probe screen port table, ensure the correct Alarm Profile is assigned to the port in the **Alarm & Delta** column. Use the drop-down menu to select the correct profile, if needed.
3. Click the **Alarm & Delta** icon to display the **Alarm & Delta: Baseline Scan** screen.
4. Click **Start/Stop** at the bottom of the screen to begin and stop the measurement, then click Save to accept the results.

5. At the bottom of the **Probe** screen below the ports table, click **Save** to apply the baseline.

1. Click Alarm & Delta icon.

Port	Node ID	Service Group	Alarm & Delta	Channel Table	MER, BER	Dur (sec)	TP Comp (dB)	On/Off	Maintenance	Needs Cert.
Port 1 AT:	a	default	default 	bAAAddefaultL		3	0.00			
Port 2 AT:	trav2	default	default	bAAAddefaultL		3	0.00			
Port 3 AT:	trav3	default	default	bAAAddefaultL		3	0.00			

2. Click Start/Stop to begin and stop the measurement. Click CSV to download the baseline scan. Click Save to accept the results.

\* For best results, allow 2-3 Full Channel Scans before stopping the measurement.



3. Click Save below the port table to save changes.

Port 15 AT:	trav15	default	default	bAAAddefaultL		3	0.00			
Port 16 AT:	trav16	default	default	bAAAddefaultL		3	0.00			

Reboot Clear all Active Alarms Delete all Resolved/Cleared Alarms **Save** All Ports Setting

### Establishing Baseline for Ports off Maintenance




To export the baseline scan to a csv (comma separated variable) file for further analysis, click the CSV button in the **Alarm & Delta Baseline Scan** screen and type a name for the file.

## 11.2 Redo Baselines

The Alarm Delta Baselines should be redone in the following circumstances.

- When a new channel table is assigned to a port.
- When channels are added to the Channel Profile.
- When limits are changed.
- After equipment maintenance, redo to ensure the levels are correct even if the signal level is not supposed to have been impacted by the maintenance.

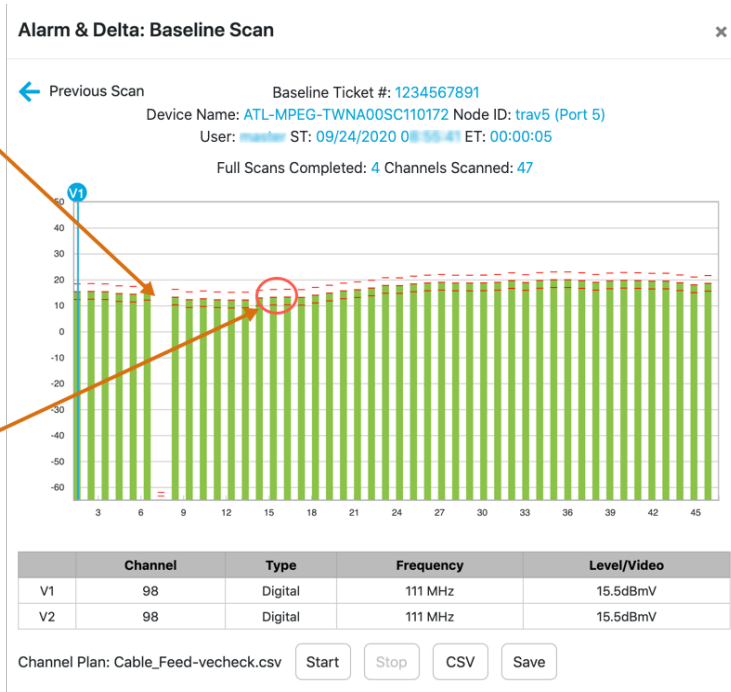
To redo the baseline, click the **Alarm & Delta** icon  to access the **Alarm & Delta: Baseline Scan** screen and restart the scan. When finished, click **Save** before exiting the screen.

It is not necessary to redo the baseline:

- When a channel is disabled.
- When a channel previously disabled, is re-enabled.

For empty channels in the baseline record, a "Channel Table Mismatch Alarm" will be triggered when the channel(s) become active with a normal signal.

Level Delta. Baseline Max limit line and Min limit line are presented if an alarm profile has applied to the port.



**Establishing a Baseline**

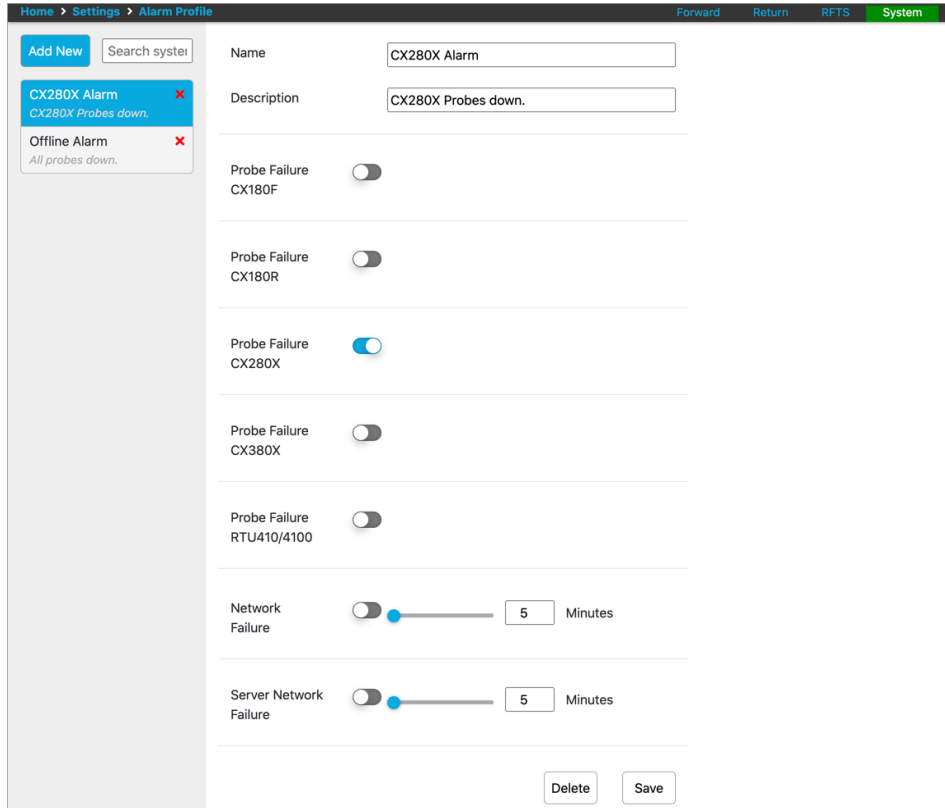
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# 12.0 Alarms and Thresholds

## 12.1 System Alarm Profiles

Use System Alarms for notification when a probe goes offline or the network goes down.




*System Alarm Profile screen*

To configure a new alarm profile:

1. Go to **Settings > Alarm Profiles > System**.
2. Click **Add New**.
3. Type a name and description for the alarm, and then select which events that need to be monitored.
  - o **Probe Failure** – select to trigger an alarm when the probe goes offline.
  - o **Network Failure** – select to trigger an alarm if the entire network goes down. Use the slider or type the number of minutes the network is down before triggering the alarm.
  - o **Server Network Failure** – select to trigger an alarm if the server goes down. Use the slider or type the number of minutes the server is down before triggering the alarm.
4. Click **Save** to save the new profile. The new alarm appears in the left panel.



**Delete a system profile in two ways:**

- Clicking the profile on the left panel and then clicking the **Delete** button at the bottom.
- Clicking  next to the profile on the left panel.

## 12.2 Forward Alarms

Forward Alarm Profile screen

### To create a new Forward alarm profile:

1. Select **Settings > Alarm Profiles > Forward**.
2. Select **Add New**.
3. Enter the monitoring information needed as described below, and then select **Add** to save the new profile.
  - o **Name** – Type a name for the alarm profile.
  - o **Description** – Type a description for the alarm profile.
  - o **Retry Count** – Enter the number of times to retry the test before an alarm is triggered.
  - o **Filter Count**
  - o **Analog Tests** – Select the analog test to run, and then enter the minimum, maximum, and tolerance values for the test.
  - o **Digital Tests** – Select the digital test to run, and then enter the minimum, maximum, and tolerance values for the test.
  - o **ISDB-T Tests** – Select the ISDB-T test to run, and then enter the minimum, maximum, and tolerance values for the test.
  - o **MPEG Tests** – Select the type of MPEG test to perform (Broadcast, Narrowcast, Music, Clear QAM, ENC Check).
  - o **Apply to All** – Select to apply settings for all MPEG tests on the alarm profile.

To delete a forward alarm, click  next to the profile on the left panel.


### 12.2.1 MPEG Alarm Thresholds

Alarm thresholds may differ between types (music, video, etc.) The MPEG Test table will populate automatically with the default values.



To perform MPEG testing, go to the Probe Settings page (**Settings > Server & Device > CX280X**) and do the following:

1. Set the **MPEG** radio button to ON.
2. Enter the **MPEG Analysis Time**. This is how long the system will monitor each channel before moving to the next in sequence. This applies to all 16 ports. **It is recommended that the MPEG Analysis time be at least 10 seconds.**



MPEG Tests **Narrowcast** Apply to All

	Test	Min	Max
<input checked="" type="checkbox"/>	Video Bandwidth (Mbps)	0.00	
<input checked="" type="checkbox"/>	Audio Bandwidth (Mbps)	0.000	
<input checked="" type="checkbox"/>	Null Bandwidth (Mbps)	0.00	
<input checked="" type="checkbox"/>	Null Max Bandwidth (Mbps) [CX280X only]		1
<input type="checkbox"/>	Stream Encryption Detection		
<input type="checkbox"/>	PSIP Errors		1
<input checked="" type="checkbox"/>	Sync Loss		1
<input checked="" type="checkbox"/>	Sync Byte		1
<input checked="" type="checkbox"/>	PMT2		1
<input checked="" type="checkbox"/>	PAT2		1
<input checked="" type="checkbox"/>	Continuity		1
<input checked="" type="checkbox"/>	PID (Video)		1
<input type="checkbox"/>	PID (Audio)		1
<input checked="" type="checkbox"/>	PID (Audio2)		1
<input checked="" type="checkbox"/>	Transport		1
<input checked="" type="checkbox"/>	CRC		1
<input checked="" type="checkbox"/>	PCR Discontinuity		1
<input checked="" type="checkbox"/>	PCR Accuracy		1
<input checked="" type="checkbox"/>	CAT		1

**MPEG Alarm Thresholds**

- **Video/Audio Bandwidth** – Set the Min and Max bandwidth thresholds for Video/Audio packet streams
- **Null Bandwidth** –Minimum threshold for the Null packet stream
- **Stream Encryption Detection** – Raises an alarm if the stream is encrypted
- **PSIP Errors** – Maximum number of PSIP errors threshold
- **Sync Loss** – Maximum number of Sync Loss fault count threshold
- **Sync Byte** – Maximum number of Sync Byte fault count threshold
- **PMT2** – Maximum number of PMT fault count threshold
- **PAT2** – Maximum number of PAT fault count threshold
- **Continuity** – Maximum number of Continuity fault count threshold
- **PID (Video, Audio, Audio2)** – Maximum number of PID fault count threshold
- **Transport** – Maximum number of transport error count threshold
- **CRC** - Maximum number of CRC fault count threshold
- **PCR Discontinuity** – Maximum number of PCR Discontinuity count threshold
- **PCR Accuracy** - Maximum of PCR Accuracy fault count threshold
- **CAT** - Maximum number of CAT fault count threshold

**To configure Forward Alarm Notification:**

1. In the bottom left panel, click **Notifications**. The **Notification Settings** box appears.

**Notification Settings** ✕

On-Demand Single Channel Low Level/MER Alert

Level (dBmV):

MER (dB):

**Forward Alarm Notification Settings screen**

2. Click the radio button to turn on the notifications, and then enter trigger values for signal level and MER.
3. Click **Save**.

## 12.3 Historical Alarms/Data

To see past alarms for a specific time period:

1. Go to **Home > Alarm & Datalog** and select the Server, Device, and Port to search.
2. Choose the date and time period for the search.
3. Click **Search**.



*Search times vary. It is recommended to search alarms generated on a specific day and/or summarize the data to reduce search times significantly.*

To generate a report of all alarms, select All in the **Port** drop-down. An Alarm List across all ports is displayed.

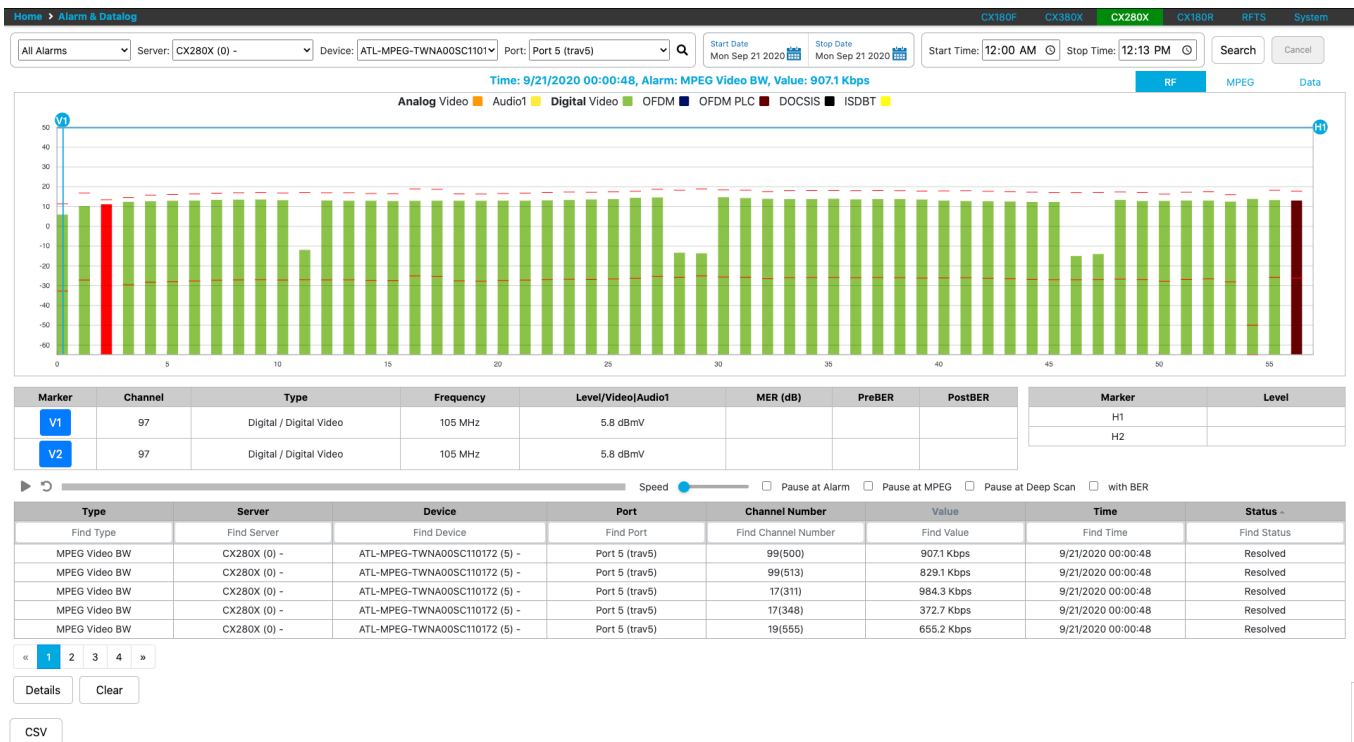
The screenshot shows the VeSion Alarm & Datalog interface. The search filters are set to: All Alarms, Server: CX280X (0) -, Device: ATL-MPEG-TWNA00SC1101, Port: All. The search time range is from Mon Sep 21 2020 00:00 to Mon Sep 21 2020 11:28. A graph above the table shows a red bar for 'MPEG Video BW' at 0.0 Kbps at 9/21/2020 09:38:45.

Type	Server	Device	Port	Channel Number	Value	Time	Status
Find Type	Find Server	Find Device	Find Port	Find Channel Number	Find Value	Find Time	Find Status
MPEG Video BW	CX280X (0) -	ATL-MPEG-TWNA00SC110172 (5) -	Port 5 (trav5)	17(299)	604.1 Kbps	9/21/2020 09:38:44	Active
MPEG Video BW	CX280X (0) -	ATL-MPEG-TWNA00SC110172 (5) -	Port 5 (trav5)	19(1503)	682.0 Kbps	9/21/2020 09:38:45	Active
MPEG Video BW	CX280X (0) -	ATL-MPEG-TWNA00SC110172 (5) -	Port 5 (trav5)	8(249)	0.0 Kbps	9/21/2020 09:38:45	Active
MPEG Audio BW	CX280X (0) -	ATL-MPEG-TWNA00SC110172 (5) -	Port 5 (trav5)	8(249)	0.0 Kbps	9/21/2020 09:38:45	Active
MPEG Video BW	CX280X (0) -	ATL-MPEG-TWNA00SC110172 (5) -	Port 5 (trav5)	8(911)	727.4 Kbps	9/21/2020 09:38:45	Active

Navigation buttons: Details, Dispatch, Clear, CSV.

**Historical Alarms for specified date/time range: ALL PORTS**

To generate an alarm report for a specific port, select the port in the **Port** drop-down. A graphical system scan for that port is displayed.



**Historical Alarms for a specified device and port**

Use the Vertical and Horizontal Markers on the graph, as needed. Click the **Data** tab to see the data table for the system scan.



*Deleted alarms are completely removed from the log and cannot be viewed.*

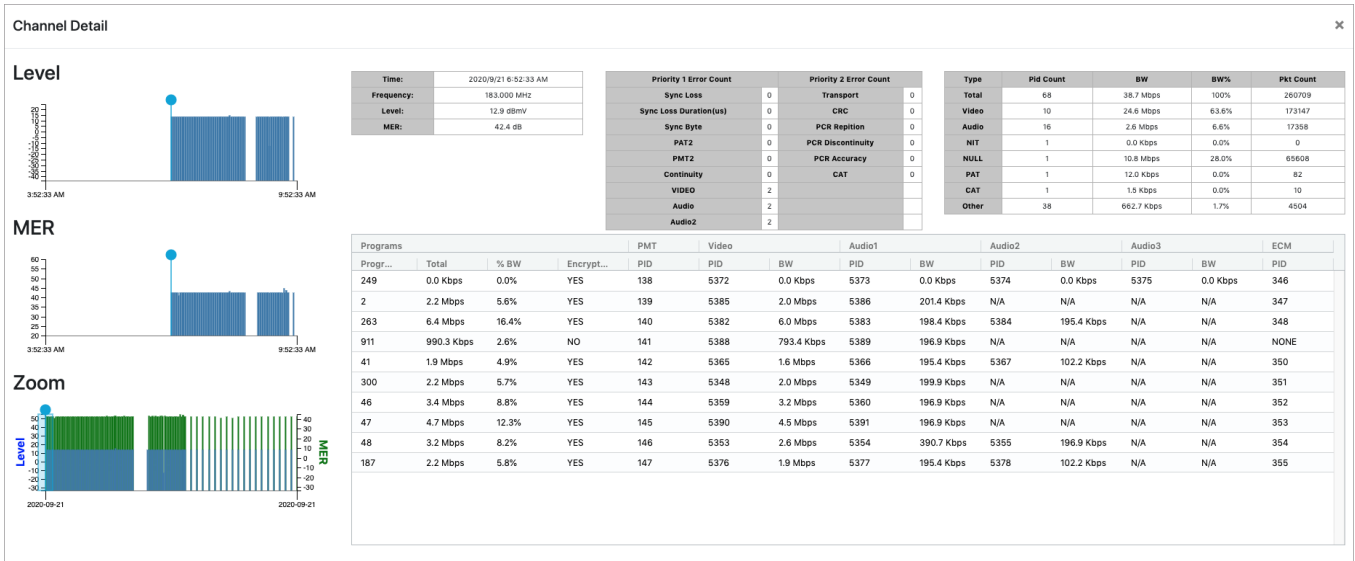
The **Status** column shows the current status for each alarm:

- **Active** – Current alarm
- **Cleared** – Alarm validated /cleared
- **Resolved** – Alarm that disappeared without being cleared, i.e. an alarm that is not active. For example, if the signal goes outside the limits only briefly.
- **Dispatched** – Alarm that has been dispatched for further troubleshooting (for information only).

At the bottom of the screen are controls to play the measurement scan over the specified time range. Use the **Speed** bar to speed up or slow down the speed. Click the specified checkbox to pause at an alarm, MPEG, Deep Scan, or to include BER.

To download the data, click the **CSV** button at the bottom of the screen.

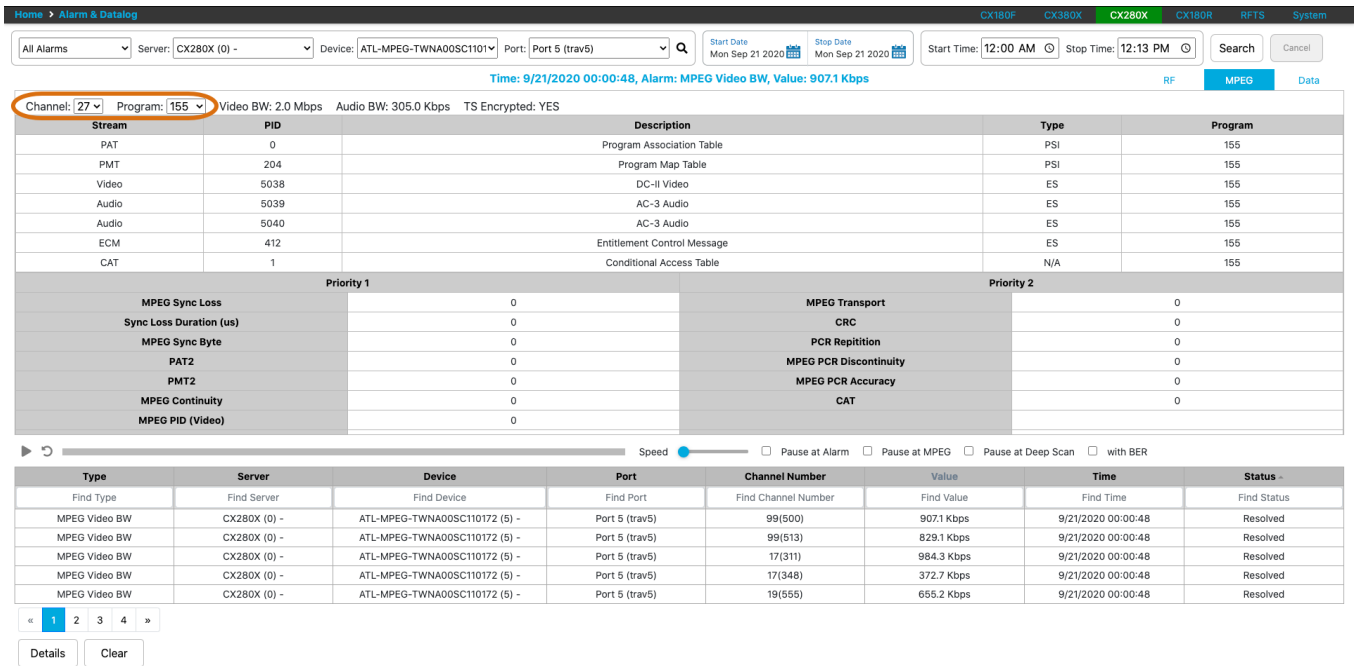
Select a channel row and click the **Details** button to view the **Channel Detail** screen for that channel.



**Historical Alarms: Channel Detail**

**12.3.1 MPEG Alarms**

Click the **MPEG** tab to view MPEG data for the specified port. Then, select a **Channel** and **Program** from the drop-down boxes to view data for those selections.



**Historical Alarms: MPEG data for a specified device and port**

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## 13.0 On-Demand Testing

Use the **Home < On-Demand Test** option to take control of the device to perform measurements. These tests are performed without waiting on the monitoring to cycle to the desired port.



Only one person can perform on-demand testing on a probe at a time. The device stops monitoring while performing on-demand tests.

Select the port and probe to scan.

Select the tab to see the Full Band Capture/ Spectrum Analysis, Digital and OFDM Channel data with SubCarrier scans, MPEG data, and an overall view of channel plan.

Select the radio button for the details to display.

Click Start/Stop to begin or stop the scan. Select the Pause radio button to pause the scan mid-test.

Full Band Spectrum On-Demand Test screen



To perform On Demand Testing, the On-Demand Test radio button must be turned ON in the port settings (**Settings < Server & Device < CX280X**). For more information on settings, see [CX280X Probe Settings](#).

Select the probe server, probe, and port to test in the left panel. Click **Port Search** to search for a specific port. Move the **Test Time** slider on the bottom left panel to adjust the length of time for the test. The default test time is 30 minutes.

Temporarily stop an ongoing test by turning on the **Pause** radio button. Click **Start** again to resume the test.

The type of CX280X purchased determine the measurement values and views available.

- **Full Band Spectrum/Spectrum Analysis** - view signal values instantly and capture transient ingress.
- **Digital Ch.** - view digital channel signal levels with limits and constellations.
- **ISDB-T** – view Signal Level, MER, Pre and Post BER, and Constellation measurements of terrestrial digital ISDB-T signals.
- **OFDM** – view OFDM channel data with subcarrier scan analysis.
- **VeCheck** - overall view of the channel plan and analysis of levels of all channels.
- **MPEG** – view MPEG data of channels.

## 13.1 Full Band Spectrum/Spectrum Analysis

The Full Band Spectrum captures the signal levels of the channels to troubleshoot ingress in the forward path. It is a basic tool for observing signals and measuring the amplitude of digitally modulated carriers.

### Spectrum Analysis Overview



The RF input signal travels through the attenuator (limiting the amplitude) and low-pass input filter (eliminating undesirable frequencies). Then, it is mixed with a Voltage Controlled Oscillator (VCO) generated signal to produce an intermediate frequency that sweeps through the RBW filter (IF filter). A detector measures the power level of the signal passing through the IF filter and as the VCO sweeps through the frequency range, a trace is drawn across the screen.

After selecting the probe server, probe, and port, click **Settings** at the bottom and enter the setting options before clicking the **Start** button. When a previously established Setting Profile is selected, the values entered for the profile will populate the analyzer parameters automatically.

Name	Start Frequency (MHz)	Stop Frequency (MHz)	RBW (kHz)	VBW (kHz)	Sweep (ms)	Attenuation (dB)
Find Name	Find Start Frequency (MHz)	Find Stop Frequency (MHz)	Find RBW (kHz)	Find VBW (kHz)	Find Sweep (ms)	Find Attenuation (dB)
OFDM-spectrum	700	820	0.1	0.1	30	10
SA-test	700	760	0.3	0.0001	30	0

*Profile Settings screen*

- **Start Frequency (MHz) / Stop Frequency (MHz):** The Start and Stop Frequencies entered will be used to determine the Center Frequency and Span setting.
- **RBW (Resolution Bandwidth (KHz, MHz)):** This IF filter parameter depends on how wide of a sweep is needed. The wider the sweep, the higher the RBW and the faster the trace is measured. However, the narrower the setting, the better the frequency resolution.
- **VBW (Video Bandwidth (KHz)):** The video bandwidth filters enable a form of digital averaging which helps to reduce signal variations caused by noise.
- **Sweep (ms):** The speed at which the frequency span is scanned. The scan rate is limited by the IF filter (RBW) and the video filter that may be used to average the reading. These RBW and VBW filters, when used, must have time to respond; otherwise, signals will be missed and inaccurate measurements will be provided.
- **Attenuation (dB):** Use a RF attenuator to avoid an overload in the input stages of the analyzer, which result in false readings. Too much attenuation, more IF gain is required and the background noise level is increased and may mask lower level signals. Optimal performance is obtained by entering a value in 10 dB increments between 0 – 50dB.

Click the row for the profile to populate the parameter values for the test.

### 13.1.1 Traces

The following traces can be turned on to view on the display. The values appear underneath the graph.

- **Peak Hold:** Highest signal level that the trace reaches.
- **Avg Hold:** Averages the traces.
- **Min Hold:** Lowest signal level.
- **Update:** Turns off the live trace from the probe while the analyzer is running. When turned off, other traces can still be seen.
- **Search Peak:** Displays arrow marker on the highest point of the trace. The value appears .



*If the Peak cannot be displayed on the graph, add attenuation until it appears.*

- **Search Min:** Displays arrow marker on the lowest point of the trace. The value appears below the graph.



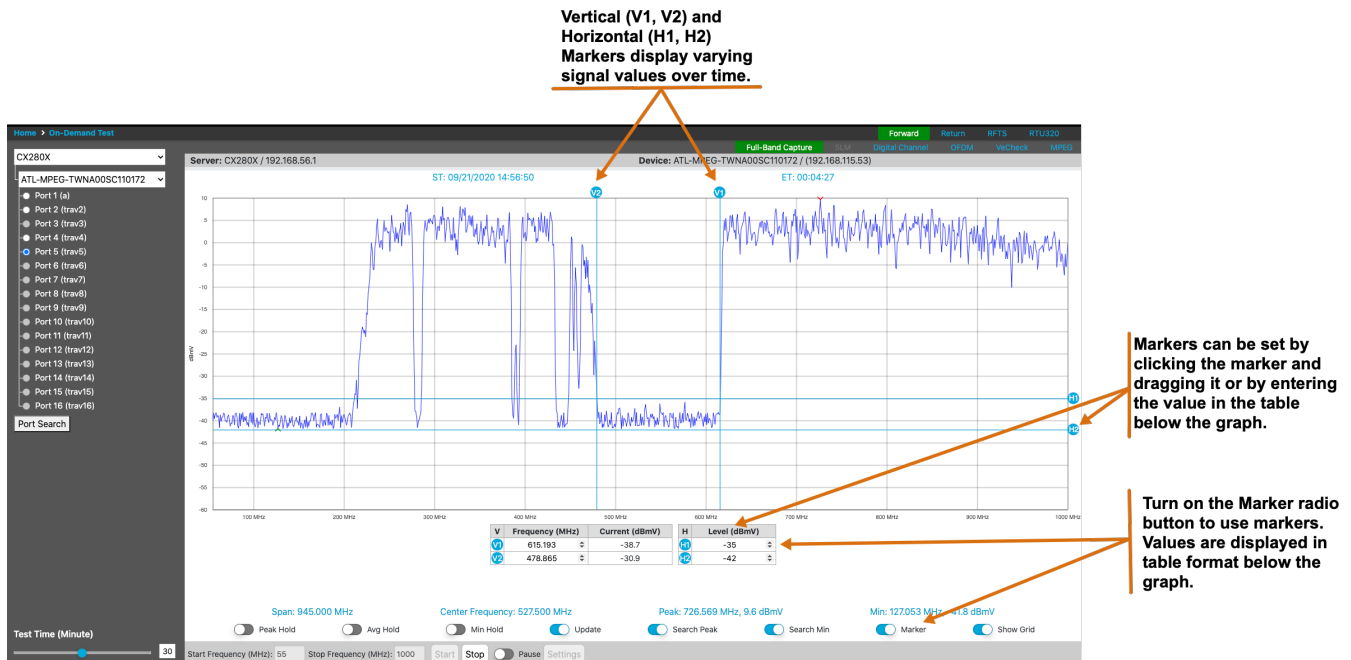
- **Marker:** Turns on Vertical (V1,V2) and Horizontal (H1,H2) Markers to further analyze the trace.
- **Show Grid:** Turn on to view graph lines.

### 13.1.2 Markers

There are four markers available: two horizontal markers (H1,H2) and two vertical markers (V1,V2).

To use the markers, click the Marker radio button at the bottom and move the marker to the frequency or level by:

- Clicking the marker (**H1, H2, V1, V2**) and dragging it to the location on the graph.
- Entering the exact value in the table below the graph, which moves the marker on the graph automatically.



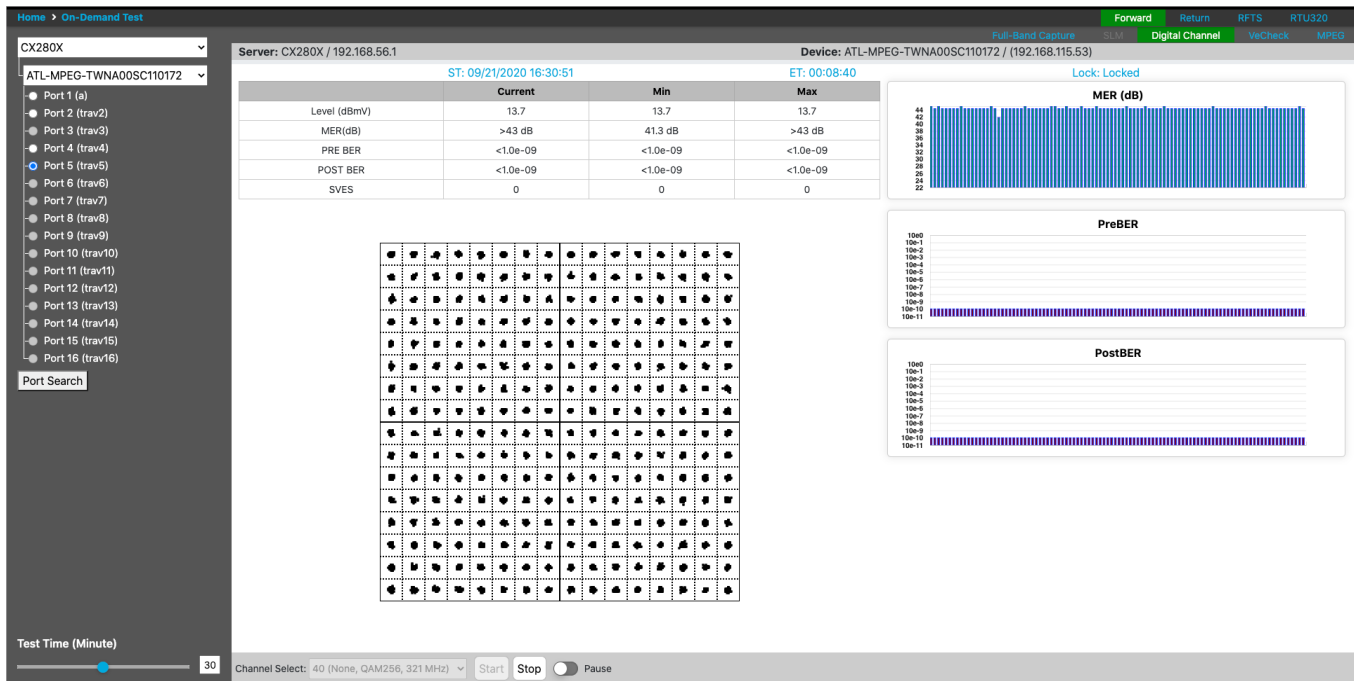
**Horizontal and Vertical Markers**

## 13.2 Digital Channel QAM Analyzer

The Digital Channel QAM Analyzer demodulates and measures various parameters of 64 and 256 quadrature amplitude modulation (QAM) signals carried through the cable system.

When testing a digital channel, the probe first tries to lock onto the QAM signal. Once the QAM signal is locked, the digital measurement results as well as the constellation diagram begin to display.

After selecting the probe server, probe, and port, click the **Channel Select** drop-down to select a channel to measure and then click **Start** to begin monitoring.



Digital Channel screen

## Measurement Parameters:

- **Level (dBmV)** – the Power Level
- **MER (dB)** – Modulation Error Ratio determines how much margin the system has available before a failure can be expected. In digital systems, MER is very similar to Carrier to Noise (C/N) in analog systems. MER measures how tightly symbols are recorded with respect to an optimum location based on the Error Vector Magnitude (EVM). A poor MER is not noticeable on the picture up until the point of system failure - this is often referred to as the "Cliff Effect". Ideally there should be at least 4 to 5 dB of margin from the MER where significant errors occur to allow for system degradation. MER measurements are useful for early detection of non-transient (noise) impairments, such as system noise Ingress. Maintaining as high a MER as feasible is preferable.
- **BER** - Bit Error Rate (BER) measures how often an error occurs in a given amount of data. The more errors, the more difficult it is for the FEC circuitry to correct those errors before picture problems occur. It is useful for measuring long term system performance and periodic transient impairments that can affect system performance occasionally. The higher the number, the lower the errors. More errors may be caused by loose connections or interference.
  - **Pre BER** –Pre-Forward Error Correction BER Ratio (before RS Encoding)
  - **Post BER** –Post-Forward Error Correction BER Ratio (after RS Encoding)
- **SVES** – Severely Error Second count indicates the number of seconds with defects or error events.

### 13.2.1 Constellation Display



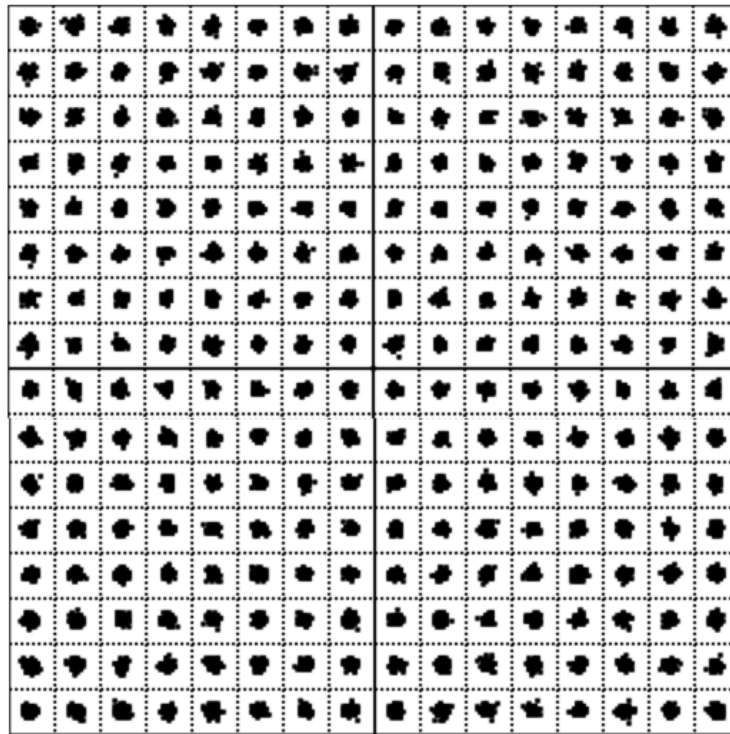
**The QAM channel must be locked on before a Constellation forms.**

Constellation diagrams identify QAM modulator problems and graphically represent the quality and distortion of a digital signal.

The diagram is an X/Y plot of the I (In-phase) and Q (Quadrature) axis components of the QAM signal. A symbol (waveform representing one or more bits) should appear as a compact or clean dot in the center of each symbol box. Decision boundaries exist within the constellation so that if the symbol falls within the boundary, the correct data is received.

If noise or other interference exists, the symbol falls outside the boundary, the data is in error. Error detection and correction (e.g. FEC) will attempt to correct these errors, thus avoiding video impairments.

Observing the symbol's general shape and location relative to their ideal positions allows conclusions to be made about the nature of an impairment.



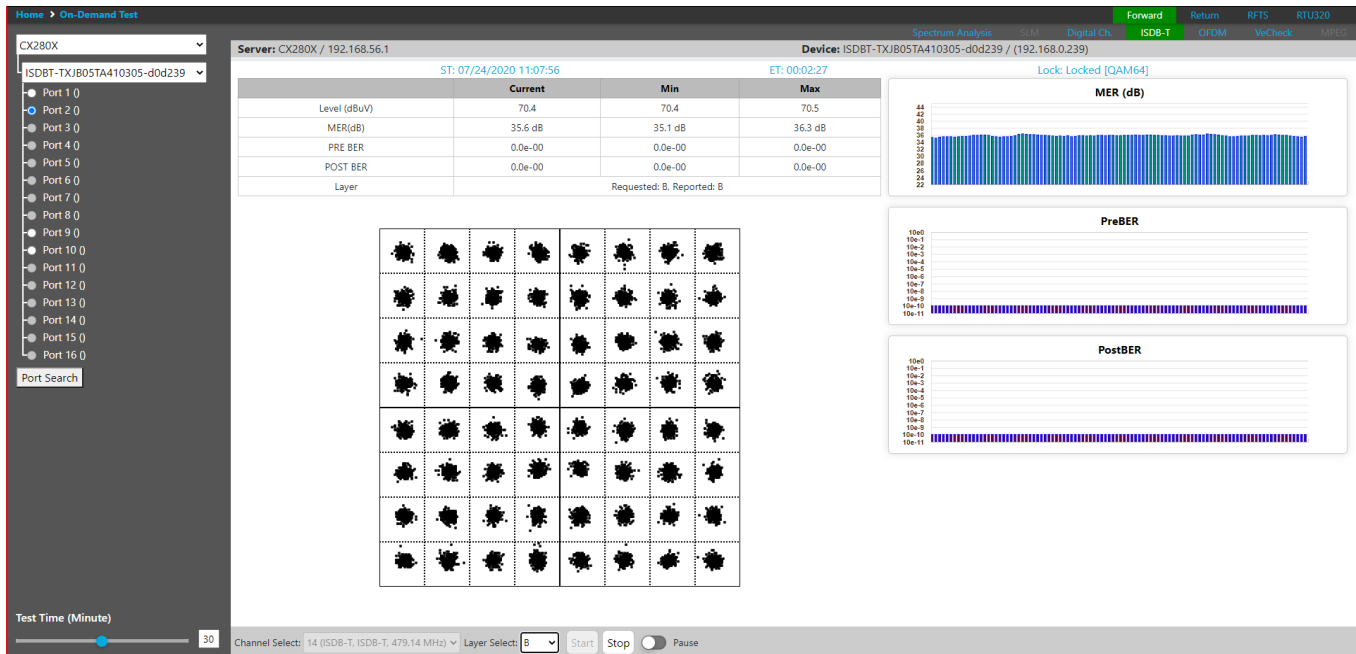
*QAM256 Constellation Display*

The following impairments can be assessed visually:

- **Gain compression** - Pulls the symbol clusters into the center while the middle ones are unaffected. Gain compression can result from poor or bad amplifiers, IF equalizers and up/down converters.
- **Broadband or system noise** - Causes symbol clusters to enlarge, which increases the probability of errors. An error occurs when the dot is pulled across a decision boundary.
- **Coherent interference** - CSO/CTB, spurs or ingress produce symbol clusters with a hole in the center so they appear as "donuts". This can also be a result of laser clipping or sweep interference.
- **Phase noise** - Also known as Phase jitter in a QAM signal, it is caused by transponders in the transmission path or by the I/Q modulator. Phase jitter is a statistical quantity that affects the I and Q path equally. Phase noise causes the symbol clusters to appear as arcs, particularly those near the edges of the constellation. Phase noise can also result from faulty headend up/down converters.

### 13.3 ISDB-T

The ISDB-T Japanese OFDM tab displays the Signal Level, MER, Pre and Post BER, and Constellation measurements of terrestrial digital ISDB-T signals.



*ISDB-T: On-Demand Test screen*

Click **Start** to begin measurements on the probe. Temporarily stop an ongoing test by turning on the **Pause** radio button. Click **Start** again to resume the test.

Click **Stop** to stop measurements.

**Layer Switching:** Select the Layer to display from the Layer Select drop-down menu.

## 13.4 OFDM

The OFDM Analyzer performs DOCSIS 3.1 OFDM measurements and analysis for Service Level Testing. The OFDM Analyzer includes the following:

- Adjustable MER Percentile measurements
- MER measurement for NCP and Profiles (A, B, C, D, E)
- PLC Search
- OFDM subcarrier scan

Server: CX280X / 192.168.56.1      Device: ATL-MPEG-TWNA00SC110172 / (192.168.115.53)

ST: 09/28/2020 10:55:42      ET: 00:00:30      Subcarrier Scan

Level (Avg)	14.1 dBmV	MER (Avg)	45.3 dB
Level (Max)	14.1 dBmV	MER (Std Dev)	0.7 dB
Level (Min)	14.1 dBmV	MER Percentile <input type="text" value="2"/> %	43 dB
PLC Frequency	744 MHz	Subcarrier Bandwidth	50 kHz
OFDM Bandwidth	192 MHz	Active Subcarriers	3800

	Modulation (QAM)	Level(dBmV)	MER(dB)	Total C/W	Correct C/W	Uncorrect C/W	C CWE	U CWE
PLC	16	14.1	44.9	108270		0		<1.0e-09
NCP	16		45.4	2815303		0		<1.0e-09
Profile A	256		45.4	44725	0	0	<1.0e-09	<1.0e-09
Profile B	1K		45.4	136	0	0	<1.0e-09	<1.0e-09
Profile C	2K		45.4	136	13	0	9.6e-2	<1.0e-09
Profile D	4K		45.4	146	27	0	1.8e-1	<1.0e-09
Profile E			N/A	N/A	N/A	N/A	N/A	N/A

Channel Select:  OR  OR  Mhz

### OFDM Analysis: On-Demand Test screen

Enter the PHY Link Channel frequency in one of three ways:

- Click the Channel Select drop-down and select the frequency.
- Type the frequency in the field provided.
- If not known, search the PLC by tapping **PLC Search**. Enter the frequency ranges, then click **Start Search**. After the PLC frequency is found, the frequency field is populated automatically.

Press **Start** to begin measurements.

#### Measurements:

- **Level:** reports Average, Maximum, and Minimum for the OFDM PLC.
- **Frequency:** Primary OFDM PLC Frequency.
- **Bandwidth:** OFDM Channel Bandwidth.
- **MER (Avg):** Average MER for the Active OFDM Subcarriers.
- **MER (Std Dev):** Standard Deviation for the Active OFDM Subcarriers.
- **MER Percentile (2):** the MER value for the lowest 2% of all OFDM Subcarriers. Can be modified from 2-50%.
- **Subcarrier Bandwidth:** bandwidth setting used for each OFDM Subcarrier.
- **Active Subcarriers:** the number of active Subcarriers in the OFDM channel.
- **PLC:** Phy Link Channel.
- **NCP:** Next Codeword Pointer. • Modulation Profiles A, B, C, D, E.
- **C CWE:** Corrected Codeword Errors.
- **U CWE:** Uncorrectable Codeword Errors.

#### 13.4.1 Subcarrier Scan

Click **Subcarrier Scan** to scan all the subcarriers. The following measurements are displayed once the scan finishes:

- **Power Scan** – Displays the Power Level of the OFDM signal in 6 MHz sections. Color coding clearly identifies the QAM modulated subcarriers, PLC subcarriers, and continuous pilots.
- **MER Scan** – Displays the individual subcarrier MER measurement.
- **Noise Floor** – Displays subcarrier Noise Floor under the OFDM carrier.



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

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

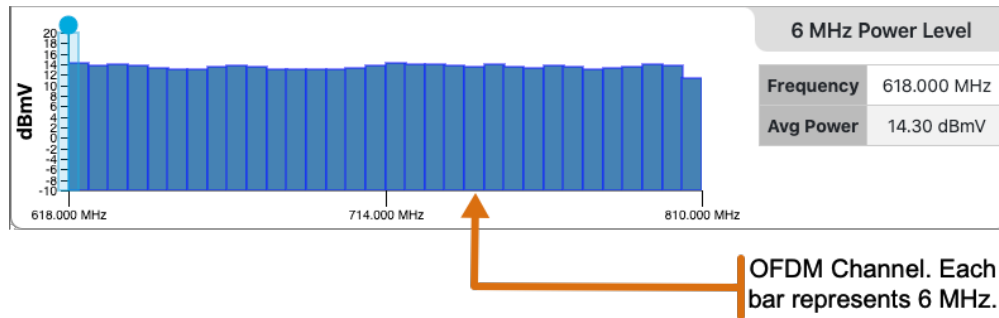
Click the **Analysis** button to return to the table view.

Click the **Update Scan** button to update the measurements.



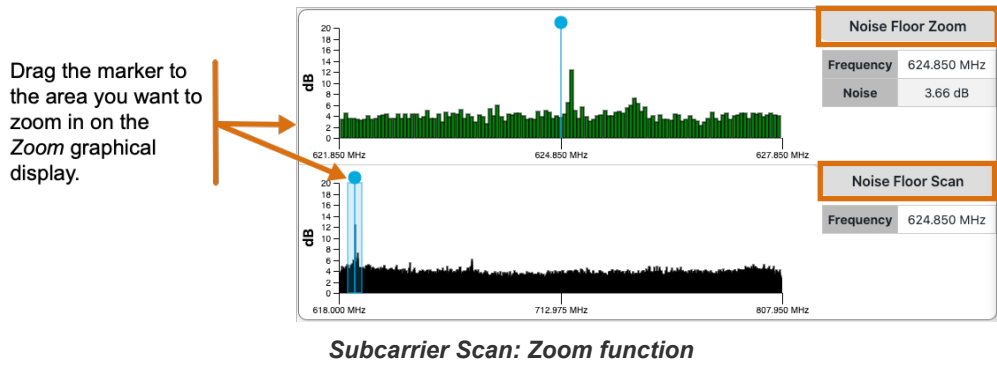
**Subcarrier Scan: OFDM On-Demand Test screen**

All graphical views appear on one screen. The OFDM Channel Power Level graph is on the bottom right.



**Subcarrier Scan: OFDM Channel Graph**

Each bar in the graph represents 6 MHz. Drag the marker to view the measurements (Power, MER, Noise Floor) for that channel. The Zoom graphs are updated to the new frequency highlighted, automatically.



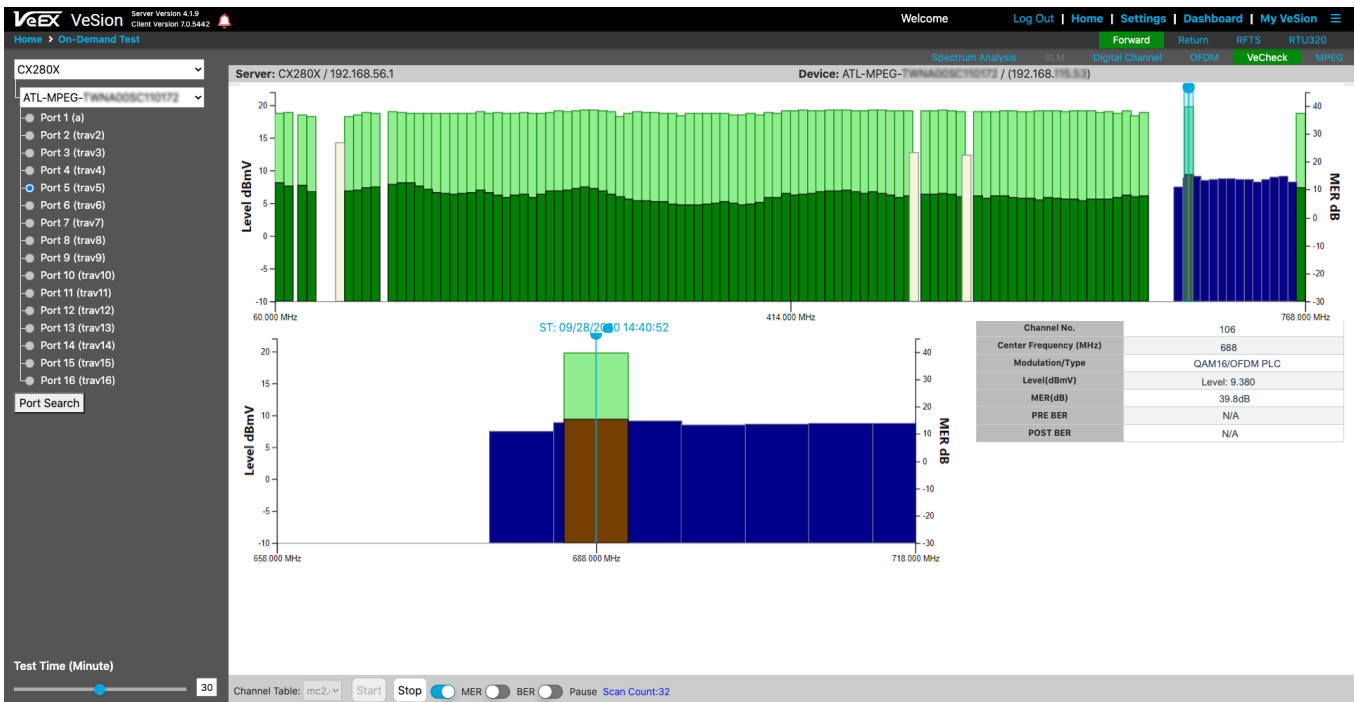
Use the markers on any graph to change the overall view on ALL graphs.

### 13.5 VeCheck

VeCheck quickly performs a headend check scan of QAM channels for the Forward Path, covering up to 1218 MHz. It displays an overall view of the channel plan and measurements across channels. It measures signal level, MER, and BER measurements, depending on the selections made.

Temporarily stop an ongoing test by turning on the **Pause** radio button. Click **Start** again to resume the test.

- **Channel Table** – Select the channel plan for channels to measure.
- **MER/BER Measurement** – Turn on/off error ratio measurements.
- **Scan Count** - Indicates how many full scan cycles have been completed.



The Level Scan displays the power level of the OFDM channel in 6MHz. The graph changes when the marker changes on the scoped channel graph at the top.

The data in the table on the right changes to reflect the selected measurement. Depending on the channel selected from the marker location, certain measurements will be available.

- DOCSIS SC-QAM's – Level, MER, Pre and Post BER metrics
- DOCSIS 3.1 OFDM – Level and MER
- QAM Digital Video – Level, MER, and BER



Analog channels are not supported.

### 13.6 MPEG

MPEG analysis of a digital carrier that contains MPEG programs is performed via MPEG Explorer. The MPEG Explorer option extracts MPEG Transport Stream payloads from the QAM carrier and decodes them to check transport and programming content. It can complete a 150 QAM Channels scan in under 2 minutes.

The MPEG Explorer evaluates quality of experience levels using a variety of metrics.

**Select up to 16 channels to scan.** Selected channels will be highlighted and indicated by a checkmark. After locking on the channel, click the green padlock to view the MPEG data for that channel. And eye icon appears next to the current channel being viewed. At the bottom of the screen, click the **Program** drop-down to select and view the Program data inside the channel.



If the padlock is unlocked and red, the channel has failed to lock. One possible reason could be an invalid PAT and PMT.

Temporarily stop an ongoing test by turning on the **Pause** radio button. Click **Start** again to resume the test.



Always check the signal level and quality of QAM carrier(s). Without a strong signal, analysis of the MPEG stream may not yield any useful information. Check FEC counters and use the Constellation diagram to identify problems. For more information, see [Constellation Display](#).

At the top of the screen, the number of actual MPEG programs for the selected channel and transport errors for the selected channel are displayed.

Select the channel to view MPEG information for that channel. An eye icon will appear next to the channel to indicate it is selected.

The screenshot shows the VeEX VeSion interface for CX280X. On the left, a channel list is shown with Port 5.0 selected. The main area displays 'Actual Programs' (2) and 'Transport Errors' (125). Below this is a table of streams including PAT, PMT, Video, Audio, and ECM. At the bottom, there are summary statistics for Video BW, Audio BW, and MPEG error counts.

Stream	Description	Pid	Type	Program	BW	BW (%)	Status	Pkt Count	Encryption
PAT	Program Association Table	0	PSI	N/A	2,989 Kbps	0.008%	OK	128	N/A
PMT	Program Map Table	256	PSI	652	2,989 Kbps	0.008%	OK	128	N/A
Video	ISO 13818-2 Video	257	ES	652	8,949 Mbps	23.057%	OK	437876	YES
Audio	AC-3 Audio	258	ES	652	388.614 Kbps	1.001%	OK	16842	YES
Audio	AC-3 Audio	259	ES	652	194.307 Kbps	0.501%	OK	8421	YES
ECM			ES	652		0.002%		0	NO

Summary of MPEG stream data for the selected channel.

Measurements for the selected Program.

MPEG error counts for the selected Program.

Select Program to view measurements on screen.

CX280X MPEG screen



Actual Programs		Transport Errors		
12		0		
Type	Pid Count	BW	BW (%)	Pkt Count
Total	49	38.688 Mbps	100%	868240
Video	12	5.532 Mbps	14.298%	231924
Audio	12	2.377 Mbps	6.145%	53182
Tables	24	288.528 Kbps	0.746%	6480
Null	1	30.537 Mbps	78.932%	577799

**MPEG: Summary Information for selected channel**

- **Actual Programs** – Number of programs in the selected channel.
- **Transport Errors** – Number of packets from all Transport Streams of the channel with a transport error indicator of '1'. It is set when a demodulator could not correct errors from the stream.
- **Type** - Indicates stream packet types of the Transport Stream: Total (all packets), Audio, Tables, Null ("Stuffing" packets that carry no data, but are needed to maintain a constant bit rate.)
- **Pid Count** – Number of PID. Null packets will always have 1 PID (8191).
- **BW** – Total bandwidth of each type.
- **BW (%)** - Percentage of the total bandwidth per type calculated by:  $BW / Total - BW * 100\%$
- **Pkt Count** – Number of total packets per type transported.

Stream	Description	Pid	Type	Program	BW	BW (%)	Status	Pkt Count	Encryption
PAT	Program Association Table	0	PSI	N/A	12.022 Kbps	0.031%	OK	270	N/A
PMT	Program Map Table	160	PSI	1	12.022 Kbps	0.031%	OK	270	N/A
Video	ISO 13818-2 Video	5143	ES	1	265.987 Kbps	0.688%	OK	26734	NO
Audio	AC-3 Audio	5144	ES	1	201.369 Kbps	0.520%	OK	4433	NO
ECM			ES	1		0.000%		0	NO

**MPEG: Individual Stream Information for selected Program**

- **Stream** - Contains information of each stream within the selected program:
  - **PAT** (Program Association Table) - Lists every program in the transport stream. Each entry in PAT points to a PMT and contains PIDs for each PMT.
  - **PMT** (Program Map Table) - Lists the PID values for packets containing a program's video, audio, clock reference and data components.
    - **Type: PSI** (Program Specific Information) - PAT and PMT are PSI. These serve the purpose of being the "Table of Contents" for the transport stream and helps the decoder locate audio and video for each program, as well as verifies Conditional Access rights.
  - **Video** – Indicates Video stream
  - **Audio** – Indicates Audio stream
  - **ECM** – Entitlement Control Message stream or "Conditional Stream". Example being a type of stream that the user needs a subscription to view
    - **Type: ES** (Elementary Streams) - Video, Audio, and ECM are ES. These streams contain one type of data
- **Description** – Description of the stream
- **Pid** – PID of the stream
- **Type** –Type of the stream
- **Program** – Program containing the streams. PAT should not be part of a program since it is the table containing the list of programs and their PIDs.
- **BW** – Bandwidth of the stream
- **BW (%)** - Bandwidth percentage of the stream
- **Status** – Status of the stream; OK is good
- **Pkt Count** – Packet count of the stream
- **Encryption** – Whether the stream is encrypted or not

	Min	Max	Avg	Current
Video BW	261.463 Kbps	3.275 Mbps	284.943 Kbps	265.987 Kbps
Video BW %	0.676%	8.464%	0.737%	0.688%
Audio BW	194.960 Kbps	201.370 Kbps	197.668 Kbps	201.369 Kbps
Audio BW %	0.504%	0.520%	0.511%	0.520%

**MPEG: Audio/Video Bandwidth for selected Program**

- **Min** – Minimum video/audio bandwidth of each stream and bandwidth percentage
- **Max** - Maximum video/audio bandwidth of each stream and bandwidth percentage
- **Avg** - Average video/audio bandwidth of each stream and bandwidth percentage
- **Current** - Current video/audio bandwidth of each stream and bandwidth percentage

	Priority 1		Priority 2
MPEG Sync Loss	0	MPEG Transport	0
Sync Loss Duration(us)	0	CRC	0
MPEG Sync Byte	0	PCR Repetition	0
PAT2	0	MPEG PCR Discontinuity	0
PMT2	0	MPEG PCR Accuracy	0
MPEG Continuity	0	CAT	0
MPEG PID (Video)	0		
MPEG PID (Audio)	0		
MPEG PID (Audio 2)	0		

**MPEG Error Counts: Priority 1/Priority 2 for selected Program**

- **Priority 1:** Errors preventing packets from being decoded. These errors cause the channel to go off air/blank screen.
  - **MPEG Sync Loss** – Loss of synchronization at the MPEG transport layer. This occurs when the decoder cannot find three consecutive sync bytes.
  - **Sync Loss Duration(us)** – Duration in which Sync Loss occurs in microseconds.
  - **MPEG Sync Byte** – Invalid/incorrect transport Sync Byte (Sync Byte not 0x47)
  - **PAT2** – Error occurs when a packet with PID 0 does not occur at least every 0.5 seconds a PID, 0x0000 does not contain a table\_id, 0x00 ( i.e. a PAT), or Scrambling\_control\_field is not 00 for PID 0x0000.
  - **PMT2** – Error occurs when some PMT sections are missing in the packets (i.e. do not occur every 0.5 seconds) or Scrambling\_control\_field is not 00 for all PIDs containing sections with table\_id 0x02.
  - **MPEG Continuity** – Error occurs when either incorrect packet sequence, duplicate packets, or a packet is lost occurs.
  - **MPEG PID (Video/Audio/Audio2)** – Error occurs when the stream PID does not occur for 5 seconds.
- **Priority 2:** Errors affecting individual programs while the transport stream is still intact. These errors affect the quality of the program to the end consumer.
  - **MPEG Transport** – Transport error. Counts when the error indicator in the MPEG Transport Stream header is set to 1.
  - **CRC** – Error occurs when data corruption occurred in one of the program tables: CAT, PAT, PMT, NIT, EIT, BAT, SDT, or TOT.
  - **PCR Repetition** – Error occurs when the time interval between two consecutive PCR values exceeds 40ms
  - **MPEG PCR Discontinuity** – Error occurs when the difference between two consecutive PCR values exceeds 100ms without a discontinuity bit set.
  - **MPEG PCR Accuracy** – Error occurs when PCR accuracy of the selected program is outside the range of +/-500ns.
  - **CAT** – Conditional access program error.

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## 14.0 Real-time Alarm Monitoring

Use the **Real-time Alarm & Monitor** menu option to view real-time traces and deep scan data for selected probes/ports and active alarms generated in the session. It scans channels and gives a live view at what's being monitoring by the monitoring system.

To view a probe's monitoring in real time, click the probe server on the left panel. Devices/Probes assigned to the server will appear in the right panel.

Select the probe server to view alarms for each associated probe.

Select the Device/Probe to view scans for all ports and/or MPEG monitoring data.

Click the port to view alarm details for that port.

*Real-time Monitoring and Alarms: Main screen*

## 14.1 Port Monitoring

Yellow indicates the port is online with alarms generated earlier.

Gray indicates the port is not being monitored on the network.

Red indicates the port has generated an active alarm while viewing in real time.




Green indicates the port is online with no alarms.

*Port Monitoring legend*

Each port is visually represented as a circle. The color determines the status of the port in real-time.

### Port Alarms Legend

Port Color	Description
	Port is not being monitored on the network.

	Green	Port is online with no alarms.
	Yellow	Port is online with alarms generated earlier.
	Red	Port has generated an active alarm while viewing in real time.

Click the port to view details about the alarm and to clear it, if needed.

Real-time Alarms - Port 5 (trav5) <span style="float: right;">x</span>				
Date	Channel Number	Frequency (MHz)	Type	Value
10/6/2020 14:31:54	8(249)	183	MPEG Video BW	0.0 Kbps
10/6/2020 14:31:54	8(249)	183	MPEG Audio BW	0.0 Kbps
10/6/2020 14:31:54	8(249,5536)	183	MPEG Video PID	2
10/6/2020 14:31:54	8(249,5537)	183	MPEG Audio PID	2
10/6/2020 14:31:54	8(249,5538)	183	MPEG Audio 2 PID	4
10/6/2020 14:31:54	8(249,5539)	183	MPEG Audio 2 PID	4
10/6/2020 14:44:09	26(3)	237	MPEG Video BW	0.0 Kbps
10/6/2020 14:44:09	26(3)	237	MPEG Audio BW	0.0 Kbps
10/6/2020 14:44:09	26(8)	237	MPEG Video BW	0.0 Kbps
10/6/2020 14:44:09	26(8)	237	MPEG Audio BW	0.0 Kbps
10/6/2020 14:44:09	26(8,6201)	237	MPEG Video PID	4
10/6/2020 14:44:09	26(3,6207)	237	MPEG Video PID	4
10/6/2020 14:44:09	26(8,6202)	237	MPEG Audio PID	4
10/6/2020 14:44:09	26(3,6208)	237	MPEG Audio PID	4
10/6/2020 14:44:18	27(1105)	243	MPEG Video BW	175.8 Kbps

*Port Alarm Details – table view*

## 14.2 Validating/Clearing Alarms

Before validating/clearing alarms, first run an On-Demand test on a single channel for the CX280X port to check the signal level. Do a Port Search by Node ID to find where the alarm occurred. After addressing the reasons for the alarm, clear the alarms.

### To clear alarms on a specific probe:

Go to the **Probe Details** page (**Home < Settings < Server & Device < CX280X**) for the device where the alarm occurred. At the bottom, click **Clear All Active Alarms**.

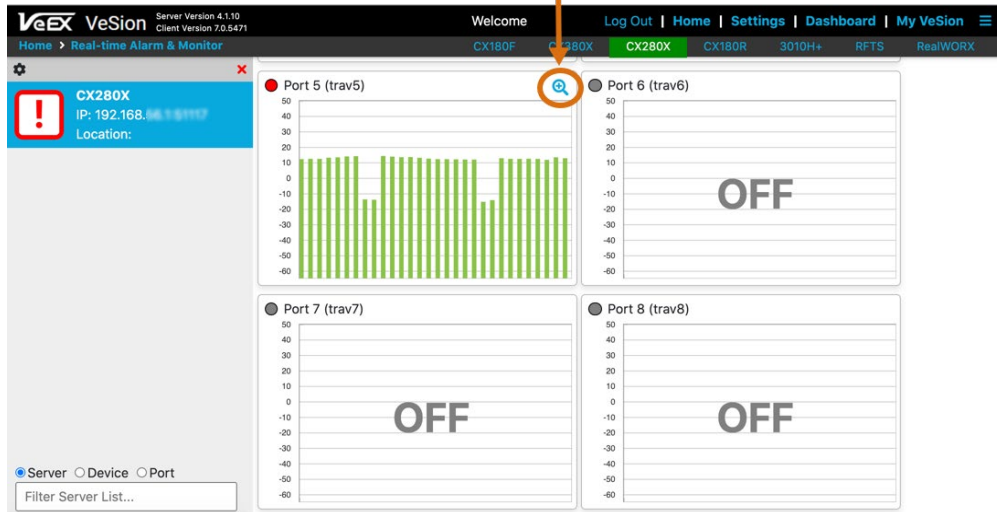
### To clear alarms on all probes:

Go to the **Probe Server Details** page (**Home < Settings < Server & Device < CX280X**). At the bottom, click **Clear All Active Alarms**. This clears all alarms on all probes assigned to the probe server.

## 14.3 Realtime Scans

To view a probe's monitoring in real time, select the probe on the **Realtime** main screen. A scan of all ports is displayed. Click the magnifying icon on a specific port to zoom in on that port.

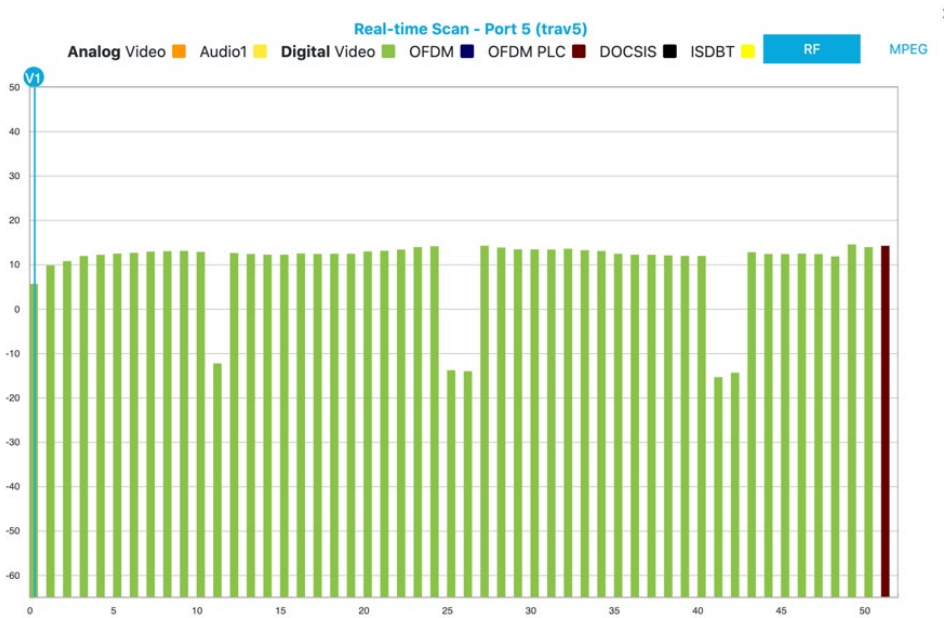
Click the magnifying icon to zoom in on a port.



**Realtime Port Scans**

### 14.3.1 RF Monitoring

Use the legend at the top to read the graph. When Vertical Markers are used, the table information below the graph changes to reflect the marker positions.



	Channel	Type	Frequency	Level   Video / Audio	MER (dB)	PreBER	PostBER
V1	97	Digital / Digital Video	105 MHz	5.6 dBmV	N/A	N/A	N/A
V2	97	Digital / Digital Video	105 MHz	5.6 dBmV	N/A	N/A	N/A

**Realtime Port Monitoring Details: RF**

### 14.3.2 MPEG Monitoring

Select the **MPEG** tab to see MPEG Monitoring data. Select **Channel** and **Program** from the drop-downs.

For definitions of data shown, see [MPEG](#).

Real-time Scan - Port 5 (trav5) RF MPEG

Channel: 8 Programs: 2 Video BW: 2.027 Mbps Audio BW: 199.869 Kbps TS Encrypted: YES

Stream	PID	Description	Type	Program
PAT	0	Program Association Table	PSI	2
PMT	139	Program Mapping Table	PSI	2
VIDEO	5533	ISO 13818-2 Video	ES	2
Audio	5534	AC-3 Audio	ES	2
ECM	347	Reserved or unknown	ES	2
CAT	1	Conditional Access Table	PSI	2

Priority 1		Priority 2	
MPEG Sync Loss	0	MPEG Transport	0
Sync Loss Duration (us)	0	CRC	0
MPEG Sync Byte	0	PCR Repitition	0
PAT2	0	MPEG PCR Discontinuity	0
PMT2	0	MPEG PCR Accuracy	0
MPEG Continuity	0	CAT	0
MPEG PID (Video)	2		
MPEG PID (Audio)	2		
MPEG PID (Audio 2)	4		


**Realtime Port Monitoring Details: MPEG**

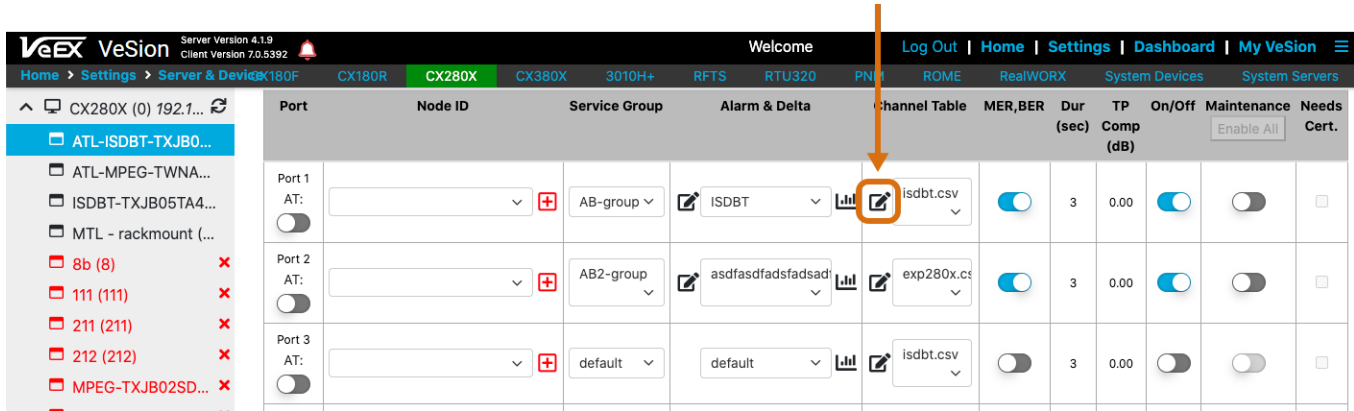
[Go back to top](#) [Go back to TOC](#)

# 15.0 Channel Profiles

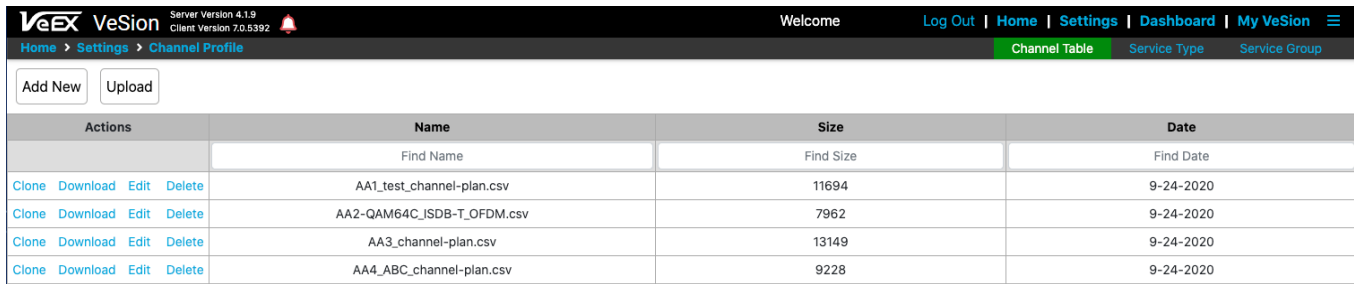
Use the Channel Profiles option to manage channel plans. Create a new channel plan or upload channel plans from a .csv file.

Access the **Channel Profile** screen in two ways:

- On the top menu bar, select **Settings < Channel Profile**.
- On the probe table, click  to open the channel plan assigned to that probe.



*Opening Channel Plan from Probe*



*Channel Profile screen*

Use the **Delete** link to completely erase a channel profile.

Click the **Download** link to download the channel profile to a .csv file.

## 15.1 Managing Channel Plans





## Example of Channel Plan .csv file

### To upload a channel plan:

1. Click **Upload**, and then click **Choose File**.
2. Locate the .csv (comma separated variable) file to upload, and then click **Open**. The **Channel Profile Editor** screen appears.
3. Make changes to the channel plan as needed, and then click **Save**. A "New Channel Profile save succeeded." message appears.
4. Click **OK**. The newly uploaded channel plan now appears in the channel profile table.

### 15.1.3 Clone Channel Plans

#### To duplicate a channel plan with a new name:

1. Click **Clone** next to the channel plan to duplicate. The **Channel Profile Editor** screen appears and "clone-" is prepended to the channel plan name.
2. Type a new name for the channel plan.
3. Make changes as needed and click **Save**. A "New Channel Profile save succeeded." message appears.
4. Click **OK**. The new channel plan now appears in the channel profile table.

## 15.2 Disabling/Enabling Channel in Channel Table

Click the column headers to sort table by that attribute.

Click the checkmark to disable the channel. Click the X to enable the channel.

Click **Digital Channel Attributes** to collapse digital columns and view analog only attributes.

Channel	Enabled	Channel Name	Modulation	Digital ...	Symbol Rate	Inverted Spectrum	FEC Mode	Modulation Check	Service Type	MPEG	MPEG-MUX	Channel Type
<input type="checkbox"/> 98	✗	None	QAM256	111.0000	5.360537	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA98	Digital Video
<input type="checkbox"/> 99	✗	None	QAM256	117.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA99	Digital Video
<input type="checkbox"/> 12	✗	None	QAM256	123.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA14	Digital Video
<input type="checkbox"/> 15	✗	None	QAM256	129.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG test string	Digital Video
<input type="checkbox"/> 17	✓	None	QAM256	141.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA17	Digital Video
<input type="checkbox"/> 18	✓	None	QAM256	147.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA18	Digital Video
<input type="checkbox"/> 19	✓	None	QAM256	153.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA19	Digital Video
<input type="checkbox"/> 20	✓	None	QAM256	159.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA20	Digital Video
<input type="checkbox"/> 21	✓	None	QAM256	165.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA21	Digital Video
<input type="checkbox"/> 22	✓	None	QAM256	171.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA22	Digital Video
<input type="checkbox"/> 7	✓	None	QAM256	177.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA27	Digital Video
<input type="checkbox"/> 8	✓	None	QAM256	183.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA8	Digital Video
<input type="checkbox"/> 9	✓	None	QAM256	189.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA9	Digital Video
<input type="checkbox"/> 10	✓	None	QAM256	195.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA10	Digital Video
<input type="checkbox"/> 11	✓	None	QAM256	201.0000	5.361000	✗	AnnexB-6M	✓	ETRI01-290	✓	MPEG-EA11	Digital Video

Channel Plan Editor: Filters

### 15.2.1 Disabling Channels

To disable a channel, click  in the **Enable** column.

All the Probes / Ports with this channel table applied will have the channel disabled globally.



All probes and ports to which the channel plan is assigned will have the channel disabled. There is no need to redo the baseline

### 15.2.2 Enabling Channels

To enable a channel click  in the **Enable** column.

If there are no changes in the channel signal level, there is no need to redo the baseline.

### 15.2.3 MPEG Channels and Service Types

Channel Profile Editor > AA1\_test\_channel-plan.csv

Name: AA1\_test\_channel-plan.csv Save Cancel

Delete Selected Channels Create Channel

Channel	Channel Name	Modulation	Frequency	Digital Frequency	Symbol Rate	Inverted Spectrum	FEC Mode	Modulation Check	Service Type	MPEG	MPEG-MUX	Channel
<input type="checkbox"/>	98	None	QAM256	111	111	5.361	X	AnnexB-6M	✓	Narrowcast	✓	
<input type="checkbox"/>	99	None	QAM256	117	117	5.361	X	AnnexB-6M	✓	Narrowcast	✓	
<input type="checkbox"/>	14	None	QAM256	123	123	5.361	X	AnnexB-6M	✓	Music	✓	
<input type="checkbox"/>	15	None	QAM256	129	129	5.361	X	AnnexB-6M	✓	Clear QAM	✓	
<input type="checkbox"/>	16	None	QAM256	135	135	5.361	X	AnnexB-6M	✓	Broadcast	✓	
<input type="checkbox"/>	17	None	QAM256	141	141	5.361	X	AnnexB-6M	✓	ENC Check	✓	
<input type="checkbox"/>	18	None	QAM256	147	147	5.361	X	AnnexB-6M	✓		X	

Configuring MPEG channels

Set a channel as MPEG by clicking in the **MPEG** column for the channel to place a checkmark.

Click the **Service Type** for the channel to designate the type of service.

### 15.2.4 Service Types

Use the **Service Types** tab on the **Channel Profile** page to designate the types of services provided, e.g. *Music, Broadband, Narrowcast*.

Click **Add New** to create and configure a new type of service. Click **Edit** to change the name, description, as well as make the service type available/unavailable to assign to a Channel or an Alarm Profile (**Settings > Alarm Profile**).

Actions	Name	Description	Enable Service	Date
<a href="#">Add New</a>	Find Name			Find Date
<a href="#">Edit</a> <a href="#">Delete</a>	Narrowcast		true	10/13/2017
<a href="#">Edit</a> <a href="#">Delete</a>	Music		true	10/13/2017
<a href="#">Edit</a> <a href="#">Delete</a>	Clear QAM		true	10/13/2017
<a href="#">Edit</a> <a href="#">Delete</a>	ENC Check		true	10/13/2017
<a href="#">Edit</a> <a href="#">Delete</a>	Broadcast		true	1/16/2020

Channel Profile: Service Types

The date in the **Date** field represents the date that the Service Type was last edited.

### 15.2.5 Service Groups

Use Service Groups to form node groups. After setting up Service Groups, assign the groups to the applicable ports on the **Probe Settings** page (**Settings > Server & Device > CX280X**). For more information on probe settings, see [CX280X Probe Settings](#).

Actions	Name	Description	Date
<a href="#">Add New</a>	Find Name		Find Date
<a href="#">Edit</a> <a href="#">Delete</a>	AB-group	NID254-60	9/25/2020
<a href="#">Edit</a> <a href="#">Delete</a>	AB2-group	NID260-76	9/25/2020
<a href="#">Edit</a> <a href="#">Delete</a>	asdf	dfa	9/25/2020
<a href="#">Edit</a> <a href="#">Delete</a>	default	default	10/13/2017

Channel Profile: Service Groups

Click the **Upload** button at the top to import a csv file with service group data.



*To restrict the visibility of a Service Group, assign the Service Group to those areas in the Org Chart.*

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## 16.0 Maintenance Mode

### 16.1 Best Practices

When fully configured, each CX280X probe will monitor up to 16 RF signals. Enabled channels of each port are scanned and compared with the alarm baseline. Any fluctuation in the signal level beyond the set limits due to maintenance activity can trigger level alarms. These alarms from planned maintenance activities can be avoided by temporarily disabling ports scheduled for maintenance.

### 16.2 Pre-Maintenance

Disable any probes and/or ports before any maintenance activity to ensure no false alarms are triggered during that time.

#### To disable a port:

1. From the **VeSion Home** page, click **Settings > Server & Device > CX280X**.
2. On the left panel, locate the **CX280X** probe scheduled for maintenance. Use the search bar at the bottom to search for a specific probe. Probes appearing in **red** indicate they are currently offline.
3. On the port table, click the **Maintenance** radio button to disable the port. Click **Enable On** to disable all ports on the probe.



*If maintenance is to be performed on all the ports, keep **Port 1 ON** and apply the "default" alarm profile. This will ensure that no alarm will trigger from Port 1 during the maintenance window.*

4. At the bottom, click **Save**.

### 16.3 Post Maintenance

#### Before turning ports back on after maintenance:

1. Redo the Alarm Delta Baseline for each port under maintenance. This ensures that any change in the signal level per channel will be recorded in the new baseline and not trigger false alarms. It also verifies that the maintenance work done did not affect the signal level.
2. For more information on redoing the baseline, see [Alarm Delta Baseline](#).
3. Reapply the Alarm Profile for any port that had been set to "default" for the purposes of maintenance only.
4. Click **Save** at the bottom.

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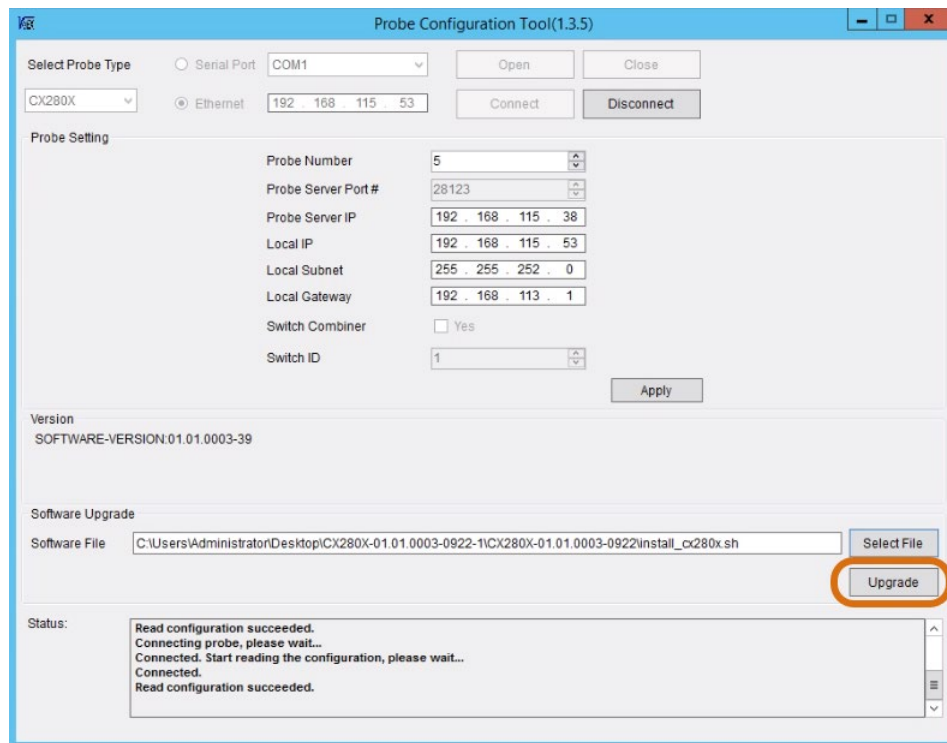
## 17.0 Upgrading Software

The VeEX Probe Configuration tool is used to upgrade the probe software. The latest software updates are available from the CX280X product page at [www.veexinc.com](http://www.veexinc.com) or can be obtained from [VeEX Customer Care](#).

### 17.1 Upgrade using Probe Configuration Tool

To upgrade the CX280X probe software to the most recent version:

1. Download the software upgrade zip file from the product page on the VeEX website, [www.veexinc.com](http://www.veexinc.com), and then extract/unzip the files to a location on the hard drive.
2. Launch the **CX Probe Configuration Tool**.
3. Click the **Select Probe Type** drop-down list box arrow, and then select **CX280X**.
4. Select the **Ethernet** radio button and enter the static IP address to assign to the probe at an earlier time, and then click **Connect**. In the **Status** box, a "Connection succeeded" message appears.
5. In the **Software Upgrade** group box, click **Select File**, navigate to the folder in which to extract the upgrade files, and then click the file to download.
6. Click **Upgrade**. In the **Status** box, a message appears that the upgrade is finished and the probe reboots automatically.



*Probe Configuration Tool: Upgrade CX280X Software*

The **Software Version** field on the **VeSion Probe Settings** page (**Settings > Server & Device > CX280X**) should be updated to reflect the latest upgrade installed.

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## 18.0 Certifications and Declarations



### What is CE?

The CE marking is a mandatory European marking for certain product groups to indicate conformity with the essential health and safety requirements set out in European Directives. To permit the use of a CE mark on a product, proof that the item meets the relevant requirements must be documented.

Use of this logo implies that the unit conforms to requirements of European Union and European Free Trade Association (EFTA). EN61010-1

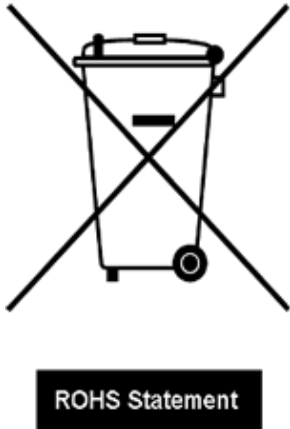
**For a copy of the CE Declaration of Conformity relating to VeEX products, please contact VeEX customer service.**

### RoHS Compliance

#### VeEX QUALITY AND ENVIRONMENTAL POLICY

Our quality and environmental policy is to limit and progressively eliminate the use of hazardous substances and chemicals in the design and manufacture of our products.

VeEX products are classified as Monitoring and Control Instruments under Article 2, Section (1), Category 9 of the WEEE 2002/96/EC Directive.



#### RoHS and WEEE Position Statement

The Council of the European Union and the European Parliament adopted Directive 2002/95/EC (January 27, 2003), to Reduce the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment, and Directive 2002/96/EC on Waste Electrical and Electronics Equipment (WEEE), with the purpose of reducing the environmental impact of waste electrical and electronic equipment. Both were later recast by Directives 2011/65/EU and 2012/19/EU respectively. All VeEX products being placed on the EU market conform with these directives.

Additional RoHS substance restrictions for the Monitoring and Control Instruments were adopted by EU Directive 2015/863 (March 31, 2015). These new restrictions will take effect from July 22, 2021. VeEX has established a program to ensure that from July 22, 2021, all its products to be sold and shipped into the EU market will conform with (EU) 2015/863.

VeEX Inc. is committed to comply with RoHS and WEEE Directives to minimize the environmental impact of our products.

For more information about RoHS as it relates to VeEX Inc, go to the VeEX web site at <https://www.veexinc.com/company/rohscompliance>.

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## 19.0 About VeEX

VeEX Inc., a customer-oriented communications test and measurement company, develops innovative test and monitoring solutions for next generation telecommunication networks and services. With a blend of advanced technologies and vast technical expertise, VeEX products address all stages of network deployment, maintenance, field service turn-up, and integrate service verification features across copper, fiber optics, CATV/DOCSIS, mobile 4G/5G backhaul and fronthaul, next generation transport network, Fibre Channel, carrier & metro Ethernet technologies, WLAN and synchronization.

Visit us online at [www.veexinc.com](http://www.veexinc.com) for the latest updates and additional documentation.

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