XPERTrak 4.1

User's Guide

Notice

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About this Guide

Thank you for purchasing XPERTrak™. This prefix explains how to use this manual to get you up and running with the software as soon as possible.

Purpose and scope

The purpose of this guide is to help you successfully use the XPERTrak features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the XPERTrak System. Additionally, this guide provides a complete description of Viavi's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the XPERTrak System effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

Technical Assistance

If you require technical assistance, call 1-844-GO-VIAVI / 1.844.468.4284.

Outside US: +1-855-275-5378

Email: **CATVsupport@viavisolutions.com**

For the latest TAC information, visit

https://support.viavisolutions.com

https://www.viavisolutions.com/en/services-and-support/support/technical-assistance

1

Introduction

This chapter provides an overview of the XPERTrak System and its key features, including the following:

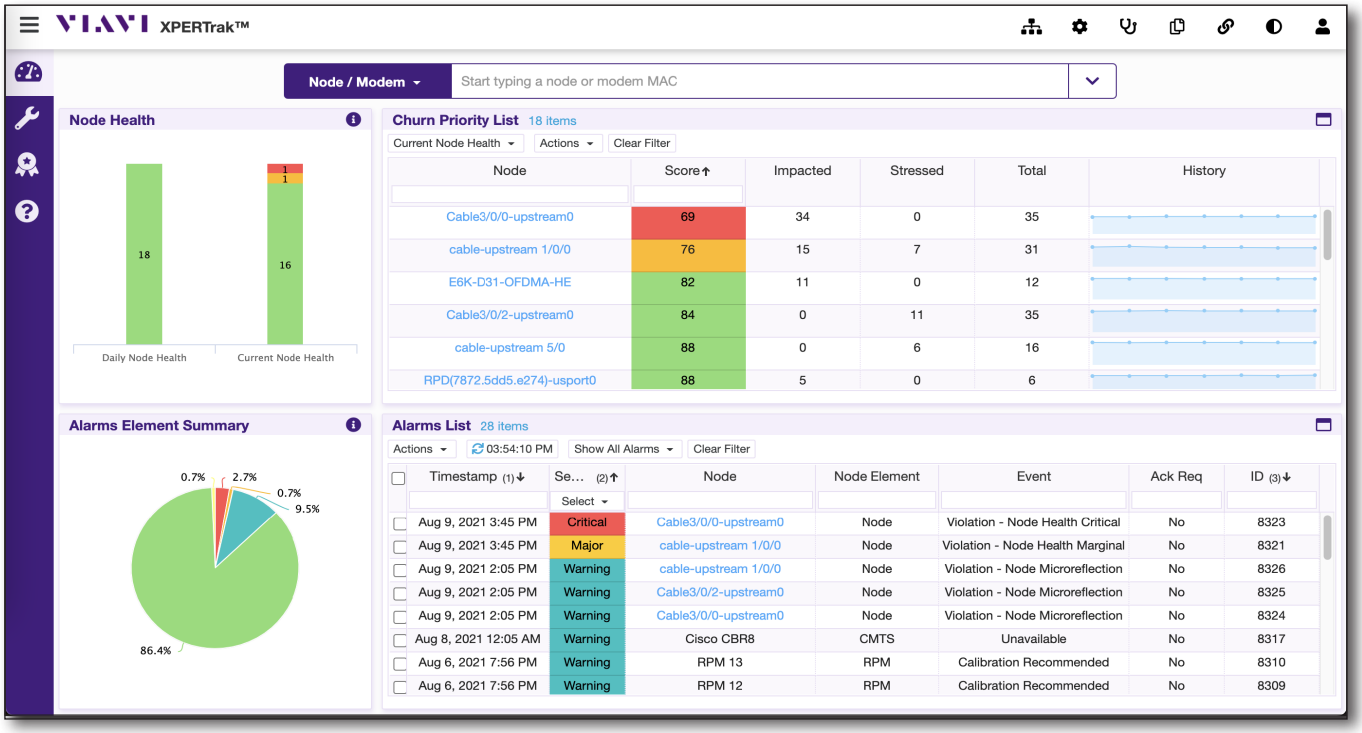
- "About the XPERTrak System" on page 16

About the XPERTrak System

There are many systems available today to turn dashboard indicators red, but only XPERTrak™ also gives you the insight and tools to help you turn them green. Spot at-risk subscribers before they churn by prioritizing plant issues based on customer impact. Address the issues quickly with integrated find and fix tools, including field meter, smart phone, and tablet interaction. Virtualized systems simplify the transition to new HFC technologies, like Remote PHY, and enable continuity of critical HFC maintenance capabilities.

XPERTrak is the next step in industry-leading systems from VIAVI designed with an enhanced focus on at-risk subscribers. XPERTrak correlates data from deployed network elements and optional PathTrak hardware to assemble a QoE-based view of HFC plant performance.

Designed with emerging technologies such as Remote PHY in mind, virtualization support is at the core of XPERTrak. Regardless of the underlying plant architecture or service provision equipment vendor in use, XPERTrak is the neutral solution to allow consistent service level measurement and superior find and fix capabilities across your entire footprint today and into the future.



XPERTrak Main Dashboard

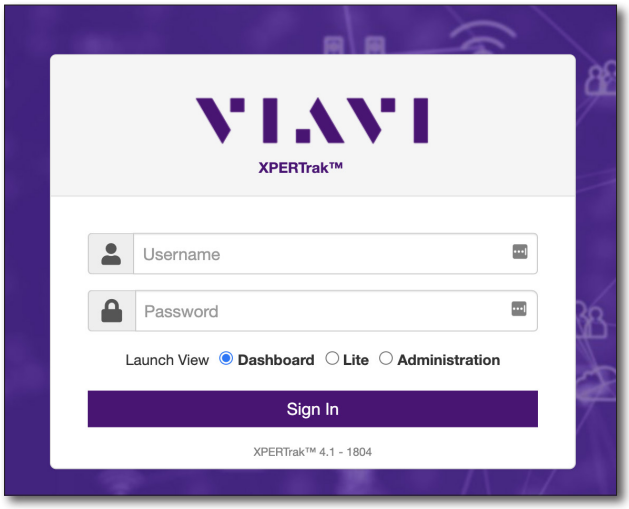
2

Getting Started

This chapter provides steps to get started using XPERTrak, including the following:

- "Connecting to XPERTrak" on page 18
- "Updating Your User Profile" on page 19
- "Setting up XPERTrak" on page 20
- "XPERTrak Visual Overview" on page 21
- "Connecting to XPERTrak Mobile" on page 26

Connecting to XPERTrak



Welcome to XPERTrak! To bring up the XPERTrak login screen from your browser, type the IP address or host name for your server and press return.

Your XPERTrak administrator may have already created a browser bookmark and user account for you.

If you are not using the default web port of 80, the format is:

IP of server:port/pathtrak

Example: http://10.10.10.10:8082/pathtrak

Enter your Username and Password, select the launch view (**Dashboard**, **Lite**, or **Administration**), then select the **Sign In** button.

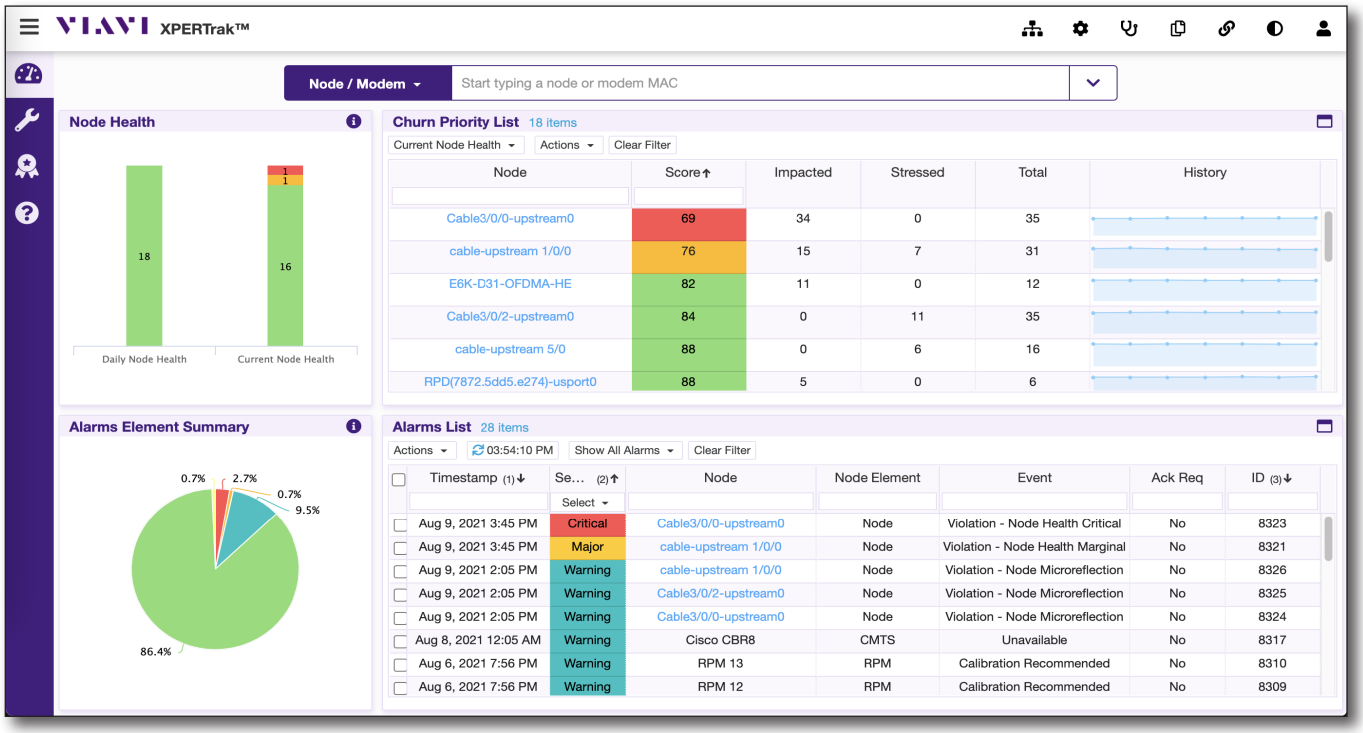
For more information on the Launch View options, see the following sections.

The default login for a new install is:

User: admin

Password: admin

Note: If you need help logging in, contact your XPERTrak administrator. If using LDAP, it may take some time to log in and will show a loading icon.



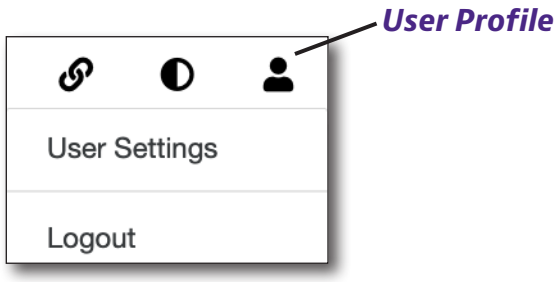
XPERTrak Main Dashboard

Updating Your User Profile

Your XPERTrak administrator should have already created an account for you. To update your user information, click **User Profile** in the Main toolbar at the top right of the screen, and select ***User Settings*** from the dropdown.

To logout your account, select ***Logout*** from the dropdown.

If you didn't receive login info, contact your XPERTrak administrator.



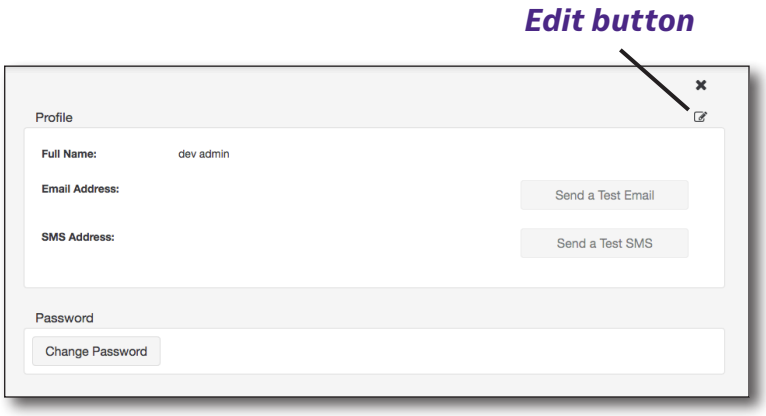
User Profile dropdown menu from the Main toolbar.

User Settings

The **User Settings** screen allows you to update your name, email address, and SMS address for texts.

You can even send test messages from here.

Click the **Edit** button to make changes. When done, click **Save** to confirm.



Change Password

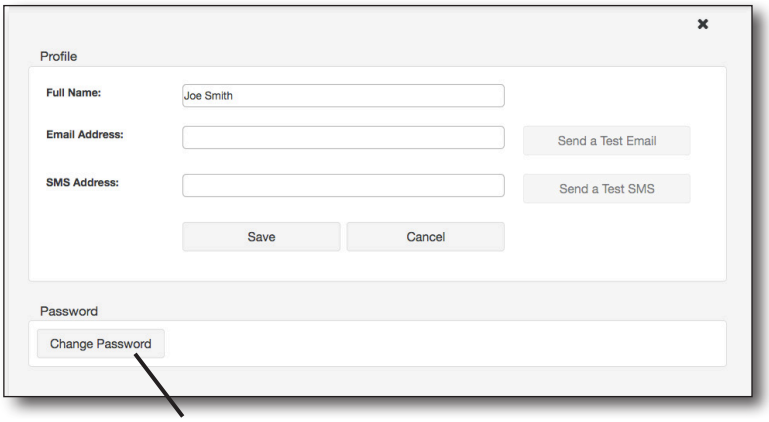
Click the **Change Password** button to update your password.

Enter the existing password, then the new one. Enter it again to confirm.

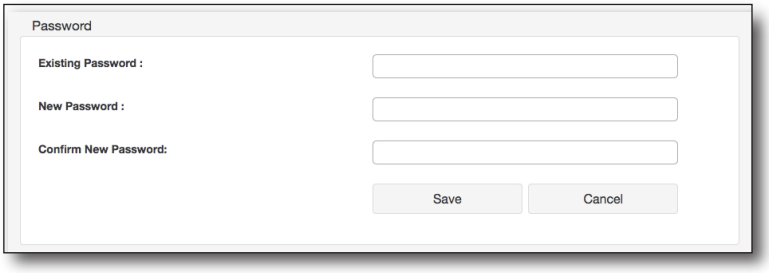
When done, click **Save** to confirm.

Note: Your password may be managed by an LDAP server.

If you need help changing your password, contact your XPERTrak administrator.



Change Password



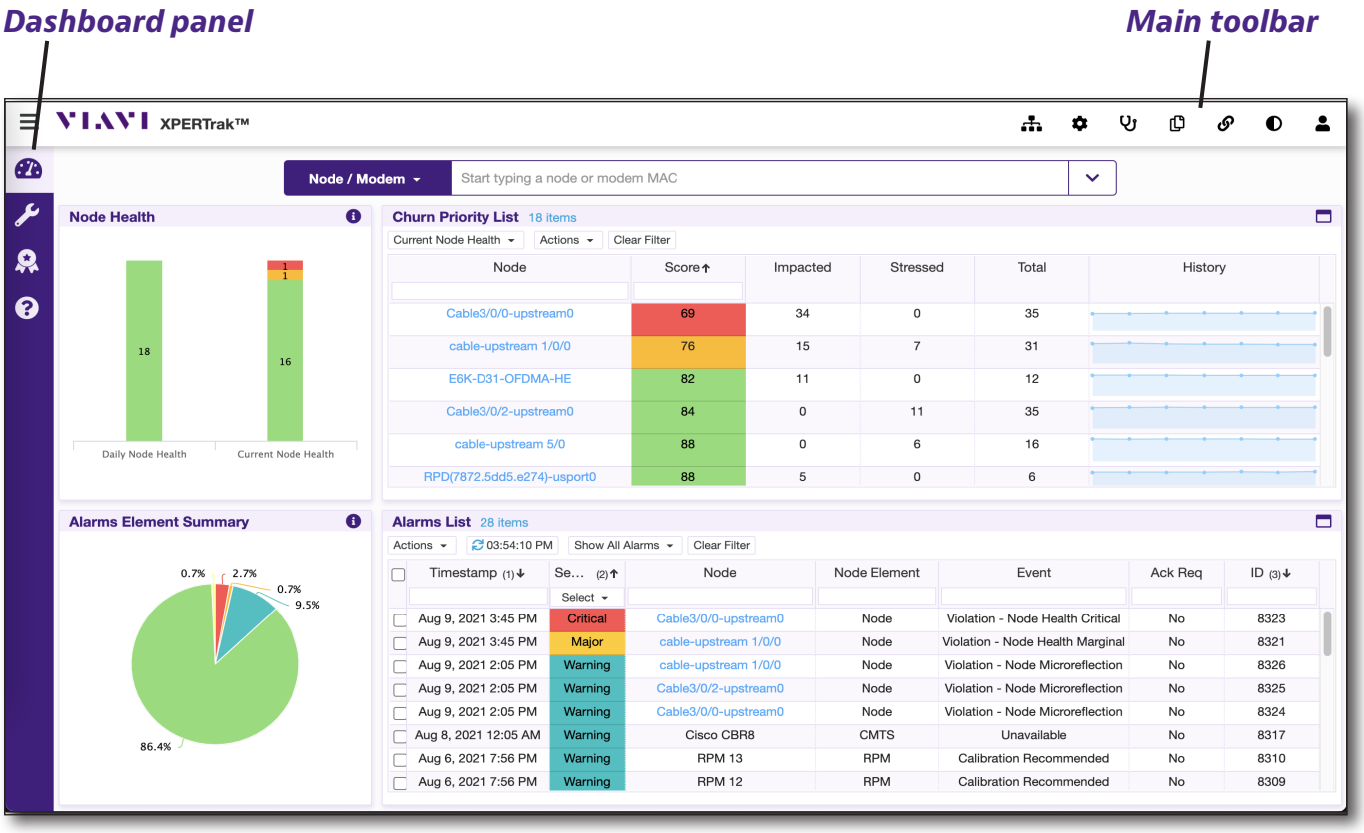
Setting up XPERTrak

For more detailed information on configuring and managing the system for administrators, see *"Configuration" on page 185*.

NOTE:

***For additional help, contact* 1-844-GO-VIAVI / 1-844-468-4284 or *CATVsupport@viavisolutions.com*.**

XPERTrak Visual Overview

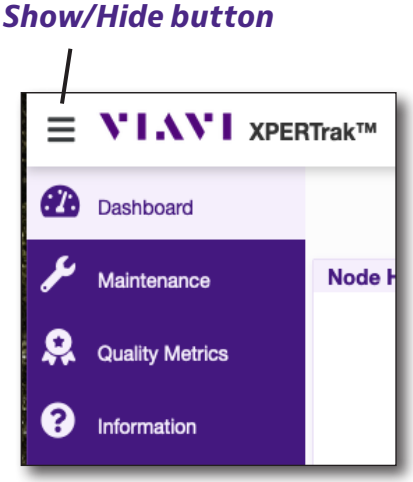


XPERTrak Main Dashboard

Navigation

Most of the navigation in the XPERTrak System is done through the **Dashboard panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right corner of the screen), as shown above.

Dashboard Panel



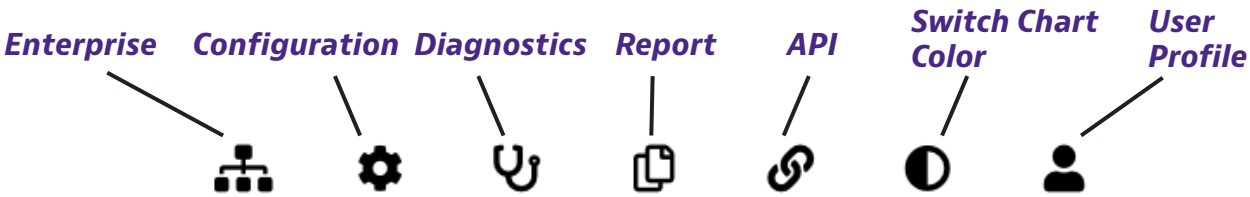
Select the icons within this panel to navigate between the **Main Dashboard** (home page), **Maintenance**, **Quality Metrics**, and **Information** screens.

The **Show/Hide** button next to the VIAVI XPERTrak logo expands or collapses the **Dashboard panel** to show/hide the name of the icons.

This button is also used in other areas of XPERTrak to show the available modules, such as the CMTS Spectrum Analyzer or MACTrak Performance View.

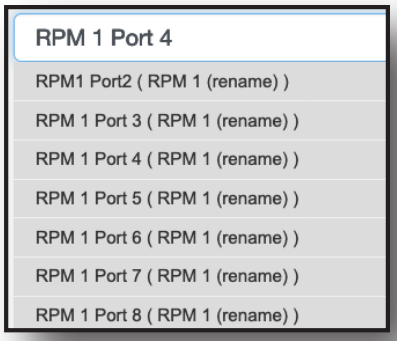
Main Toolbar

Along the top right side of the screen are several menu items, as shown below.

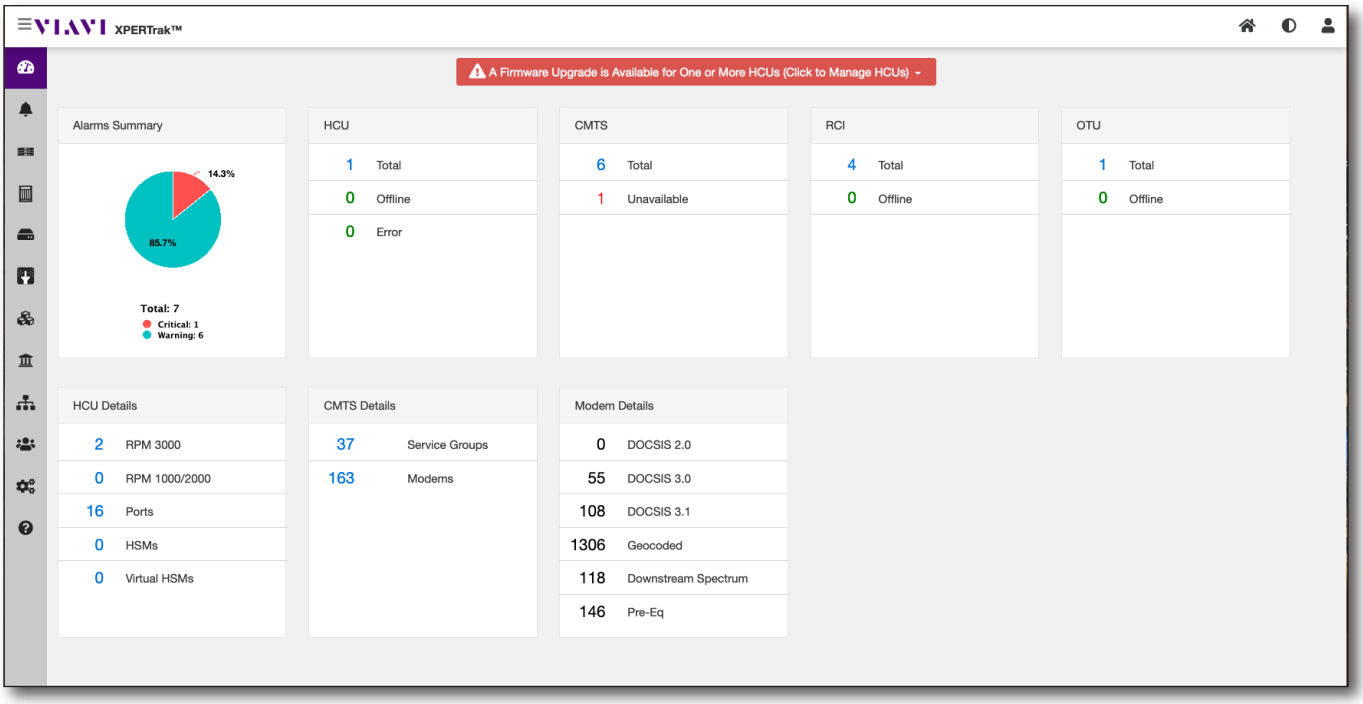


Enterprise – Enterprise is an application giving a multi-server view of PathTrak monitoring. For an enterprise view of HFC Assurance, the VIAVI Nitro BI application is available.

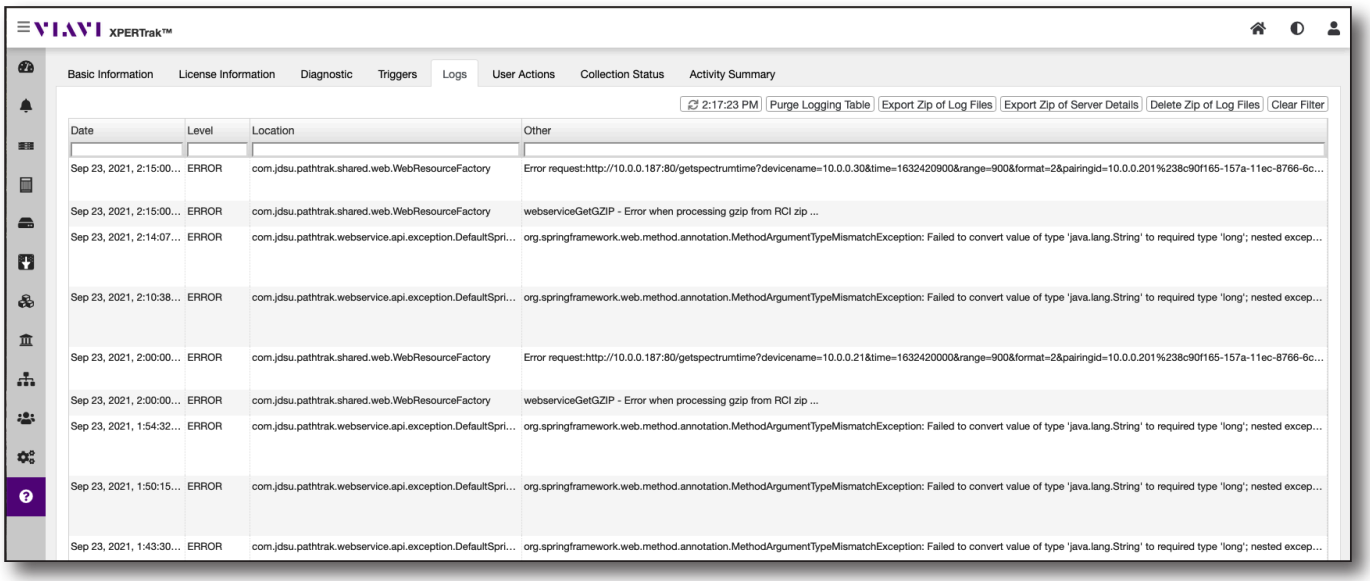
In **Enterprise Search**, search by RPM and port number or by node. **Enterprise Performace** shows details by Regions or Systems for monthly or daily detail.



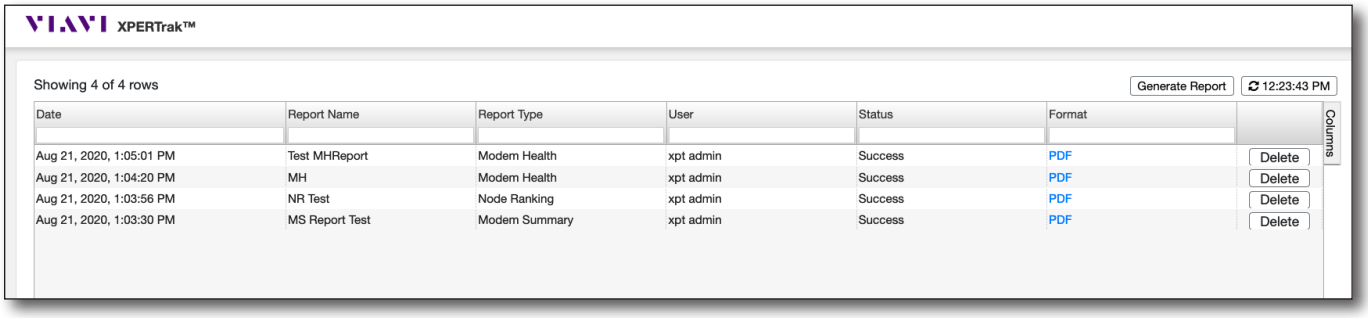
Configuration – This feature is used to access the configuration features including administration tasks, CMTS configuration, modem uploads, system settings, and license management. See *"Configuration" on page 186*.



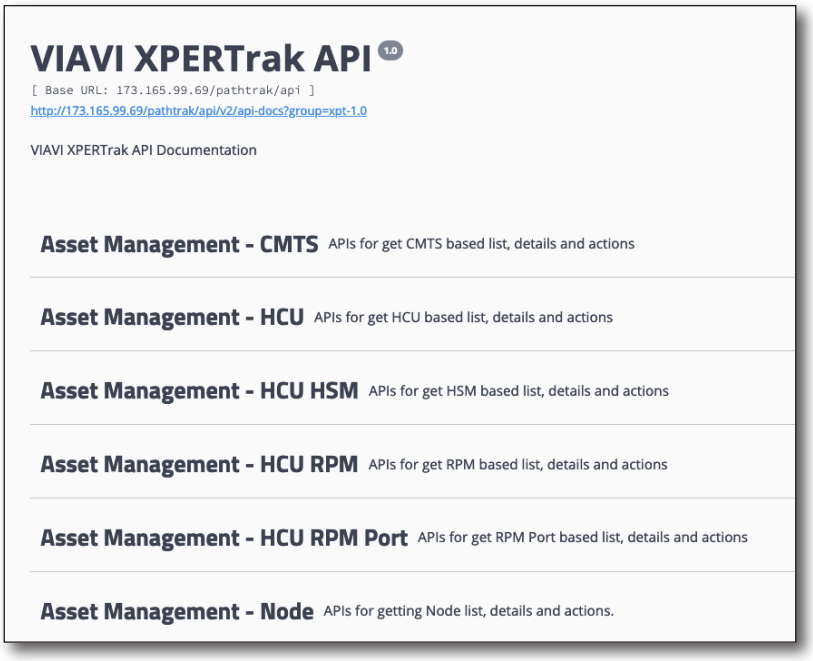
Diagnostics – This feature is used to view diagnostics and server logs of the XPERTrak System. See *"Logs Tab" on page 250*.



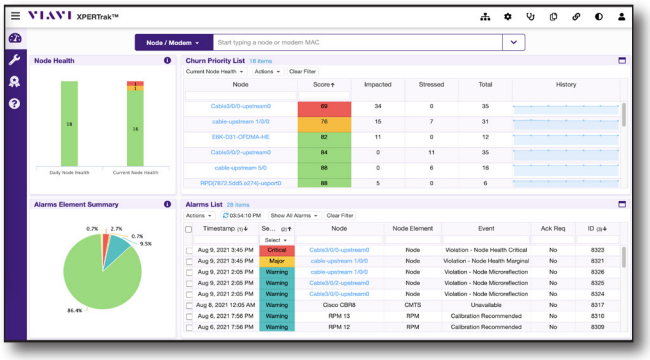
Reports – This feature is used to view detailed reports of the XPERTrak System. See *"Reports" on page 180*.

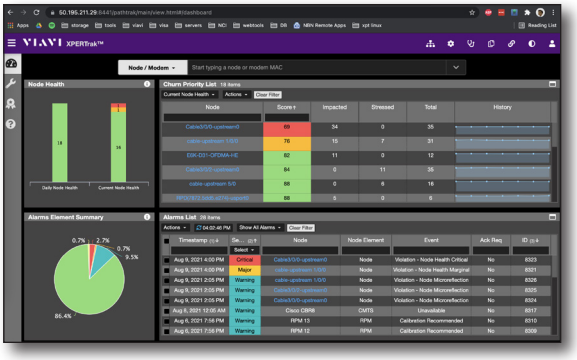


API – This feature is used to view documentation related to the Application Programming Interface (API) of the XPERTrak System.



Switch Chart Color – This feature is used to control the color palette of the XPERTrak System. Selecting this icon will toggle between the light and dark themes, as shown below.

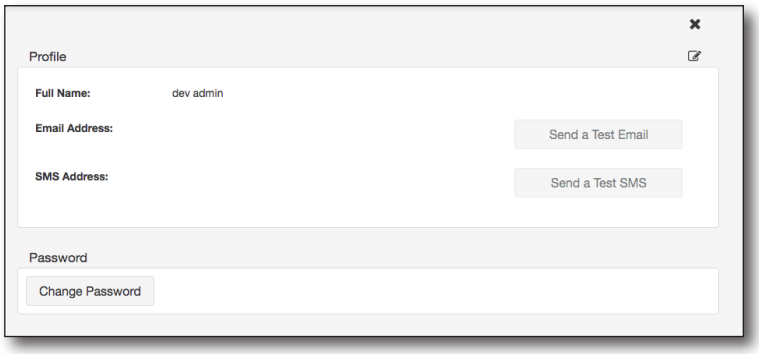




User Profile – This feature is used to access the current user's profile information or logout of the XPERTrak System.

Within the user's profile you are able to adjust the full name, email address, SMS address, and change passwords.

See *"Updating Your User Profile" on page 19*.

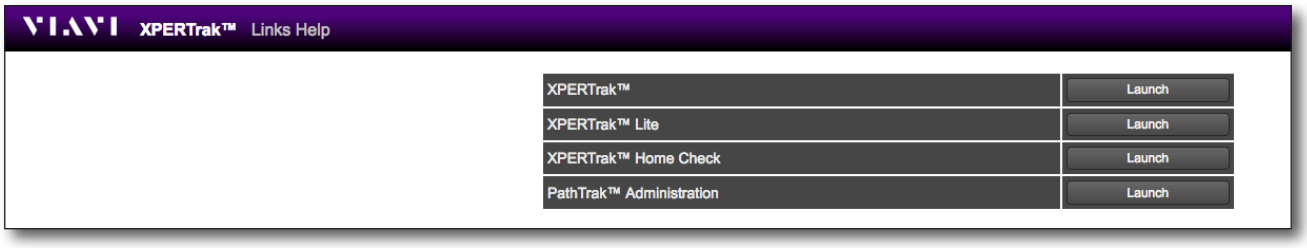


Connecting to XPERTrak Mobile

You can connect to XPERTrak using your smart phone or tablet anytime, anywhere.

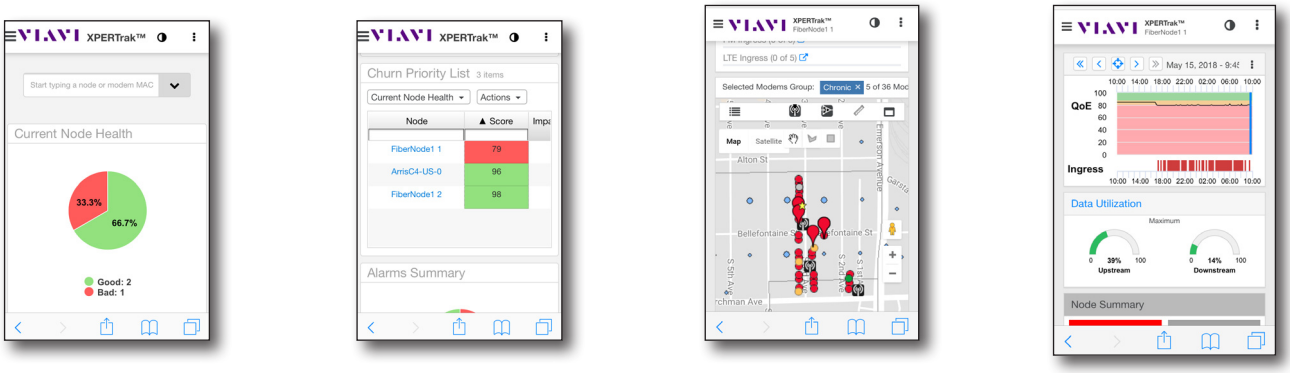
To bring up the XPERTrak Mobile links from your browser, type the IP address or host name for your server, add **/pathtrak/help,** and hit return. Then log in with your username as password, as usual.

Your XPERTrak administrator may also have already created a browser bookmark for you.



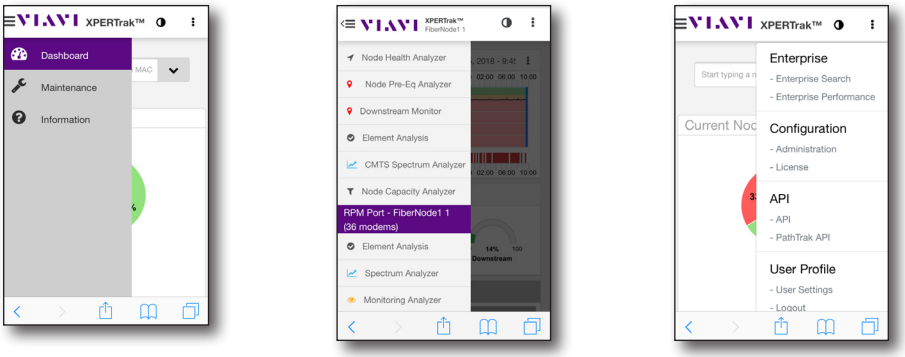
The **XPERTrak Help** menu will display, as shown above, and includes:

- **XPERTrak** – Takes you to the XPERTrak Main Dashboard.



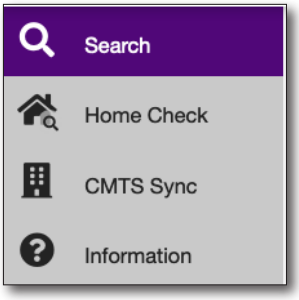
All of the features of XPERTrak are available on your mobile browser, as shown here on an iPhone.

At a glance, you can see your Main Dashboard, Node Map, and Node Health Analyzer, etc.



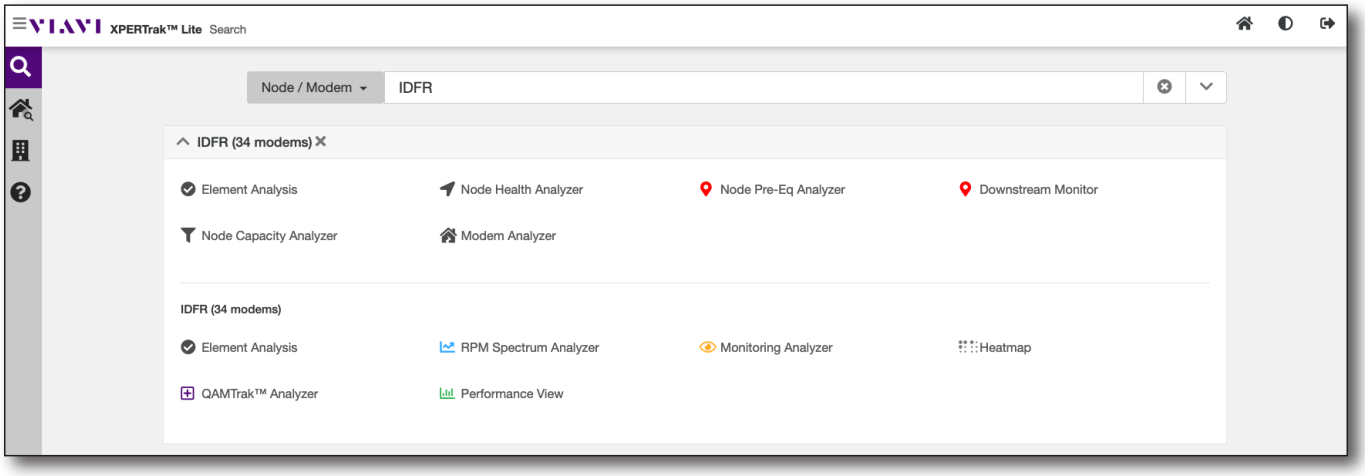
The menus work very similarly to the web version, as well.

- **XPERTrak Lite** – XPERTrak Lite provides a focused user interface to allow users to get to commonly used displays without having to log in through the main dashboard. It allows you to search for an RPM port, fiber node, modem MAC address, name, or field and provides links to corresponding modules for more detailed investigation. You can also use the dropdown to choose a specific field you want to search.



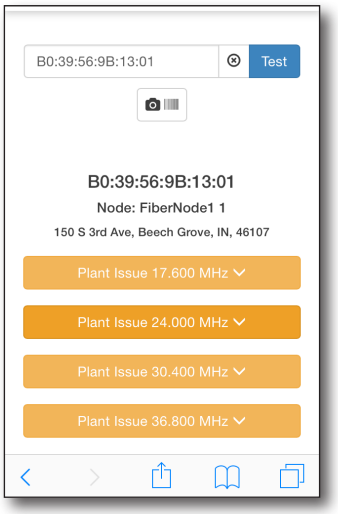
  This screen may vary from what is shown here, depending on what you search, e.g. node, RPM port, RPD, modem, etc.

  You can also get to XPERTrak Lite directly by adding **/pathtrak/lite** to your IP address or host name.



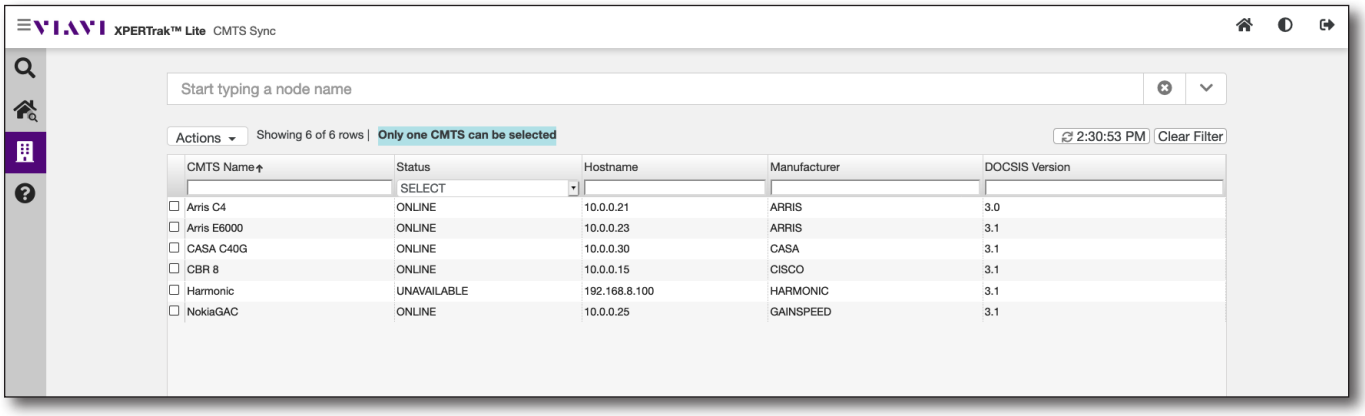
Enter a node, port, or MAC address in XPERTrak Lite, then use the module links to go right to the detail.

- **XPERTrak Home Check** – Allows you to check a modem MAC address for potential issues.

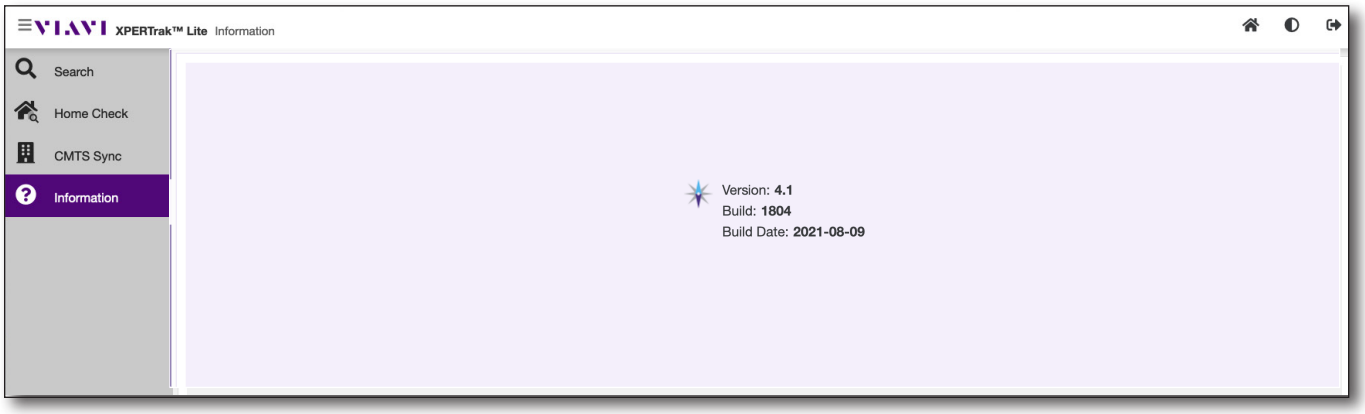


- **CMTS Sync** – Forces a CMTS sync, which updates all the node logical information. This would be done if a node was split on the CMTS, or new QAMs were added, for example. After a sync is completed, these changes will be known to XPERTrak.

  You must have permissions in the Admin settings to sync the CMTS. See ***"Roles Tab" on page 220.***

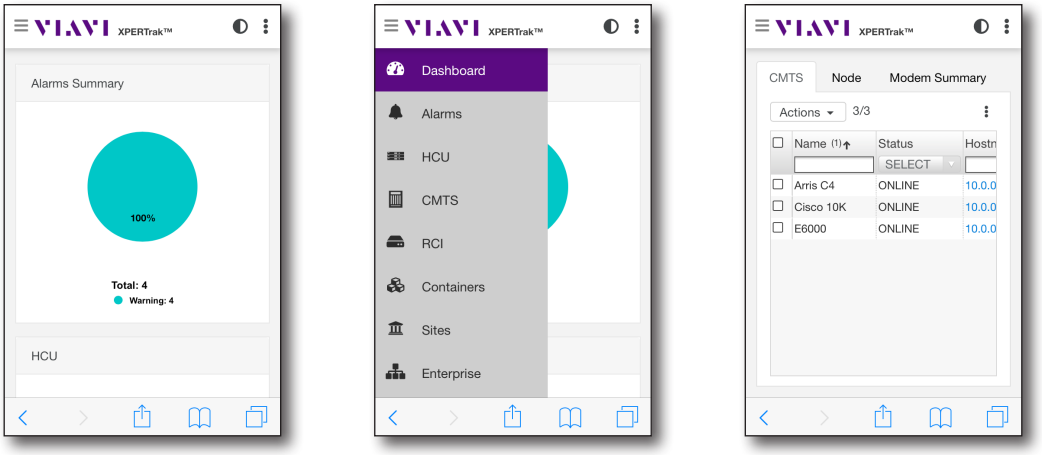


- **Information** – Allows you to see the current XPERTrak software version.



- **PathTrak Administration** – Takes you to the XPERTrak Administration section for advanced configuration and monitoring.

  This must be done by an XPERTrak administrator.



All of the features of XPERTrak Administration are available on mobile, as well, giving you a high-level view of your plant and systems.

3

XPERTrak Basics

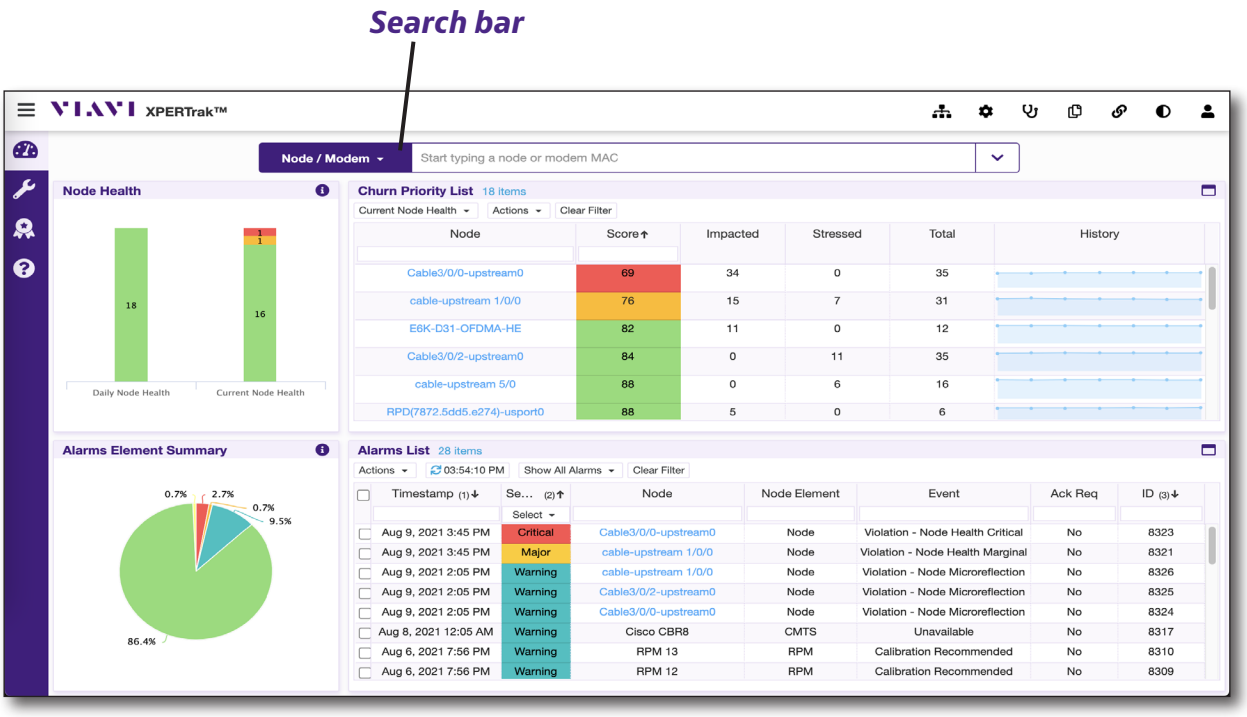
This chapter covers how to use the XPERTrak System, including the following:

- "Main Dashboard" on page 32
- "Proactive Network Maintenance Dashboard" on page 38
- "Quality Metrics Dashboard" on page 43
- "Information Dashboard" on page 46

Main Dashboard

The **XPERTrak Main Dashboard** is the default view that appears after initial login, as shown below. This view is used to easily determine overall plant health and quickly provide access to detailed measurement data and alarms for affected nodes.

It also appears after selecting the gauge from the **Dashboard panel.**



XPERTrak Main Dashboard

Searching from the Dashboard

You can search any node, port, modem MAC address, name, or field easily using the **Search Bar** at the top. Type a few keywords, and all related information will come up. You can also use the dropdown to choose a specific field to search.

The last 6 searchable fields are user defined and will reflect what is entered. It will be searchable based on what fields are used and what data is in them. These fields are defined as part of the topology/ billing system CSV import process. For details, see *"Topology and Billing Import" on page 271.*

Click the link for the results to take you directly to the detail.

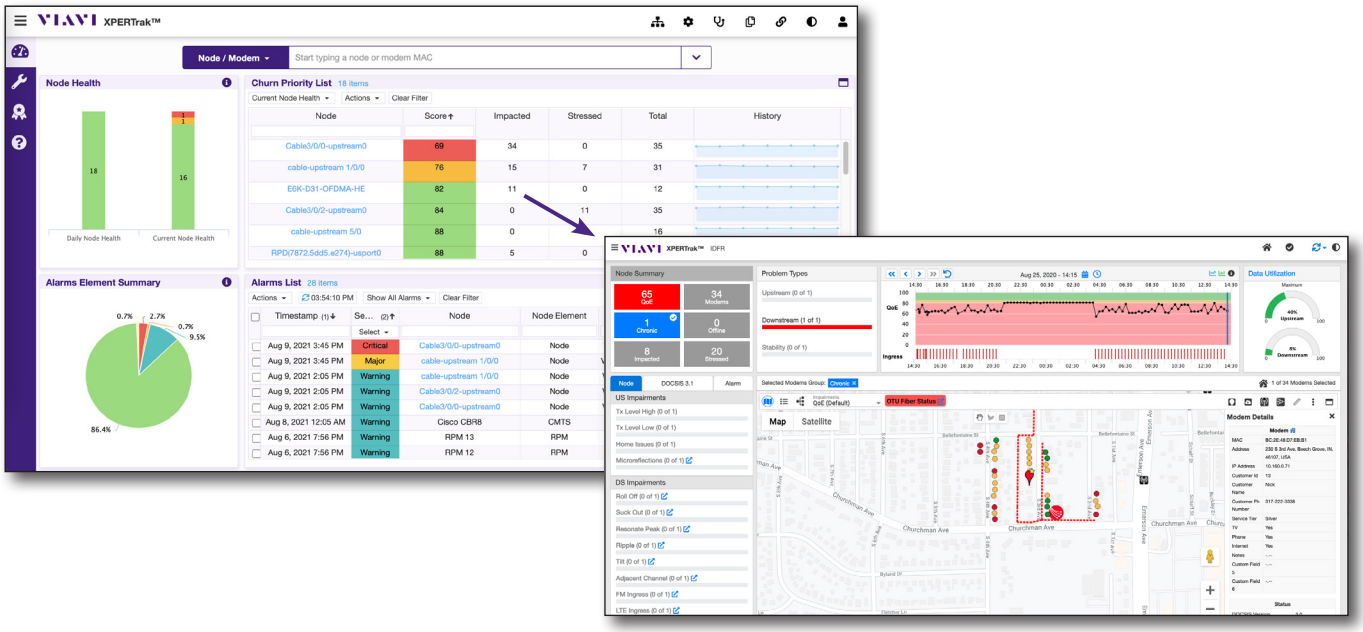
In this example, we searched for Fiber, and clicked "FiberNode1", taking us to the Node Health Analyzer for that node.

Node Health Workflow

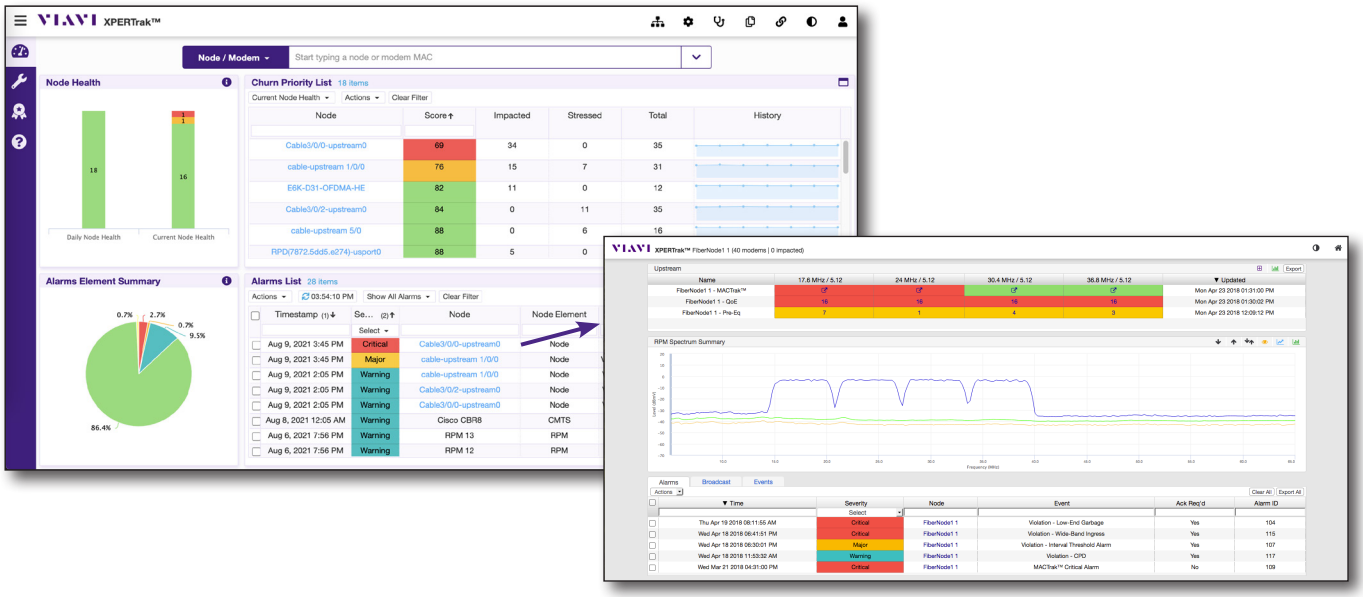
From the Main Dashboard, you can launch right into the detail of a node, including these views:

- **Node Health Analyzer** – PNM or QoE nodes (nodes mapped to a CMTS or DAA port, with or without PathTrak hardware) will link to the Node Health Analyzer screen
- **Node Performance and Alarm Lists**– PathTrak hardware and virtual ports will ink to the Node performance and Alarm lists.

In each case, click the link for the node to open a new tab for the detail.



For PNM, QoE, or DAA nodes, launch the Node Health Analyzer right from the Main Dashboard.

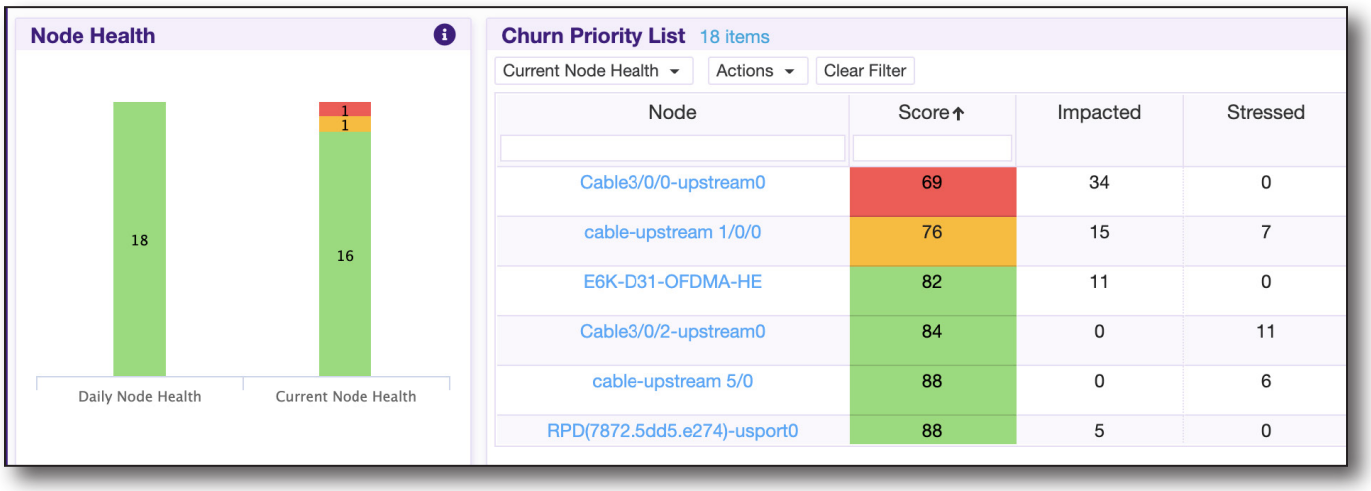


For PathTrak hardware-only and all virtual nodes, launch the Node Performance and Alarms right from the Main Dashboard.

Node Health Graphs (Daily/Current)

These graphs are used to represent the number of good (green), stressed (yellow) and critical (red) nodes within the system. Daily represents the average node health over the past 24 hours, while current averages the health since the last 15 minute poll.

Select a graph to change the score in the Churn Priority List to **Daily** or **Current Node Health**.

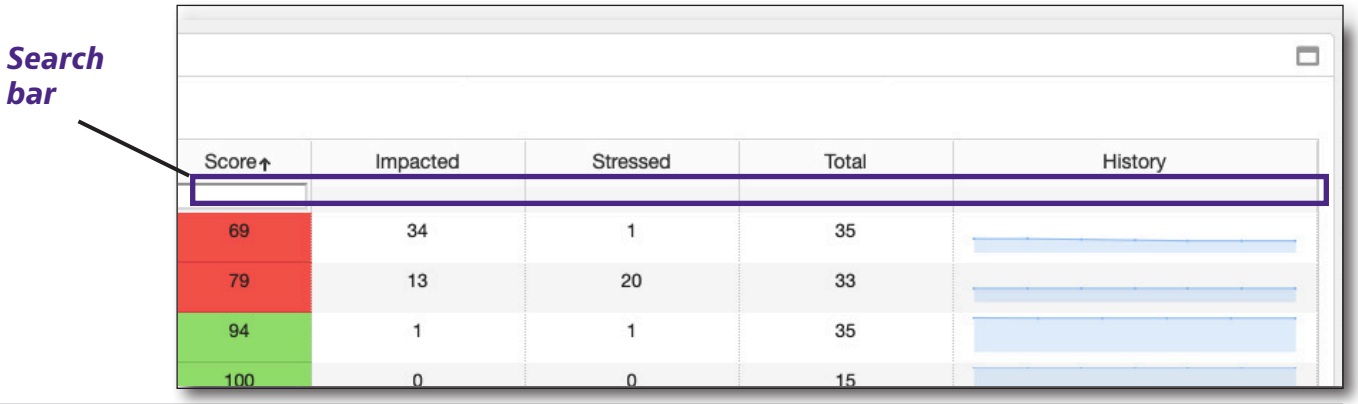


Churn Priority List

The **Churn Priority List** sorts the nodes based on rank, directing the user to the nodes most needing attention. Just click the node name to follow the workflow. Note the node list only shows nodes for which the user has access permissions. The values within this list can be sorted (ascending or descending) by selecting the column header (1st row of table).

By default, this list is sorted by worst to best node health to prioritize the most critical nodes for maintenance (up to 250). If you have more than 250 nodes, select **Show All** from the **Actions** dropdown to show all nodes in the system.

Additionally, you can search within specific data columns by typing a value into the column search bar (2nd row of list).



Note: Remember, you can launch the detail of PNM and QoE nodes right from the Main Dashboard. Click the link for the node to open a new tab for the detail.

See *"Node Health Analyzer" on page 48* , for more information.

- **Node Health dropdown** – Found on the top left of the table and can be used to select between daily/current node health data.
- **Full Screen** ⛶ – Found at the top of the Churn Priority List section, allows you to toggle full screen.
- **Export Table button** – This button can be used to download a CSV Excel file of the current list.

The list provides the following information:

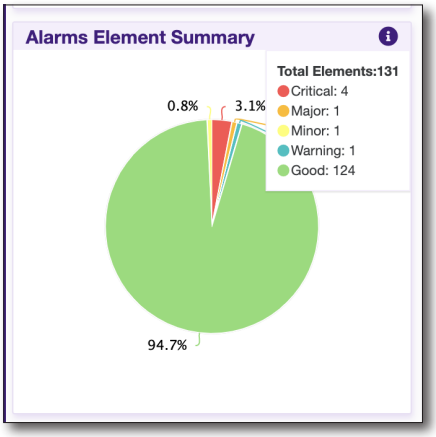
- **Node Name** – The friendly name of the node that is selected during system installation and setup. Select the name of the node to view
- **Node Health Score** – Determined using a configurable algorithm that uses all of the measurements available within the system to calculate an overall health of each node.
- **Impacted Subscribers** – The number of impacted subscribers.

  Depending on whether you have current or daily node health selected, the Impacted Subscribers column refers to the following:

  - **Current Node Health** – Current number of modems with an impacted status.
  - **Daily Node Health** – Highest number of modems with an impacted status during the 24 hour interval.
- **Stressed Subscribers** – The number of stressed subscribers.
- **Total Subscribers** – The total number of subscribers (modems) on the node, including offline and clear modems.
- **History** – Graph providing the history of the node daily health score for the previous 7 days This serves as a quick method of determining whether problems are constant, intermmitent, or trending upward/downward.

Alarms Element Summary Graph

This graph represents the number of nodes within the system that are not critically alarmed (good / green), and are critically alarmed (critical / red) at the current time, including varying degrees of severity. Hover your mouse over **Info** for more detail.



The accompanying graph also displays the percentage of non-critically alarmed and critically alarmed nodes within the system.

The graph shows the number of nodes with critical, major, and no alarms from PathTrak, QoE, or PNM data sources.

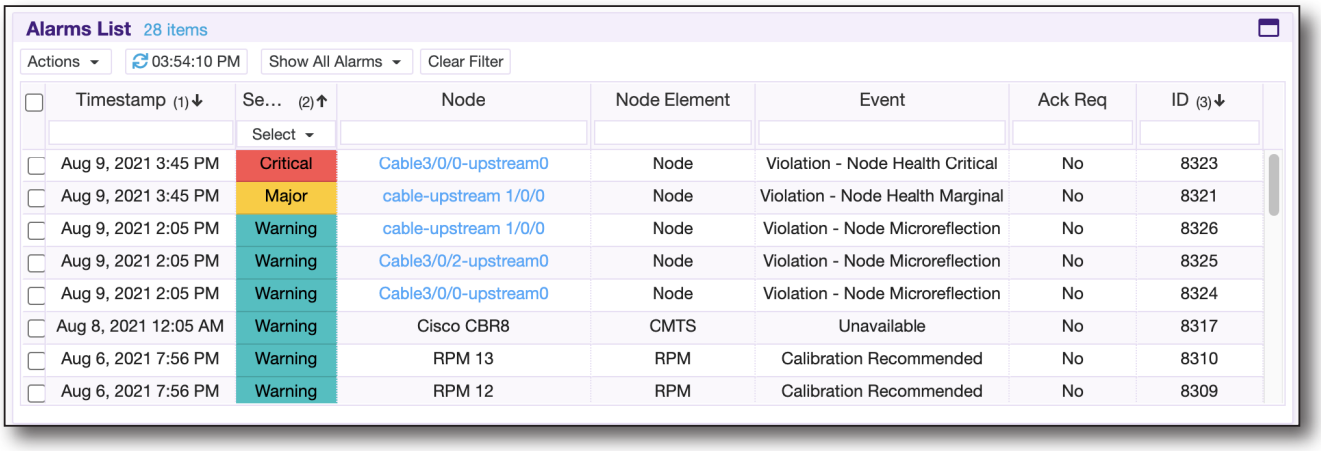
Alarms List

This list is used to display the current nodes that are in alarm within the system. The values within this list can be sorted (ascending or descending) by simply selecting the column header (1st row of table). Selections made will persist on the next login.

If you have imported your topology information, you can also see the street alarms that have been triggered. See *"Appendix" on page 253* for more information.

By default, the list is sorted by oldest to newest time to prioritize the oldest alarms for maintenance (up to 100 alarms). If you have more than 100 alarms, select **Show All** from the **Actions** dropdown to show all alarms.

Additionally, you can search within specific data columns by typing a value into the column search area (2nd row of list).



Note: Remember, you can launch the detail of PathTrak hardware-only nodes (RPM ports) right from the Main Dashboard. Click the link for the node to open a new tab for the detail.

See *"Node Performance" on page 91* for more information.

- **Actions dropdown** – The **Actions** dropdown to the top left of the table can be used to clear alarms within the table that have been selected using the checkboxes to the far left of each row in the table and then choosing **Clear All** or **Clear Selected**. To select all items within the table, select the check box at the top left corner of the table.

  Additionally, this dropdown can be used to download a CSV file of the current list using **Export All** or **Export Selected** and **Show More** or **Show Less**, depending what is selected.

- **Show All Alarms** –Filter by **Network Alarms** or **All Alarms**.

  All Alarms adds equipment alarms to the list such as PathTrak hardware alarms or CMTS connectivity alarms. The equipment alarms are also viewed in the configuration section using the Alarms dashboard.

- **Full Screen** ⬜ – Found at the top of this section, allows you to toggle full screen.

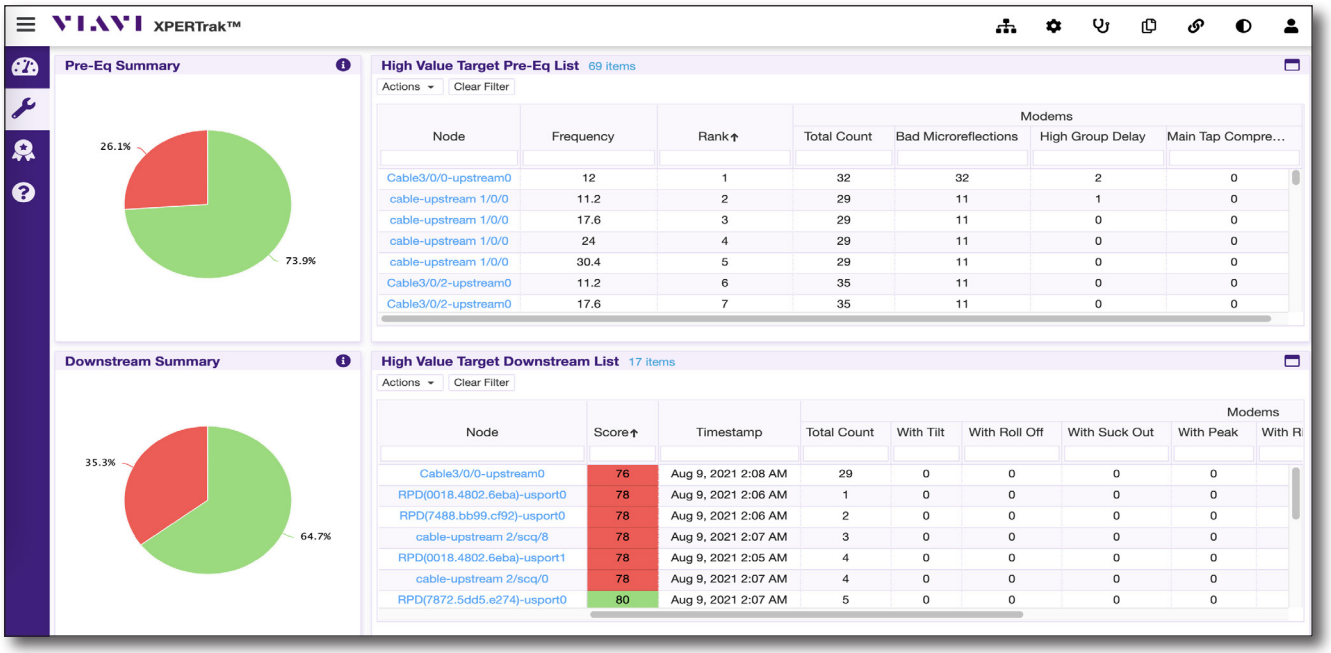
The list provides the following information:

- **Time** – The date and time of the alarm.

- **Alarm Severity** – The severity of the alarm (Critical, Major, Minor, or Warning). The table can be filtered by alarm severity by selecting the dropdown list at the top of the column and then choosing the desired alarm severity.
- **Node Name** – The name defined by the label of the RPM port, topology/billing import data, or interface data from the CMTS. This is the main workflow item and as with all network alarms, the node name is a clickable link, which will take the user to the next logical screen to troubleshoot the affected element.
- **Node Element** – The type of element involved in the alarm, such as a node, CMTS, RPM port, etc.
- **Event Type** – The type of alarm that has been triggered.
- **Acknowledgement Required** – Whether or not an alarm must be acknowledged before it can be dismissed.
- **Alarm ID** – The unique identification number for the alarm that has been triggered.

Proactive Network Maintenance Dashboard

The XPERTrak **Proactive Network Maintenance Dashboard** appears after selecting the wrench from the **Dashboard panel**. This view is tailored specifically to guide maintenance teams to the high-value targets within the HFC network that are experiencing upstream and downstream impairments.

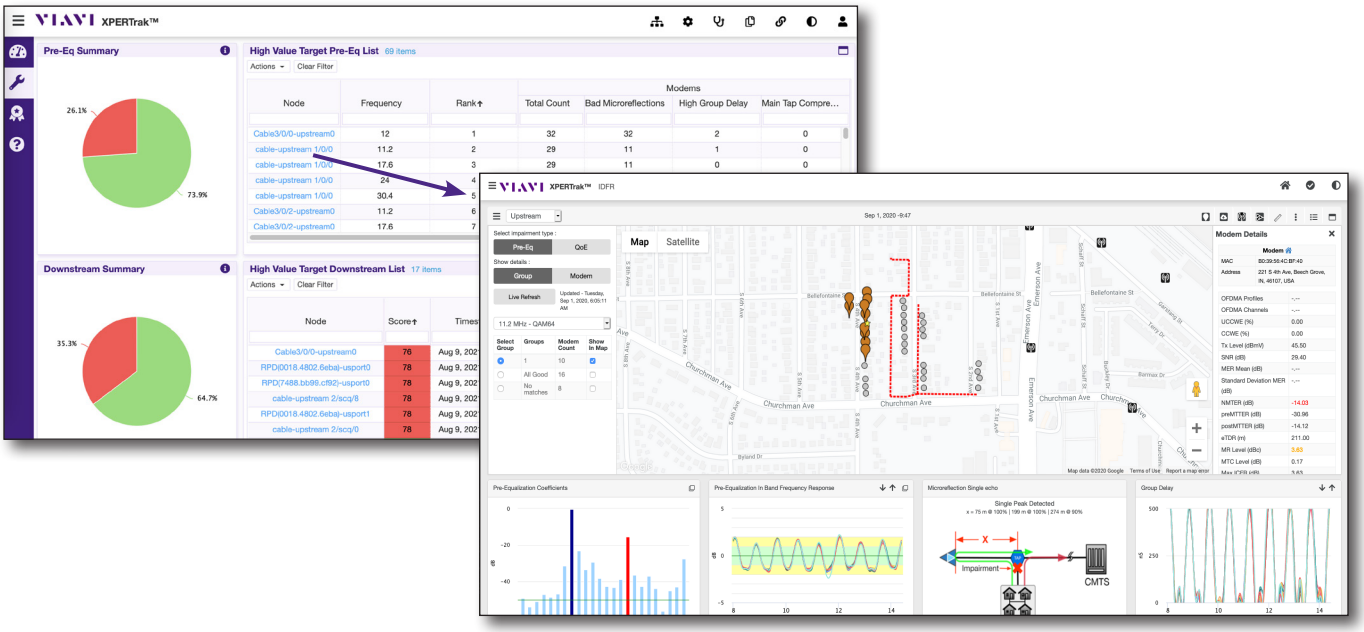


XPERTrak Proactive Network Maintenance Dashboard

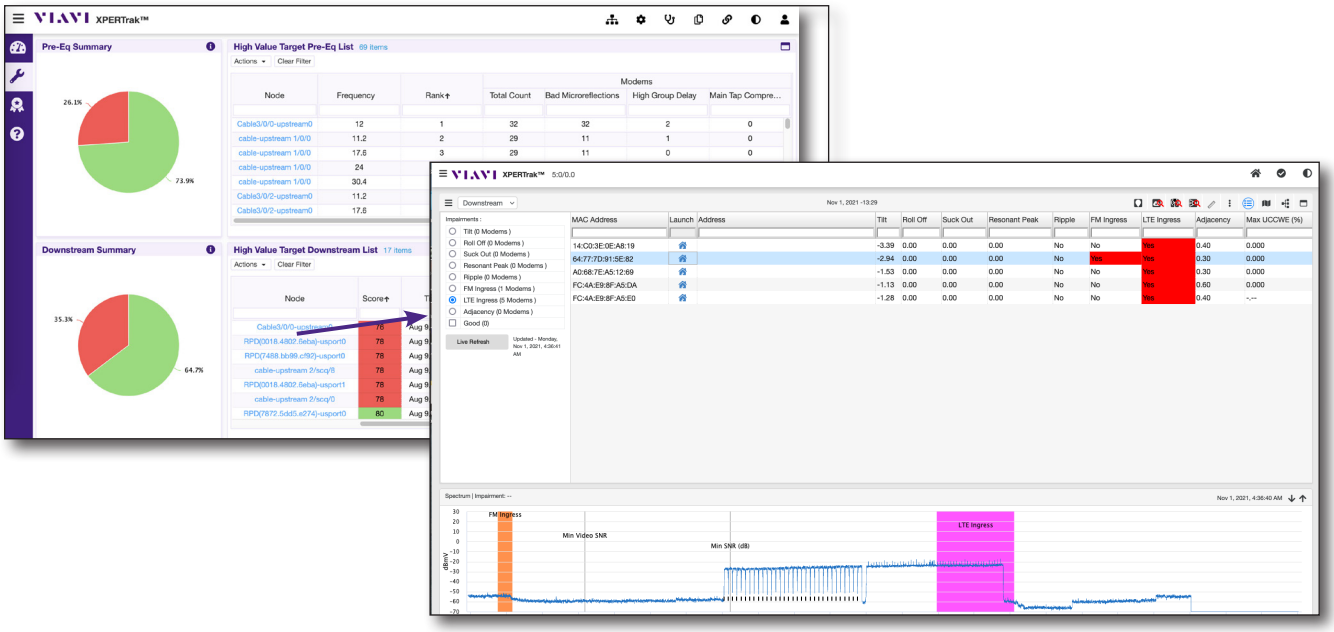
Proactive Network Maintenance Workflow

From the PNM Dashboard, you can launch directly into the upstream and downstream detail of a node.

For the upstream detail, click the link for the channel on the corresponding node. For the downstream detail, including full-band capture of each available modem, click the link for the node.

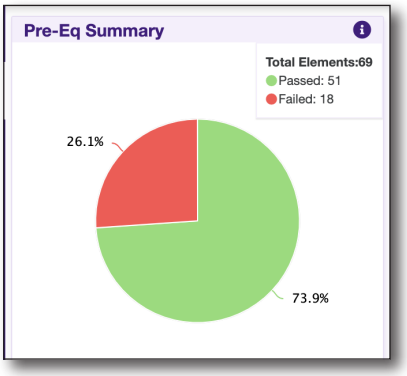


Get to upstream channel detail directly from the PNM Dashboard.



Downstream detail is just a click away, as well.

Pre-Eq Summary Graph



This graph is used to present the number upstream channels within the system that passed upstream PNM (passed - green) and did not pass upstream PNM (failed - red) at the current time. The accompanying pie graph also displays the percentage of passed and failed upstream channels within the system. Hover your mouse over **Info** for more detail.

High-Value Target Pre-Eq List

This table is used to display a list of the current upstream channels within the system. The values within this table can be sorted (ascending or descending) by simply selecting the column header (1st row of table). By default, this table is sorted to rank the upstream channels from 1st to last based on the severity of the impairments and number of affected customers. Additionally, you can search within specific data columns by typing a value into the column search area (2nd row of table).

High Value Target Pre-Eq List 69 items

Actions | Clear Filter

Node	Frequency	Rank	Modems			
			Total Count	Bad Microreflections	High Group Delay	Main Tap Compre…
Cable3/0/0-upstream0	12	1	32	32	2	0
cable-upstream 1/0/0	11.2	2	29	11	1	0
cable-upstream 1/0/0	17.6	3	29	11	0	0
cable-upstream 1/0/0	24	4	29	11	0	0
cable-upstream 1/0/0	30.4	5	29	11	0	0
Cable3/0/2-upstream0	11.2	6	35	11	0	0
Cable3/0/2-upstream0	17.6	7	35	11	0	0

The following global controls are available for this table;

- **Full Screen** – Found at the top of this section, allows you to toggle full screen.
- **Clear Filter –** Clears the sort filters.
- **Export Table** – From the **Actions** dropdown, this button can be used to download a CSV file of the current list.

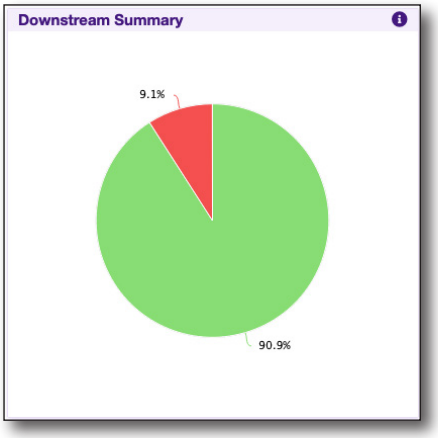
Within this table, you will be presented with the following information;

- **Node Name** – The friendly name of the node that is selected during system installation and setup. Select the name of the node to view
- **Upstream Channel Frequency** – The frequency of each upstream channel within the system.
- **Rank** – The rank from worst to best upstream channel.
- **Total Count** – The number of modems that are Impaired.
- **Bad Microreflections** – The number of modems that have bad microreflections.

- **High Group Delay** – The number of modems that have high group delay.
- **Main Tap Compression** – The number of modems that have main tap compression.

Downstream Summary

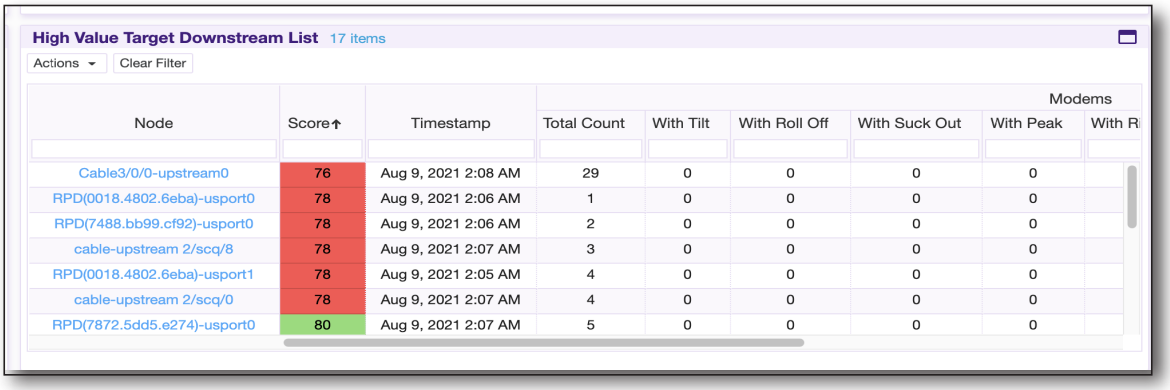
This graph is used to present the number downstream nodes within the system that passed downstream PNM (passed - green) and did not pass downstream PNM (failed - red) at the current time. The accompanying pie graph also displays the percentage of passed and failed downstream nodes within the system. Hover your mouse over **Info** for more detail.



High-Value Target Downstream List

This table is used to display a list of the current downstream nodes within the system. The values within this table can be sorted (ascending or descending) by simply selecting the column header (1st row of table). By default, this table is sorted by downstream node health score from lowest to highest.

Additionally, users can search within specific data columns by typing a value into the column search bar (2nd row of table).



The following global controls are available for this table;

- **Full Screen** – Found at the top of this section, allows you to toggle full screen.
- **Clear Filter –** Clears the sort filters.
- **Export Table** – From the **Actions** dropdown, this button can be used to download a CSV file of the current list.

Within this table you will be presented with the following information;

- **Node Name** – Friendly name of the node that is selected during system installation and setup. Select the name of the node to view.
- **Score** – Downstream node health score.
- **Timestamp** – Date and time of the last measurement.
- **Total Count** – Modems that are Impaired.
- **With Level** – Modems that have bad levels.
- **With Tilt** – Modems that have bad tilt.
- **With Roll Off** – Modems that have bad roll off.
- **With Suck Out** – Modems that have bad suck out.
- **With Peak** – Modems that have bad peak resonance.
- **With Ripple** – Modems that have bad ripple.
- **With FM Ingress** – Modems that have FM ingress.
- **With LTE Ingress** – Modems that have LTE ingress.
- **With Adjacency** – Modems that have bad adjacency.

NOTE:

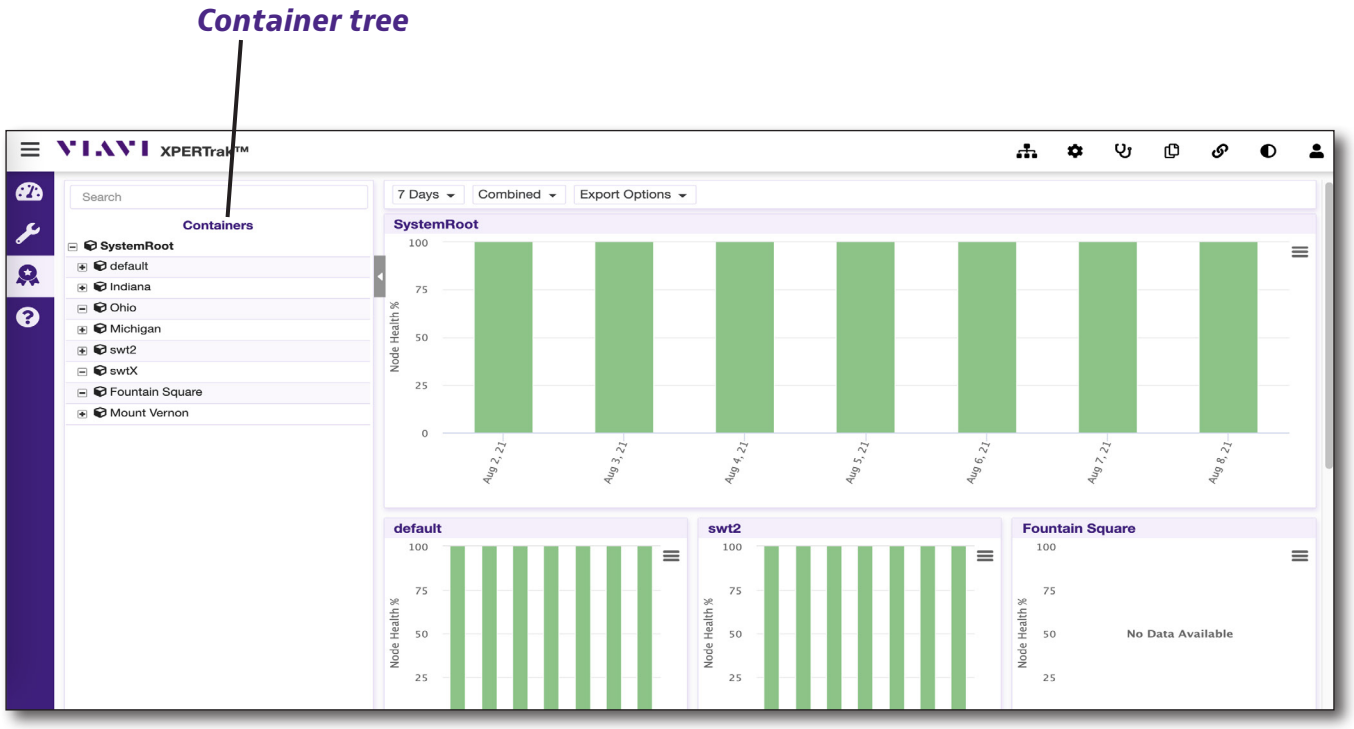
For more detail, see "Downstream Impairments and Thresholds" on page 261.

Quality Metrics Dashboard

The XPERTrak **Quality Metrics Dashboard** appears after selecting the ribbon from the **Dashboard panel**. This view is tailored specifically to allow management the ability to see node health at a very high level, indicated by simple red (critical), yellow (stressed), and green (good) graphs.

You can then use the Container tree and click the plus (+) buttons to drill down further into the HFC network to determine where to send your techs for further investigation. You can also use the search bar on the top of the tree to narrow your search.

From **Export Options**, you can print a chart or save as a PDF. You can also choose an individual chart to export from the **chart options**.



XPERTrak Quality Metrics Dashboard

NOTE:

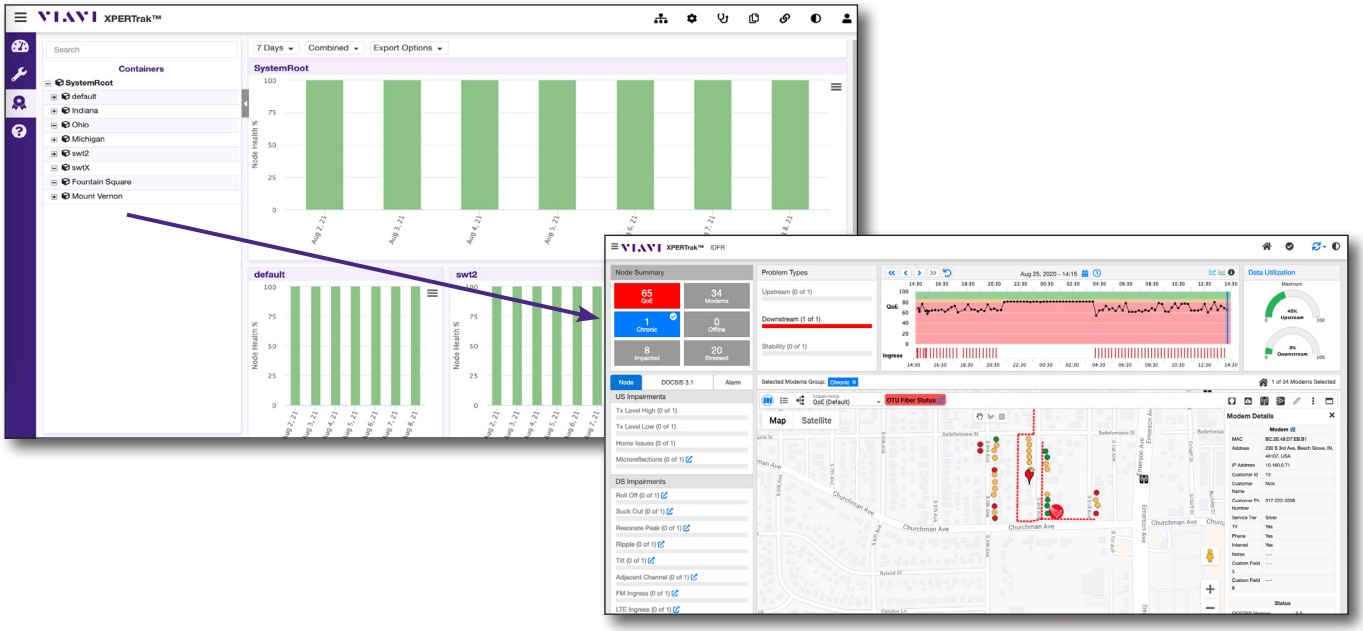
This view will automatically be filtered to show only the nodes you have permission to view.

Quality Metrics Workflow

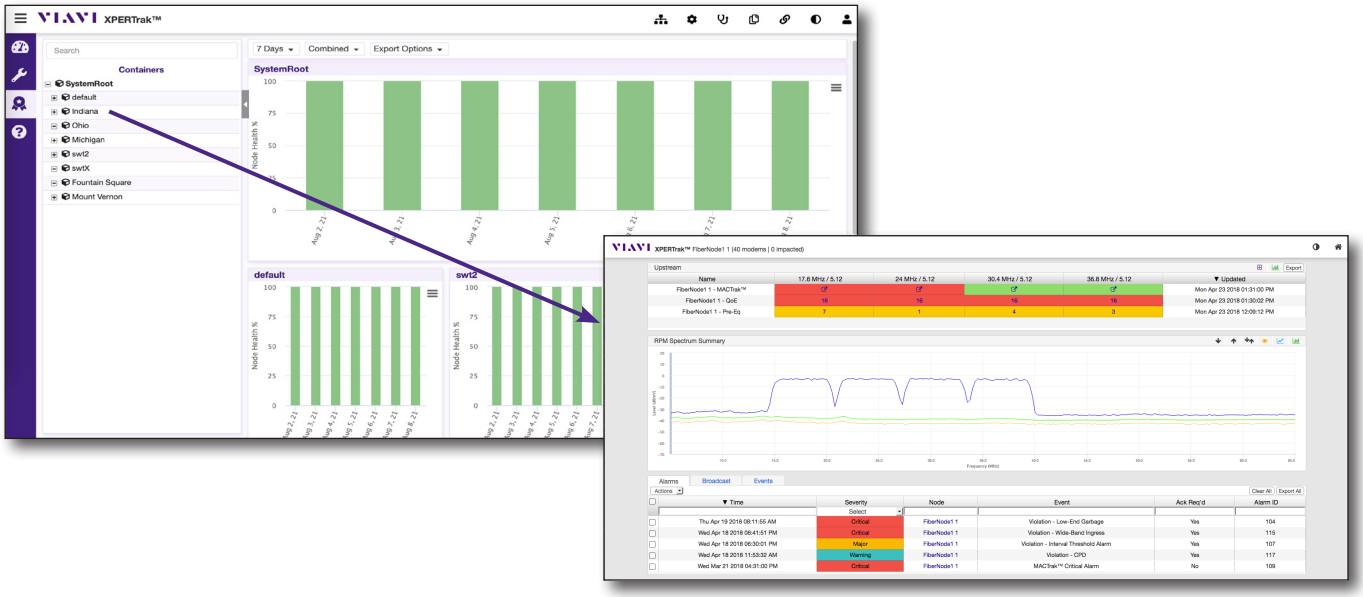
From the Quality Metrics Dashboard, you can launch directly into the detail of a node, including these views:

- **Node Health Analyzer** – PNM or QoE nodes (nodes mapped to a CMTS or DAA port, with or without PathTrak hardware)
- **Node Performance and Alarm Lists**– PathTrak hardware-only nodes (RPM ports)

In each case, click the link for the node to open a new tab for the detail.



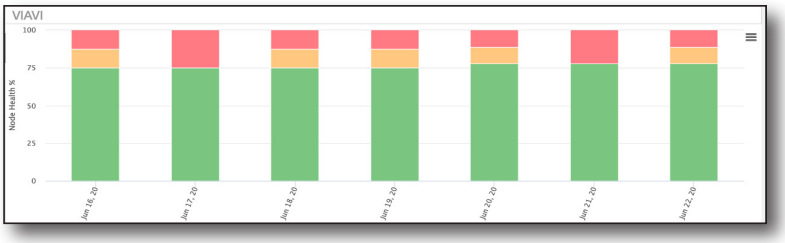
For PNM or QoE nodes, launch the Node Health Analyzer directly from the Quality Metrics Dashboard.



For PathTrak hardware-only nodes, launch the Node Performance and Alarms directly from the Quality Metrics Dashboard.

Server Node Health Chart

This **Server Node Health** chart is used to show the percentage of node health for the selected servers that passed (green), are stressed (yellow), or failed (red) in the last 7 or 30 days.



Container and Node Charts

Below the main server chart are individual charts for all the first-level associated child containers and nodes. If additional children are below a container or node, you can click the name of the chart and drill down to the next lower level.

You can also navigate using the breadcrumb path at the top of the screen by clicking the link for each section, using the container tree, or doing a search.

The following controls are available for these charts;

- **7 or 30 Days** – The time period you want the charts to cover.
- **Type** – The type of chart, choose from the following:

  Combined – Looks at the worst case across all conditions

  QoE – Considers the node health

  MACTrak – Uses the MACTrak NPI score

  Spectrum – Considers status based on spectrum alarm status
- **Export Options**– Print or export the charts to PDF. You can also use the **Options** button for each chart to export them individualy.

Information Dashboard

The XPERTrak **Information Dashboard** appears after selecting the question mark from the **Dashboard panel**. This screen has details about the XPERTrak version, build, and build date.

XPERTrak Information Dashboard

4

Node Health Analyzer

This chapter covers how to use the Node Health Analyzer, including the following:

- "Node Health Analyzer" on page 48
- "Navigation" on page 49
- "Visual Overview" on page 50
- "Node Map" on page 54
- "Modem List" on page 63
- "Topology Map" on page 69
- "Quality of Experience (QoE) and Ingress Charts" on page 72
- "Data Utilization Chart" on page 73
- "Node Capacity Analyzer" on page 74
- "DOCSIS 3.1 Analyzer" on page 77
- "Modem Analyzer" on page 85

Node Health Analyzer

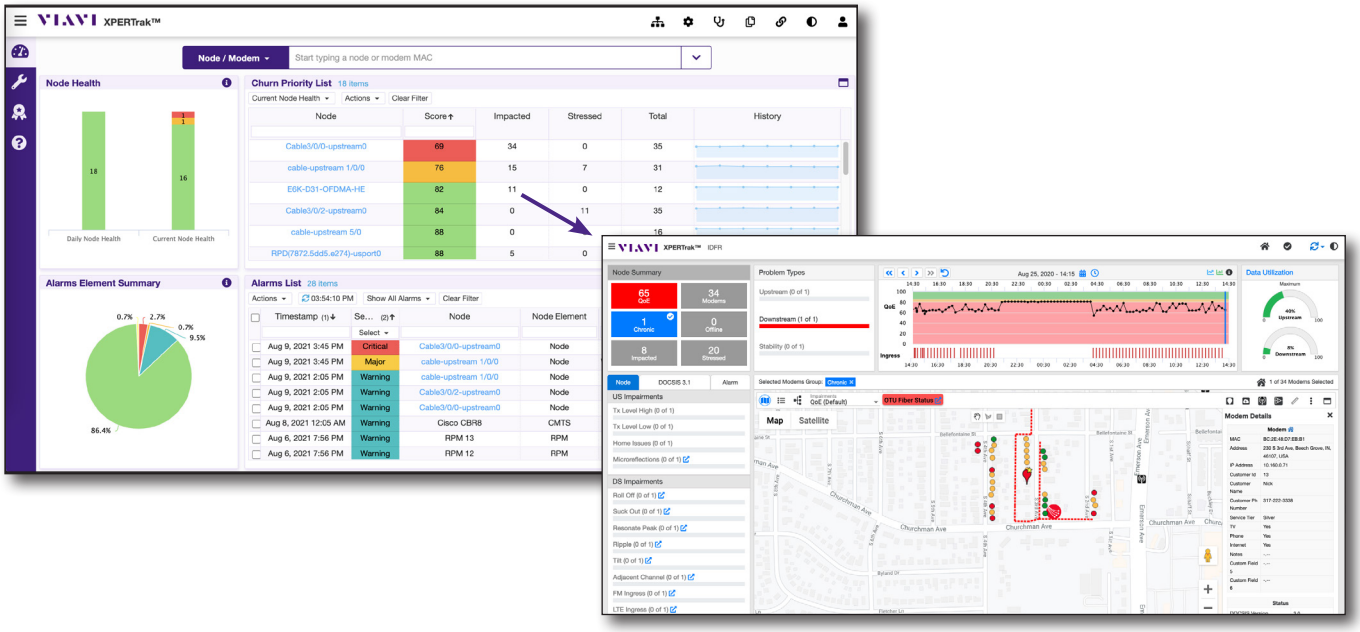
The **Node Health Analyzer** view is designed to greatly simplify pinpointing issues causing Quality of Experience (QoE) problems and can be selected right from the Main Dashboard.

Not only does it provide capacity information to evaluate the performance of the HFC, but also historical analysis to drill down to the node, modem, or group of modems turning your map red. You can use filters on specific groups or impairments to refine your results, as well. (For more information on how we categorize modem status and impairments, see *"Appendix" on page 253*).

Use advanced tools to track chronic, impacted, and stressed modems; look at intermittent problems; and correlate ingress, upstream/downstream impairments, and capacity issues with poor QoE. For even more detail, you can overlay your plant and leakage maps or switch to the list view for expanded details.

This view will open within a new window or tab for each link selected from the Dashboard views. To return to the Main Dashboard, simply close the new tab or window.

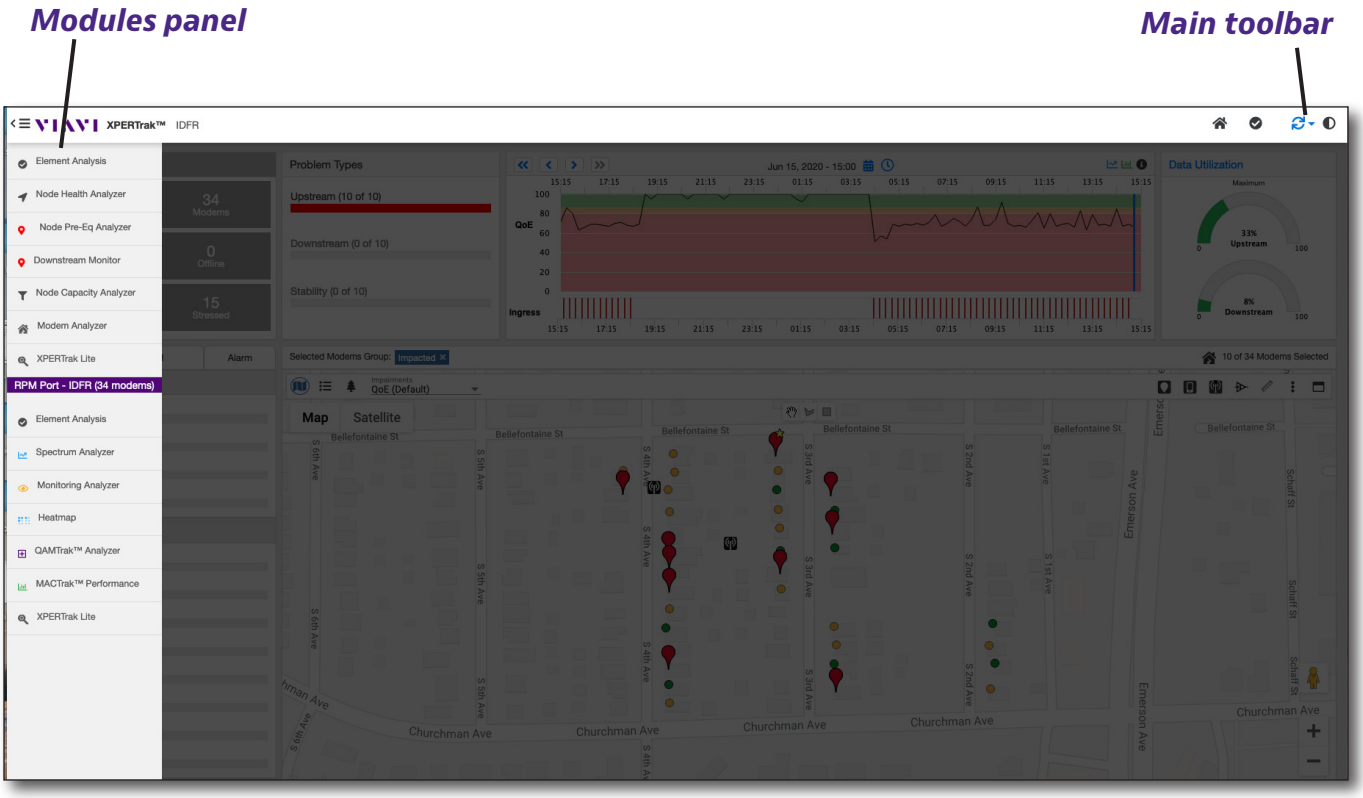
From the Main Dashboard, you can launch directly into the detail of your PNM or QoE nodes. Click the link for the node to open a new tab for the detail.



Launch the Node Health Analyzer directly from the Churn Priority List on the Main Dashboard.

Navigation

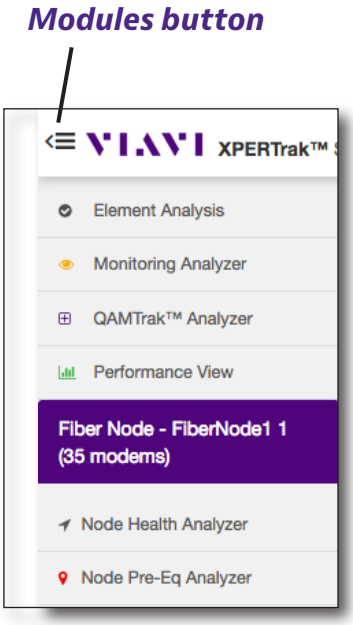
Most of the navigation in the Node Health Analyzer view is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can navigate across all the available analysis modules. Select the module to go to that screen.



Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

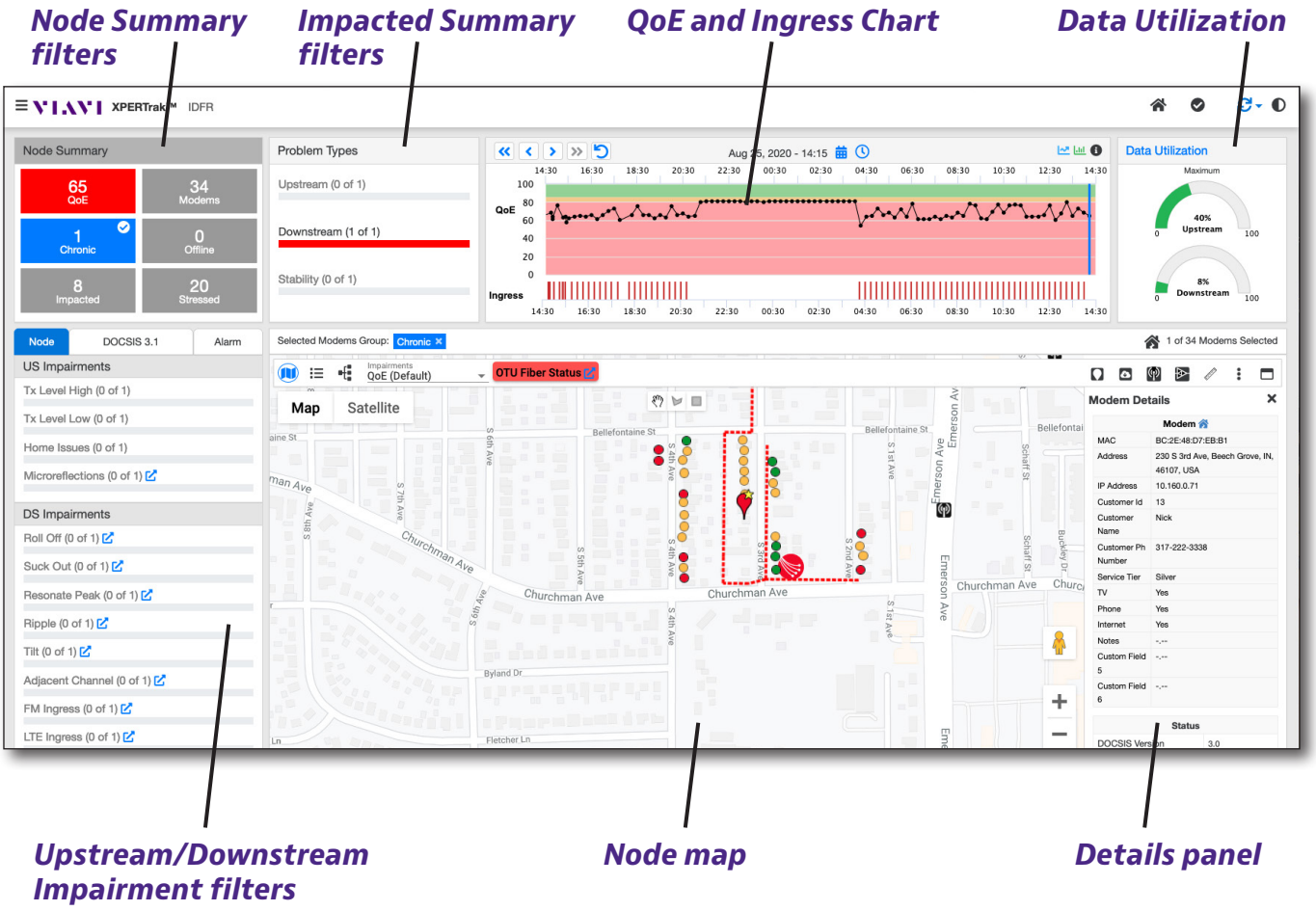
Home – Returns to the Main Dashboard.

Element Analysis – Selects the Element Analysis screen (node, modem, etc).

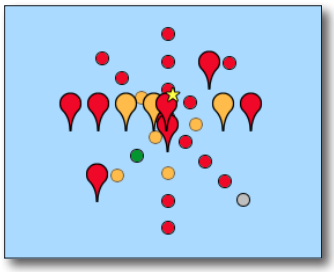
Refresh Now – Refeshes **All Collections** or refresh and **Skip Downstream**.

Switch Chart Color – Controls the color palette of the XPERTrak System.

Visual Overview



The workflow of the Node Health Analyzer is to filter to modems with problems and see what the other displays tell us. As modems are selected using a combination of the filters or manual selection, the other filter boxes update to show what common problems exist.



Also, the modem shape changes from a circle to a pin. So if a user filters on impacted modems and sees them in a cluster on the map, it would clearly be a localized problem.

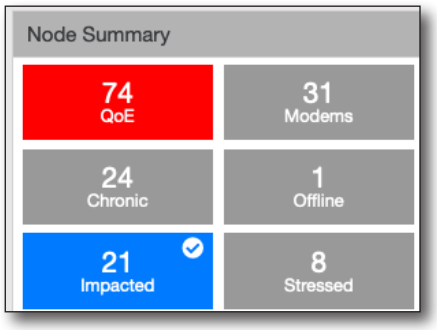
If 9 of the 10 impacted modems also had a common micro-reflection, the micro-reflection would be investigated to resolve the node health.

Node Summary

The **Node Summary** allows you to quickly see how many modems are being impacted, or are chronic, stressed, and offline.

Click the group of modems you want to select. (Notice the checkmark on the selected group).

Selecting a group filters the modems on the map to match the selected group.



QoE –QoE score for the currently selected time (not selectable)

Modems – Modems on this node, according to the CMTS

Chronic – Modems with chronic status (with an impacted status for multiple days).

Impacted – Highest number of modems with impacted status during a 15-minute time period for the last 24 hours. These are modems that already have problems. Selected by default.

Stressed – Modems with status that appears to be worsening, may be impacted soon

Offline – Modems offline

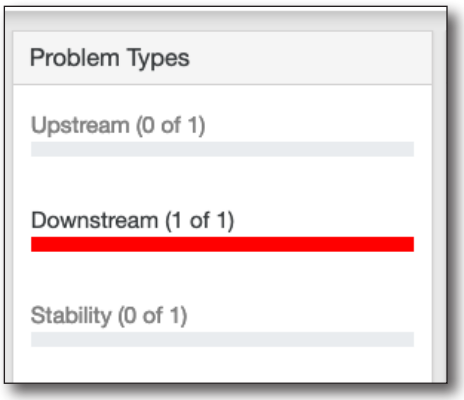
Problem Types

Problem Types shows the detail for both the upstream and downstream impairments for the selected group, including the modem impact count.

Click the impairment to select only those modems to show in the map or list.

Selecting a group filters the modems on the map to match the selected group.

Notice the status bars indicate the severity of the impairment and match the modems on the map.



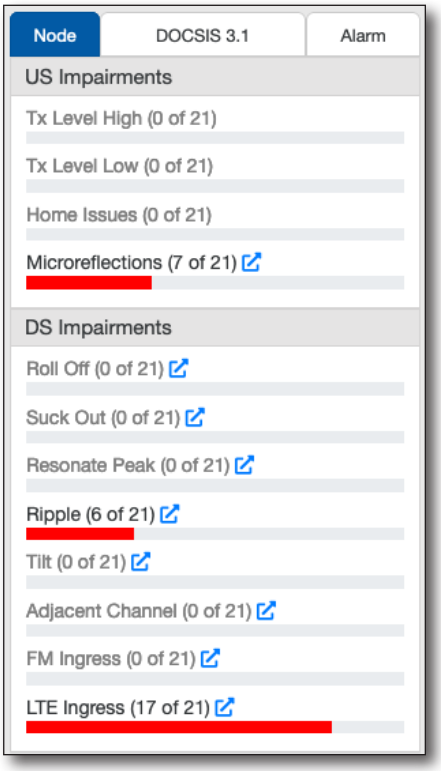
A modem is classified as having an upstream, downstream, or stability impairment when the modem violates the QoE thresholds defined for these catagories. See *"QoE" on page 243*.

Colors

- **Red** – Impacted modem
- **Yellow** – Stressed
- **Green** – Good
- **Gray** – Offline or no response

Node tab

The **Node** tab shows even more detail for both the upstream and downstream impairments for the selected group, including each type of impairment and modem impact count (number of modems with the impairment compared to the number of selected modems).



Select a specific impairment to filter the modems on the map to match that impairment.

Scaling and Severity

The bar below each impairment shows how many of the selected modems are impacted or stressed. So if 9 of 10 selected modems had a microreflection, it would be wise to investigate the microreflection as a root cause.

Notice the status bars indicate the severity of the impairment and match the modems on the map.

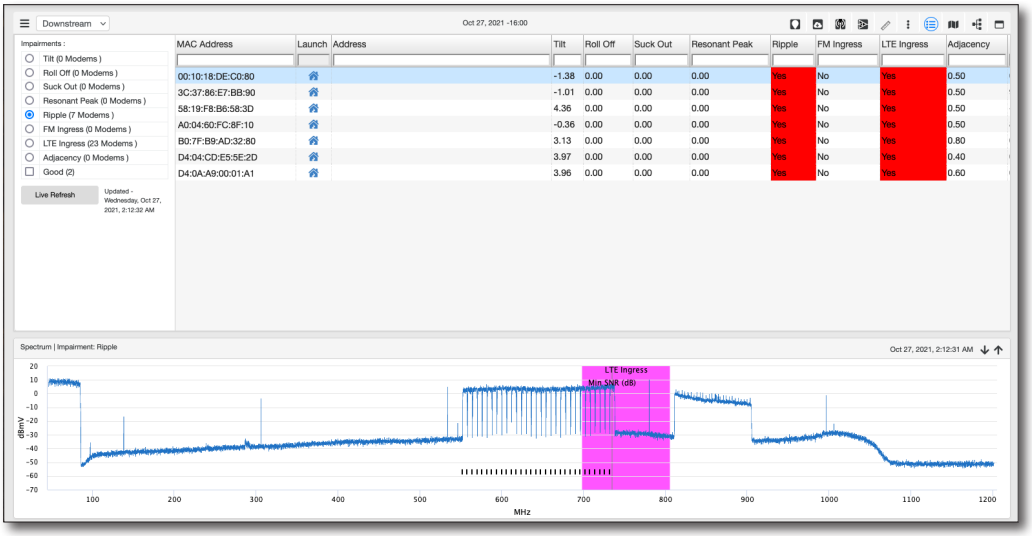
Colors

- **Red** – Impacted modem
- **Yellow** – Stressed
- **Green** – Good
- **Gray** – Offline or no response

Go to Analyzer

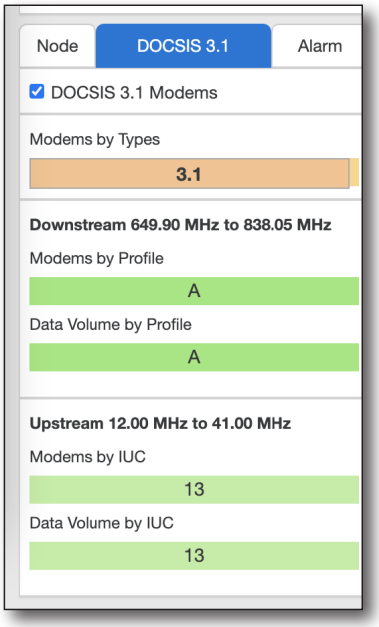
You can also click the analyzer link next to the impairments to bring up the upstream or downstream analyzer with the corresponding mode or impairment already selected.

For example, if you select the Ripple link, the Downstream Analyzer will open with Ripple selected, showing the impacted modems.



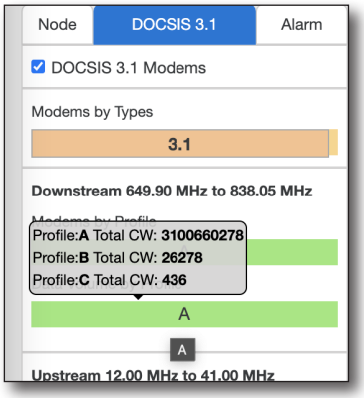
DOCSIS 3.1 tab

The **DOCSIS 3.1** tab also shows graphs of modems by type and profile. Single out only **DOCSIS 3.1 modems** by selecting the checkbox at the top.



Modem by Types shows the number of DOCSIS 2/3 and 3.1 modems. This bar chart can also be selected to quickly filter on modems by DOCSIS type.

You can select the **Modems by Profile** and **Modems by IUC** to single out those modems.



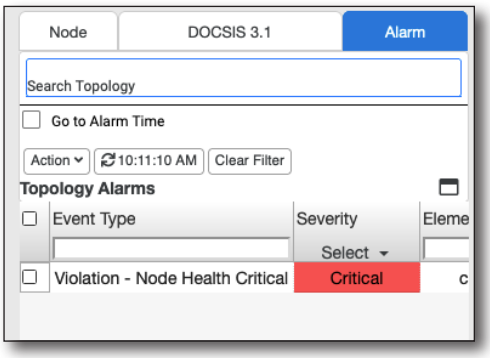
The modems by profile/IUC and data volume by profile/IUC show how well DOCSIS 3.1 is working for the node.

If most modems are only able to run profile A on the downstream OFDM carriers, this would indicate the node needed maintenance, or the profile setting in the CMTS were not appropriate for that particular node. A cluster of modems only operating on profile A is a good indication of a localized problem affecting those modes.

Hover your mouse over the **Data Volume by Profile** and **Data Volume by IUC** sections for codeword information for each profile.

Alarm tab

The Alarm tab shows all alarms for the node, including fiber node, RPM port, OTU port, CMTS US port, and streets alarms if you have imported your topology data. For more information, See *"Topology and Billing Import" on page 271.*



If you select an alarm, the corresponding topology element will be selected in the map topology view. See *"Topology Map" on page 69.*

You can also use the **Search Topology** at the top to search for a specific element.

Select **Go to Alarm Time** to update Node Health Analyzer to the time the alarm occurred when an alarm is selected.

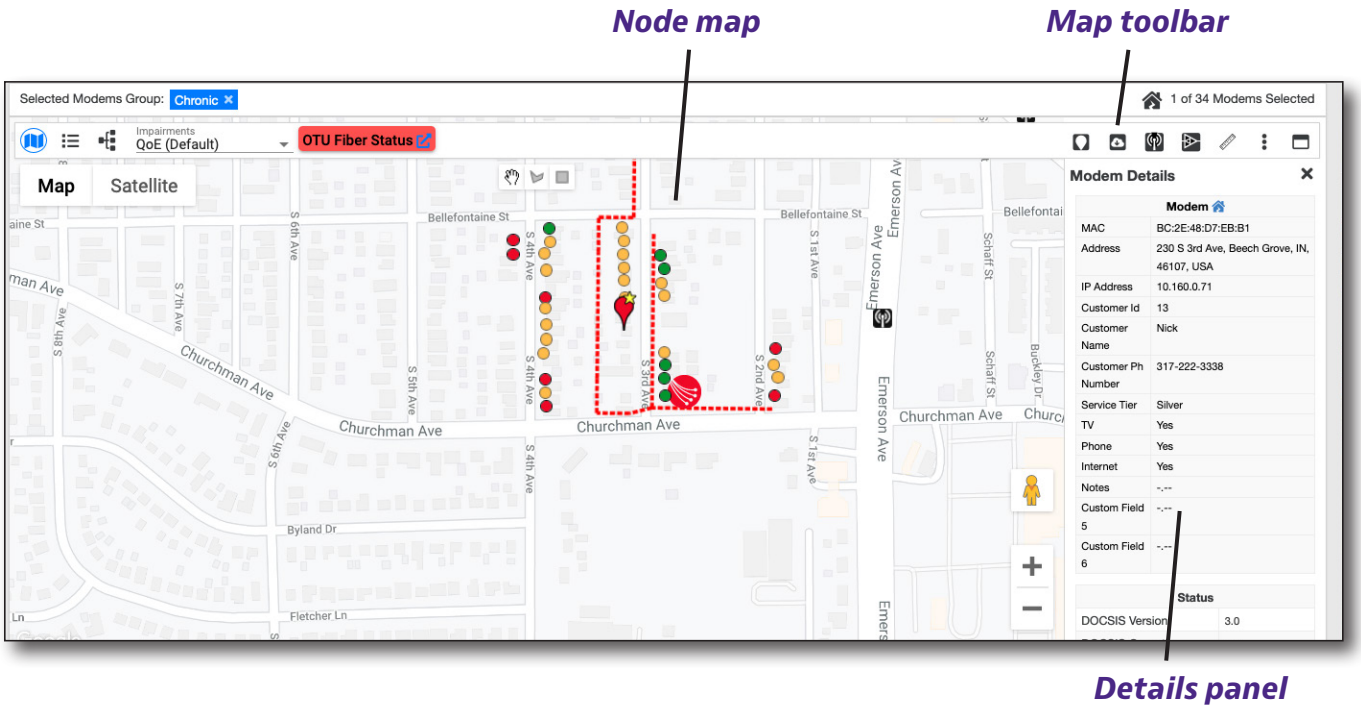
Select all alarms with the checkbox above them, or an individual alarm, and use the **Action** dropdown to clear them or export to CSV.

Again, the severity colors match the severity associated to the alarm.

Node Map

The **Node Map** is designed to provide detailed location, status, and measurement results for the modems selected in the Node Health Analyzer.

To retun to the Node Map at any time, click **Map** .



The modems with large "push pin" icons will match the filter selections described on the previous pages. These modems are selected. Small round dots represent modems that are not part of the filter group, and are therefore not selected.

Filters from Node Summary, Problem Types, and Node tab may be used in conjunction with one another, and are displayed as the **Selected Modem Groups**.

The modem with a star shows the selected modem. Click any modem to change it.

Like the status bars indicate the severity of the impairment, the modems are color-coded on the map.

Colors

- **Red** – Impacted modem
- **Yellow** – Stressed
- **Green** – Good
- **Gray** – Offline or no response

Navigation

You can navigate using the **Map views** and **Map toolbar** located at the top of the map.

Map views

Found on the top left of the map, this area allows you to can change the map views.

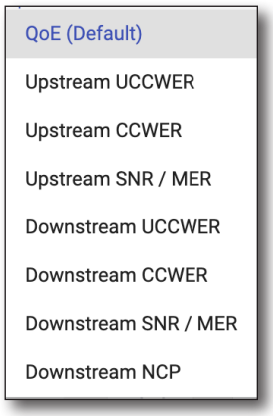
Map – Selects the map view. The map is displayed by default. You can also display/hide the terrain map layer here.

List – Selects the modem list view. See *"Modem List" on page 63.*

Topology – Selects the topology map view if you have imported topology data.

See *"Topology Map" on page 69.*

Impairments – Selects the type of impairment which will color a modem. The default is the overall QoE status, which is the worst condition for a modem across the upstream, downstream, and stability QoE metrics. If focusing on an upstream SNR/MER issue, the modems will be colored ONLY by the overall status of all upstream carriers for each modem, compared to the QoE settings for SC-QAM and OFDM-A SNR/MER.

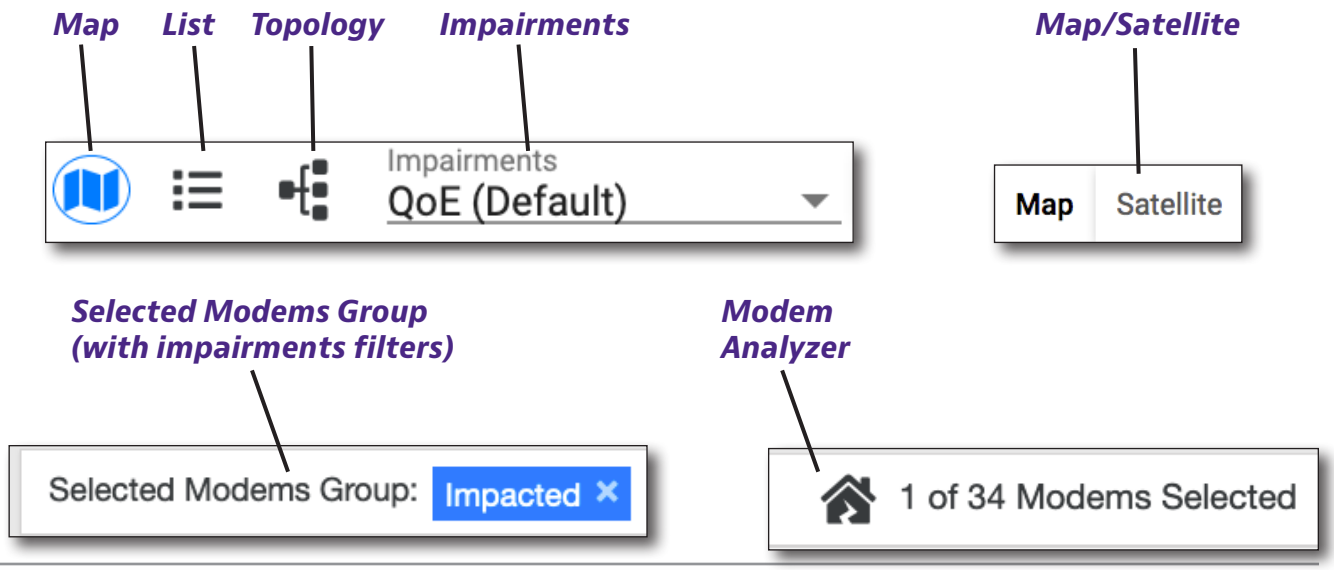


You can select a set of impairments from the dropdown, which are then shown on the map, or topology view. QoE is the default. This list is dependent on having Street Alarms licensed.

Map / Satellite – Toggles between the map and satellite views.

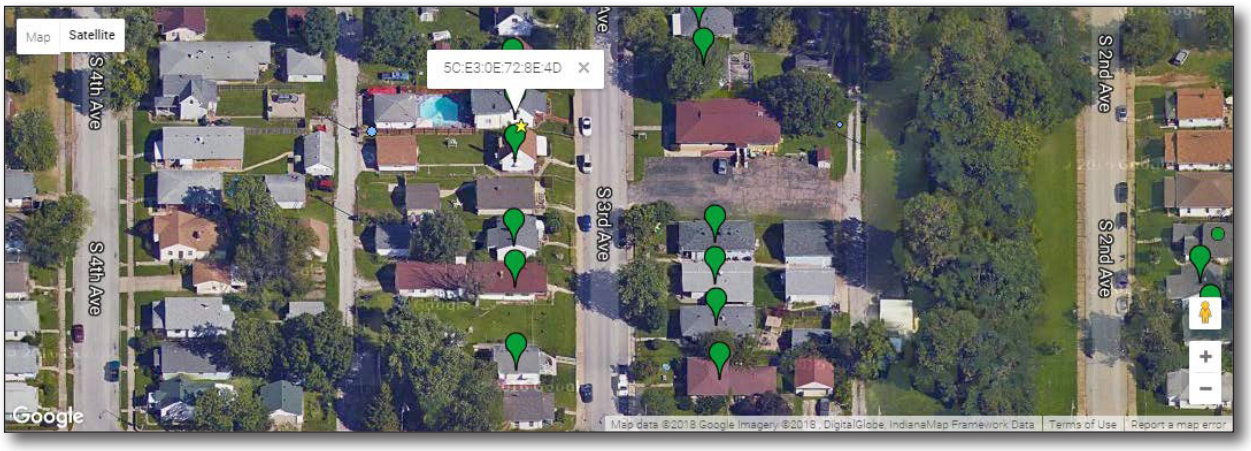
Selected Modems Group – All selected filters from Node Summary, Problem Types, and Node tab. Click the X to remove.

Modem Analyzer – Launches the Modem Analyzer in a new window, and allows you to select a live or performance view. For more information, see *"Modem Analyzer" on page 85*.



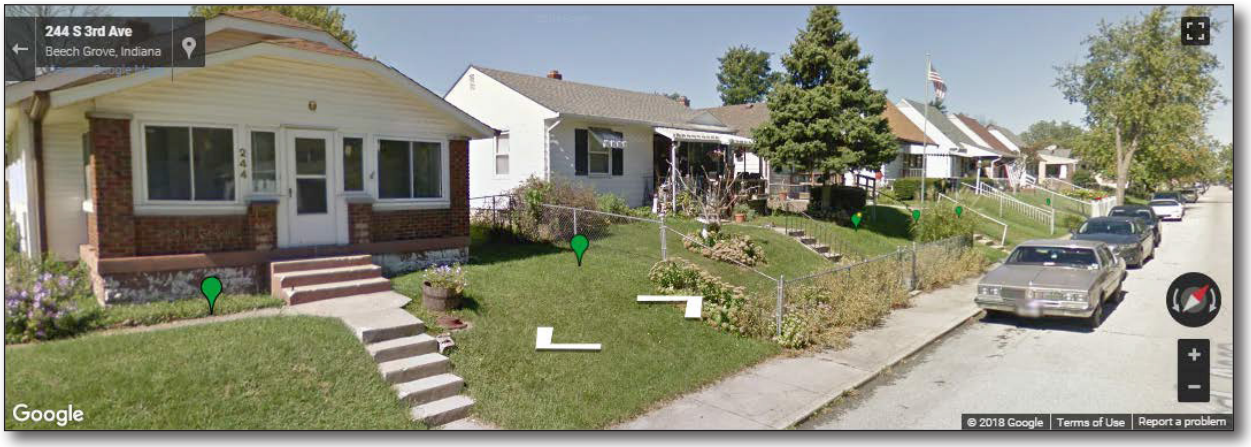
Satellite

The **Satellite** view shows a satellite image of the selected area. You can also display/hide map labels here.



Street

The **Street** view shows the street level of the selected area. You can also display/hide map labels here. On the Map or Satellite view, click and drag the Pegman to the location where you want to display the street view.



Map toolbar

Found on the top right of the map, this area allows you to change the map overlays and details.

Modem markers – Toggles the modem markers.

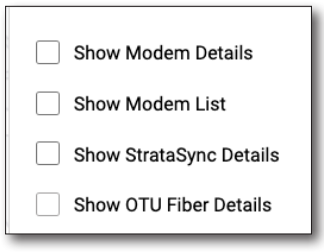
StrataSync overlay – Toggles the StrataSync overlay. See *"StrataSync Overlay" on page 58.*

Leakage Map – Toggles the leakage map overlay.

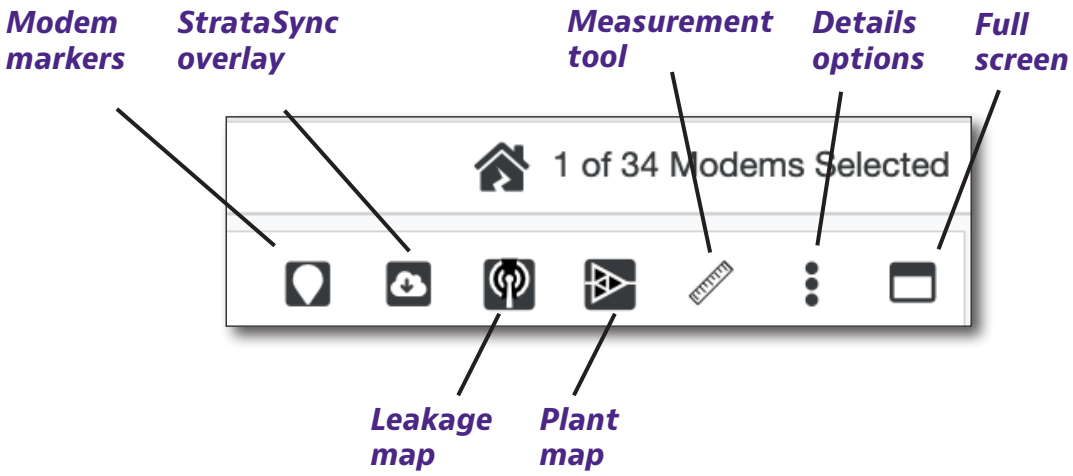
Plant Map – Toggles the plant map overlay.

Measurement tool – Allows measuring distance between two points on the map. Toggle on the measurement tool. Click anywhere on the map to start, then click another point to measure. Drag a point to change location, click points to remove them. Toggle off the measuring tool when done to clear from the map display.

Details options – From the dropdown, allows you to select what additional info will be displayed on the map: Modem details, Modem list, StrataSync details, and OTU fiber details. See the following sections on these features.



Full Screen – Toggles full screen.



Map overlays have red magnifying glasses when the map is zoomed out beyond the settings. To adjust, see "XPERTrak Map Overlays Configuration" on page 279.

StrataSync Overlay

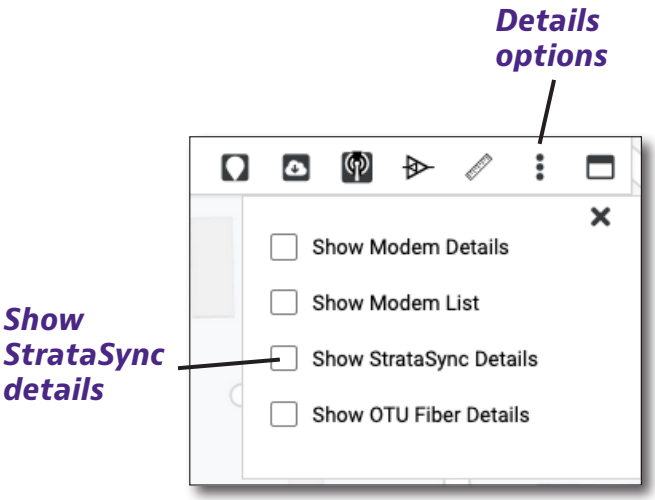
The **StrataSync overlay** integration allows for field instrument test data reports from StrataSync with geo-location coordinates to be overlaid on the Node Health Analyzer map with an additional map layer.

This allows you to very quickly correlate problems detected in XPERTrak with locations that have had RF, Fiber, or Ethernet tests performed with VIAVI field meters. Instrument test types must first be defined in StrataSync by the admin before displaying in XPERTrak.

1. Select **StrataSync overlay** from the Map toolbar. The dropdown is displayed.
2. Select the date and time from the calendar and clock icons. Duration allows for 1 day, 7 days, 15 days, or 30 days. The duration is the number of days of test results from the selected day back the number of days.

   Note: The date and duration may not show test results if tests were not uploaded to StrataSync, test data from StrataSync is not enabled, or the data retention time has expired.
3. Choose the duration and test type, then select **Show**. The map will update with the detail.

You can also enable the **Show StrataSync Details** from the **Details options** in the Map toolbar to show the panel or select **Full screen** to see more detail.



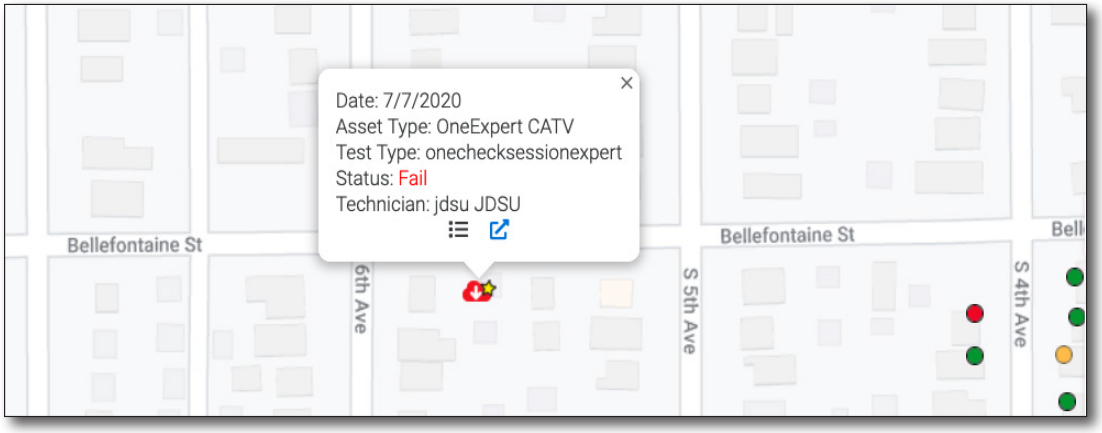
Enabling the StrataSync overlay places StrataSync icons on those locations where a test has been run. A mouse over of the icon displays the details of the test. A green icon is a passed test, red is a failed test.

Note: StrataSync integration requires an active maintenance contract.

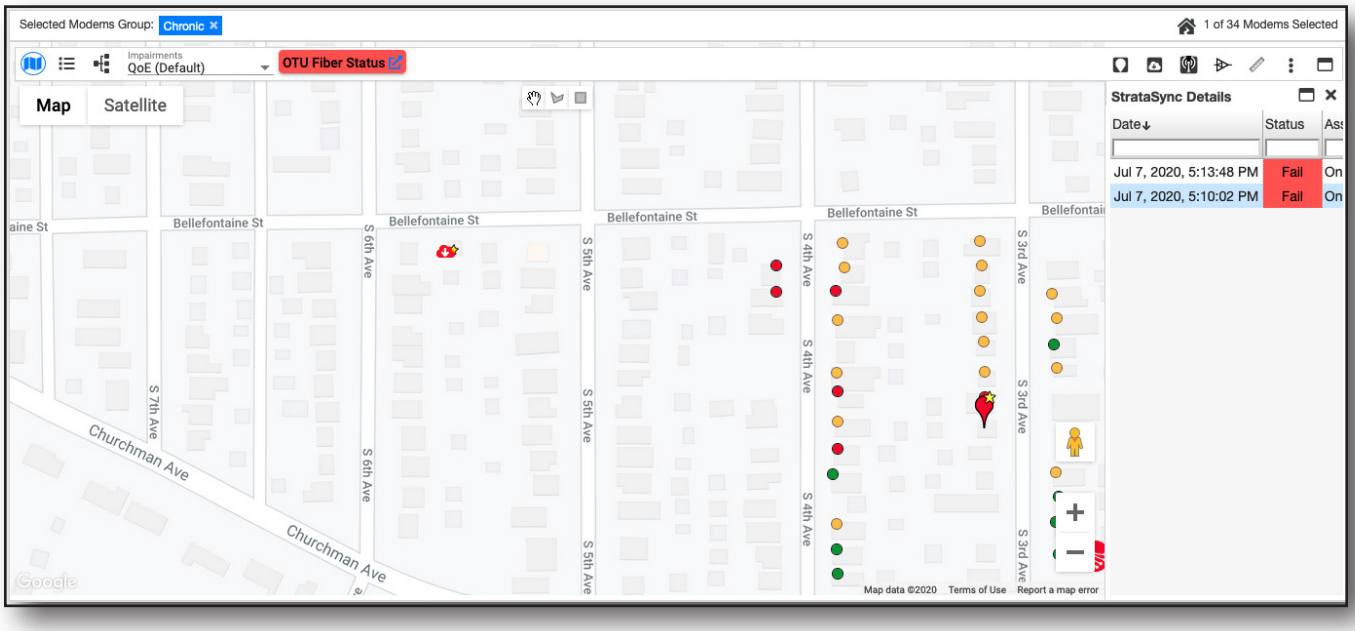
NOTE:

For advanced Details panel column adjustments and what info is displayed, see "Column Options" on page 68.

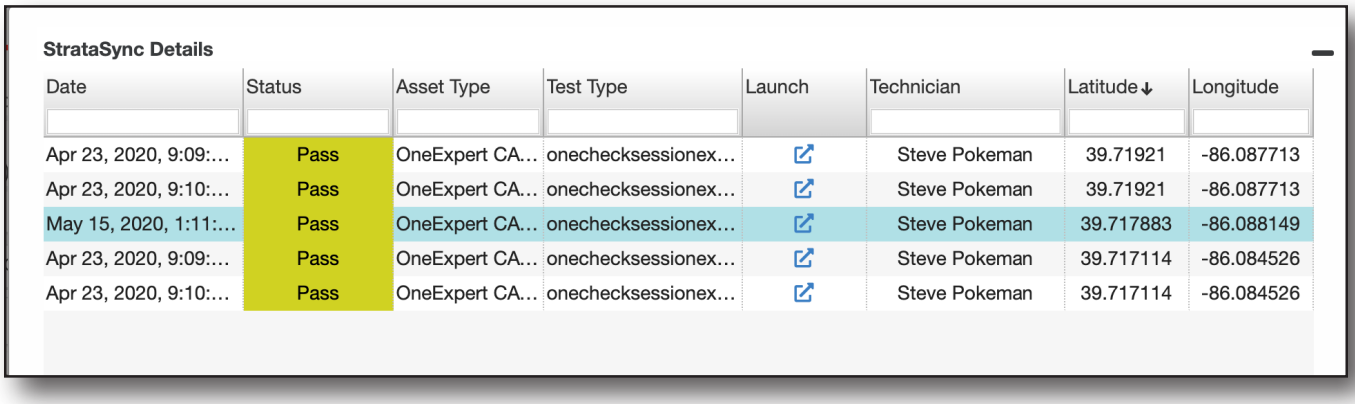
For searching and sorting tips, see "Modem List" on page 63.



Node Health Analyzer with StrataSync overlay



StrataSync Details panel with Node map



StrataSync Details

Date	Status	Asset Type	Test Type	Launch	Technician	Latitude	Longitude
Apr 23, 2020, 9:09:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.71921	-86.087713
Apr 23, 2020, 9:10:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.71921	-86.087713
May 15, 2020, 1:11:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717883	-86.088149
Apr 23, 2020, 9:09:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717114	-86.084526
Apr 23, 2020, 9:10:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717114	-86.084526

StrataSync Details using full screen

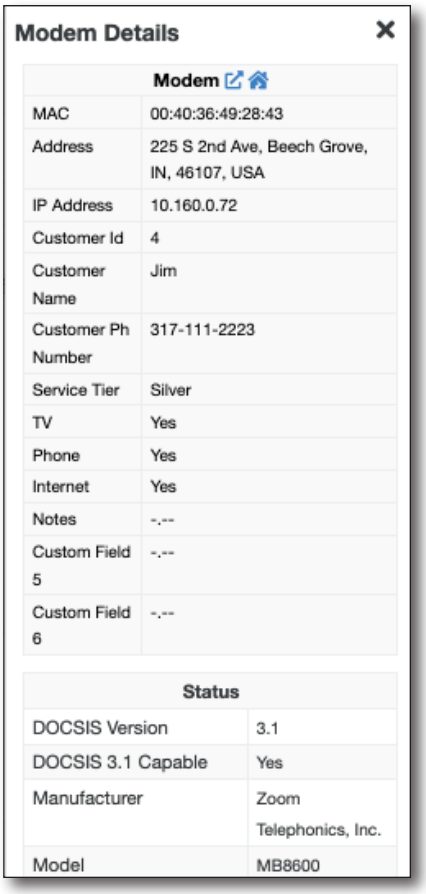
Note: The Launch icon launches StrataSync test results if already signed in, or the login page.

Details Panel

This panel is used to view the details about the currently selected modem, including the following categories.

Click the analyzer links to go to the respective analyzers: DOCSIS 3.1 (for D3.1 modems), upstream, or downstream.

Click the **Modem Analyzer** to go to the Modem Analyzer. For more information, see *"Modem Analyzer" on page 85*.



Modem

- MAC address
- Street address
- IP address
- Customer ID*
- Customer Name*
- Customer Phone Number*
- Service Tier*
- Custom Fields 1-6*

Status

- DOCSIS version
- DOCSIS 3.1 Capable
- Manufacturer
- Model
- Up Time
- Impacted
- Chronic
- Chronic Days
- Stressed
- Registration

* These fields need to be imported using the topology import. See *"Topology and Billing Import" on page 271* for more information.

- Bonded
- DSxUS
- DSxUS Config
- Registration Flaps
- Power Adjust Flaps

Upstream Summary

- OFDMA Profiles
- OFDMA Channels
- Max UCCWE (%)
- Max CCWE (%)
- Max Tx Level (dBmV or dBµV)
- Min Rx Power (dBmV or dBµV)
- Min SNR (dB)
- MER Mean (dB)
- Standard Deviation MER (dB)
- Max T3
- Max T4
- Max Range Aborts
- Max MR (dB)
- Max GD (nS)
- Max MTC (dB)

DOCSIS Downstream

- OFDMA Profiles
- OFDMA Channels
- Max UCCWE (%)
- Max CCWE (%)
- Min SNR (dB)
- Rx Min Level (dBmV or dBµV)
- Min MER per OFDM Subcarrier
- Min Avg. OFDM Amplitude
- Min Avg. OFDM Group Delay
- Amplitude Pk-Pk (dB)
- Amplitude RMS (dB)
- Amplitude Slope (dB/MHz)
- GD Pk-Pk (ns)
- GD RMS (ns)
- GD Slope (ns/MHz)
- Standard Deviation MER (dB)
- PLC CWER (%)
- NCP CRC Failure Rate (%)
- Avg MER Margin (dB)
- MER Margin Threshold
- Sub-carriers Below Threshold
- Avg Level (dBmv)
- Min Level (dBmv)
- Max Level (dBmv)
- Rx MER Min (dB)

Downstream Summary

- SNR (Min dB)
- Roll off
- Tilt
- Suck out
- Peak
- Ripple
- Adjacency
- FM ingress
- LTE ingress

NOTE:

For more information, see the Upstream and Downstream sections in "Proactive Network Maintenance (PNM)" on page 101 and "DOCSIS 3.1 Analyzer" on page 77.

Also see "Downstream Impairments and Thresholds" on page 261.

Modem List

Like the Node Map, the Modem List is designed to provide detailed location, status, and measurement results for the modems selected in the Node Health Analyzer in list form.

Selected modems are retained when changing from map to list to topology views, and are highlighed in blue in the list. They are highlighted automatically by selecting an impairment. The **Selected Modems Group** filter at the top shows what is filtered (e.g. DOCSIS 3.1 and Microreflections combined).

Placing a check mark in the box at the left will add a modem to the selected group to display.

The list view is intended to show items which violate overall QoE and color them red or yellow depending on severity of the violation. Click the plus (+) signs to expand columns to see which metric is the problem, then expand the row for the modems to see the performance of all channels related to the affected QoE parameter. Click the link for the channel to go right to the detail in the Node Health Analyzer.

To return to the Node Map at any time, click **Map.**

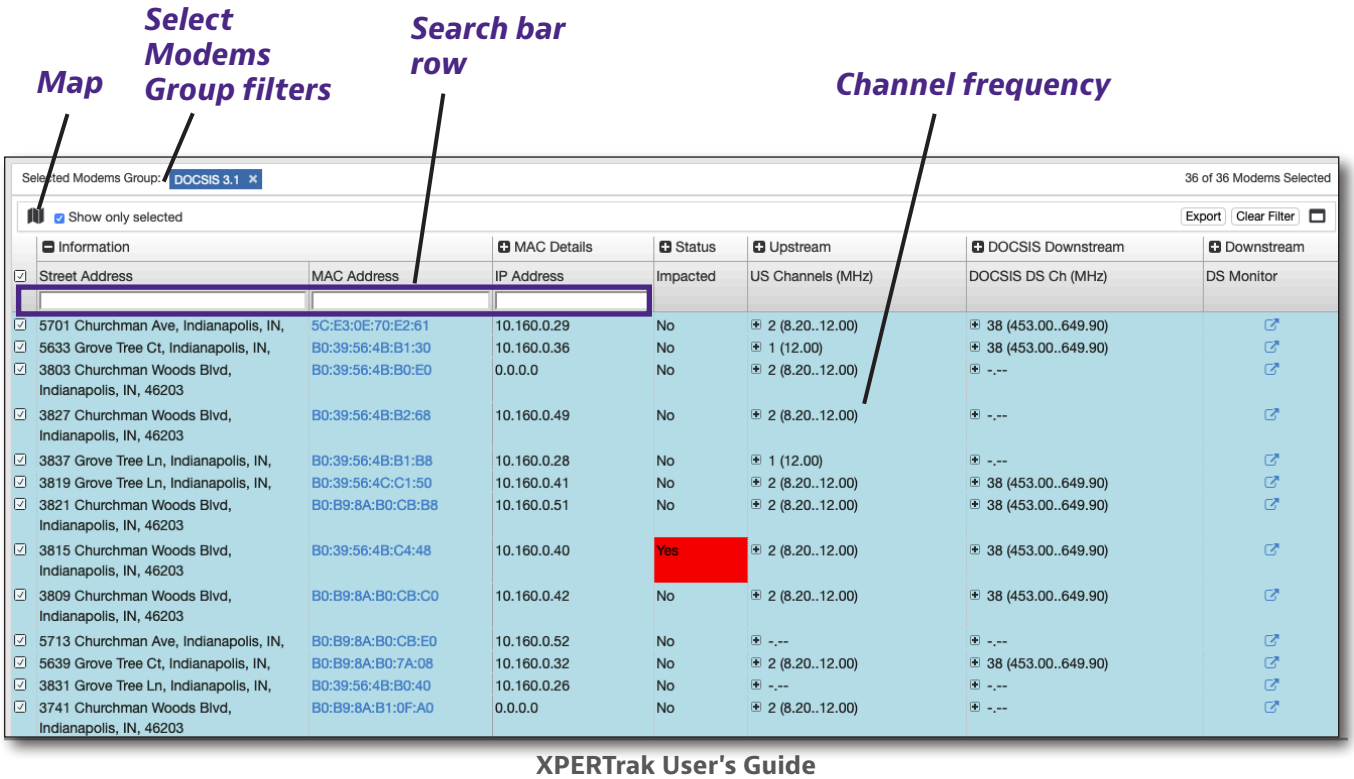
Searching

You can search by typing into the search bar under the column header. The list updates with the results.

Sorting

You can also easily sort the columns by clicking the column header to sort by ascending / descending values. Toggle through the options to remove the sort.

To show only selected rows, select the **Show only selected** checkbox at the top.

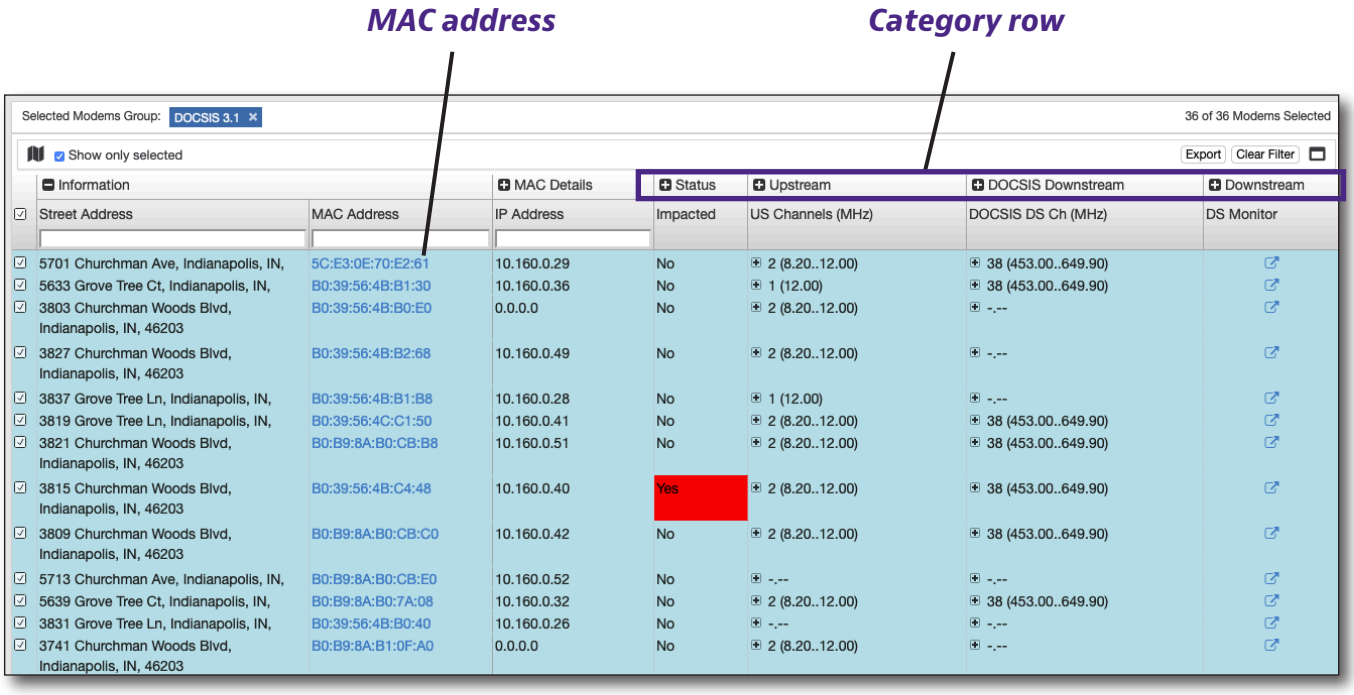


Categories

To focus on just the information you want, there are expandable categories at the top of the list. Click to expand horizontally.

For example, if you expand the Status category, you will now see the Impacted, Stressed, Chronic, and Registration columns, etc.

Status			
Impacted	Stressed	Chronic	Registration
No	No	No	Online
No	No	No	Online
No	No	No	Online
No	No	No	Online



The MAC address is a link that will take you to the D3.1 analyzer if it is running D3.1. For all other modems, D3.0 and below, this link directs you to the regular Modem Analyzer.

Again, click the plus (+) buttons to expand the upstream and downstream channel columns. Ranges for frequencies are indicated by "-.--" and "2 (8.20..12.00)" This indicates that 2 channels are collapsed, between the channels of 8.20 and 12.00, for example.

Information

- Street Address
- MAC Address

MAC Details

- IP Address
- DOCSIS Version
- DOCSIS Operating Mode
- Manufacturer
- Model
- Up Time
- Hardware Version
- Software Version
- Customer ID
- Customer Name
- Customer Phone Number
- Service Tier
- Custom Field (1-6)

Status

- Impacted
- Stressed
- Chronic
- Chronic Days
- Registration
- DSxUS (Downstream x Upstream)
- Reg Flaps
- Power Adjust Flaps
- Lost Syncs
- US Traffic Level (Upstream traffic level)
- DS Traffic Level (Downstream traffic level)

Upstream

- US Channels (MHz) (Upstream channels)
- Preferred IUC
- UCCWE %
- CCWE %
- Tx Level (dBmv)
- Rx Level (dBmV)
- SNR (dB)
- Standard Deviation MER (dB)
- T3 Timeout
- T4 Timeout
- Range Aborts
- MR Level (dB)
- GD Level (ns)
- MTC Level (dB)
- Max ICFR (dB)

DOCSIS Downstream

- DOCSIS DS Channel (MHz)
- Preferred Profile
- UCCWE %
- CCWE %
- MER Mean (dB)
- Standard Deviation MER (dB)
- SNR (dB)
- Amplitude Pk-Pk (dB)
- Amplitude RMS (dB)
- Amplitude Slope (dB/MHz)
- Amplitude Mean (dB)
- GD Pk-Pk (ns)
- GD RMS (ns)
- GD Slope (ns/MHz)
- GD Mean (dB)

- PLC CWER (%)
- NCP CRC Failure Rate (%)
- Avg MER Margin (dB)
- MER Margin Threshold
- Sub-carriers Below Threshold
- Avg Level (dBmV)
- Min Level (dBmV)
- Max Level (dBmV)
- RxMER Min (dB)
- Rx Min Level (dBmV)

Downstream

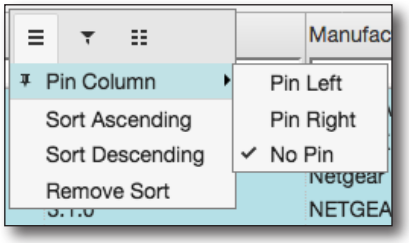
- DS Monitor
- DS Channels
- SNR Min (dB)
- Roll Off
- Tilt
- Suck Out
- Peak
- Ripple
- Adjacency
- FM Ingress
- LTE Ingress

Column Options

Additional options can be found in the column header. Hover the mouse over the column you want, and select Options ☰ to open the menu.

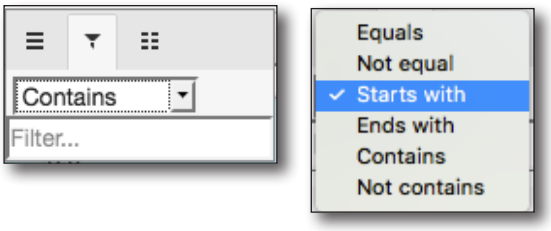
Pin column

You can pin a column to the left or right side of the modem list, so it doesn't move when scrolling. If unpinned, the column reverts to the original location.



Filtering

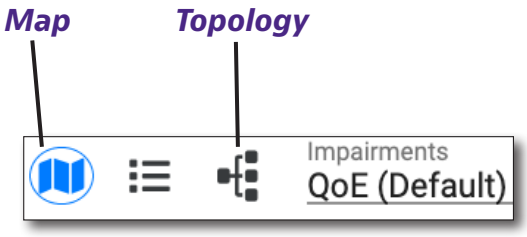
Filtering allows you to set values to include or not include, such as "starts with" or "ends with". Select the Filter ▼ submenu and use the dropdown to choose a filter.



List View Options

You can customize what columns appear in the modem list using this feature. Select the List View ☷ submenu and check /uncheck which columns you want to show. You can even change entire categories at once.

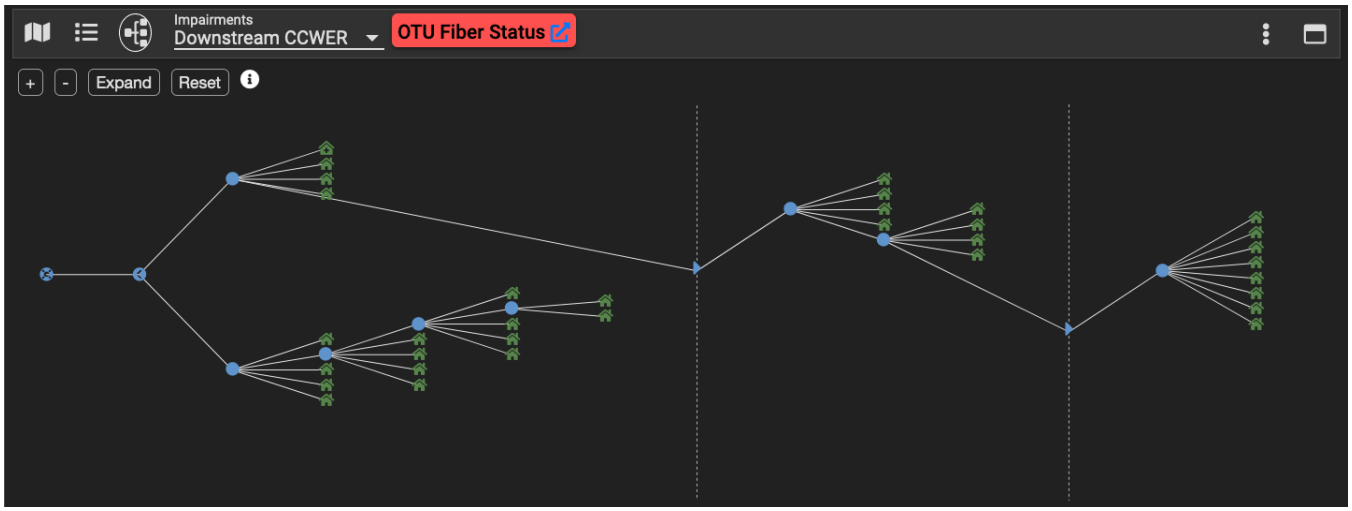
Topology Map



The **Topology Map** is designed to provide detailed alarming and visibility based on the actual relationship of the elements and devices in the HFC network (node → node port → amp → tap → modem) if you have imported topology information for your plant.

When you select a topology path, it will highlight the parent and all its children. If the modem list view is displayed, the modems will also be selected there.

To see the Topology map, click **Topology** . To retun to the Node Map at any time, click **Map** .



As mentioned previously, clicking on an individual topology alarm from the Node Health Analyzer Alarm tab focuses the topology view on the device in the network that produced the alarm and therefore aids in troubleshooting in the field.

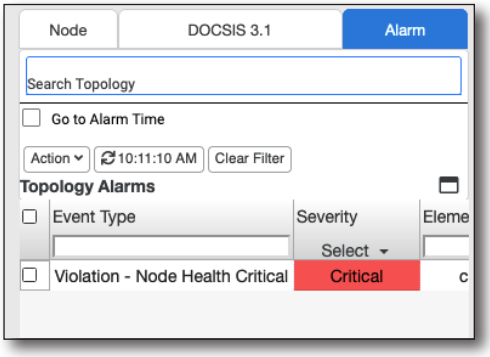
Note: If no topology exists, all of the modems in the node will show as a child of the node itself.

NOTE:

Map topology is determined by your imported topology file. Any element that is not included in the import file will not populate in map view).

For more details, see "Import Topology / Billing" on page 276.

You also have the option to search for an event type, severity, or element type at the top.



Filters from the Node Summary, Impact Summary, and Impairment Type may be used in conjunction with each other.

Again, the severity colors match the corresponding elements in the map topology.

Colors

- **Red** – Impacted modem
- **Yellow** – Stressed
- **Green** – Good
- **Gray** – Offline or no response

To copy data from an element at any time, right click on the topology element, and select **Copy**.

The following information is copied:

- **Modems** – Modem MAC address
- **Network elements** – All associated element info, including make, model, power supply, node number, etc.

Navigation

You can navigate using the **Map options** and **Map toolbar** located at the top of the map.

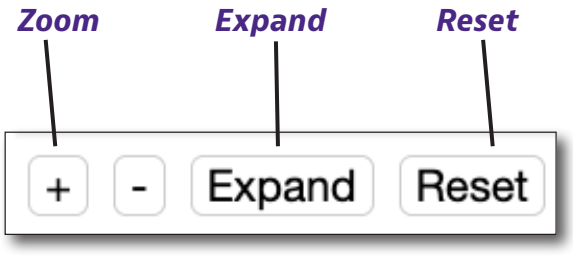
Map options

Found on the top left of the map, under the Map views, this area allows you to change the map.

Zoom +/- – Zooms the map.

Expand– Expands all the parent/child elements on the map.

Reset – Resets the map to the default view.

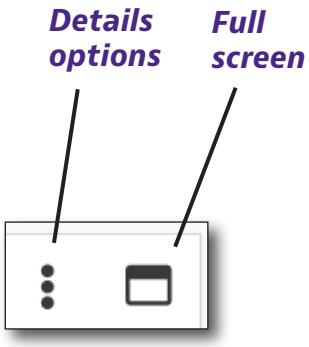


Map toolbar

Found on the top right of the map, this area allows you to change the map options and details.

Details options – Allows you to select modem details and modem list panels to displays on the map.

Full Screen – Toggles full screen. Here you can see the topology and the details of the modem list view at the same time.



Topology view with modem list using full screen

Quality of Experience (QoE) and Ingress Charts

The QoE and Ingress charts are designed to provide detailed QoE and ingress history charts of any 24-hour selectable time period, so you can correlate quality problems with a specific time period.

Use the blue marker bar to manually select one of the 96 15-minute time periods to display the QoE data from that time. Click and move your mouse to position, then click again to place.

For more information on adjusting settings for this chart, see *"Measurement Defaults" on page 229*.

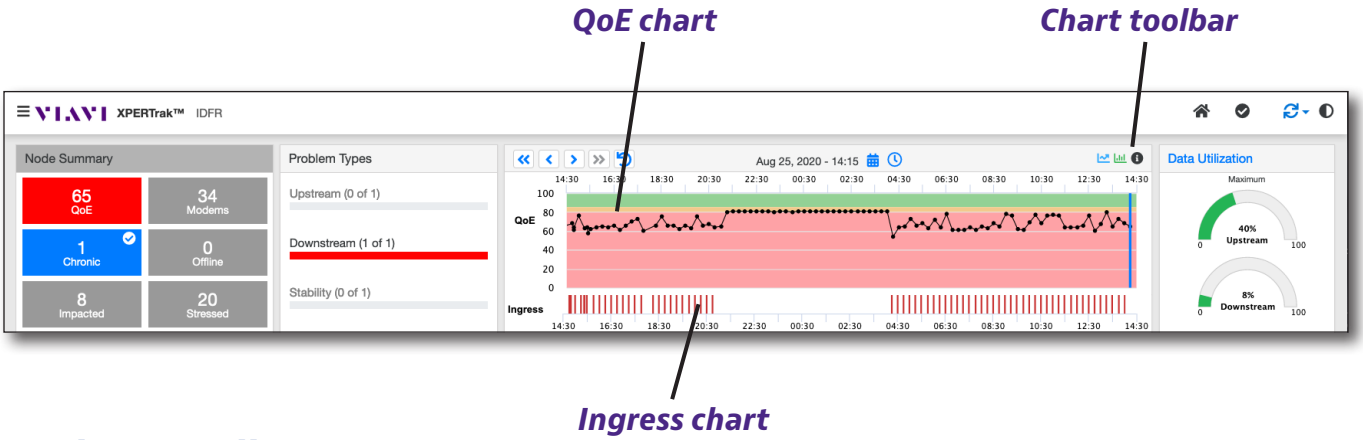


Chart Toolbar

You can navigate using the **Chart toolbar** located at the top of the chart.

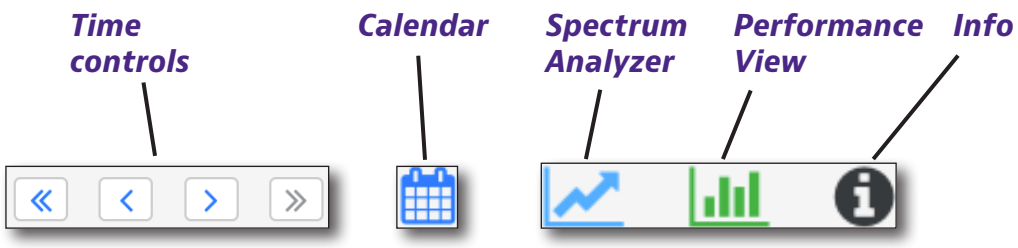
Time controls – Found on the top left of the chart, allow you to adjust the time period shown in full day (double arrows) or 15-minute increments (single arrows).

Calendar – Found near the top middle of the chart, allows you to pick the day to display.

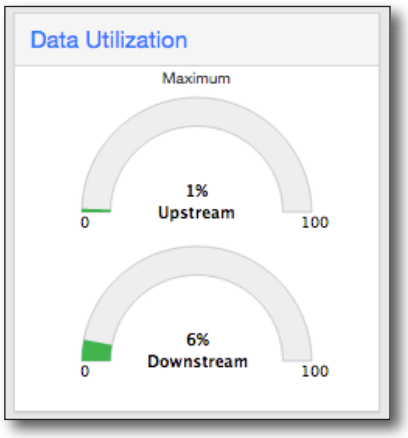
Spectrum Analyzer – Found on the top right of the chart, launches the CMTS spectrum analyzer or Spectrum Analyzer in a new window. For more information, see *"CMTS Spectrum Analyzer" on page 124* and *"PathTrak Return Path Monitoring (RPM)" on page 131*.

Performance View – Found on the top right of the chart, launches the MACTrak Performance view in a new window. For more information, see *"Performance View" on page 157*.

Info – Found on the top right of the chart, shows the last time the data was collected.



Data Utilization Chart



The **Data Utilization** chart is designed to provide a quick view of the highest utilization value of the upstream and downstream signals for the selected time period and node.

From there, you can select ***Data Utilization*** to link you directly to the Node Capacity Analyzer for more detail.

The upstream and/or downstream displays will turn red if the capacity thresholds defined in the administrative setup are exceeded.

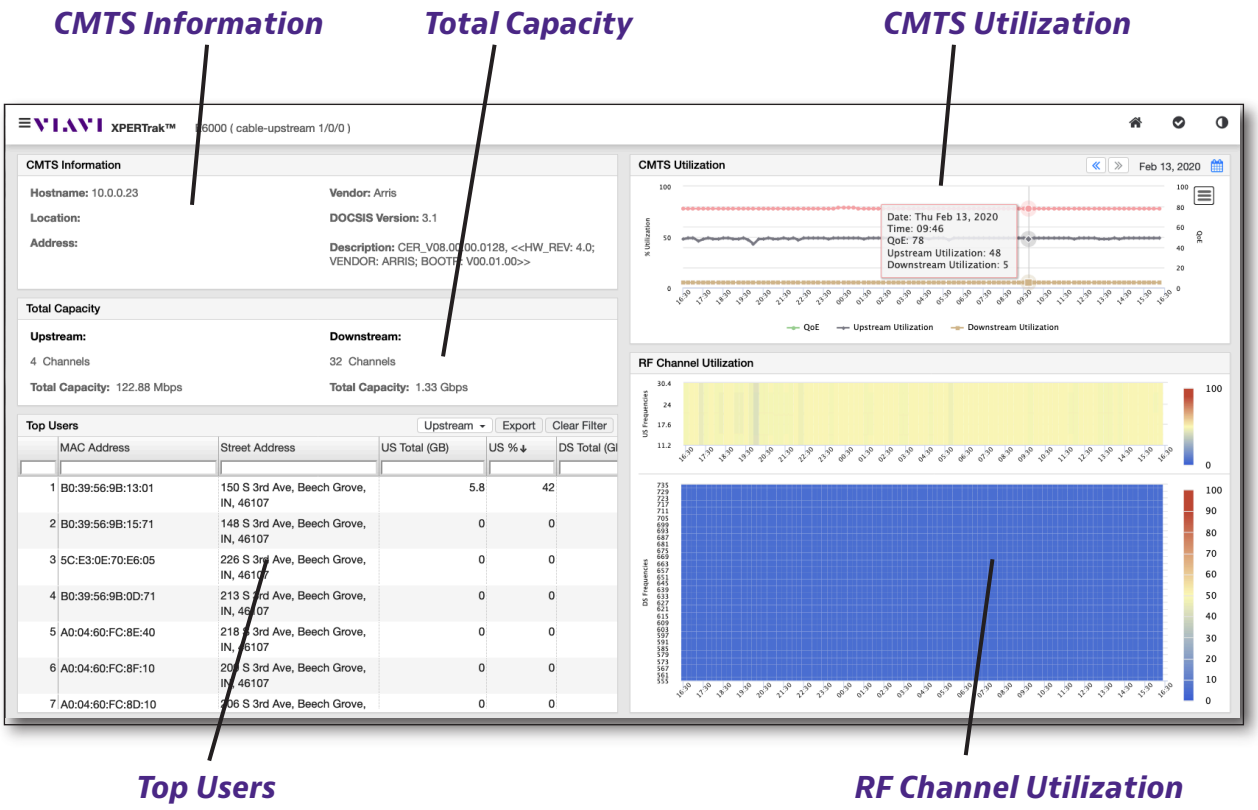
It is often seen that high utilization, especially on the upstream, can cause modem stability issues as modems are unable to complete the necessary station maintenance to stay online. If these turn red during times of poor QoE it is wise to check the utilization as a potential problem.

Note also that when the network has very bad upstream and/or downstream, a lot more traffic is re-transmitted, which can also drive up utilization. So upstream noise and high upstream utilization can be seen together.

Node Capacity Analyzer

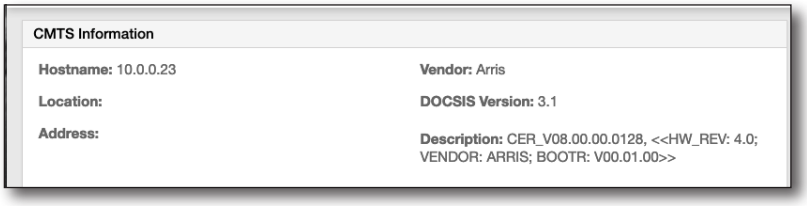
The **Node Capacity Analyzer** provides the detail you need to monitor your node utilization performance and the overall health of how your CMTS is optimized for the best efficiency over a 24-hour time period.

Here you will find information on the following: general CMTS information and location, total node capacity, top users, and CMTS and RF channel utilization.



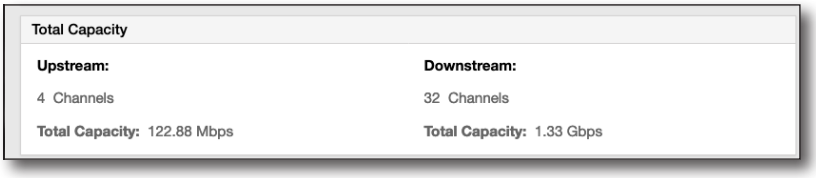
CMTS Information

Here you'll find general information for the CMTS, including: hostname, location, street address, vendor, DOCSIS version, and a description of the the current CMTS/CCAP software version installed.



Total Capacity

The upstream and downstream channels and capacity are shown here.



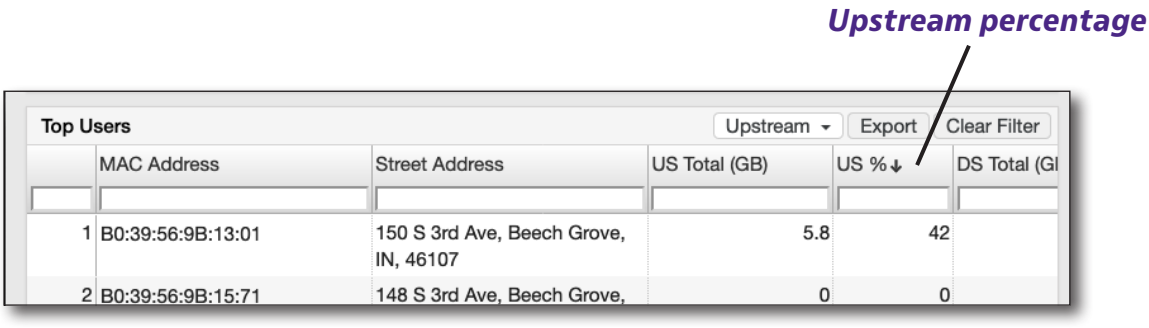
Top Users

Every 15 minutes, XPERTrak polls the amount of data used by each modem. The Node Capacity Analyzer then retains the aggregate amount of data to track utilization, as well as the peak users, purging the remaining data.

The peak values represent utilization for the subscriber in that period, not an aggregate per-user view of upstream/downstream. As such, for each 15-minute poll interval, you could have over 100% utilization for the top 10 users in that period.

The anaylzer is meant to be more of a quick check for node utilization, rather than a capacity planning tool.

You can sort your top users using the search bar at the top for each column. Use the dropdown to choose upstream or downstream.

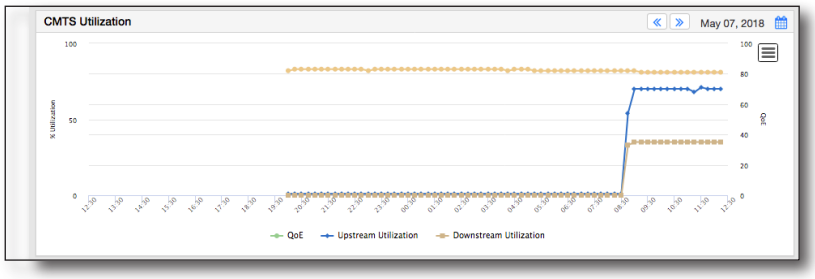


The Top Users panel can give you a snapshot of your peak individual users in a 15-minute period, rolling into your aggregate node usage.

CMTS Utilization

Here you can see the total CMTS utilization, including the QoE, upstream, and downstream.

The colors relate to those shown on the QoE chart of the Node Health Analyzer, and are dependent on the thresholds you set up in the configuration settings.



RF Channel Utilization

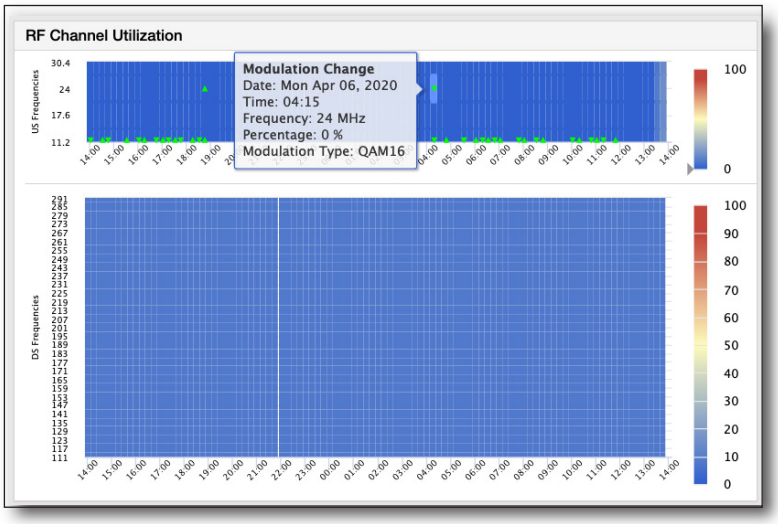
The total RF channel utilization for both upstream and downstream frequencies are shown here.

The colors show the maximum % of data utilization for each channel for that 15-minute polling interval.

The scale on the right shows the utilization levels.

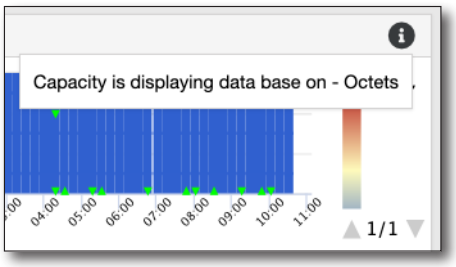
Upshifts ▲ and downshifts ▼ in the utilization indicate QAM rollback or roll forward.

Use your mouse to roll over the arrows for more detail.



Mouse over **Information** in the upper right corner to show what the capacity data is based on: octets (approximation) or mini slots (exact). Mini slots is the default.

To change the setting, see *"Capacity/Utilization" on page 239.*

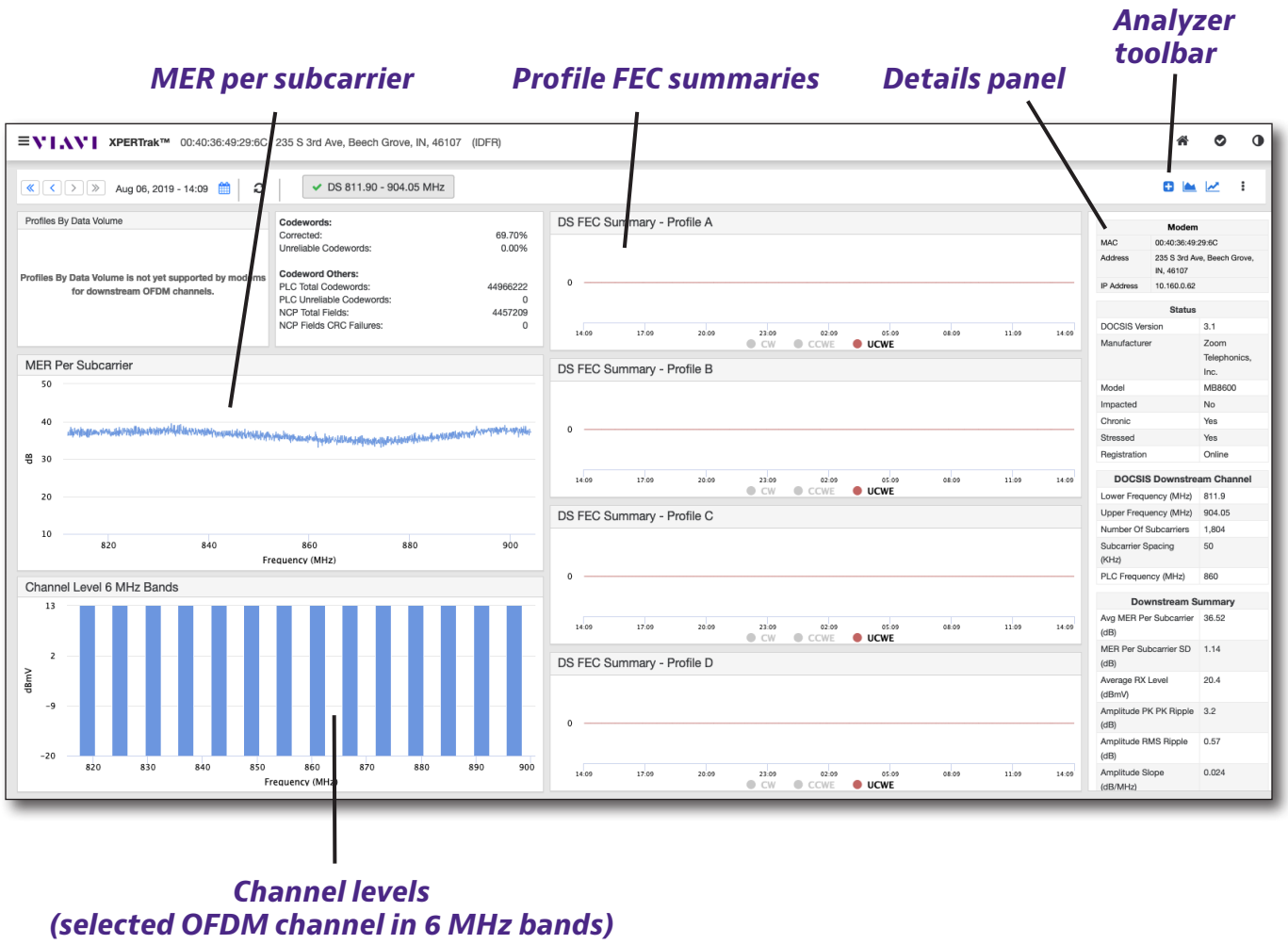


DOCSIS 3.1 Analyzer

Once you have selected a DOCSIS 3.1 modem in the map, list, or modem details view, you can bring up specific D3.1 information for that modem using the **DOCSIS 3.1 Analyzer.**

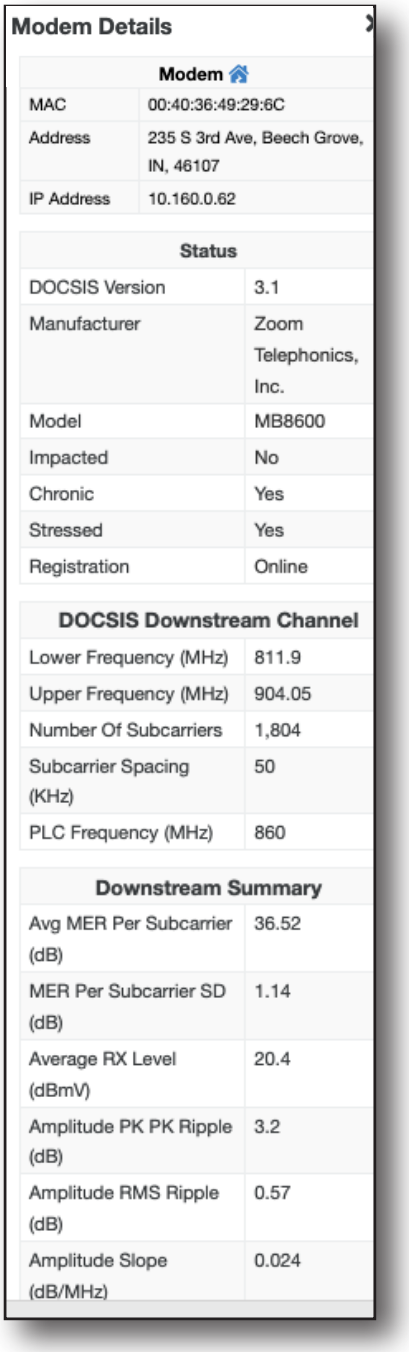
Here you can see specific OFDM and OFDMA upstream/downstream details on the modem, including profile by data volume, codeword errors, MER per subcarrier, channel levels, and profile FEC summaries. The DOCSIS 3.1 Analyzer is licensed as part of the HFC Assurance package.

Note: OFDMA MER per subcarrier is not supported by all CMTS vendors.



Modem Details

This panel is used to view the details about the currently selected D3.1 modem, including the following categories.



Click the **Modem Analyzer** to go to the Modem Analyzer. For more information, see *"Modem Analyzer" on page 85*.

Modem

- MAC Address
- Street Address
- IP Address

Status

- DOCSIS Version
- Manufacturer
- Model
- Impacted
- Chronic
- Stressed
- Registration

DOCSIS Downstream Channel

- Lower Frequency (MHz)
- Upper Frequency (MHz)
- Number Of Subcarriers
- Subcarrier Spacing (KHz)
- PLC Frequency (MHz)

Downstream Summary

- Avg MER Per Subcarrier (dB)
- MER Per Subcarrier SD (dB)
- Average RX Level (dBµV or dBmV)
- Amplitude PK-PK Ripple (dB) (Peak to Peak)
- Amplitude RMS Ripple (dB)
- Amplitude Slope (dB/MHz)
- Group Delay Mean (ns)
- Group Delay PK-PK Ripple (ns) (Peak to Peak)
- Group Delay RMS Ripple (ns)
- Group Delay Slope (ns/MHz)
- PLC Total Codewords
- PLC Unreliable Codewords
- NCP Total Fields
- NCP Field CRC Failures
- DS UCCWER (Downstream Uncorrectable Codeword Errors)
- DS CCWER (Downstream Correctable Codeword Errors)
- PLC CWER (Codeword Errors)

Analyzer Toolbar

You can navigate to other tools using the **Analyzer toolbar** located at the top of the analyzer.

Time controls – Found on the top left of the screen, allow you to adjust the time period shown in full day (double arrows) or 15-minute increments (single arrows).

Calendar – Found near the top middle of the screen, allows you to pick the day to display.

Refresh – Found near the top middle of the screen, allows you to refresh the analyzer measurements.

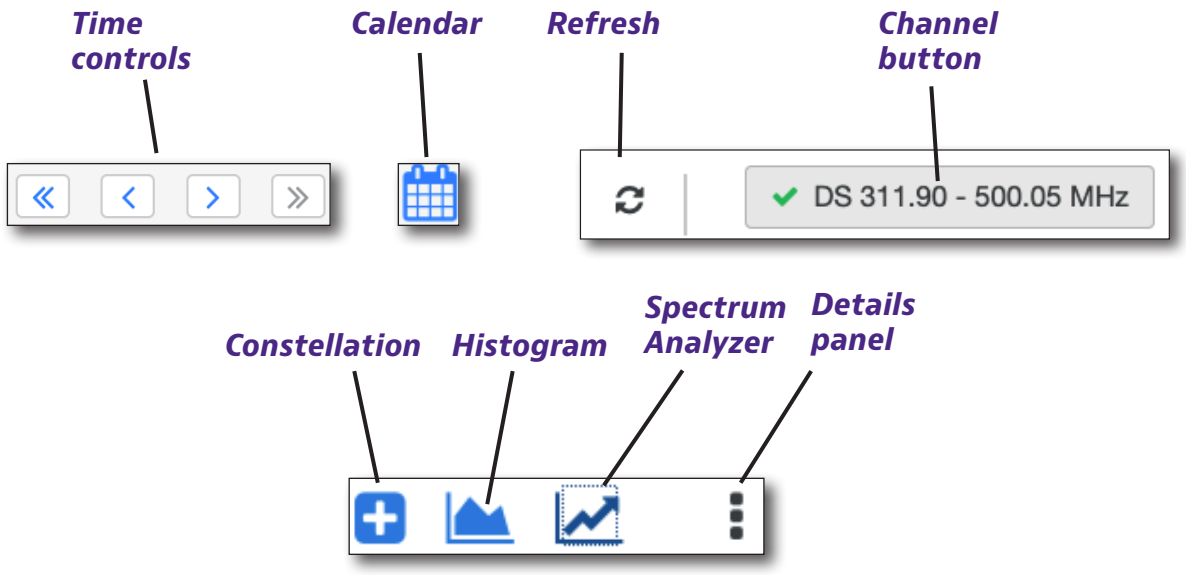
Channel button – Found near the top middle of the screen, shows more detail about the upstream or downstream. Multiple OFDM downstreams or OFDMA upstreams may display here, as well. For more information, see the next section.

Constellation – Found on the top right of the screen, launches the Constellation view in a new window. May not be supported by some vendors. For more information, see this section later in the chapter. For more information, see *"Constellation Chart" on page 83.*

Histogram – Found on the top right of the screen, launches the Histogram view in a new window. May not be supported by some vendors. For more information, see *"Histogram Chart" on page 84*.

Spectrum Analyzer – Found on the top right of the chart, launches the CMTS spectrum analyzer or Spectrum Analyzer in a new window. For more information, see *"CMTS Spectrum Analyzer" on page 124* and *"PathTrak Return Path Monitoring (RPM)" on page 131*.

Details panel – Found on the top right of the screen, allows you to show/hide the panel. The Details panel is displayed by default.



Upstream / Downstream Channel Details

As mentioned previously, this area shows specific OFDM and OFDMA upstream/ downstream details on the modem, including profile by data volume, codeword errors, MER per subcarrier (if supported by vendor), channel levels, and profile FEC summaries.

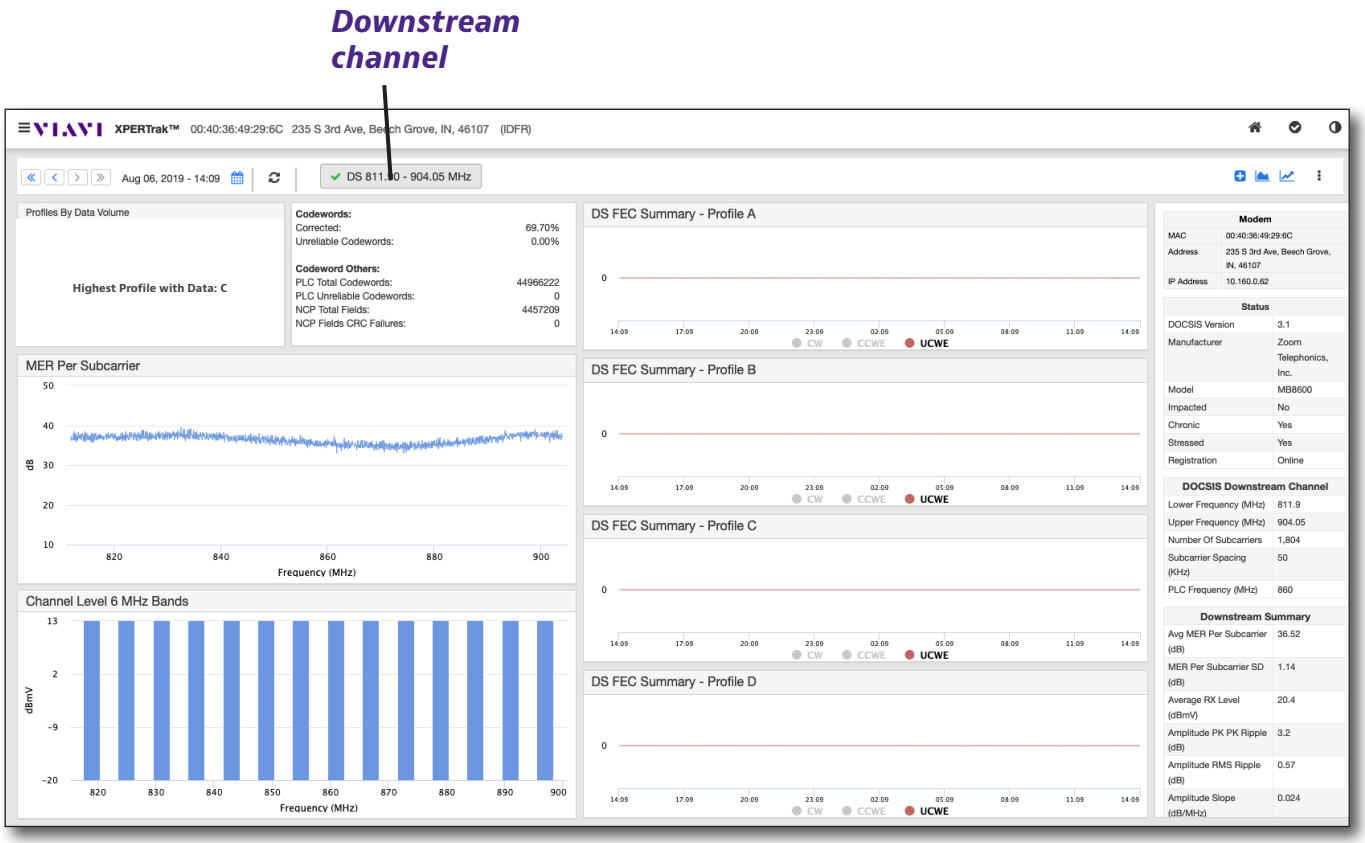
For each downstream OFDM channel and each upstream OFDMA channel, use the **Upstream/downstream channel** buttons near the top of the screen to show detailed information about the selected channel in the display below.

The buttons contain the start and stop frequencies for each channel and designate them as upstream (US) or downstream (DS) channels. The red X and green checkmark show the user if the channel is passing or failing thresholds set in the admin settings.

Multiple OFDM downstreams or OFDMA upstreams may display here, as well.

Downstream

Select the **Downstream channel** button to see all the details for a particular downstream.



Upstream

Select the **Upstream channel** button to see all the details for a particular upstream.

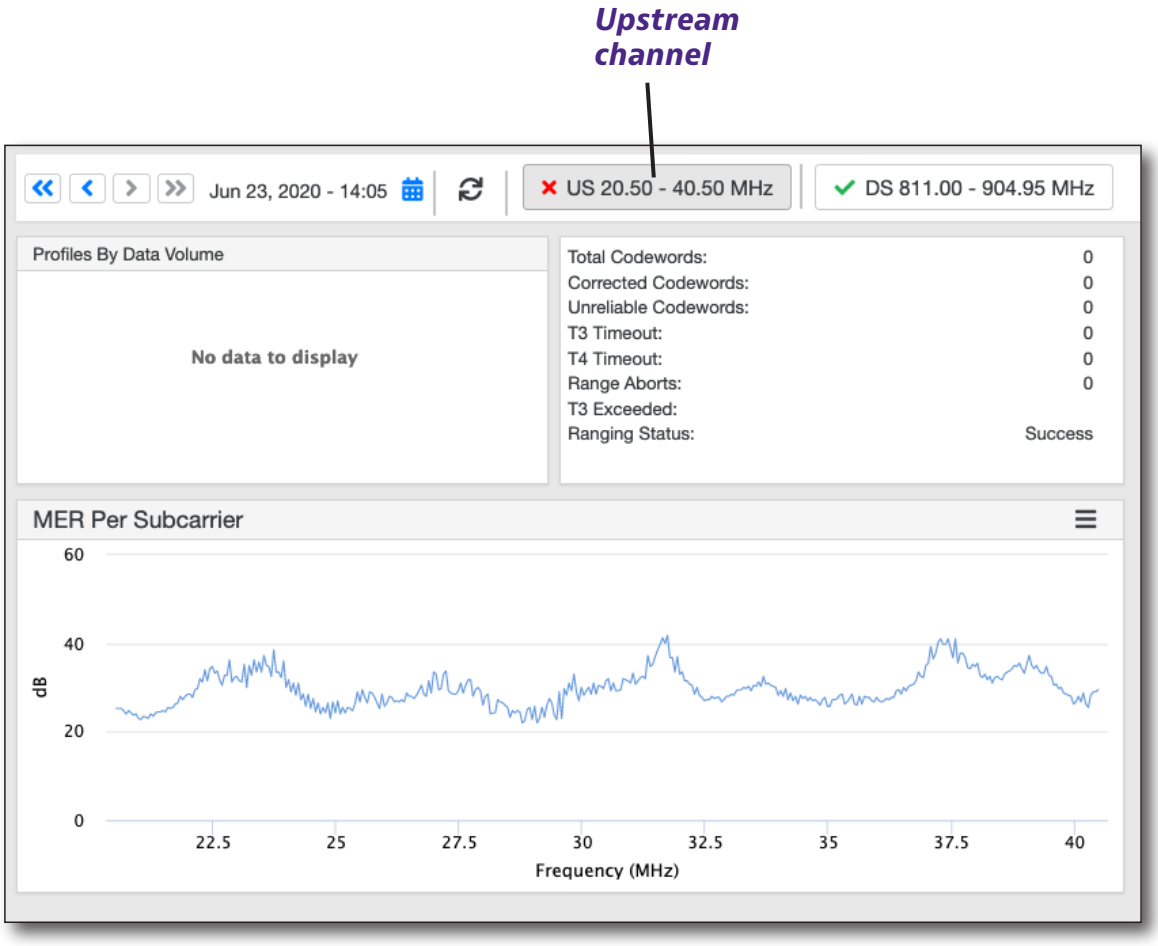


Chart options

Select **chart options** to show the average MER per subcarrier (if supported by vendor).

Constellation Chart

Similar to the QAMTrak constellation chart, this screen displays an on-demand, static view of the demodulated signal for bursty, downstream traffic, as well as for a steady, injected OFDM and OFDMA signal. Data for all the packets received is displayed, including more detail in the Channel Information panel.

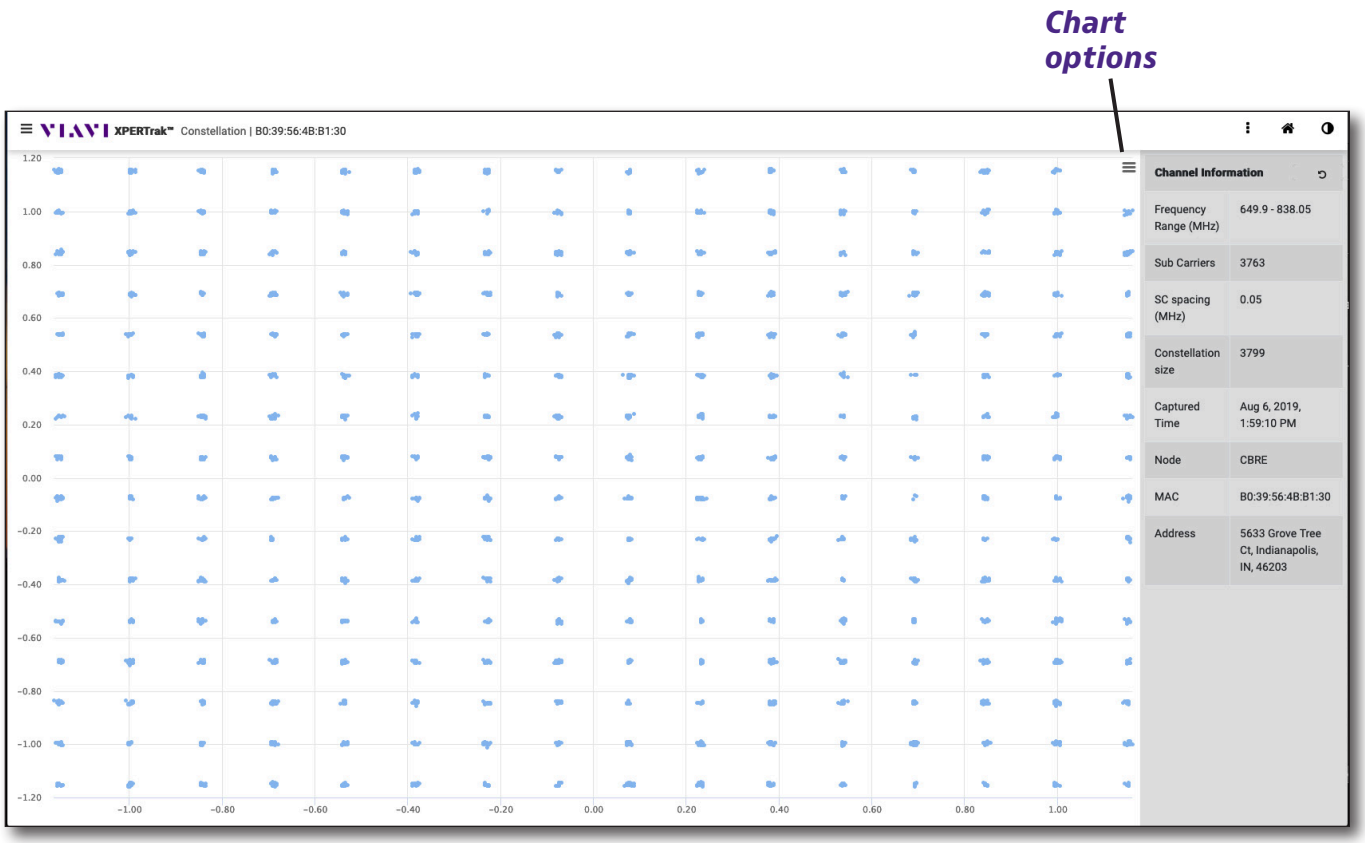
Chart options

From this dropdown, you can do the following actions.

Print chart – Print a chart of the current constellation.

Download PDF document – Download a PDF of the current constellation.

Download JPEG image – Download a JPEG of the current constellation.



NOTE:

This feature may not be supported by some vendors.

Histogram Chart

The **Histogram** captures the amplitude distribution of the carrier, which could show issues such as amplifier distortion or laser clipping.

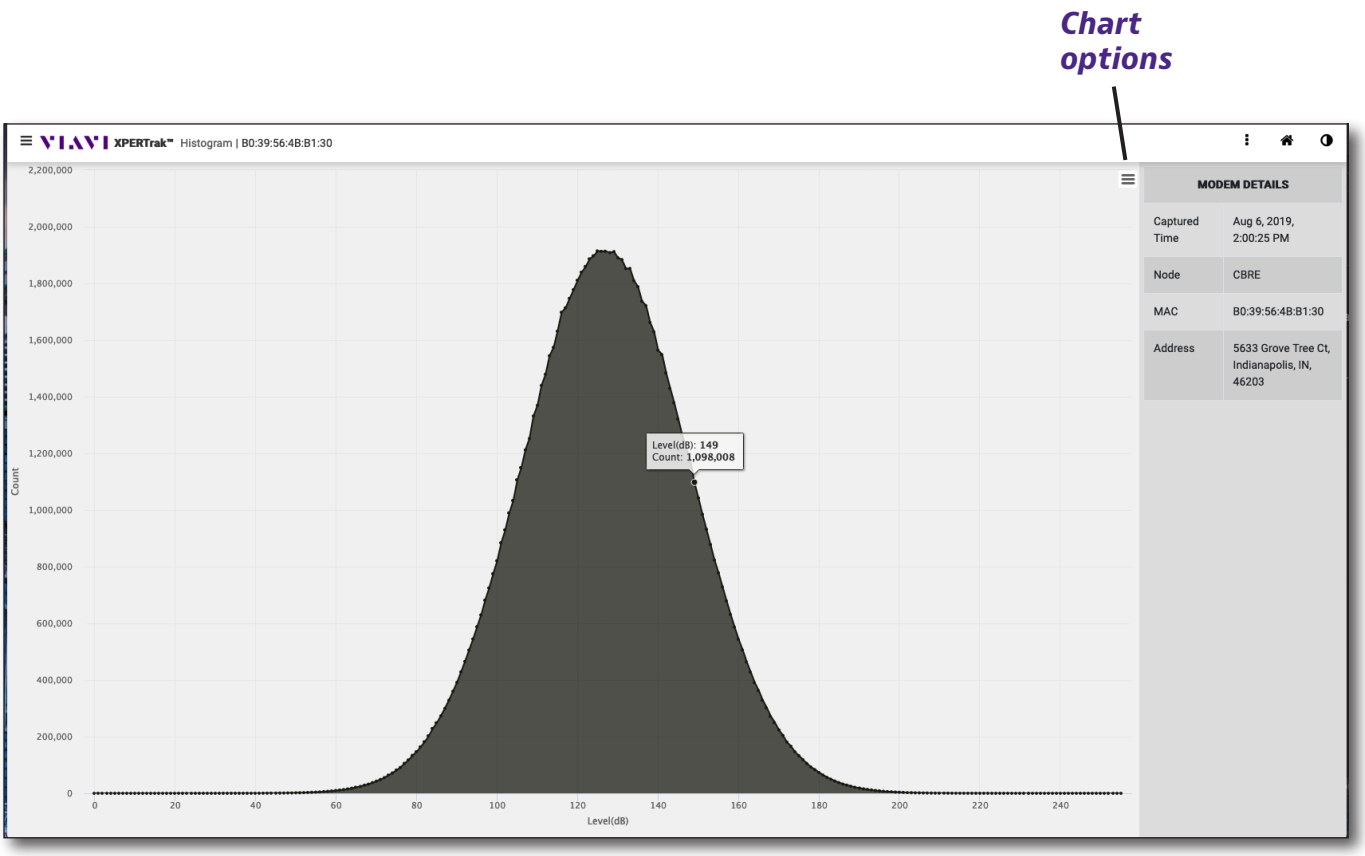
Chart options

From this dropdown, you can do the following actions.

Print chart – Print a chart of the current histogram.

Download PDF document – Download a PDF of the current histogram.

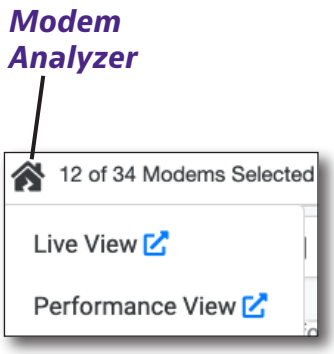
Download JPEG image – Download a JPEG of the current histogram.



NOTE:

This feature may not be supported by some vendors.

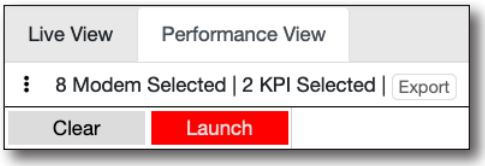
Modem Analyzer



The **Modem Analyzer** allows you to view selected Key Performance Indicators (KPIs) live and historically for up to 20 modems at a time.

From the Node Health Analyzer, select **Modem Analyzer** .

Select the **Performance View** or **Live View** tab at the top. Then select the KPIs and channels you want to include and click **Launch** at the top of the KPI list. A separate chart will be displayed for each KPI.

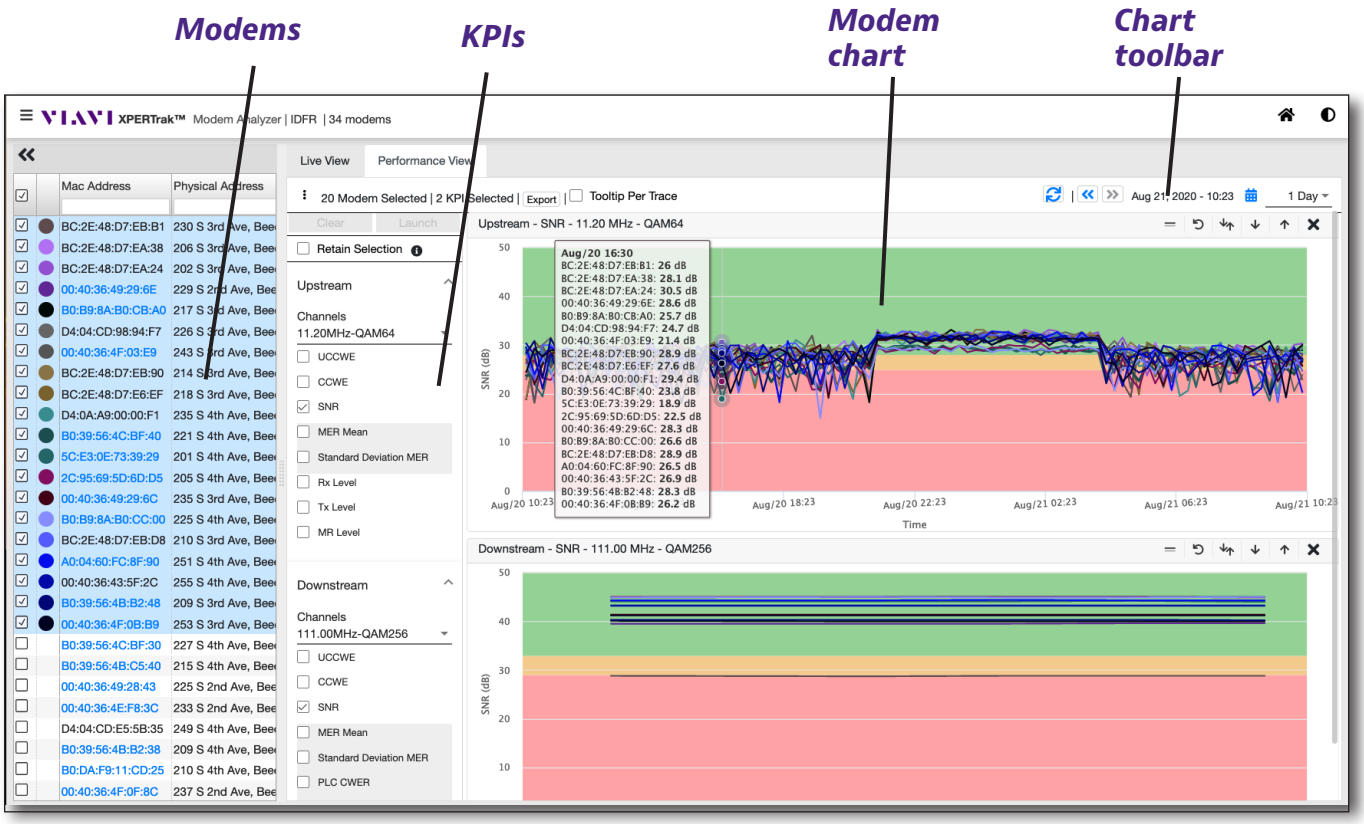


For each KPI selected, the graph will show upstream or downstream, the KPI, channel frequency, and modulation of that channel. At the top of the chart is the summary information for the number of modems selected, number of KPIs selected, and the option to export data for the currently selected modems and KPIs.

The modem list can be expanded by dragging the edge of the window left or right to show more detail. The details available are **MAC Address**, **Physical Address** (street address), **DOCSIS Version**, and **Online Status**. Hide/show the modem list with the double arrows above the list.

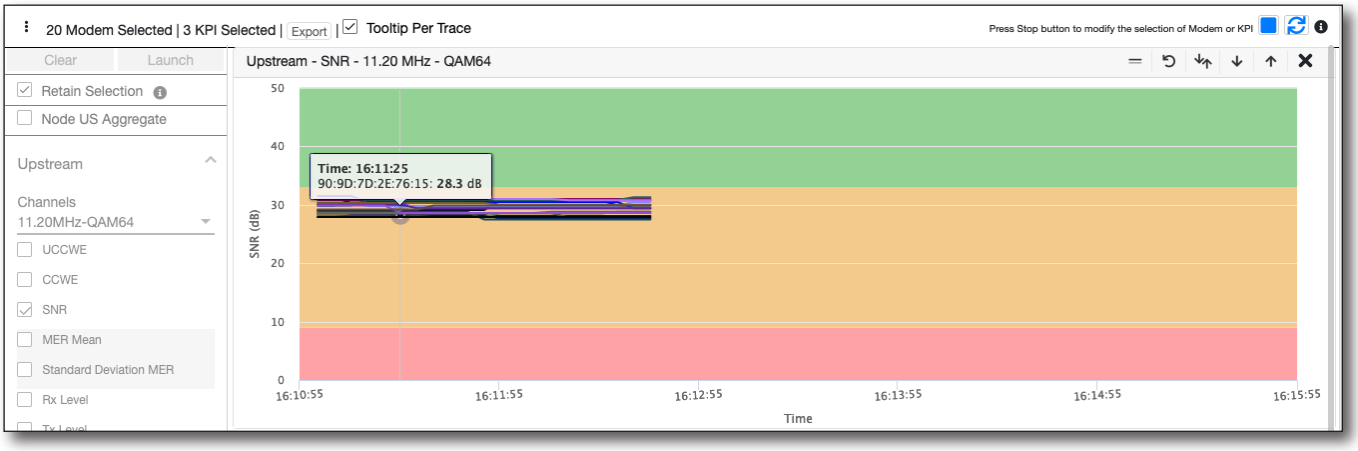
Select **Retain Selection** at the top of the KPI list to retain selected KPIs and channels when changing modems or to Performance View.

Hover your mouse over the traces for more details on the modems.



Modem Analyzer historical view (up to 20 modems max)

Select **Tooltip per Trace** to break it down per trace. Hover your mouse over the trace for more details on the individual modem for the selected time period.

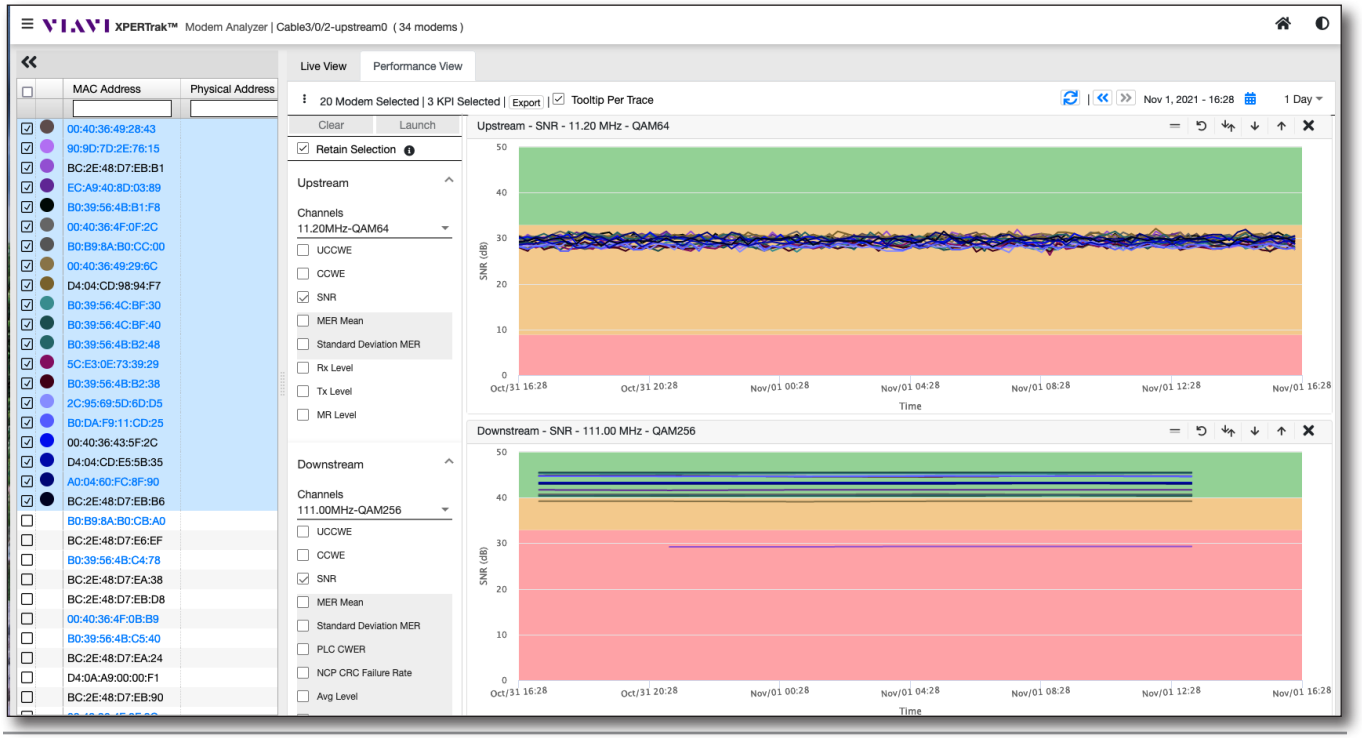


The time period shown at the bottom of the graph is in 5 minute increments for Live view. For Performance view, the time scale will match the time period selected. (1 day, 7 days, etc.).

Note: The display can only show performance data up to the maximum admin setting for the number of days of detailed data to store. If the selected range is greater than the storage limit, the display will be blank beyond the maximum saved date.

Performance View tab

Performance View lets you select a specific time period or select a longer duration. CWER and UCCWER details are not stored historically. These KPIs are live and only the summary data is stored.

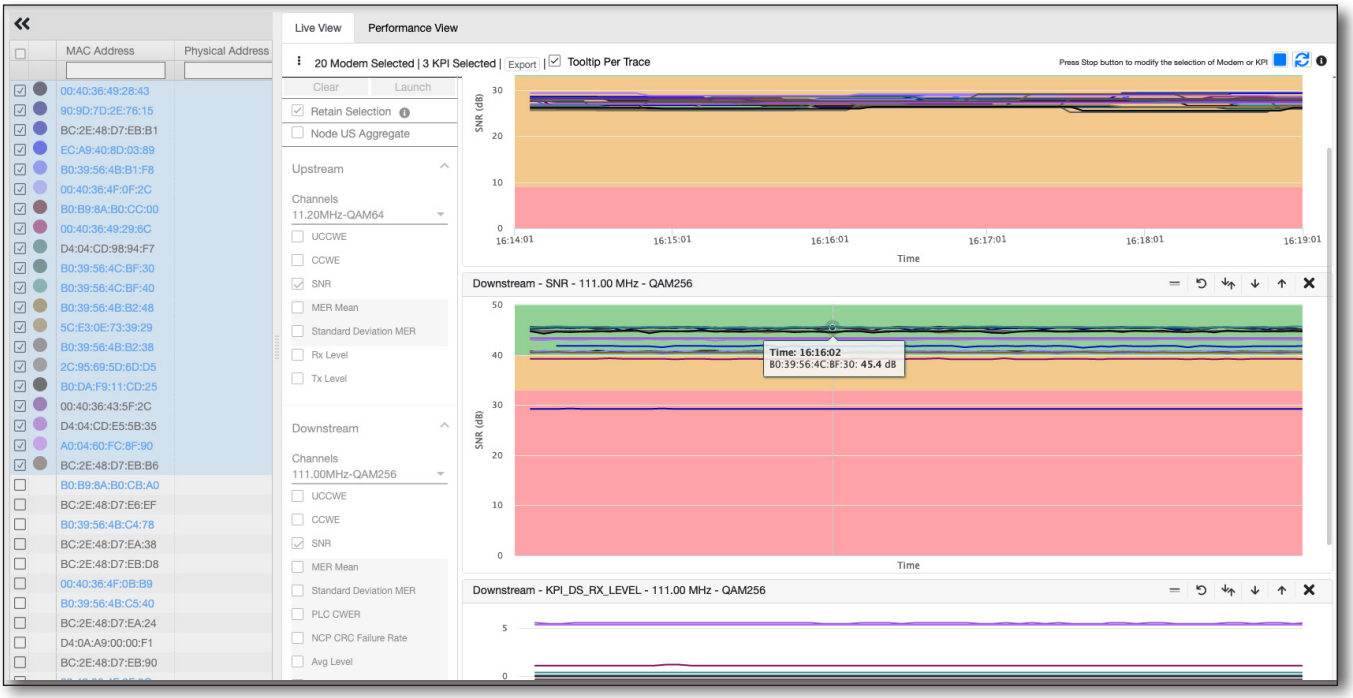


Live View tab

Live View shows the current view of the modem analysis, refreshing every 5 seconds.

Select **Node US Aggregate** at the top of the KPI list to show Upstream KPIs in live mode.

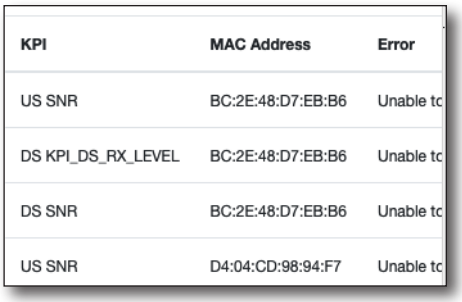
Click and drag your mouse over a time period to zoom in. When done, click **Reset Zoom**.



To modify the modem or KPI selection in Live view, select the **Stop** button at the top, make your changes, then select **Launch** to resume.

To refresh the charts, select **Refresh**.

Select the **Info** icon for more details on the traces.



KPI	MAC Address	Error
US SNR	BC:2E:48:D7:EB:B6	Unable to
DS KPI_DS_RX_LEVEL	BC:2E:48:D7:EB:B6	Unable to
DS SNR	BC:2E:48:D7:EB:B6	Unable to
US SNR	D4:04:CD:98:94:F7	Unable to

Chart Toolbar

In Performance View, navigate using the **Chart toolbar** located at the top of the chart.

Refresh – Refreshes the chart.

Time controls – Adjust the time period shown in full day increments.

Calendar – Select the day to display.

Duration – Selects the duration to display. Limited to the setting for maximum days to retain detailed modem information. This can be adjusted in the Admin settings.

Controls

Toggle Legend – Shows the trace color legend.

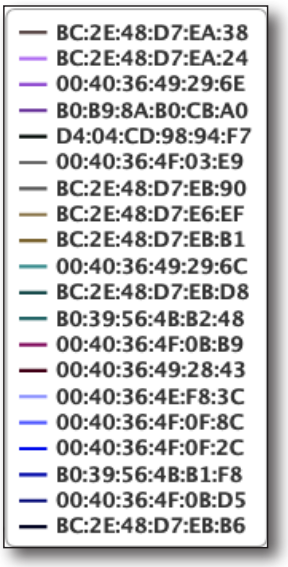
Reset – Resets the chart.

Auto Reference Level – Adjusts the reference level so that the trace fits in the window for easier viewing.

Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

X – Closes the current chart. Re-launch the analyzer to show again.



Trace legend

KPIs

Upstream

- UCCWE
- CCWE
- SNR
- MER Mean
- Standard Deviation Mean
- Rx Level
- Tx Level
- MR Level

Downstream

- UCCWE
- CCWE
- SNR
- MER Mean
- Standard Deviation Mean
- PLC CWER
- NCPCRC Failure Rate
- Avg Level
- Min Level
- Max Level

Stability

- T3 timeouts
- T4 timeouts
- Range Aborts
- Registration Flaps
- Power Adjust Flaps

5

Node Performance

This chapter covers how to use Node Performance, including the following:

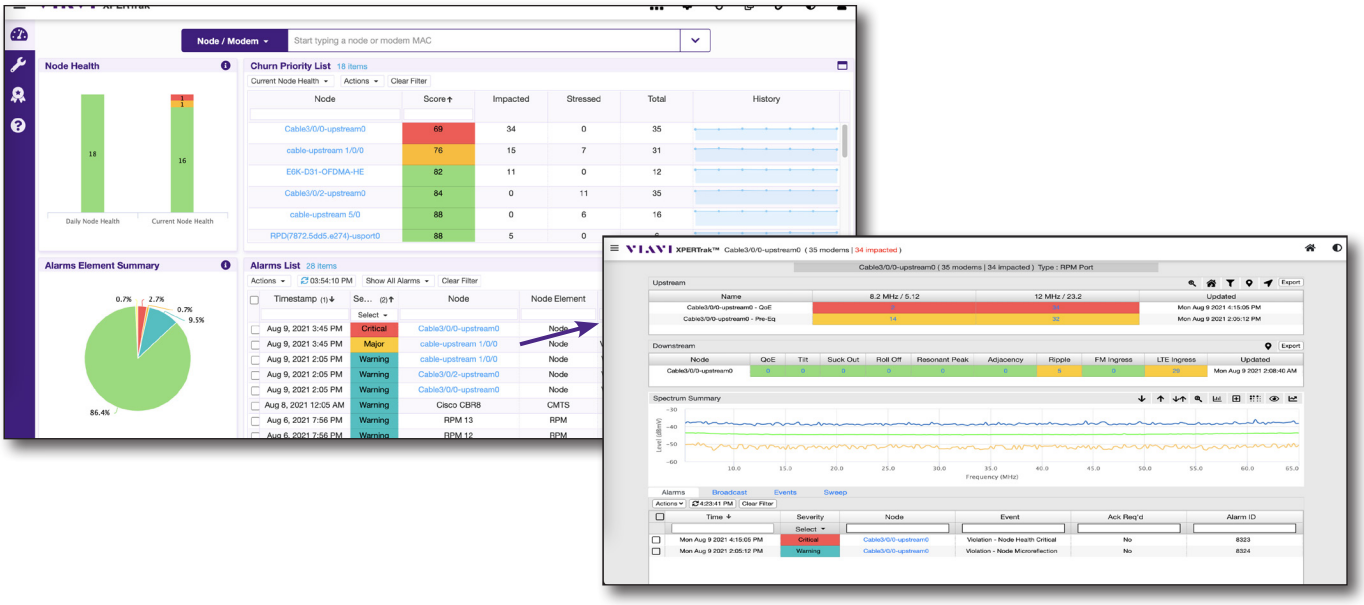
- "Node Performance Detail (Element Analyzer)" on page 92
- "Navigation" on page 93
- "Upstream" on page 94
- "Downstream" on page 96
- "RPM Spectrum Summary" on page 97
- "Alarms tab" on page 98
- "HSM Broadcasts tab" on page 99
- "Events tab" on page 99

Node Performance Detail (Element Analyzer)

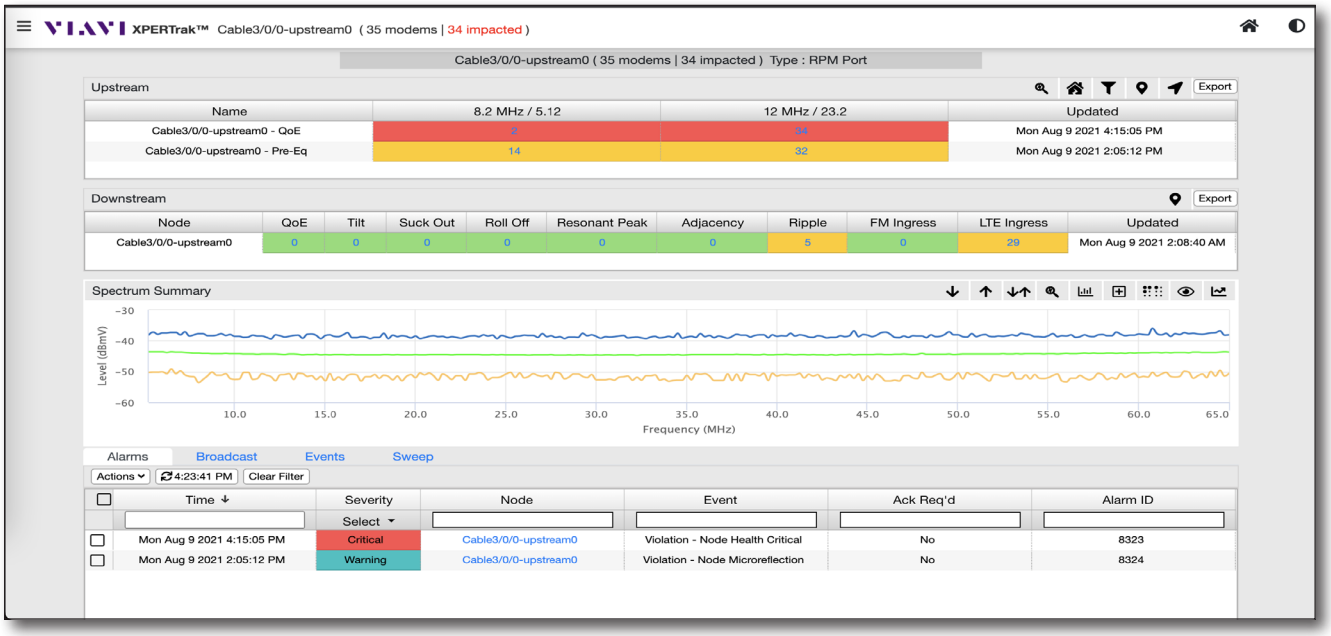
The Node Performance Detail view, also known as the Element Analyzer, is designed to provide detailed measurement results for the nodes selected from the alarms list on the Main Dashboard.

This view will open within a new window or tab for each link selected from the Dashboard views. To return to the Main Dashboard, simply close the new tab or window.

From the Main Dashboard, you can launch directly into the detail of PathTrak hardware nodes (RPM ports) and virtual spectrum. Click the link for the alarm to open a new tab for the detail.



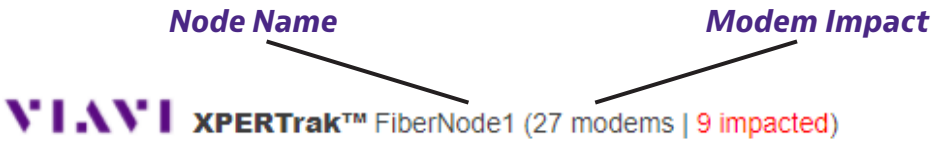
Launch Node Analysis directly from the Alarms List on the Main Dashboard.



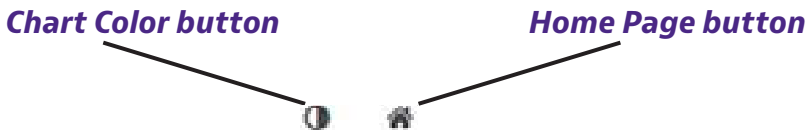
Navigation

Navigation within the Element Analysis view is accomplished using the horizontal control bar located at the top of the XPERTrak browser window. From this area you can perform the following actions;

- **Node Name** – The friendly name of the node is located to the right of the VIAVI XPERTrak logo, as shown below.
- **Modem Impact Summary** – The number of modems assigned to the node and the modems impacted with either an upstream or downstream impairment based on threshold settings are located to the right of the node name.

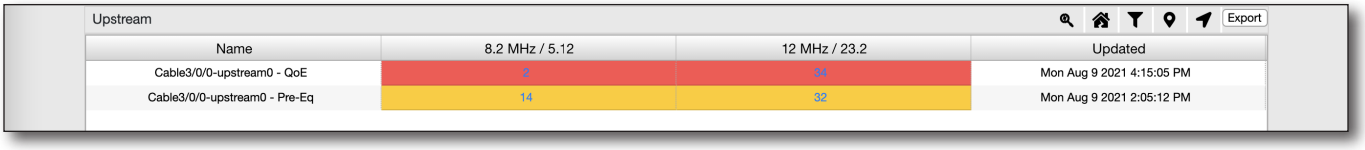


- **Switch Chart Color** – Controls the color palette that is displayed within the XPERTrak System. Selecting this icon will toggle the light and dark screen display themes.
- **Home** – Launches a new tab or window to display the Dashboard view of the XPERTrak System. The current tab or window will remain open until you close it.



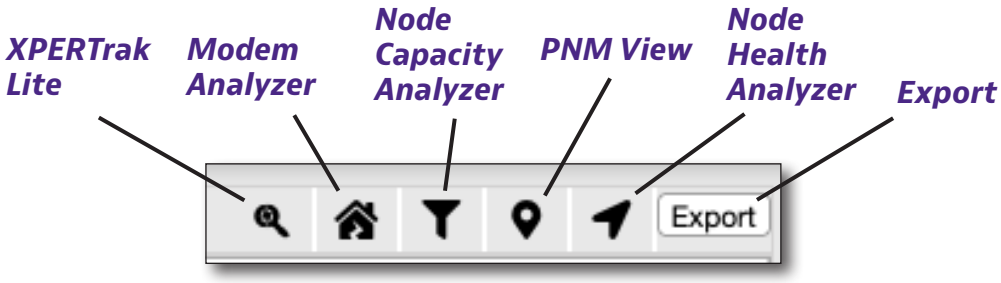
Upstream

The upstream node performance is outlined within this area of the Node Performance view.



The following global controls are available for this table;

- **XPERTrak Lite** – Launches XPERTrak Lite in a new window.
- **Modem Analyzer** – Launches the Modem Analyzer in a new window. For more information, see *"Modem Analyzer" on page 85*.
- **Node Capacity Analyzer** – Launches the Node Capacity Analyzer in a new window. For more information, see *"Node Capacity Analyzer" on page 74*.
- **PNM View** – Launches the PNM view in a new window and highlights the impairment with the greatest modem count. For more information, see *"Proactive Network Maintenance (PNM)" on page 101*. (Not shown if PNM is not licensed.)
- **Node Health Analyzer** – Launches the Node Health Analyzer in a new window. For more information, see *"Node Health Analyzer" on page 47*.
- **Export** – Downloads a CSV Excel file of the current list.



Within this table, you will be presented with the following information;

- **Name** – The name of the node
- **Numbers of Impacted Modems** – The upstream channels are labeled with their center frequency and bandwidth and are displayed as individual columns within the table. The modem numbers within these fields can be selected to launch the PNM screen to show measurement data (if licensed).
- **Updated** – Date and time of the last successful measurement update (poll)
- **QoE row** – Quality of Experience (QoE) score of the node
- **MACTrak row** – Worse-case color state for that channel and links take you to the MACTrak performance view
- **Pre-EQ row** – Number of modems in the worse-case color state for that channel

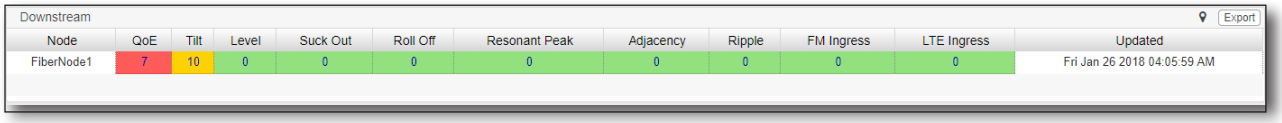
Colors

Chart colors are based on threshold settings set by admin for good, marginal and fail.

- **Red** – Failing
- **Yellow** – Marginal
- **Green** – Good

Downstream

The downstream node performance is outlined within this area of the Node Performance view.



The number in each impairment column represents the total count of modems with that detected impairment. The number is a selectable link that launches the PNM screen and selects all modems with the selected impairment.

The following global controls are available for this table;

- **PNM View** – Launches the PNM view in a new window and highlights the impairment with the greatest modem count. For more information, see *"Proactive Network Maintenance (PNM)" on page 101*. (Not shown if PNM is not licensed.)
- **Export button** – Downloads a CSV file of the current list

Within this table you will be presented with the following information;

- **Node** – Name of the node
- **QoE** – Quality of Experience (QoE) score of the node
- **Numbers of Impacted Modems** – The downstream impairment types are displayed as individual columns within the table. The downstream node performance measurements include; Tilt, Level, Suck Out, Roll Off, Resonant Peak, Adjacency, Ripple, FM Ingress, and LTE Ingress. The modem numbers within these fields can be selected to launch the PNM screen to show measurement data (if licensed).
- **Updated** – Date and time of the last successful measurement update (poll)

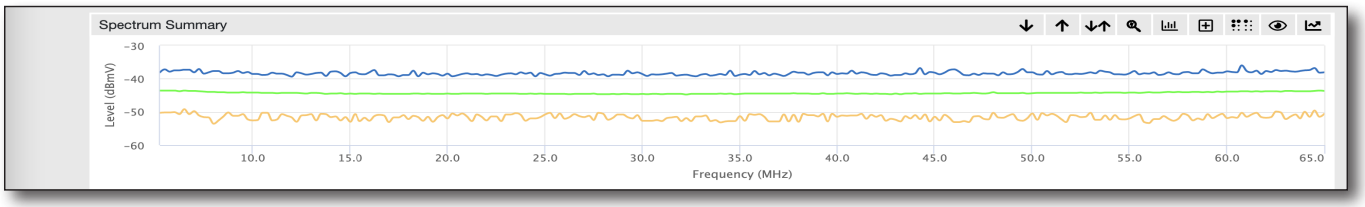
Colors

Chart colors are based on threshold settings set by admin for good, marginal and fail.

- **Red** – Failing
- **Yellow** – Marginal
- **Green** – Good

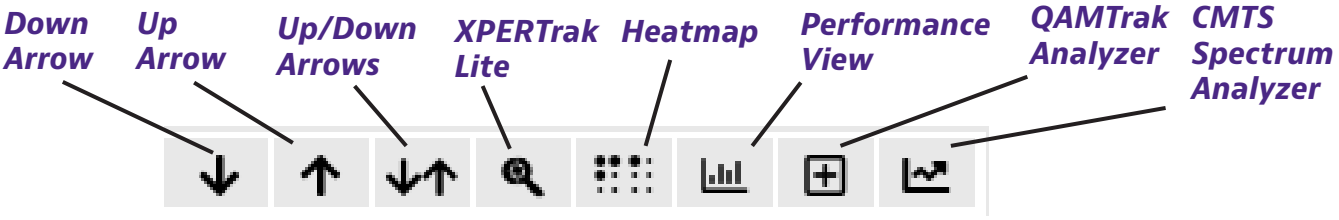
RPM Spectrum Summary

The return path spectrum is outlined within this area of the Node Performance view.



The following global controls are available for this table;

- **Down Arrow** – Moves the trace down and increases the reference level.
- **Up Arrow** – Moves the trace up and decreases the reference level.
- **Up/Down Arrows** – Automatically sets the reference level.
- **XPERTrak Lite** – Launches XPERTrak Lite in a new window.
- **Heatmap** – Launches the Heatmap in a new window. For more information, see *"Heatmap" on page 171*. Requires and active maintenance contract.
- **Performance View** – Launches the Performance Monitoring view in a new window. For more information, see *"Performance View" on page 157*.
- **QAMTrak Analyzer** – Launches the PathTrak RPM Monitoring Analyzer view in a new window. For more information, see *"QAMTrak Upstream Analyzer" on page 145*. (Not supported by all vendors).
- **CMTS Spectrum Analyzer** – Launches the PathTrak RPM Spectrum Analyzer view in a new window. If CMTS or DAA spectrum is used, the label will be **CMTS Spectrum Analyzer**. If PathTrak hardware is used, it will be **HCU Spectrum Analyzer**. For more information, see *"CMTS Spectrum Analyzer" on page 123.*



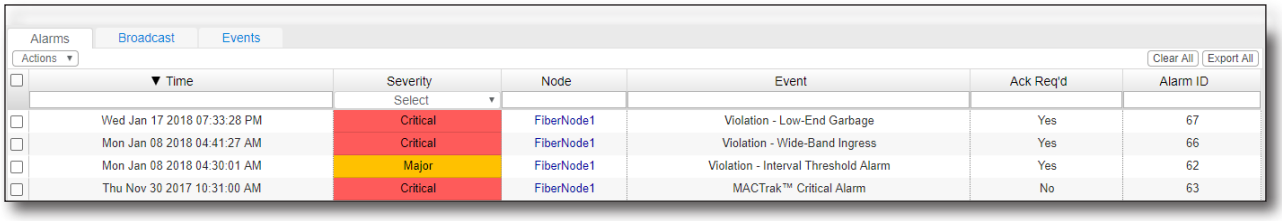
The RPM Spectrum Summary graph displays measured levels in dBmV, dBµV, or dBm (Y-Axis, Vertical), versus frequency in MHz (X-Axis, Horizontal). Within this graph, you will be presented with the following information;

- **Maximum Hold Level** – Displayed as a blue line relative to the maximum measured RF level at the specific frequency during the previous measurement period.
- **Average Level** – Displayed as a horizontal green line relative to the average measured RF level at the specific frequency during the previous measurement period.
- **Minimum Hold Level** – Displayed as a horizontal orange line relative to the minimum measured RF level at the specific frequency during the previous measurement period.

- **Interactive Marker** – Simply hover your mouse over the graph to display the interactive marker. The marker will display the frequency, max hold level, average level, and min hold level at that location.
- **Frequency Span** – By default, the frequency span is set to full span. To adjust the frequency span, simply click and hold on the graph (at the desired start frequency) with your left mouse button and then drag the mouse to highlight the desired span. Release the mouse button over the graph (at the desired stop frequency) to select the span. To reset to full span, select the Reset button in the upper right corner of the graph.

Alarms tab

The alarms for the selected node are outlined within this area of the Node Performance view. The values within this table can be sorted (ascending or descending) by simply selecting the column header (1st row of table). By default, this table is sorted by time from newest to oldest. Additionally, users can search within specific data columns by typing a value into the column



search area (2nd row of table).

The following global controls are available for this table;

- **Actions dropdown** (top left of the table) – Clears alarms within the table that have been selected using the checkboxes to the far left of each row in the table. To select all items within the table, select the checkbox at the top left corner of the table. Additionally, this dropdown can be used to download a CSV Excel file of the current list.
- **Clear All button** – Clears all alarms within the table.
- **Export All button** – Downloads a CSV file of the current list.

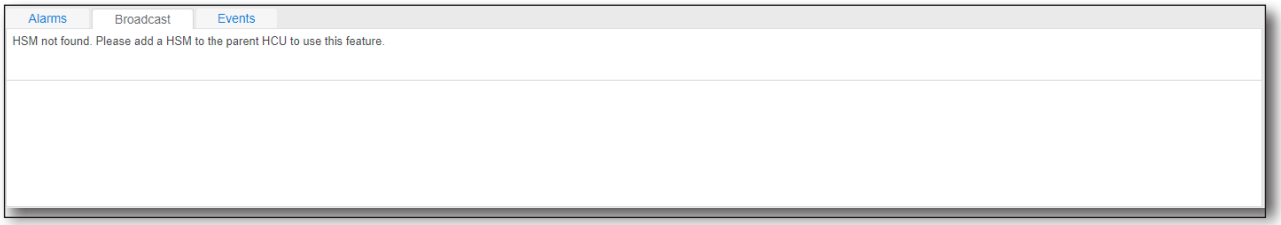
Within this table you will be presented with the following information;

- **Time** – The date and time of the alarm.
- **Alarm Severity** – The severity of the alarm (Critical, Major, Minor, or Warning). The table can be filtered by alarm severity by selecting the dropdown list at the top of the column and then choosing the desired alarm severity.
- **Node Name** – Friendly name of the node that is selected during system installation and setup.
- **Event Type** – The type of alarm that has been triggered.
- **Acknowledgement Required** – Whether or not an alarm must be acknowledged before it can be dismissed.
- **Alarm ID** – The unique identification number for the alarm that has been triggered.

HSM Broadcasts tab

The Headend Stealth Modem (HSM) broadcasts from Remote Headend Control Units (HCU) for the selected node are outlined within this area of the Node Performance view. The values within this list can be sorted (ascending or descending) by simply selecting the column header (1st row of table).

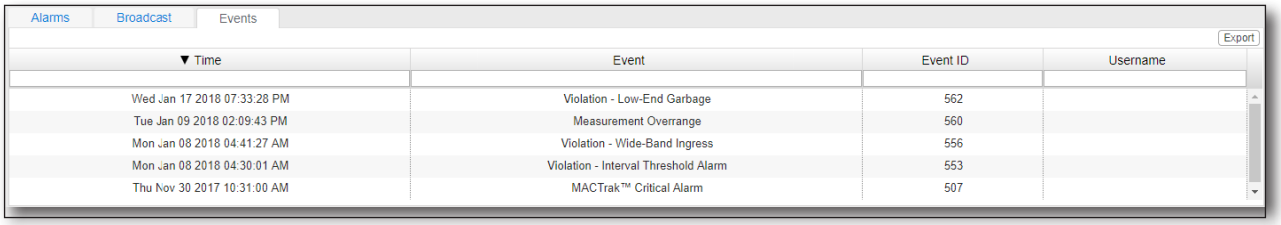
By default, this table is sorted by time from newest to oldest. Additionally, users can search within specific data columns by typing a value into the column search area (2nd row of table).



Events tab

The events for the selected node are outlined within this area of the Node Performance view. The values within this table can be sorted (ascending or descending) by simply selecting the column header (1st row of table).

By default, this table is sorted by time from newest to oldest. Additionally, users can search within specific data columns by typing a value into the column search area (2nd row of table).



The following global controls are available for this table;

- **Export button** – Downloads a CSV file of the current list.

Within this table you will be presented with the following information;

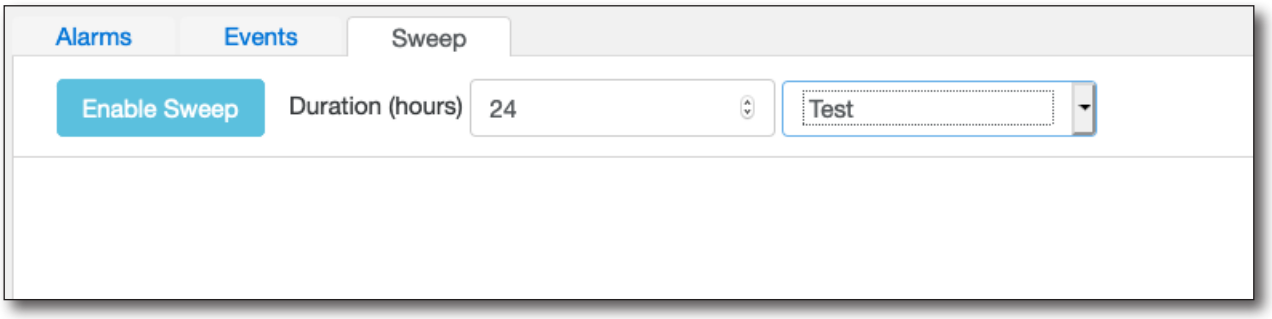
- **Time** – The date and time of the alarm.
- **Event Type** – The type of alarm that has been triggered.
- **Event ID** – The unique identification number for the event that has been triggered.
- **Username** – Associates the event with a specific user.

Sweep tab

A sweep plan must be defined in Admin settings prior to being able to enable sweep for a particular node. See *"Sweep Plan Tab" on page 205.*

You can enable sweep for the selected node in this area of the Node Performance view. You can also set the duration and choose a sweep plan.

When done, click **Enable Sweep**.



6

Proactive Network Maintenance (PNM)

This chapter covers how to use Proactive Network Maintenance, including the following:

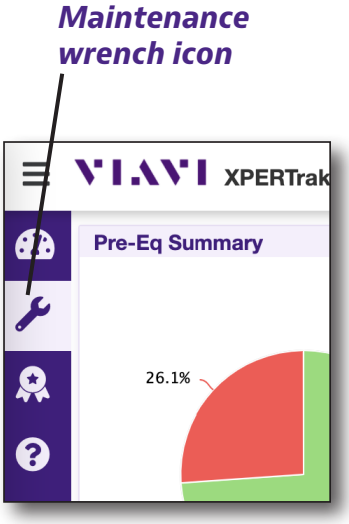
- "Proactive Network Maintenance (PNM) View" on page 102
- "Navigation" on page 103
- "Visual Overview" on page 104
- "Node map" on page 105
- "Topology Map" on page 113
- "Pre-Equalization Upstream Analyzer" on page 116
- "Downstream Spectrum (Full-Band Capture)" on page 119

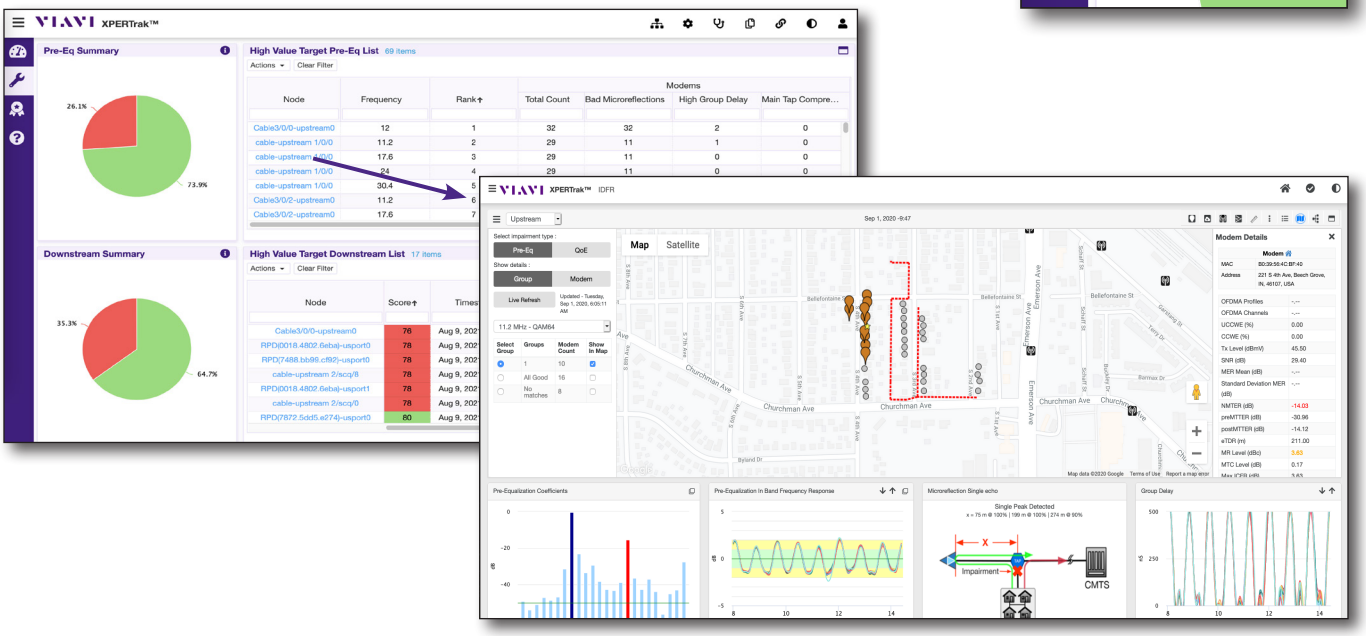
Proactive Network Maintenance (PNM) View

The Proactive Network Maintenance (PNM) view is designed to provide detailed measurement results for the nodes selected from the Maintenance views within the XPERTrak System. This view will open within a new window or tab for each link selected from the Maintenance view. To return to the Maintenance view, you can simply close the new tab or window.

To bring up the **PNM Dashboard** from the Main Dashboard, select the **Maintenance wrench** icon within the Dashboard panel.

From the PNM Dashboard, you can launch directly into the upstream and downstream detail of a node.

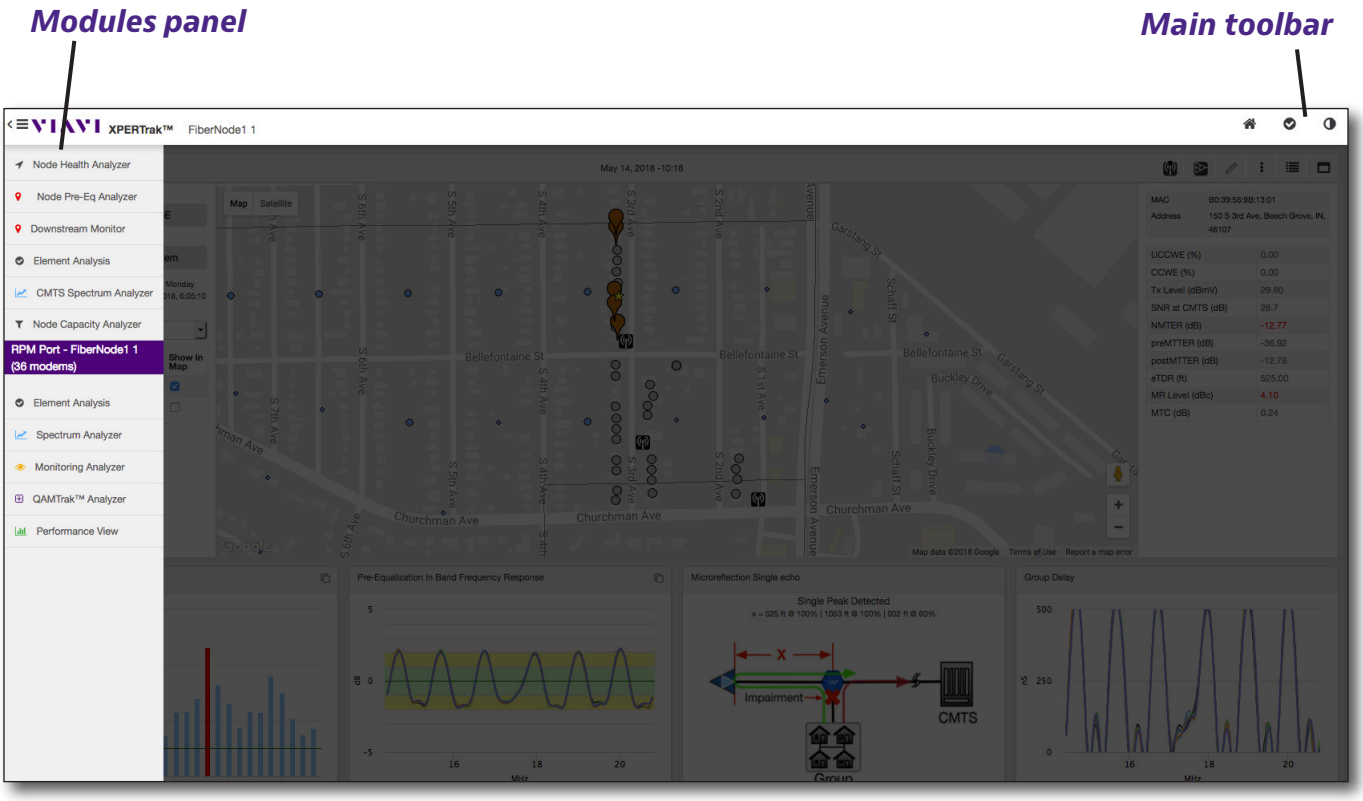




Get to upstream channel detail directly from the PNM Dashboard.

Navigation

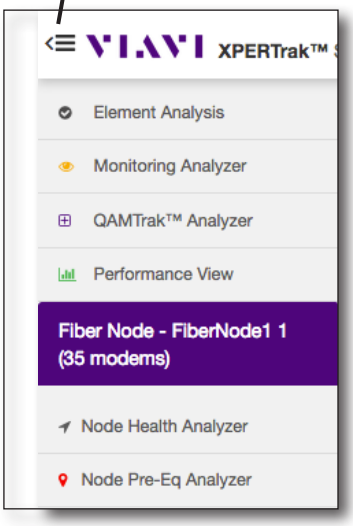
Most of the navigation in the PNM View is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.



Main Toolbar

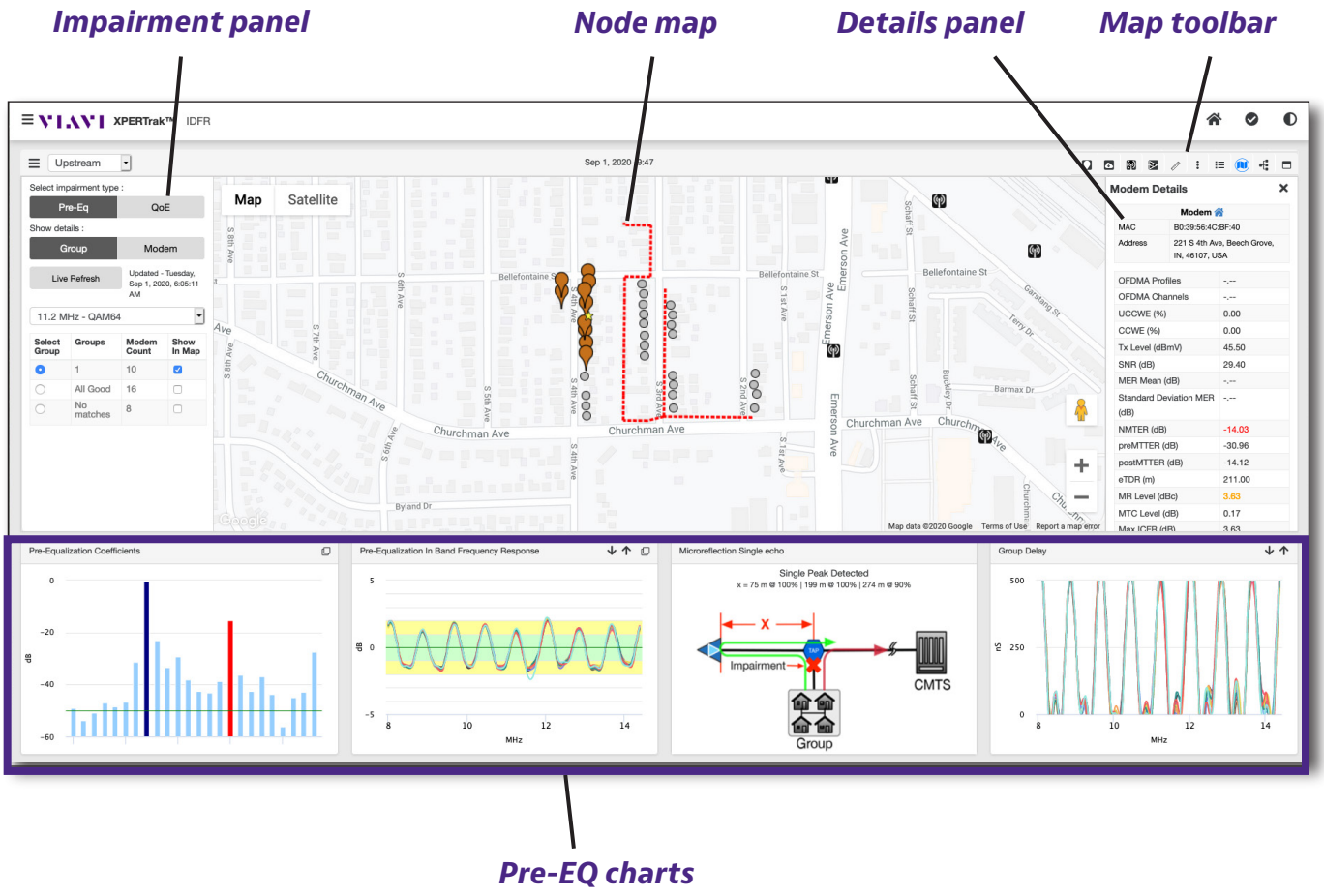
This control bar is located across the top of the browser window. From this area you can perform the following actions;

Home – Takes you back to the Main Dashboard.

Element Analysis – Takes you to the Element Analysis screen (node, modem, etc).

Switch Chart Color – This feature is used to control the color palette of the XPERTrak System.

Visual Overview

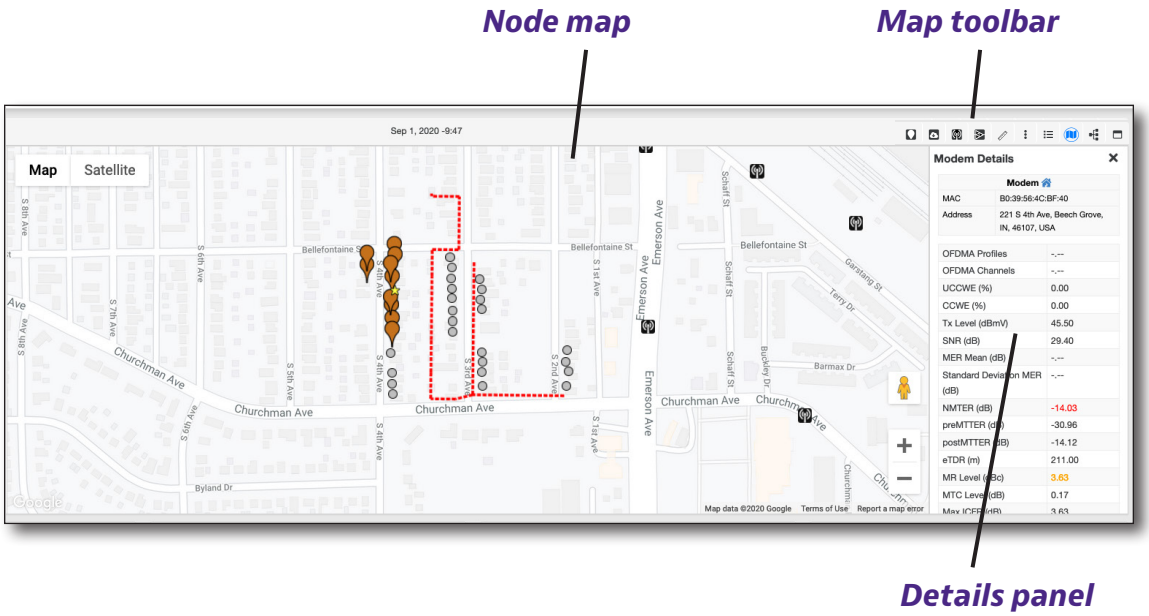


Node Map

Like the map for the Node Health Analyzer, the **Node Map** is designed to provide detailed location, status, and measurement results for the modems selected in the Proactive Network Maintenance View.

This view will open within a new window or tab for each link selected from the Proactive Network Maintenance View. To return to the previous view, close the new tab or window.

To retun to the Node Map at any time, click **Map** .



In the upstream, the Node map also displays groups of modems that have similar transmitted ICFR (In-Channel Frequeny Response), possibly indicating a common impairment.

In the downstream, the Node map displays all modems with the spectrum impairment selected from the list.

Navigation

You can navigate using the **Map toolbar** located at the top of the map and the **Impairment panel** located to the left of the map.

Map Toolbar

From this area you can perform the following actions;

Map / Satellite – Found near the top left of the map, allows you to toggle between the map and satellite views.

Impairment panel – Found on the top left of the Impairment panel and shows/ hides the Impairment panel. The panel is displayed by default.

Frequency band –Switches between upstream and downstream PNM measurements.

Modem markers – Toggles the modem markers.

StrataSync overlay – Toggles the StrataSync overlay. See *"StrataSync Overlay" on page 58.*

Leakage Map – Toggles the leakage map overlay.

Plant Map – Toggles the plant map overlay.

Measurement tool – Allows measuring distance between two points on the map. Click anywhere on the map to start, then click another point to measure. Drag to change location, click points to remove.

Details options – From the dropdown, allows you to select what additional info will be displayed on the map: Modem details, Modem list, and StrataSync details.

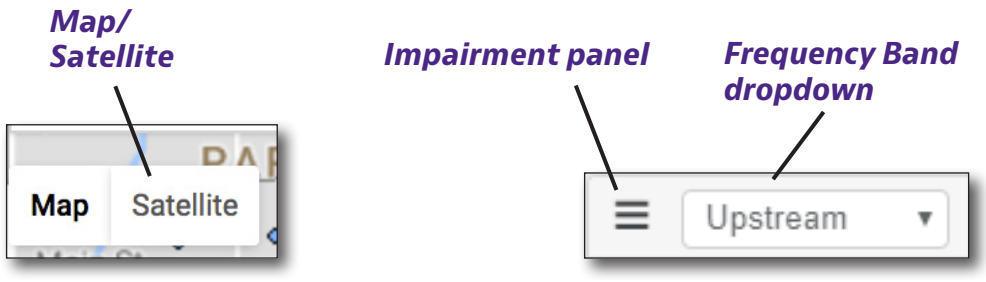
List – Selects the modem list view. See *"Modem List" on page 63.*

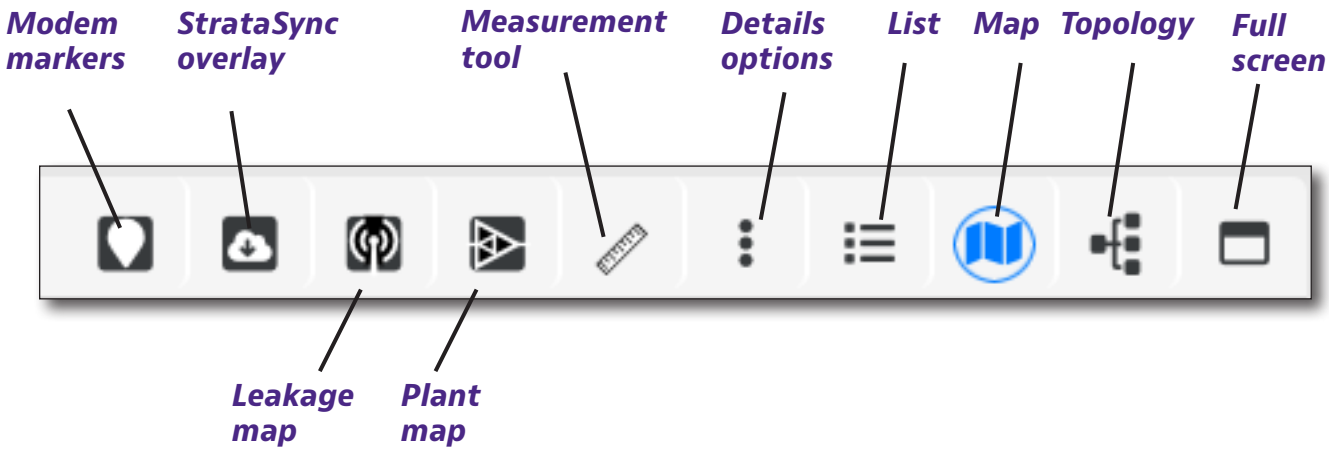
Map – Selects the map view. The map is displayed by default.

Topology – Selects the topology map view if you have imported topology data.

See *"Topology Map" on page 113.*

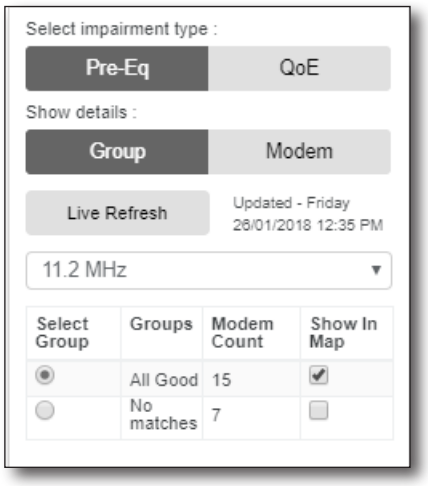
Full Screen – Toggles full screen.





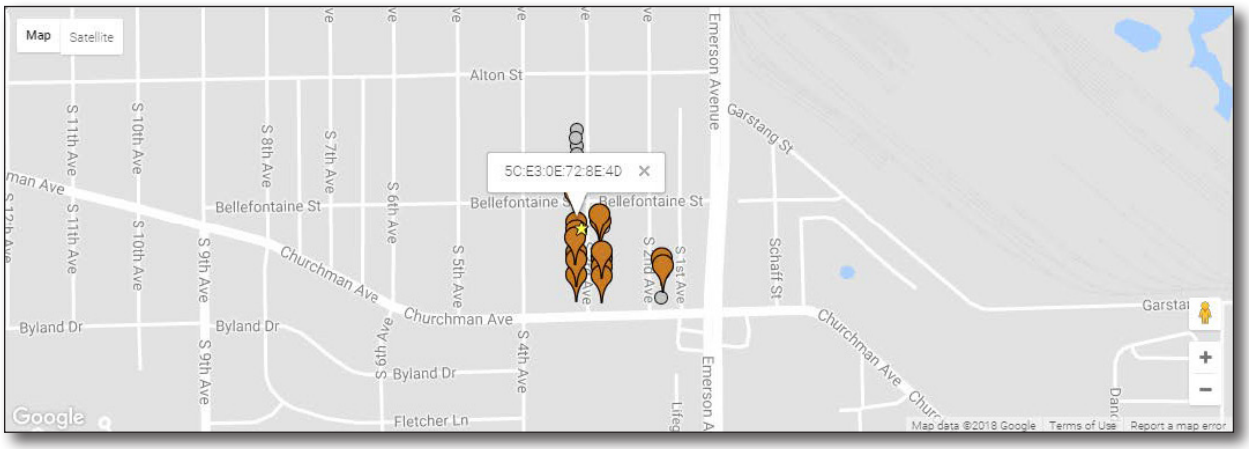
Impairment Panel

This panel is used to control what types of impairments are displayed in the map and list displays. We'll discuss this more in the upstream and downstream sections.



Map Display Options

By default, the map display is located in the upper middle part of the PNM view. All modems within the selected area of the node or impairment group are displayed on the map and are color coded to match their status. By selecting a modem from the map, the corresponding measurement details will be shown in the Details panel.

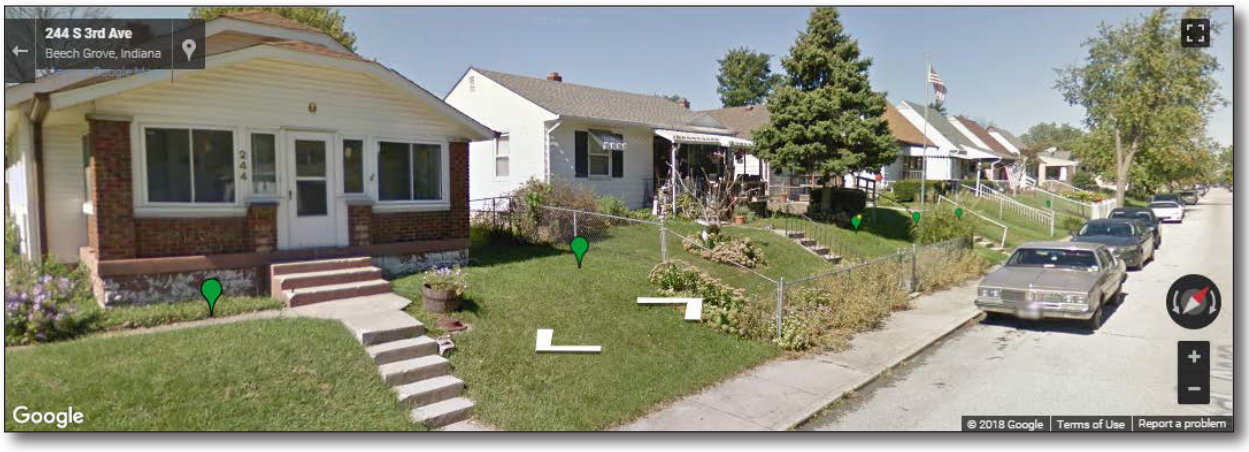


From this area you can perform the following actions;

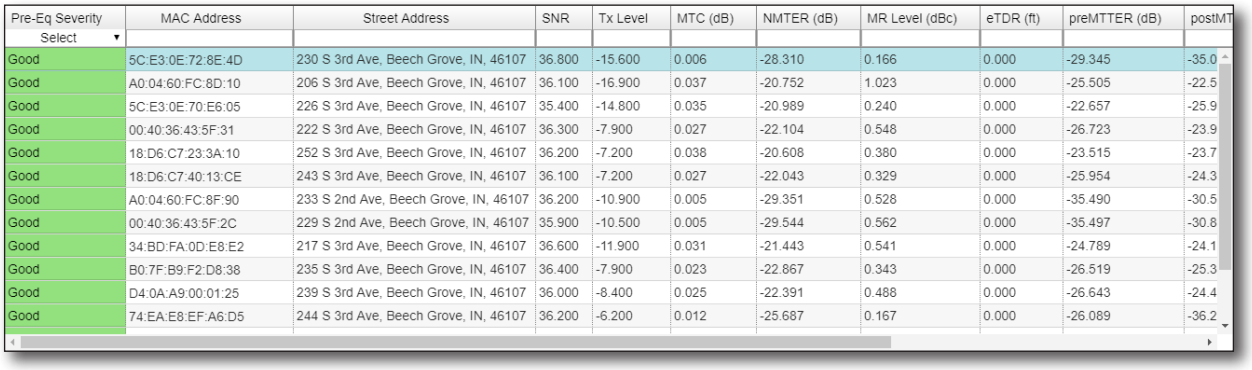
Map View – This button is located in the upper left corner of the map display. Select this button to disable the Satellite View. This control also allows users to display/hide the terrain map layer. The default Map view will be displayed as shown in the image above.

Satellite View – Select this button to enable the satellite image view. This control also allows users to display/hide map labels. The Map view will display the Satellite View as shown in the following image.

Street View – This icon is located in the lower right corner of the map display just above the zoom controls. Click and drag the Pegman to the location where you want to display the street view. The Map view will display the Street View as shown in the following image.



List Display – As an alternate view, the list display is located in the upper middle part of the PNM view. The values within this table can be sorted (ascending or descending) by simply selecting the column header (1st row of table). By default, this table is sorted by Pre-Eq Severity from worst to best. Additionally, users can search within specific data columns by typing a value into the column search area (2nd row of table).



Pre-Eq Severity	MAC Address	Street Address	SNR	Tx Level	MTC (dB)	NMTER (dB)	MR Level (dBc)	eTDR (ft)	preMTTER (dB)	postMT
Select										
Good	5C:E3:0E:72:8E:4D	230 S 3rd Ave, Beech Grove, IN, 46107	36.800	-15.600	0.006	-28.310	0.166	0.000	-29.345	-35.0
Good	A0:04:60:FC:8D:10	206 S 3rd Ave, Beech Grove, IN, 46107	36.100	-16.900	0.037	-20.752	1.023	0.000	-25.505	-22.5
Good	5C:E3:0E:70:E6:05	226 S 3rd Ave, Beech Grove, IN, 46107	35.400	-14.800	0.035	-20.989	0.240	0.000	-22.657	-25.9
Good	00:40:36:43:5F:31	222 S 3rd Ave, Beech Grove, IN, 46107	36.300	-7.900	0.027	-22.104	0.548	0.000	-26.723	-23.9
Good	18:D6:C7:23:3A:10	252 S 3rd Ave, Beech Grove, IN, 46107	36.200	-7.200	0.038	-20.608	0.380	0.000	-23.515	-23.7
Good	18:D6:C7:40:13:CE	243 S 3rd Ave, Beech Grove, IN, 46107	36.100	-7.200	0.027	-22.043	0.329	0.000	-25.954	-24.3
Good	A0:04:60:FC:8F:90	233 S 2nd Ave, Beech Grove, IN, 46107	36.200	-10.900	0.005	-29.351	0.528	0.000	-35.490	-30.5
Good	00:40:36:43:5F:2C	229 S 2nd Ave, Beech Grove, IN, 46107	35.900	-10.500	0.005	-29.544	0.562	0.000	-35.497	-30.8
Good	34:BD:FA:0D:E8:E2	217 S 3rd Ave, Beech Grove, IN, 46107	36.600	-11.900	0.031	-21.443	0.541	0.000	-24.789	-24.1
Good	B0:7F:B9:F2:D8:38	235 S 3rd Ave, Beech Grove, IN, 46107	36.400	-7.900	0.023	-22.867	0.343	0.000	-26.519	-25.3
Good	D4:0A:A9:00:01:25	239 S 3rd Ave, Beech Grove, IN, 46107	36.000	-8.400	0.025	-22.391	0.488	0.000	-26.643	-24.4
Good	74:EA:E8:EF:A6:D5	244 S 3rd Ave, Beech Grove, IN, 46107	36.200	-6.200	0.012	-25.687	0.167	0.000	-26.089	-36.2

The following global controls are available for this table;

- The severity select dropdown to the top left of the table can be used to filter the modems shown within this view by impairment severity (Good, Warning, and Critical).

Within this table you will be presented with the following information;

- **Pre-Eq Severity**
- **MAC Address**
- **Street Address**
- **Transmit (Tx) Level**
- **Main Tap Compression (MTC)** – Indicates how effective the equalization is. Higher values are worse, and above 2.0 means there are problems that cannot be corrected by equalization.
- **Non-Main Tap to Total Energy Ratio (NMTER)** – Ratio of non-main taps to main-tap, e.g. how tall are the other taps compared to the main tap; used as the first indicator of whether a modem is ok or has problems. Higher values are worse, values above -25dB are likely to have problems (this threshold is configurable).
- **Microreflection (MR) Level** – Level of signal being reflected back from a fault or anomaly in the cable plant, derived from peak-to-valley (dB) of in-channel frequency response (ICFR). This level or the trend in this level is used to determine if a modem is in a critical (red) state.

- **eTDR** – The distance (in feet or meters) from the common reflection point to the fault. Also referred to as the Echo cavity. The distance is calculated by using the VOP of the cable and the time delay of the microreflection arriving at the CMTS port.

  Note: The common reflection point is usually the downstream amplifier, as the diplexers typically cause the highest reflection levels in the network.

- **Pre-Main Tap to Total Energy Ratio (PreMTTER)** – Similar to NMTTER, but specific to the taps to the left of the main tap. High pre values could indicate group delay.
- **Post-Main Tap to Total Energy Ratio (PostMTTER)** – Similar to NMTTER, but specific to the taps to the right of the main tap. High high post values could indicate microreflections.
- **Correctable Codeword Error Rate (CCWER)**
- **Uncorrectable Codeword Error Rate (UCCWER)**
- **Signal-to-Noise Ratio (SNR)**
- **Modulation Error Ratio (MER) Mean (dB)**
- **Standard Deviation Modulation Error Ratio (MER) (dB)**

StrataSync Overlay

The **StrataSync overlay** integration allows field test reports from StrataSync with geo-location coordinates to be overlaid on the Proactive Network Maintenance map with an additional map layer.

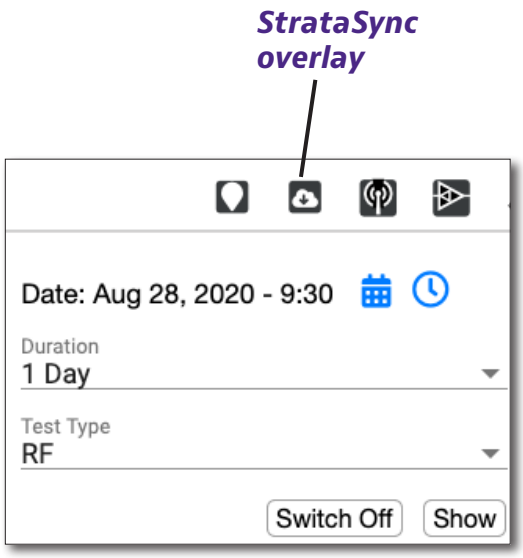
This allows you to very quickly correlate problems detected in XPERTrak with locations that have had RF, Fiber, or Ethernet tests performed with VIAVI field meters.

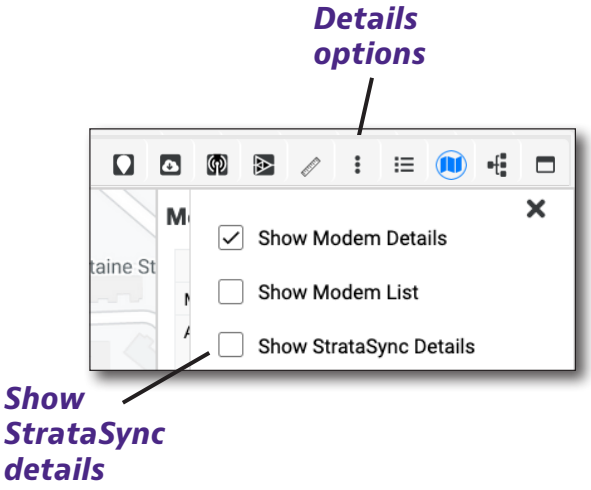
Select **StrataSync overlay** from the Map toolbar. Choose the date, duration, and test type, and select **Show**. The map will update with the detail.

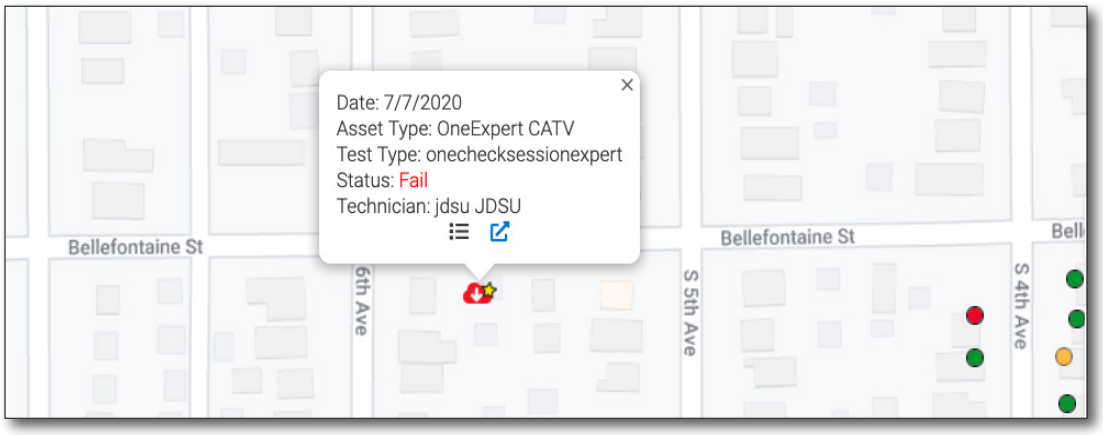
You can also enable the **Show StrataSync Details** from the **Details options** in the Map toolbar to show the panel or select **Full screen** to see more detail.

Enabling the StrataSync overlay places StrataSync icons on those locations where a test has been run. A mouse over of the icon displays the details of the test. A green icon is a passed test, red is a failed test.

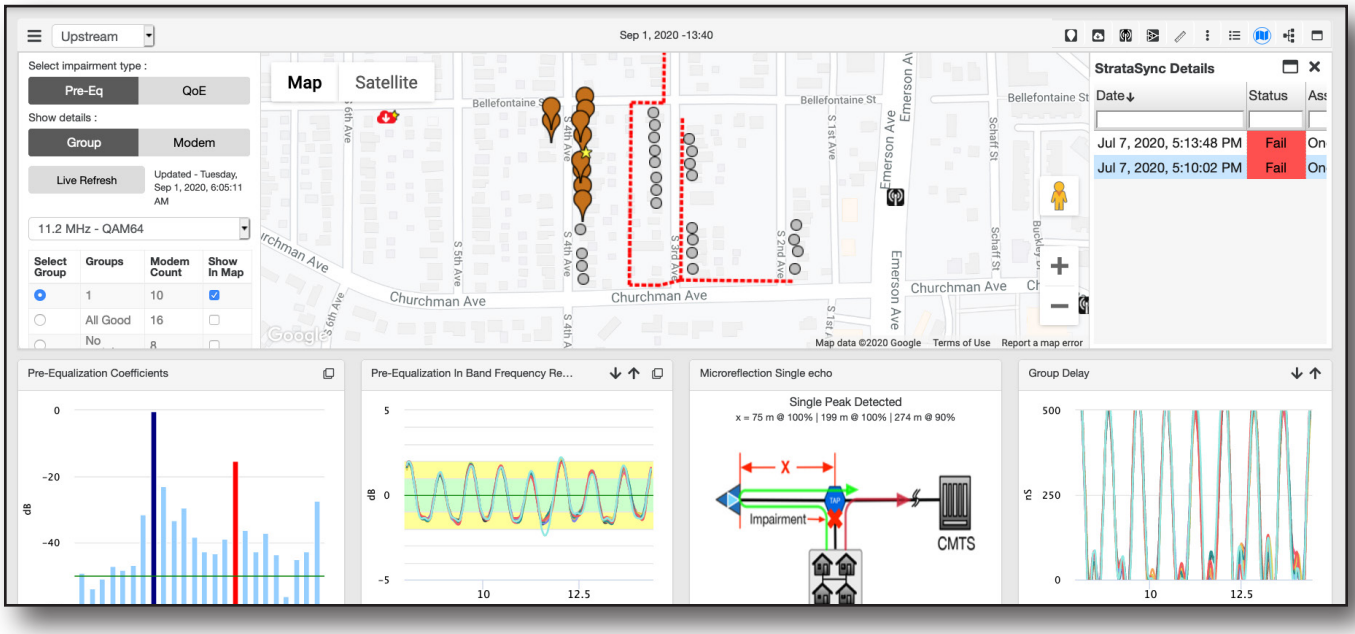
Note: StrataSync integration requires an active maintenance contract.



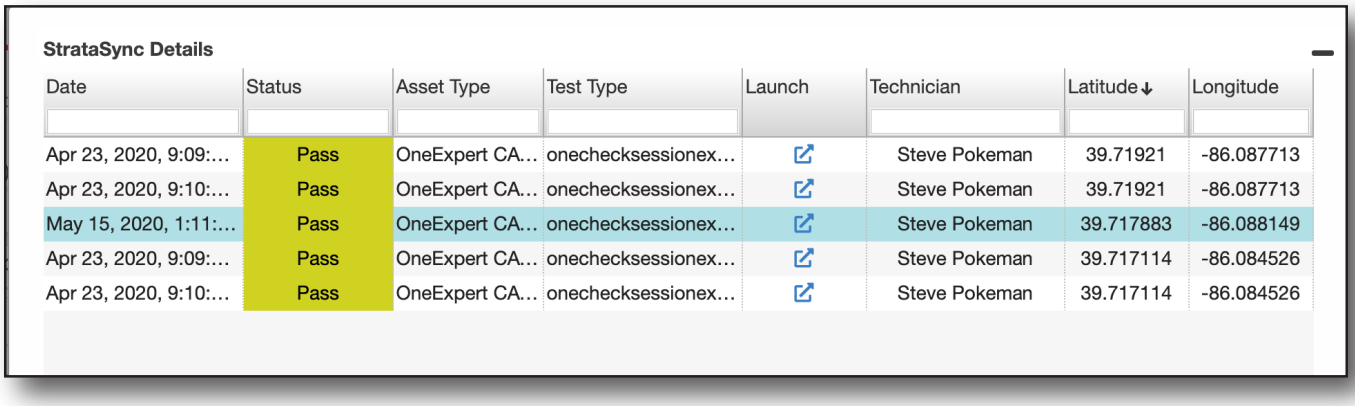




Proactive Network Maintenance View with StrataSync overlay



StrataSync Details panel with Node map



StrataSync Details

Date	Status	Asset Type	Test Type	Launch	Technician	Latitude	Longitude
Apr 23, 2020, 9:09:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.71921	-86.087713
Apr 23, 2020, 9:10:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.71921	-86.087713
May 15, 2020, 1:11:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717883	-86.088149
Apr 23, 2020, 9:09:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717114	-86.084526
Apr 23, 2020, 9:10:...	Pass	OneExpert CA...	onechecksessionex...		Steve Pokeman	39.717114	-86.084526

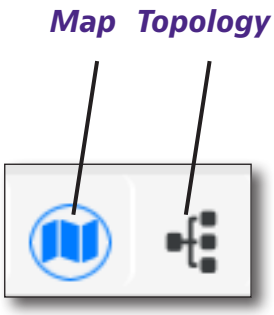
StrataSync Details with full screen

NOTE:

For advanced Details panel column adjustments and what info is displayed, see "Column Options" on page 68.

For searching and sorting tips, see "Modem List" on page 63.

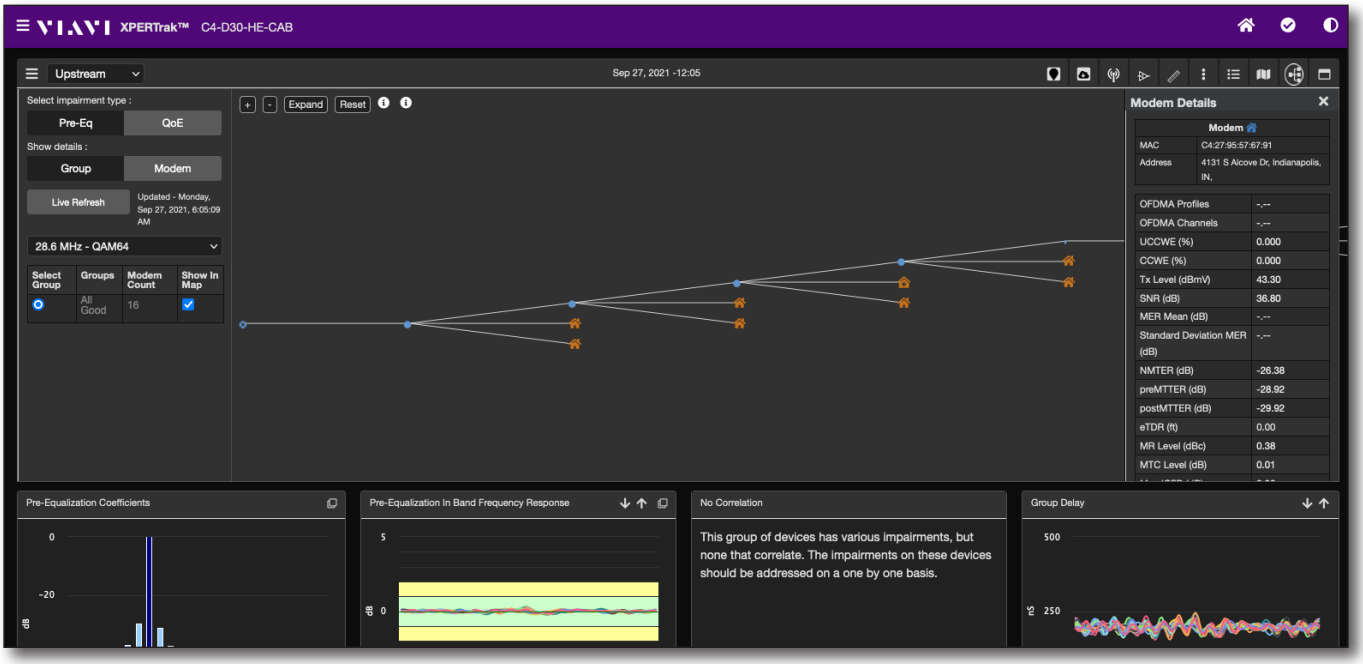
Topology Map



The **Topology Map** is designed to simplify common-point visibility based on the actual relationship of the elements and devices in the HFC network (node → node port → amp → tap → modem) if you have imported topology information for your plant.

When you select a topology path, it will highlight the parent and all its children. If the modem list view is displayed, the modems will also be selected there.

To see the Topology map, click **Topology** . To retun to the Node Map at any time, click **Map** .



The modem coloring works as described in the PNM map view based on the PNM group the modem is associatd with.

NOTE:

Map topology is determined by your imported topology file. Any element that is not included in the import file will not populate in map view.

For more details, see "Import Topology / Billing" on page 276.

To copy data from an element at any time, right click on the topology element, and select **Copy**.

Navigation

You can navigate using the **Map options** and **Map toolbar** located at the top of the map.

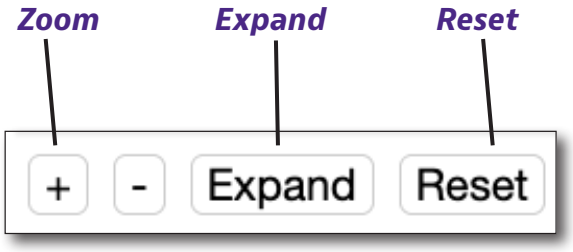
Map options

Found on the top left of the map, under the Map views, this area allows you to change the map.

Zoom +/- – Zooms the map.

Expand– Expands all the parent/child elements on the map.

Reset – Resets the map to the default view.

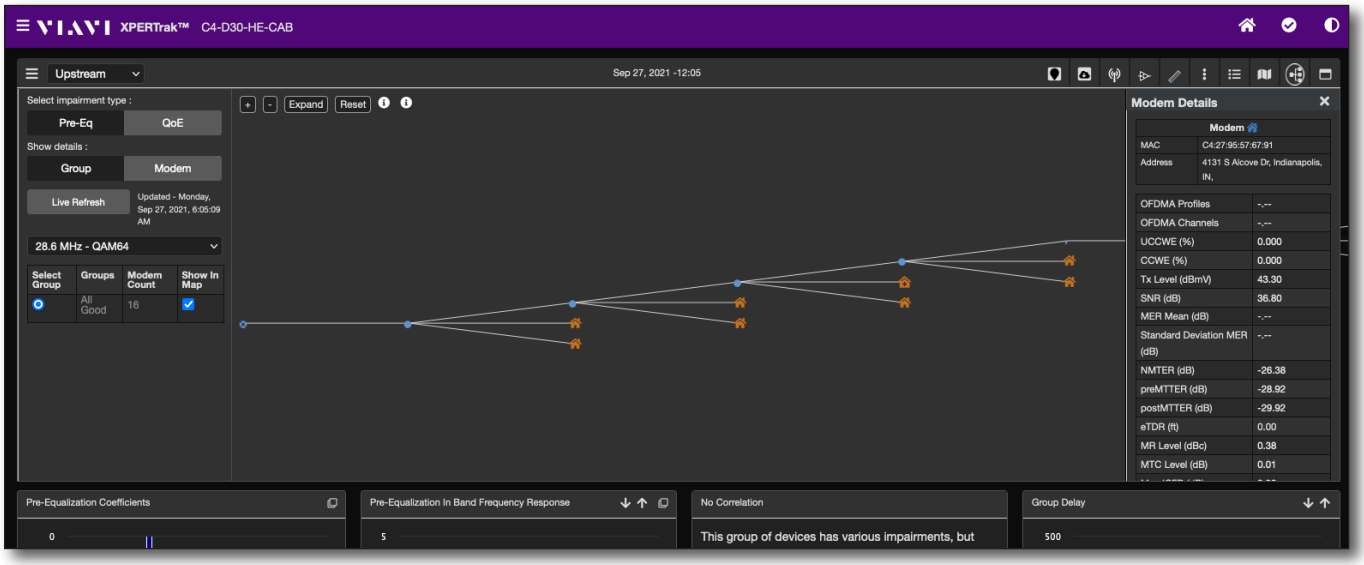


Map toolbar

Found on the top right of the map, this area allows you to change the map options and details.

Details options – Allows you to select modem details and modem list panels to displays on the map.

Full screen – Toggles full screen. Here you can see the topology and the details of the modem list view at the same time.



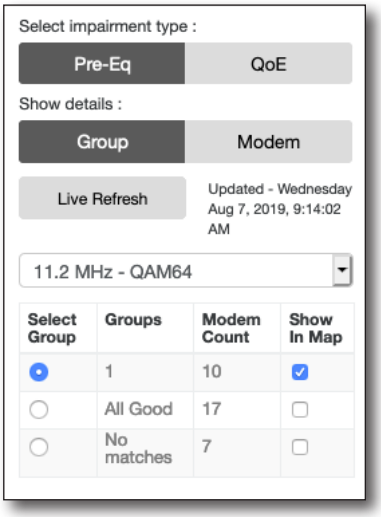
Topology view with modem list using full screen

Pre-Equalization Upstream Analyzer

Navigation within the PNM view is accomplished using the horizontal and vertical control bars located at the top and left sides of the XPERTrak browser window, respectively.

Impairment Selection Panel

This panel is used to control what types of impairments are displayed in the Map and List Displays.



Select Impairment Type – Use this control to view the modems on the map using Pre-Eq or QoE measurement data. A modem may have a Pre-Eq problem but not affecting QoE.

Show Details – Group and Modem are available. Select the **Group** button to show the modems grouped by correlation signature. When Group is selected, the Group Selection appears at the bottom of the Impairment Selection Panel. Selecting the **Modem** button will display the modems without any grouping, allowing the selection of one modem at a time.

Live Refresh – Request current upstream data from the modems for the entire node. The last poll date and time are shown to the right of this button (for Pre-Eq data only).

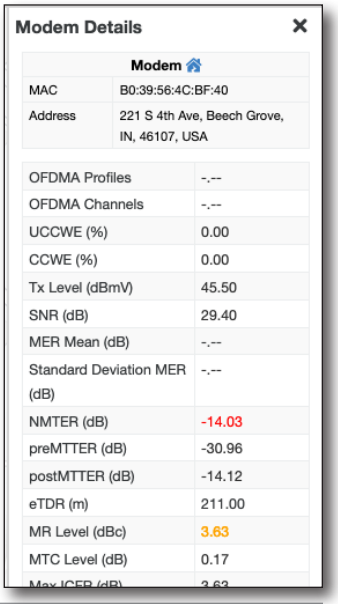
Upstream Channel Selection dropdown – Choose from the desired upstream modem channels.

Group Selection – This area is only displayed when the Group button has been selected. Allows you to control which groups are selected and displayed along with the count of modems within the group.

Modem Details

This panel is used to view the details about the currently selected modem, including:

- **MAC Address**
- **Street Address**
- **OFDMA Profiles**
- **OFDMA Channels**
- **UCCWE (%) (Uncorrectable Codeword Error Rate)**
- **CCWE (%) (Correctable Codeword Error Rate)**
- **Tx Level (dBµV or dBmV) (Transmit)**



- **SNR (dB) (Signal-to-Noise Ratio)**
- **Modulation Error Ratio (MER) Mean (dB)**
- **Standard Deviation Modulation Error Ratio (MER) (dB)**
- **NMTER (Non-Main Tap to Total Energy Ratio) (dB)**
- **preMTTER (Pre-Main Tap to Total Energy Ratio) (dB)**
- **postMTTER (Post-Main Tap to Total Energy Ratio) (dB)**
- **eTDR –**The distance (in feet or meters) from the common reflection point to the fault. Also referred to as the Echo cavity. The distance is calculated by using the VOP of the cable and the time delay of the microreflection arriving at the CMTS port.

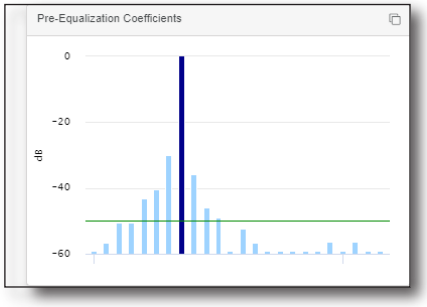
  Note: The common reflection point is usually the downstream amplifier, as the diplexers typically cause the highest reflection levels in the network.
- **MR Level (Microreflection) (dBc)**
- **MTC Level (Main Tap Compression) (dB)**

Pre-Equalization Coefficients

This area is used to display the Equalizer Tap Coefficients for the selected modem.

Pre-equalized data is the raw signal that arrives at the CMTS, and equalized data is the signal after it has been adjusted by the modem.

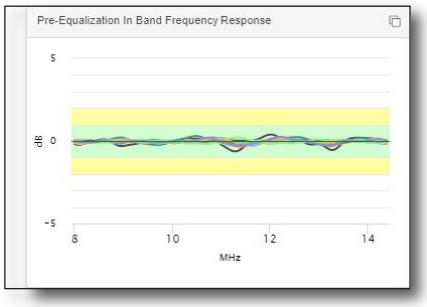
To toggle between the pre-equalized and equalized coefficients, select the gray box in the upper right corner of this area.



Pre-Equalization In-Band Frequency Response

This area is used to display the In-Band Frequency Response of the selected group or modem.

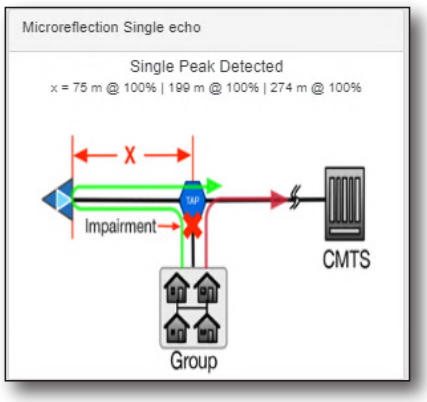
To toggle between the unequalized (what the modem is transmitting) and equalized (what the CMTS is receiving) frequency response, select the gray box in the upper right corner of this area.



Correlation Diagnosis

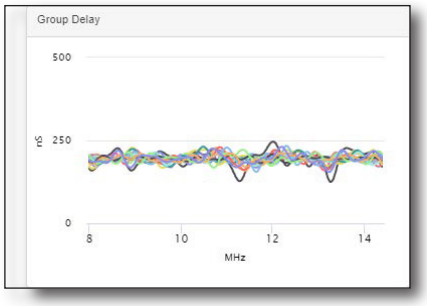
This area is used to display the correlation details of the selected group or modem.

In various ways, this shows the impairment distance or echo cavity to the fault.



Group Delay

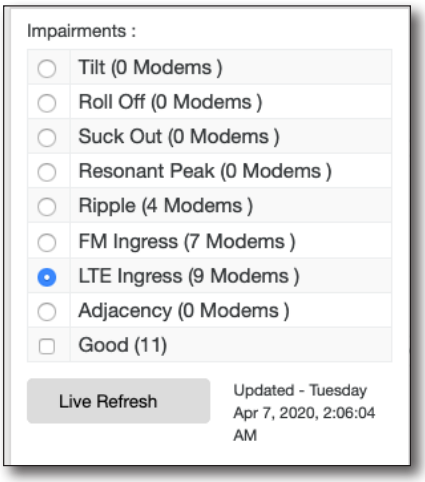
This area is used to display the Group Delay of the selected group or modem.



Downstream Spectrum (Full-Band Capture)

Impairment Selection Panel

This panel is used to control what types of impairments are displayed in the Map and List Displays as shown in the image to the right.



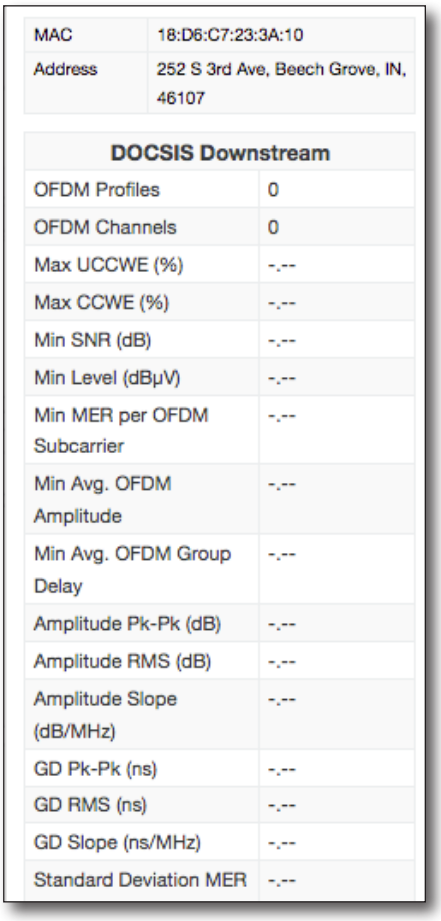
Live Refresh – Request current downstream data from the modems for the entire node. The last poll date and time are shown to the right of this button.

Modem Details

This panel is used to view the details about the currently selected modem. Within this area you will be presented with the following information;

Modem

- **MAC Address**
- **Street Address**



DOCSIS Downstream

- **OFDM Profiles**
- **OFDM Channels**
- **Max UCCWE (%) (Max Uncorrectable Codeword Error Rate)**
- **Max CCWE (%) (Correctable Codeword Error Rate)**
- **Min SNR (dB) (Signal-to-Noise Ratio)**
- **Min Level (dBµV)**
- **Min MER per OFDM Subcarrier**
- **Min Avg. OFDM Amplitude**
- **Min Avg. OFDM Group Delay**
- **Amplitude Pk-Pk (dB)**
- **Amplitude RMS (dB)**
- **Amplitude Slope (dB/MHz)**

- **GD Pk-Pk (ns)**
- **GD RMS (ns)**
- **GD Slope (ns/MHz)**
- **Standard Deviation MER (dB)**
- **PLC CWER (%)**
- **NCP CRC Failure Rate (%)**

Downstream Summary

- **Min Video SNR (Signal-to-Noise Ratio)**
- **Roll Off**
- **Tilt**
- **Suck Out**
- **Resonant Peak**
- **Ripple**
- **Adjacency**
- **FM Ingress**
- **LTE Ingress**

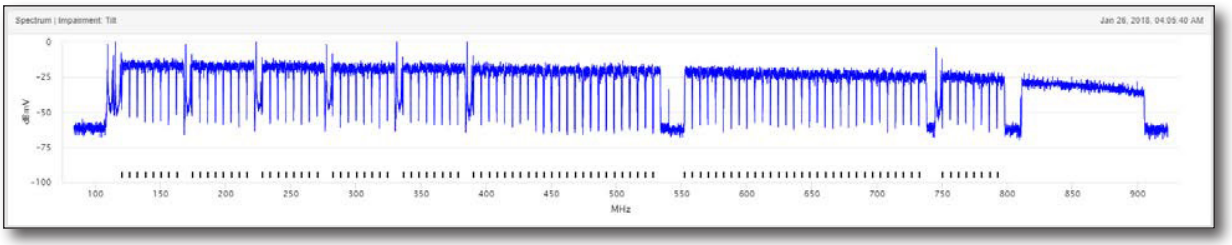
NOTE:

For more detail, see "Downstream Impairments and Thresholds" on page 261.

Full-Band Capture

This graph displays the measured downstream spectrum levels for the selected modem during the last successful collection in dBmV, dBµV, or dBm (Y-Axis, Vertical) versus frequency in MHz (X-Axis, Horizontal). The trace displayed within this area will be filtered based on the selected impairments.

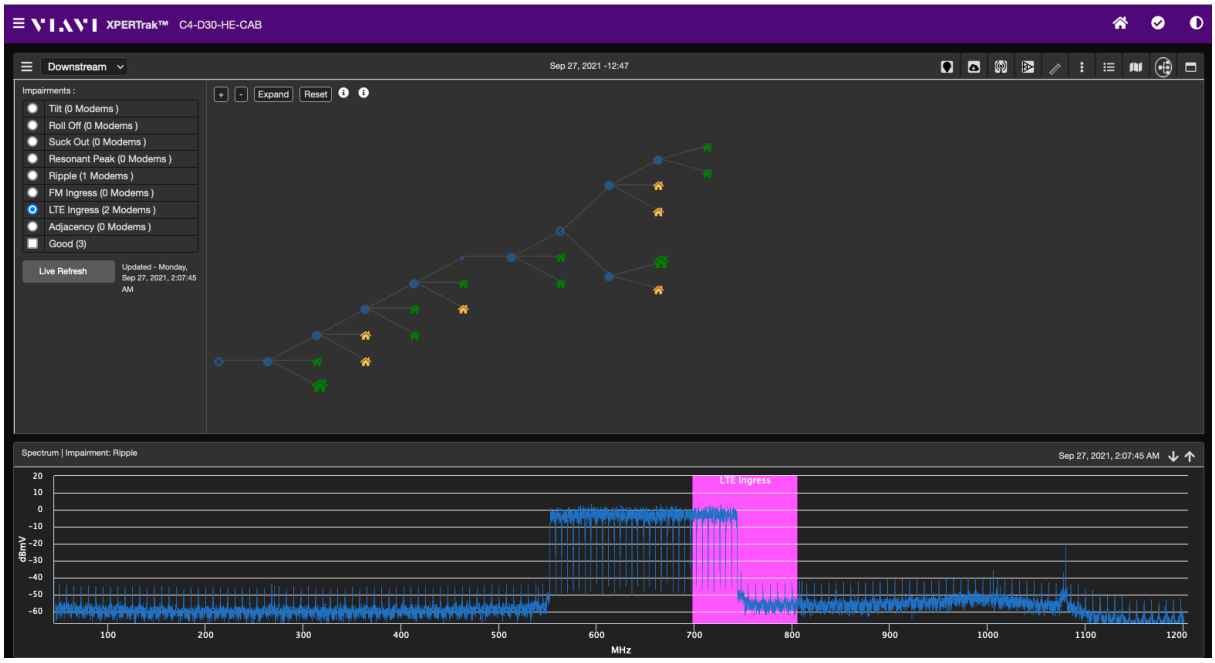
This is captured once per day.



Within this graph, you will be presented with the following information;

- **Level** – This level is displayed as a horizontal blue line.
- **Interactive Marker** – Simply hover your mouse over the graph to display the interactive marker. The marker will display the frequency and level at that location.
- **Frequency Span** – By default, the frequency span is set to full span. To adjust the frequency span, simply click and hold on the graph (at the desired start frequency) with your left mouse button and then drag the mouse to highlight the desired span. Release the mouse button over the graph (at the desired stop frequency) to select the span.

  To reset to full span, select the **Reset** button in the upper right corner of the graph.



Topology view of downstream modems using full-band capture

7

CMTS Spectrum Analyzer

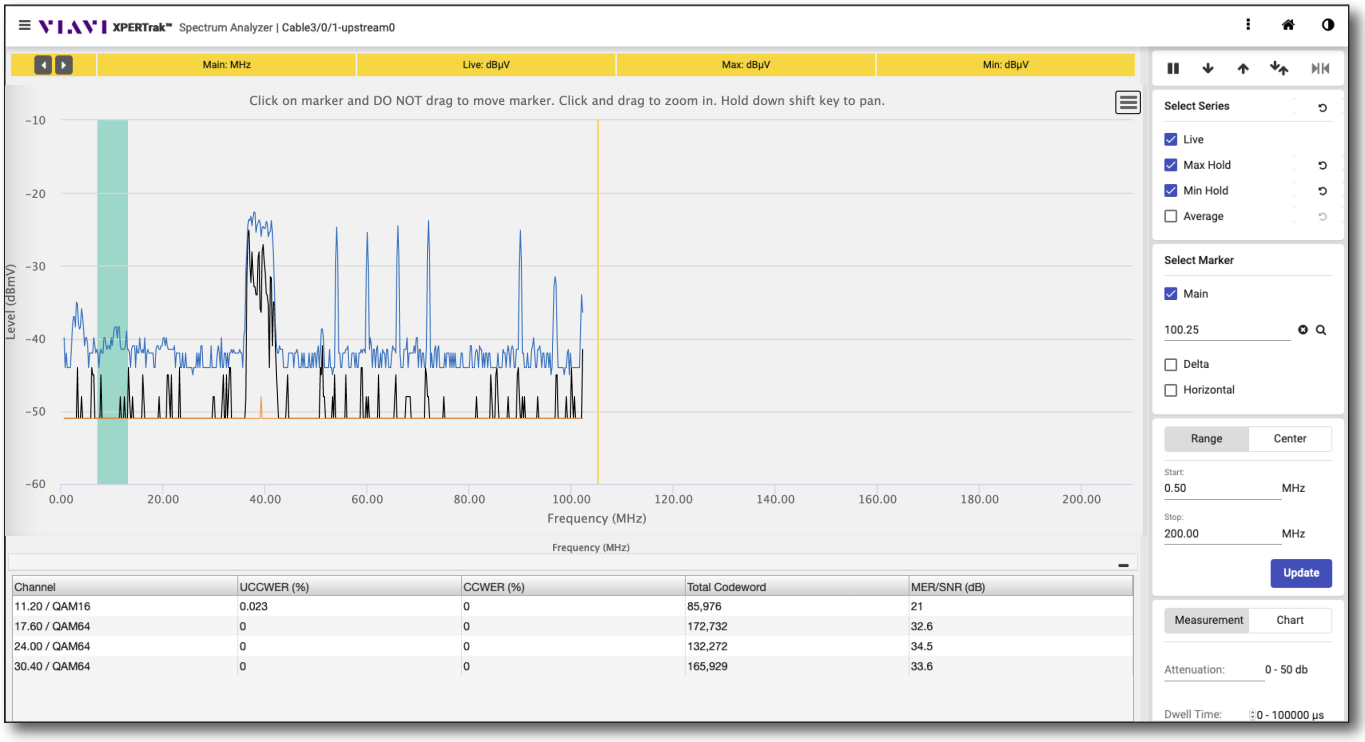
This chapter covers how to use the CMTS Spectrum Analyzer feature, including the following:

- "CMTS Spectrum Analyzer" on page 124
- "Spectrum Analyzer for virtual sources" on page 125
- "Navigation" on page 126
- "Measurements Panel" on page 127
- "Interactive Graph" on page 129

CMTS Spectrum Analyzer

The CMTS Spectrum Analyzer view is designed to provide live access to the CMTS upstream spectrum analyzers within the XPERTrak System. This view will open within a new window or tab when the **CMTS Spectrum Analyzer** icon is selected from the Upstream area of the element analysis view.

To return to the Node Health Analyzer, you can simply close the new tab or window.



Spectrum Analyzer for virtual sources

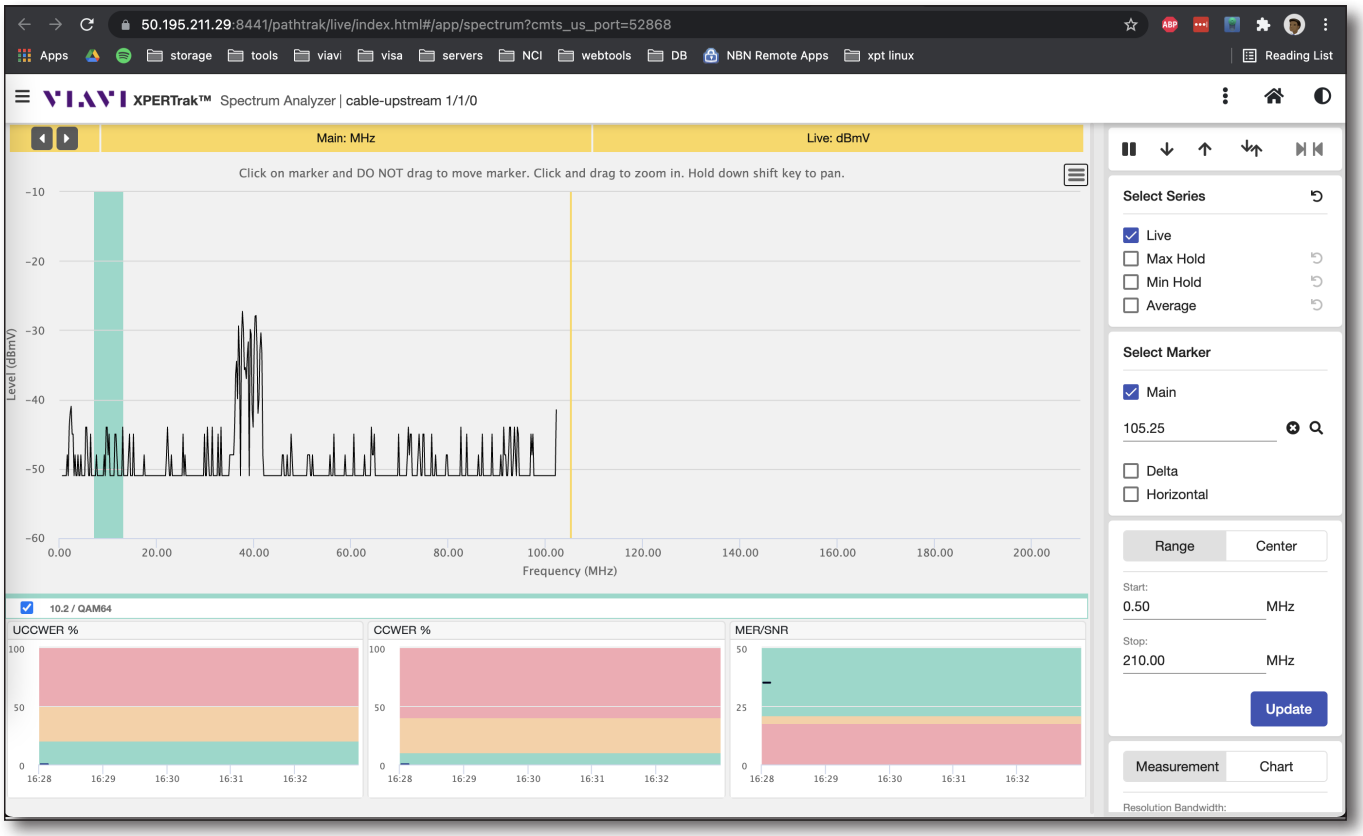
Similar to the CMTS Spectrum Analyzer, this view is designed to provide live access to the CMTS upstream port virtual spectrum analyzers within the XPERTrak System. This view will open within a new window or tab when the **CMTS Spectrum Analyzer** icon is selected from the Upstream area of the element analysis view. RCI is required to see this view.

RCI minimum and maximum levels are received from the RCI and displayed on the graph.

Also, only available spectrums (CMTS, RPM, RPD, etc.) will show in the element analysis view for upstream and spectrum summary.

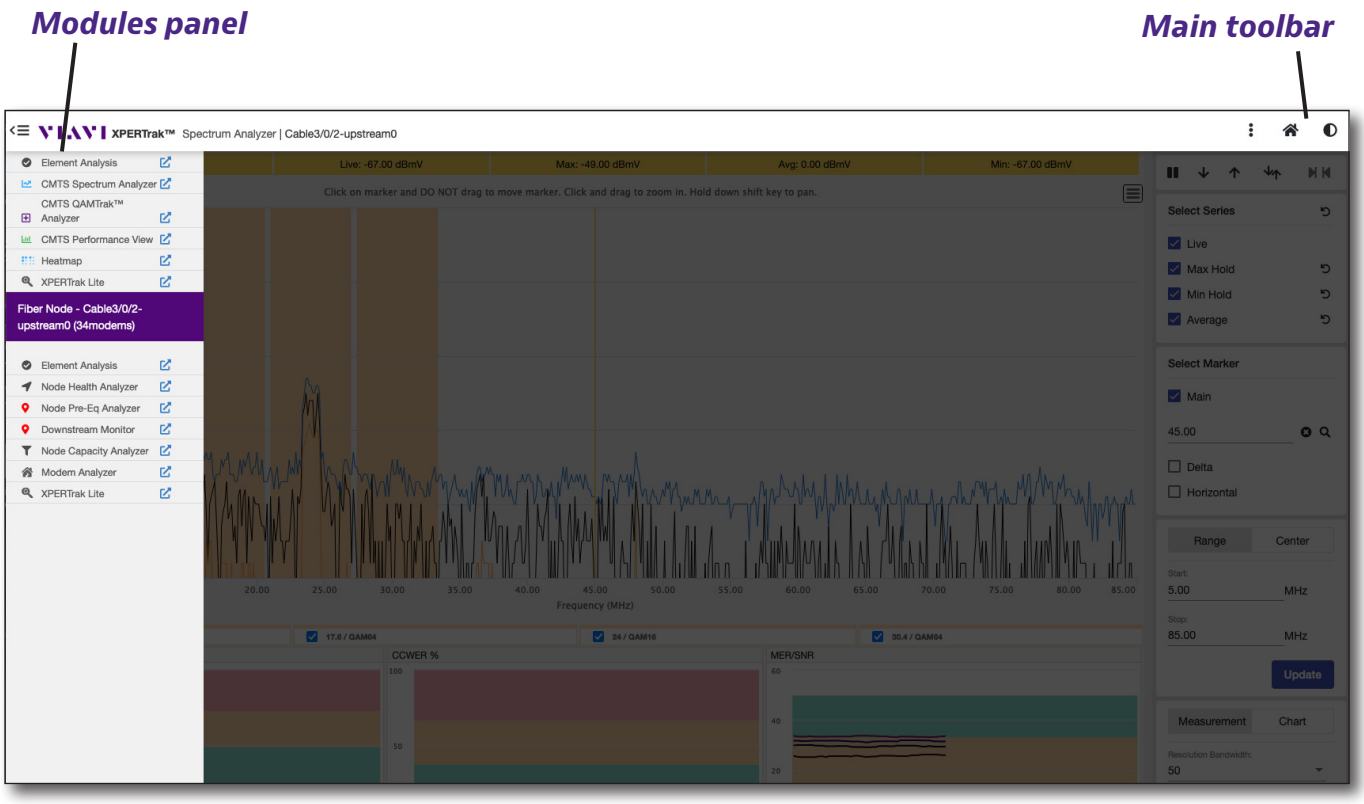
At the bottom is a table for the upstream port channel data. It provides channel frequency, modulation, code words in format, and SNR.

To return to the Node Health Analyzer, you can simply close the new tab or window.

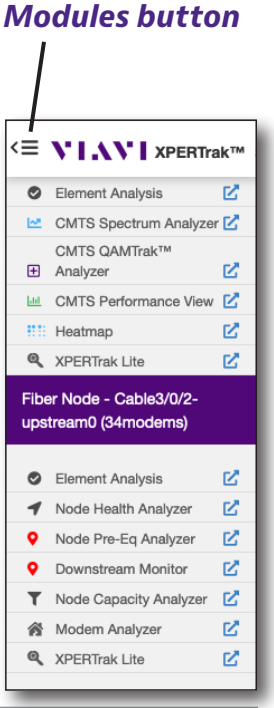


Navigation

Most of the navigation in the CMTS Spectrum Analyzer is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel



You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.

Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

Show/Hide Measurements Panel ⋮ – Found on the far right of the Main toolbar and shows/hides the **Measurements** panel along the right side of the Spectrum Analyzer view. The Measurements panel is shown by default.

Home – Takes you back to the Main Dashboard

Switch Chart Color – Toggles between light and dark themes

Measurements Panel

Playback Controls

Pause – Pauses the live trace on the graph.

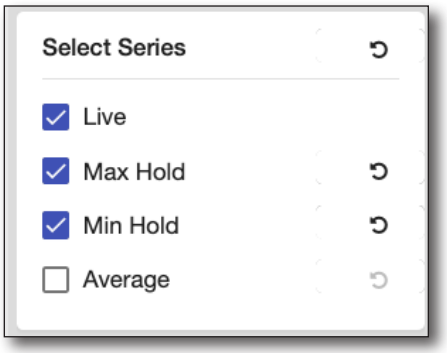
Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

Auto Reference Level – Automatically adjusts the reference level of the graph.

Select Series

From this area of the control panel, you can choose which of the following spectrum traces to display;

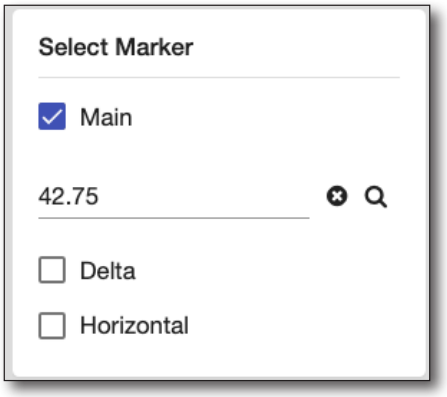


- Live (Black)
- Max Hold (Blue)
- Min Hold (Orange)
- Average (Green)

You can reset individual traces or the whole set of measurements using reset ↺.

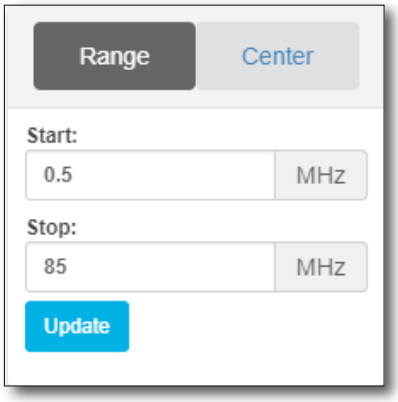
Select Marker

From this area of the control panel, you can choose which of the following markers to display



- Main (Yellow)
- Delta (Blue)
- Horizontal (Red)

Frequency Controls



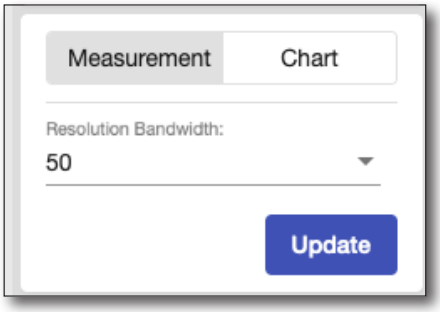
From this area of the control panel, you can choose the frequency span or range to display on the interactive graph.

Note: The maximum allowed stop frequency is dependent on admin settings and vendor limitations. If the vendor supports 204 MHz and the admin setting is set for 85 MHz, then spectrum will only be displayed up to 85 MHz. Verify the limits of the vendor and the admin settings, as needed.

Start/Stop – Select the **Range** button to enable the entry of a start and stop frequency to be displayed on the interactive graph.

Center/Span – Select the **Center** button to enable the entry of a center frequency and span to be displayed on the interactive graph.

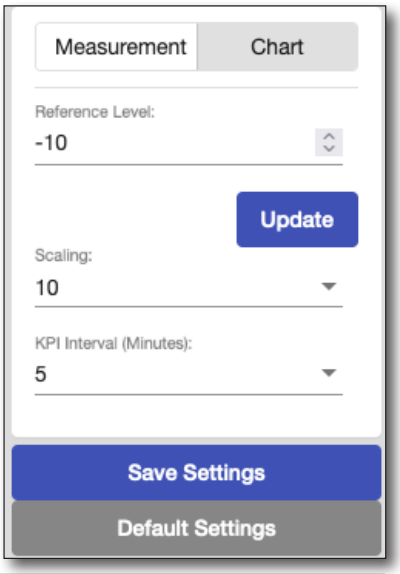
Measurement Controls



From this area of the control panel, you can choose resolution bandwidth to display on the interactive graph (only available for the advanced spectrum analyzer).

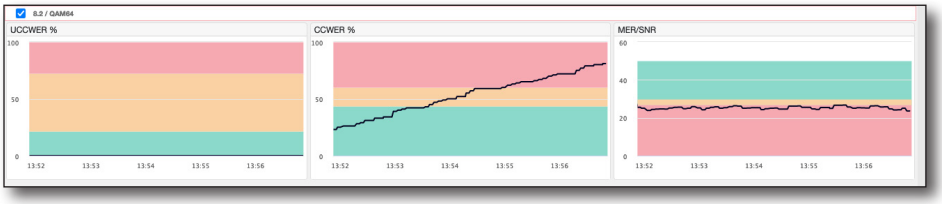
Resolution bandwidth options available will be the native FFT capture size of the vendor used, 300kHz and 1000kHz.

Chart Controls



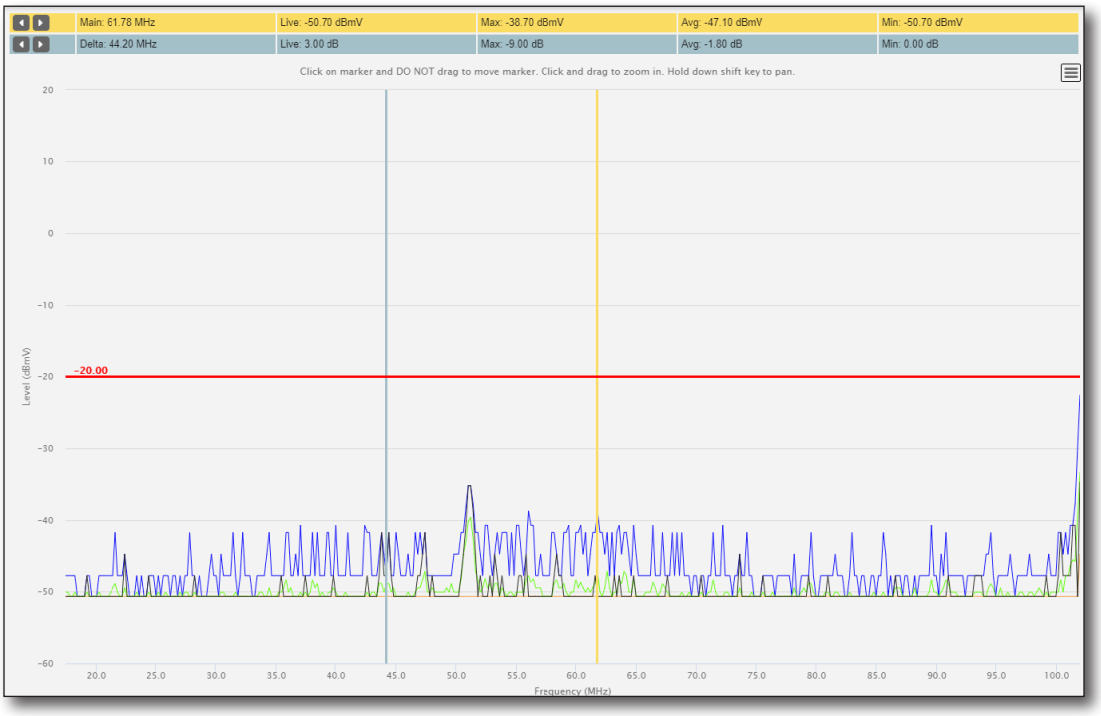
From this area of the control panel, you can choose the reference level, vertical scaling, and KPI intervals to display on the interactive graph (only available for the advanced spectrum analyzer).

The bottom charts show CCWE, UCCWER, and SNR/MER, including plotting the bands to show the status.



Interactive Graph

This graph displays measured levels in dBmV, dBµV or dBm (Y-Axis, Vertical), versus frequency in MHz (X-Axis, Horizontal). The traces, markers, reference level, vertical scaling and frequency range/span are displayed within this area based on the settings of the Measurement Control Panel.



Within this graph, you will be presented with the following information;

- **Interactive Marker** – Simply hover your mouse over the graph to display the interactive marker. The marker will display the frequency, level, and trace at that location.
- **Zoom** – Click and drag your mouse over a frequency span to zoom in. When done, click the **Reset Zoom** button.
- **Live Trace** – This level is displayed as a horizontal blue line.
- **Max Hold Trace** – This level is displayed as a horizontal blue line.
- **Min Hold Trace** – This level is displayed as a horizontal orange line.
- **Average Trace** – This level is displayed as a horizontal green line.
- **Main Marker** – The Main marker is a vertical yellow line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker and then move your mouse to the location you would like to mark and click the mouse button again to set its location. The marker will display the frequency and level for each trace at the top of the graph.

- **Delta Marker** – The Delta marker is a vertical blue line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker and then move your mouse to the location you would like to mark and click the mouse button again to set its location. The marker will display the delta frequency and level for each trace at the top of the graph.

- **Horizontal Marker** – The Horizontal marker is a horizontal red line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker and then move your mouse to the location you would like to mark and click the mouse button again to set its location. The marker will display the reference level at that location to the left side of the graph.

- **Frequency Span** – By default, the frequency span is set to full span. To adjust the frequency span, simply click and hold on the graph (at the desired start frequency) with your left mouse button and then drag the mouse to highlight the desired span.

  Release the mouse button over the graph (at the desired stop frequency) to select the span.

  To reset to full span select the **Reset Zoom** button in the upper right corner of the graph.

8

PathTrak Return Path Monitoring (RPM)

This chapter covers how to use the PathTrak Return Path Monitoring feature, including the following:

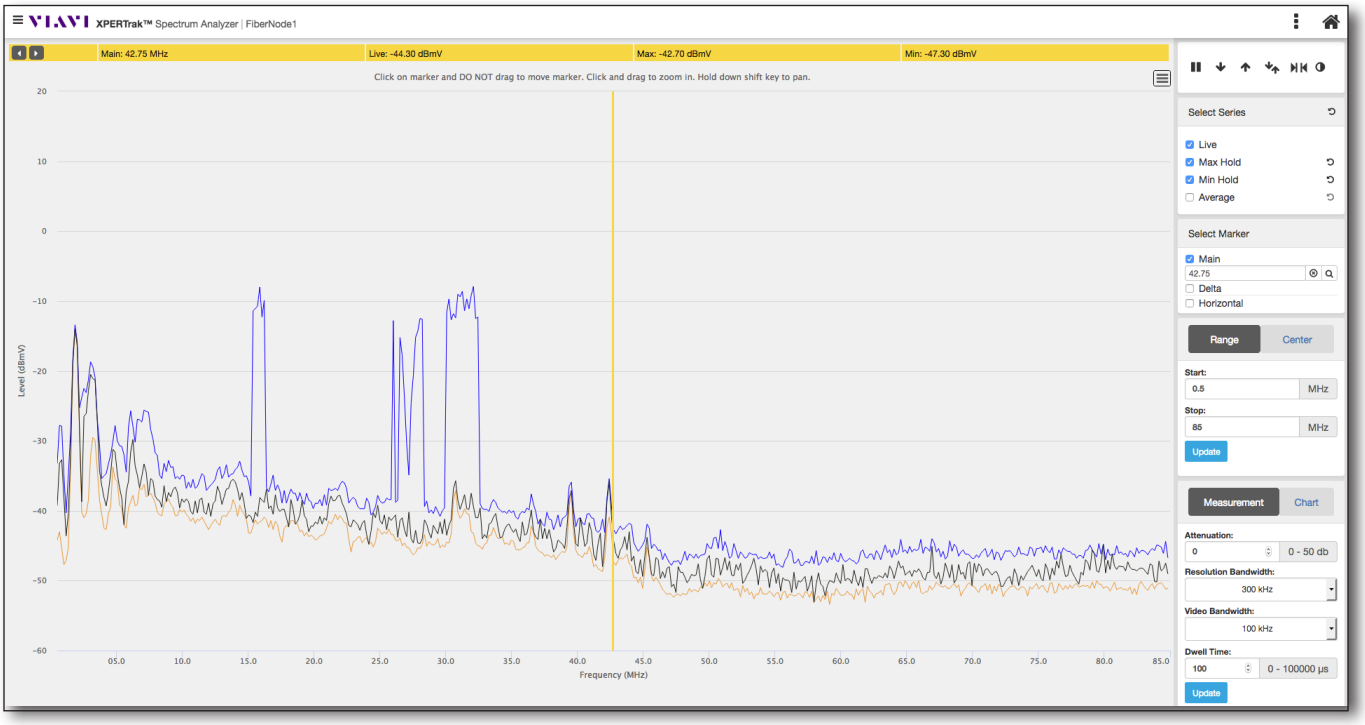
- "RPM Spectrum Analyzer" on page 132
- "Navigation" on page 133
- "Measurements Panel" on page 135
- "Spectrum Analyzer Graph" on page 137
- "Monitoring Analyzer" on page 139
- "Measurements Panel" on page 140
- "Monitoring Analyzer Graph" on page 142

RPM Spectrum Analyzer

The **RPM Spectrum Analyzer** view is designed to work with PathTrak upstream monitors to provide live access to the RPM upstream monitors.

You can bring up the RPM Spectrum Analyzer by:

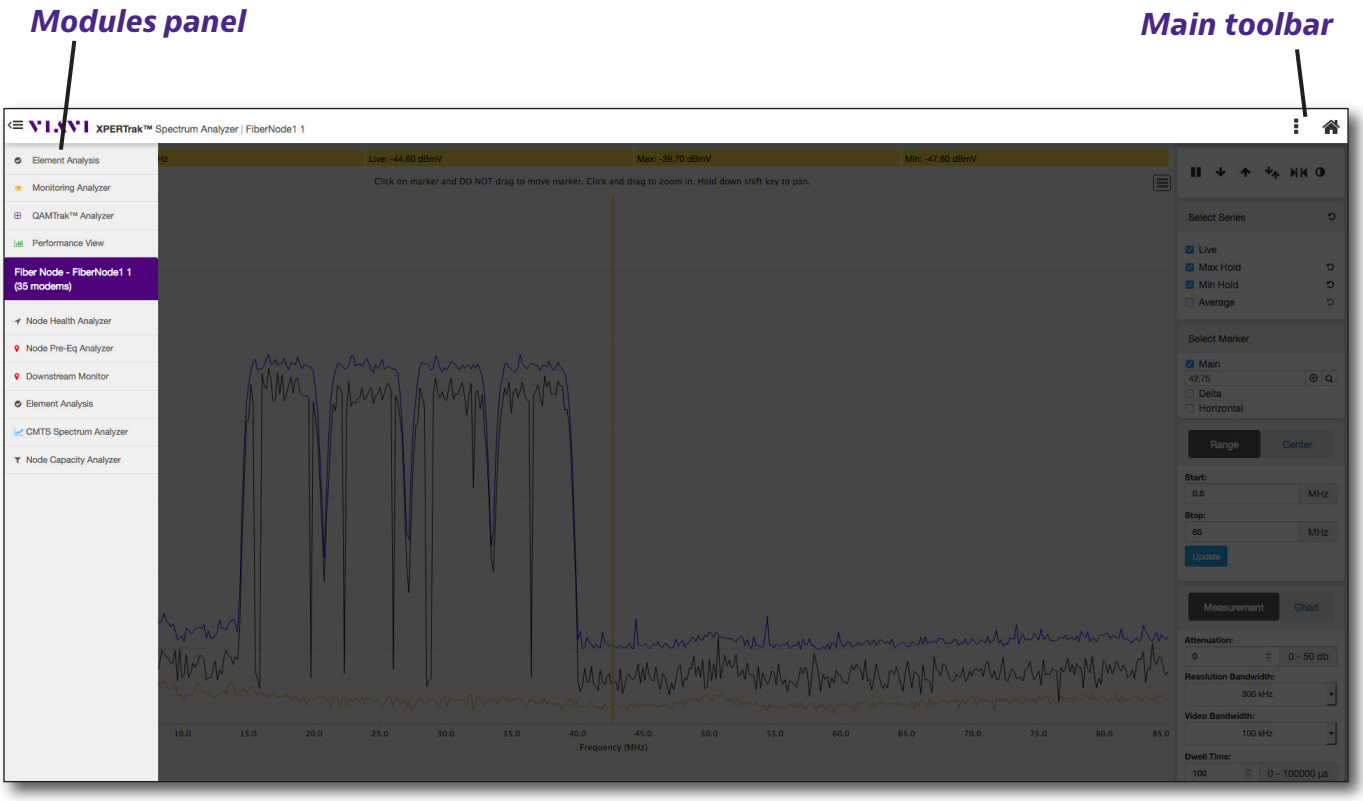
- Selecting it from the Modules Panel from any screen.
- Selecting the **Spectrum Analyzer** icon from the upstream area of the Node Health Analyzer or Node Performance view.



Note: The RPM Spectrum Analyzer view is only available on XPERTrak systems that have PathTrak hardware.

Navigation

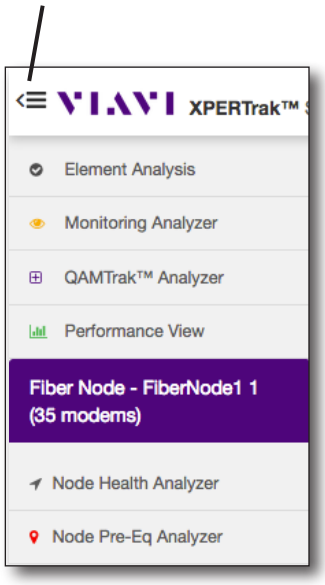
Most of the navigation in the Spectrum Analyzer is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.



Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

Show/Hide Measurements Panel – Found on the far right of the Main toolbar and shows/hides the **Measurements** panel along the right side of the Spectrum Analyzer view. The Measurements panel is shown by default.

Home – Takes you back to the Main Dashboard

Switch Chart Color – Toggles between light and dark themes

Measurements Panel

Playback Controls

Pause – Pauses the live trace on the graph.

Reset – Resets the live trace on the graph.

Trace Down – Moves the trace down and increases the reference level.

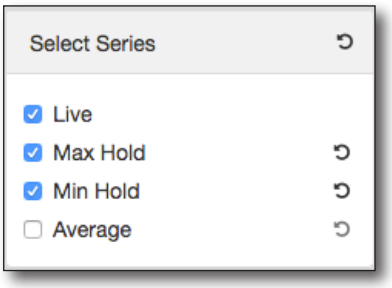
Trace Up – Moves the trace up and decreases the reference level.

Auto Reference Level – Automatically adjusts the reference level of the graph.

Zero Span – Opens the zero span time-domain graph.

Select Series

From this area of the measurements panel, you can choose which of the following spectrum traces to display;

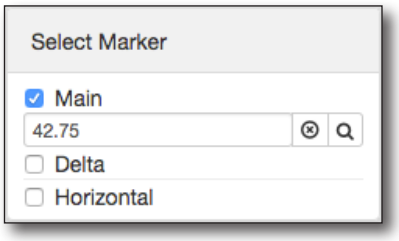


- Live (Black)
- Max Hold (Blue)
- Min Hold (Orange)
- Average (Green)

You can reset individual traces or the whole set of measurements using reset .

Markers

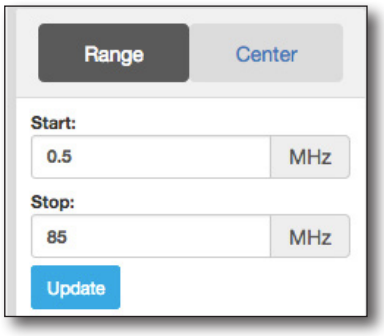
From this area of the measurements panel you can choose which of the following markers to display



- Main (Yellow)
- Delta (Blue)
- Horizontal (Red)

Frequency Controls

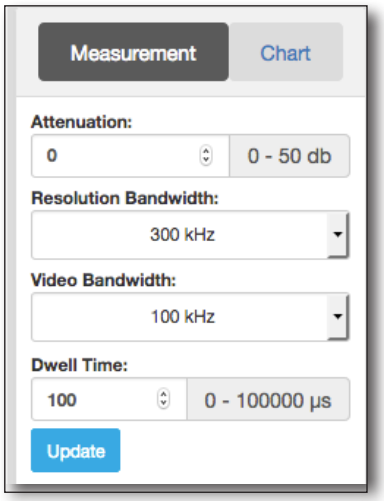
From this area of the measurements panel, you can choose the frequency span or range to display on the graph.



- **Start/Stop** – Select the **Range** button to enable the entry of a start and stop frequency to be displayed on the graph.
- **Center/Span** – Select the **Center** button to enable the entry of a center frequency and span to be displayed on the graph.

Measurement Settings

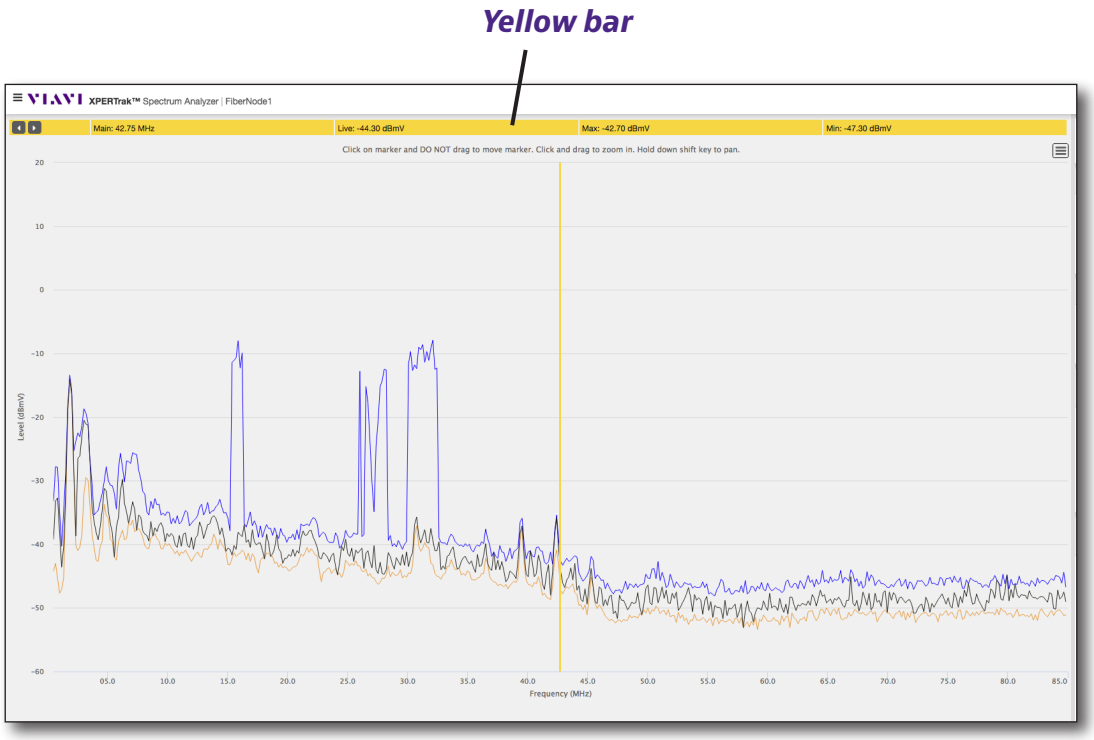
From this area of the measurements panel, you can choose the following measurements to display on the graph. When done, click the **Update** button to confirm your changes.



- Attenuation
- Resolution Bandwidth
- Video Bandwidth
- Dwell Time

Spectrum Analyzer Graph

The **Spectrum Analyzer** graph displays measured levels in dBmV, dBµV, or dBm (Y-Axis, Vertical) depending on settings, versus frequency in MHz (X-Axis, Horizontal). The traces, markers, reference level, vertical scaling, and frequency range/span are displayed within this area based on the settings of the frequency controls.



- **Interactive Marker** – Click the marker and move to display the frequency, level, and trace at that location.
- **Zoom** – Click and drag your mouse over a frequency span to zoom in. When done, click the **Reset Zoom** button.
- **Live Trace** – Displayed as a horizontal black line.
- **Max Hold Trace** – Displayed as a horizontal blue line.
- **Min Hold Trace** – Displayed as a horizontal orange line.
- **Average Trace** – Displayed as a horizontal green line.
- **Main Marker** – Displayed as a vertical yellow line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker, then move your mouse to the location you would like to mark, and click the mouse button again to set its location. The marker will display the frequency and level for each trace at the top of the graph.

  In the yellow bar at the top, the marker may also be moved using the arrows on the left.

- **Delta Marker** – Displayed as a vertical blue line that can be controlled via the measurement control panel or using the mouse.

  Like the main marker, click on the marker, then move your mouse to the location you would like to mark, and click the mouse button again to set its location. The marker will display the delta frequency and level for each trace at the top of the graph.

- **Horizontal Marker** – The Horizontal marker is a horizontal red line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker and then move your mouse to the location you would like to mark and click the mouse button again to set its location. The marker will display the level at that location to the left side of the graph.

- **Frequency Span** – By default, the frequency span is set to full span.

  To adjust, enter the desired start and stop frequencies in the control panel.

  You can also click and hold on the graph (at the desired start frequency) with your left mouse button and then drag the mouse to highlight the desired span. Release the mouse button over the graph (at the desired stop frequency) to select the span.

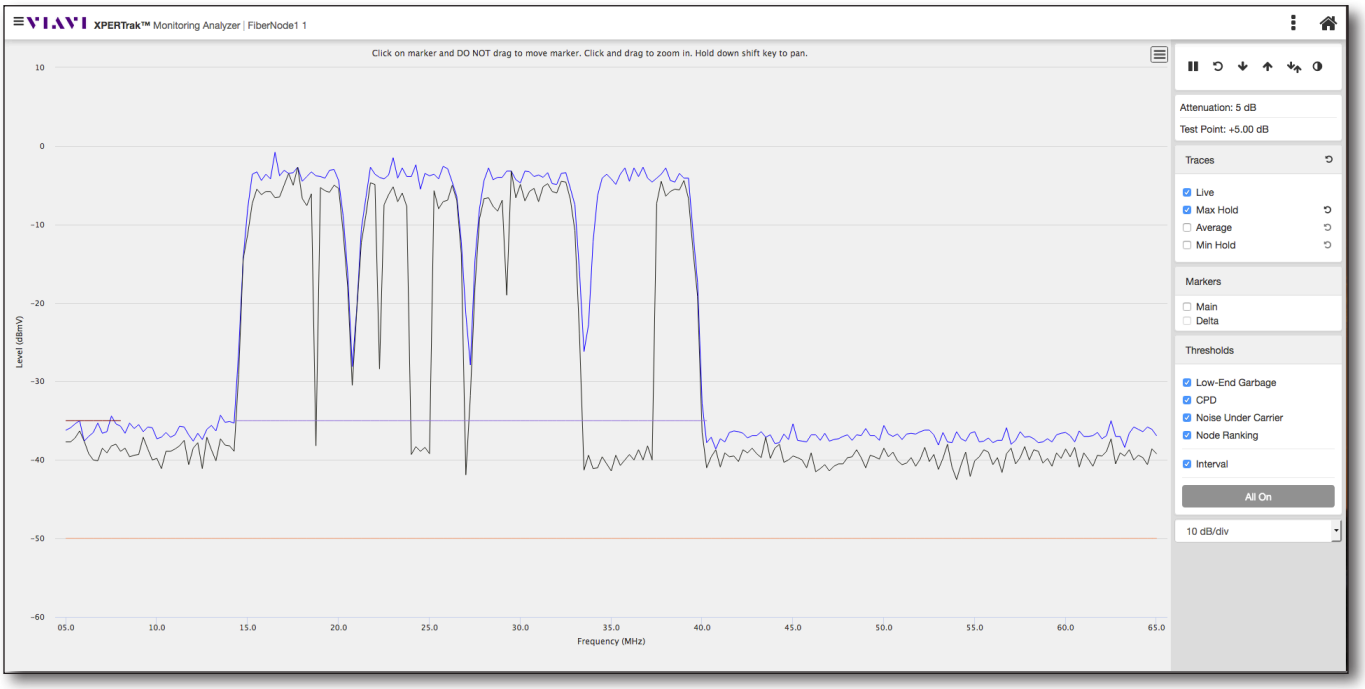
  To reset to full span select the **Reset Zoom** button in the upper right corner of the graph.

Monitoring Analyzer

The **Monitoring Analyzer** view is designed to provide live access to the RPM upstream monitors within the XPERTrak System to be used as a data source. You'll notice there are fewer settings to adjust and test than the Spectrum Analyzer, so in order to change the settings for advanced testing, see that section.

You can bring up the Monitoring Analyzer by:

- Selecting it from the Modules Panel from any screen
- Selecting the **Monitoring Analyzer** from the upstream area of the Node Health Analyzer or Node Performance view (available for RPM ports only).



The Monitoring Analyzer view is set by the user-created monitoring plan. The plan may contain up to 250 frequencies to be monitored, level-based threshold and the interval threshold.

The monitoring plan and the monitoring analyzer are what generate XPERTrak hardware (RPM port) alarms as well as the spectrum performance history.

NOTE:

***For help on creating monitoring plans, contact* 1-844-GO-VIAVI /1-844-468-4284 or *CATV@viavisolutions.com*.**

Measurements Panel

The Measurement Panel is similar to the Spectrum Analyzer without the advanced customizations for range, attenutation, etc. Its meant for more of quick view of the data source for comparison and benchmarking.

Playback Controls

Pause – Pauses the live trace on the graph.

Reset – Resets the live trace on the graph.

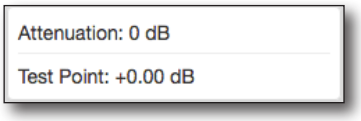
Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

Auto Reference Level – Automatically adjusts the reference level of the graph.

Switch Chart Color – Toggles between light and dark themes.

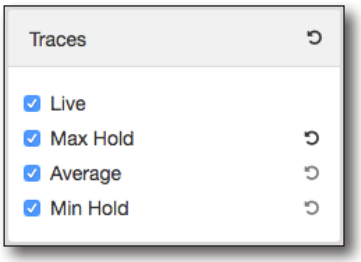
Below the playback controls are the attenuation and test point measurements, if applicable.



Neither of these are adjustable from within the monitoring analyzer and must be configured from the properties of the RPM port.

Traces

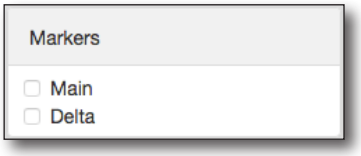
From this area of the control panel, you can choose which of the following spectrum traces to display;



- Live (Black)
- Max Hold (Blue)
- Min Hold (Orange)
- Average (Green)

Markers

From this area of the control panel, you can choose which of the following markers to display;

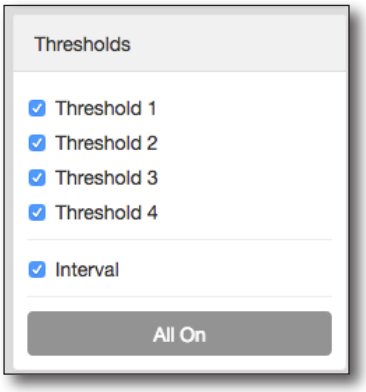


- Main (Yellow)
- Delta (Blue)

Thresholds

From this area of the control panel, you can choose which of the 4 thresholds and the interval to display. Click the **All On** button for all the thresholds.

The thresholds and threshold labeling can be adjusted from the Admin settings. See *"RPM Port Custom Threshold Names" on page 223.*



Vertical Scale

From this dropdown, you can choose the vertical scale to display.

Monitoring Analyzer Graph

The **Monitoring Analyzer** graph displays measured levels in dBmV, dBµV, dBm (Y-Axis, Vertical) depending on settings, versus frequency in MHz (X-Axis, Horizontal). The traces, markers, thresholds, and vertical scaling are displayed within this area based on the settings of the Measurement Control panel.

- **Interactive Marker** – Hover your mouse over the graph to display the interactive marker. The marker will display the frequency, level, and trace at that location.
- **Zoom** – Click and drag your mouse over a frequency span to zoom in. When done, click the **Reset Zoom** button.
- **Live Trace** – Displayed as a horizontal blue line.
- **Max Hold Trace** – Displayed as a horizontal blue line.
- **Min Hold Trace** – Displayed as a horizontal orange line.
- **Average Trace** – Displayed as a horizontal green line.
- **Main Marker** – Displayed as a vertical yellow line that can be controlled via the measurement control panel or using the mouse.

  Click on the marker, then move your mouse to the location you would like to mark, and click the mouse button again to set its location. The marker will display the frequency and level for each trace at the top of the graph.

- **Delta Marker** – Displayed as a vertical blue line that can be controlled via the measurement control panel or using the mouse.

  Like the main marker, click on the marker, then move your mouse to the location you would like to mark, and click the mouse button again to set its location. The marker will display the delta frequency and level for each trace at the top of the graph.

- **Thresholds** –Thresholds 1–4, plus the interval threshold from the user-configured monitoring plan

9

QAMTrak Upstream Analyzer

This chapter covers how to use the QAMTrak Upstream Analyzer feature, including the following:

- "HCU QAMTrak Analyzer with MACTrak Capability" on page 146
- "DAA QAMTrak Analyzer" on page 147
- "Navigation" on page 148
- "Channel Settings and Filters Panel" on page 149
- "Dashboard Panel" on page 152
- "Packet History Chart" on page 154
- "Constellation Chart" on page 155

HCU QAMTrak Analyzer with MACTrak Capability

The HCU QAMTrak Analyzer with MACTrak Capability tool provides fully interactive control of measurement parameters and live display of measurement data for any one RPM port in the system. It allows you to control typical measurement parameters, such as channel frequency and bandwidth and displays the results in a real-time manner. This process does not stop the on-going monitoring and data collection for any RPM port.

QAMTrak analysis is useful for displaying data about your digital signal in a variety of forms. The most commonly used form is the QAM constellation. The system can display a demodulated signal for bursty, upstream traffic as well as for a steady, injected QAM signal.

While the QAMTrak Analyzer is running, the system calculates all data gathered until the view is reset or closed. This data can be seen to the right of the constellation and the strip chart. Packet statistics are directly applicable to the active packet, which is either the latest packet received, or the packet the Marker is on in the Packet History Chart.

Each section of the charts may have additional options. Click the **Options** button ⋮ to display these, including the following:

- Vertical scale (2, 5, 10 dB/div)
- Autoscale level on/off
- Minimum hold show/hide
- Data points show/hide

There are also arrow buttons to change the reference level or set to auto reference.

DAA QAMTrak Analyzer

Similar to the HCU QAMTrak Analyzer, this view is designed to provide live access to the CMTS upstream port of QAMTrak analyzers within the XPERTrak System. This view will open within a new window or tab when the CMTS QAMTrak Analyzer icon is selected from the Upstream area of the Node Performance view.

RCI is required to view this data.

Key Features

- Extends exclusive QAMTrak capabilities beyond just nodes monitored by PathTrak hardware
- Extensive per-packet analysis including VIAVI-exclusive metrics* to know why services are impacted
- EQ/UnEqualized constellation*, spectrum, unequalized MER*, MER, carrier level delta, micro-reflection, in-band response, group delay, ingress under the carrier*, and impulse noise*
- Detailed tabular information from CCAP, including CPE MAC and CER/CCER available for deeper analysis

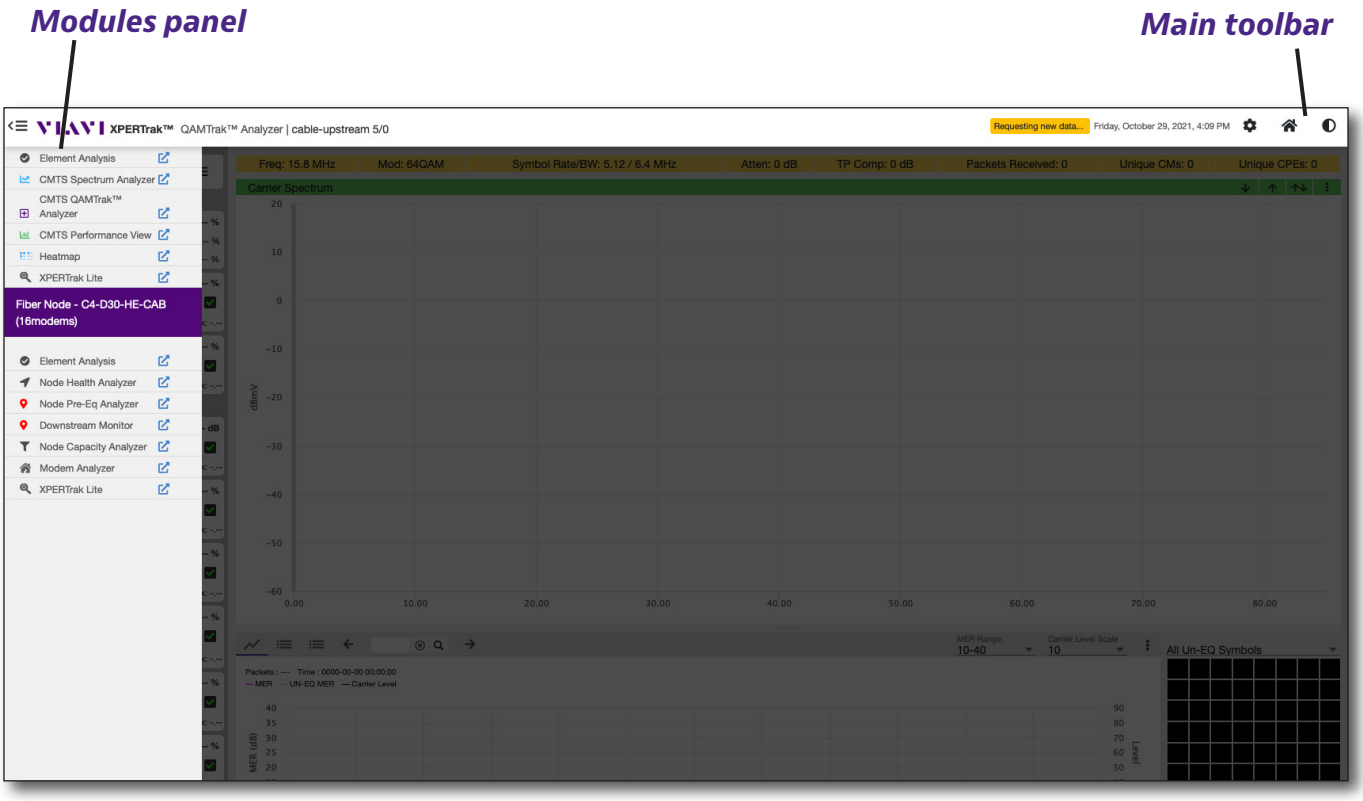
To return to the Node Performance view, you can simply close the new tab or window.

NOTE:

Only the Arris E6000 CMTS and Harmonic support IQ data for QAMTrak. For ports monitored with PathTrak, this capability comes from the hardware, not the CMTS.

Navigation

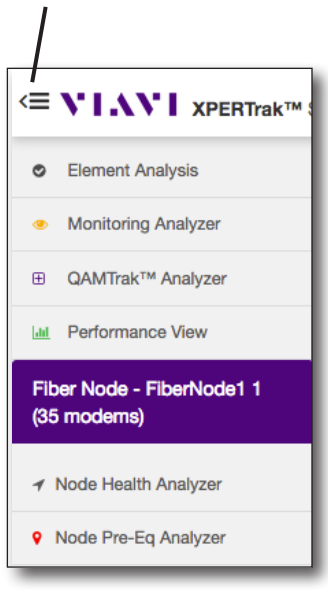
Most of the navigation in the QAMTrak Analyzer is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.



Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

Home – Takes you back to the Main Dashboard

Channel Settings – Brings up the Channel Settings and Filters Panel. Allows you to select the channel for QAMTrak/MACTrak analysis

Switch Chart Color – Toggles between light and dark themes

Channel Settings and Filters Panel

The first screen you will see when opening QAMTrak is the **Channel Settings and Filters** panel.

Upstream Channels tab

This panel contains a list of channels contained in the server database and HCU and is configured by obtaining the UCDs (Upstream Channel Descriptors) from the CMTS.

Note: QAMTrak channels will only populate in the list when the channels are active and/or there is sufficient data throughput to detect the channel. Once a UCD is detected, the channel should continue to populate in future sessions.

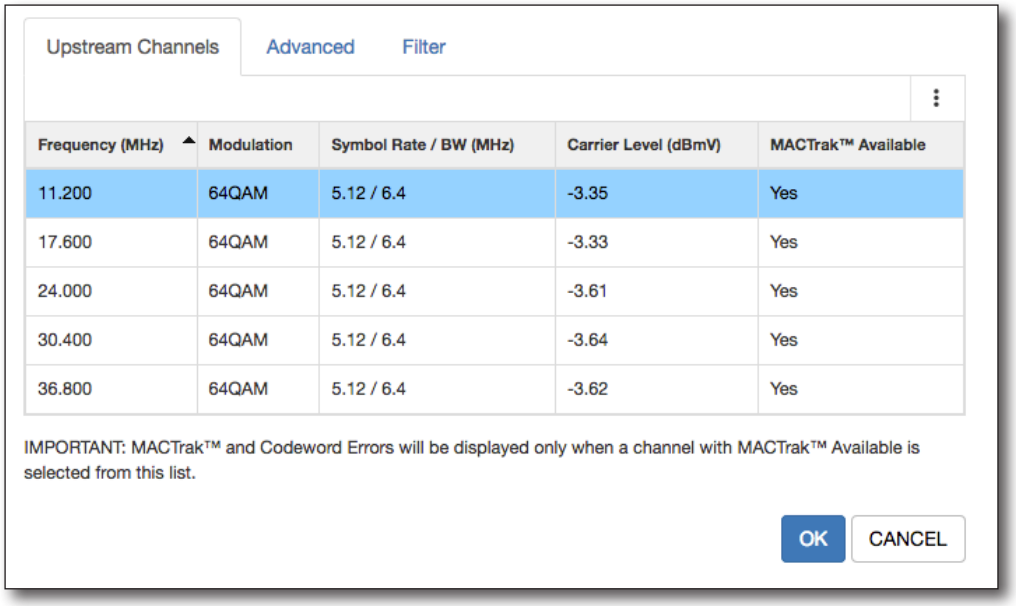
The channel information displays in frequency, modulation, symbol rate, carrier level, and MACTrak available columns. All the columns are sortable using the arrows on the top of the columns.

Select a channel and click **OK** to view the main screen.

You can also click the **Options** ⋮ button on the top right for additional functionality:

- **Scan for Upstream Channels** – If no upstream channels display, you can scan the upstream channels again to get the channel list.
- **Clear then Scan for Upstream Channel** – If the channel list is incorrect or incomplete, it clears the list and scans again.

Note: Channel Scan and detect occurs on every port at different scheduled times throughout the day to ensure proper channels.



Advanced tab

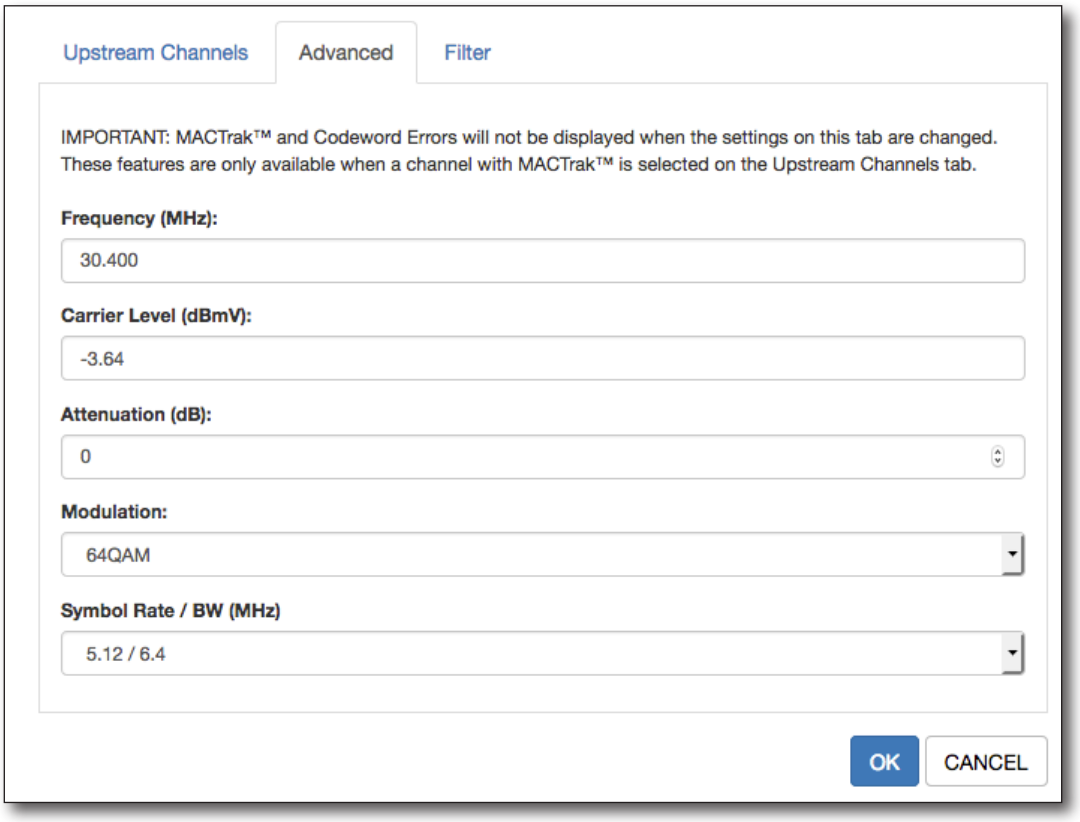
The following settings are used for the information displayed on the Upstream Channels tab. Default values are used if these are not set.

- Frequency (MHz)
- Carrier Level (dBµV or dBmV)
- Attenuation (dB)
- Modulation
- Symbol Rate / BW (MHz)

When done, click **OK** to view the main screen.

Note the disclaimer on the top:

IMPORTANT: MACTrak™ and Codeword Errors will not be displayed when the settings on this tab are changed. These features are only available when a channel with MACTrak™ is selected on the Upstream Channels tab.

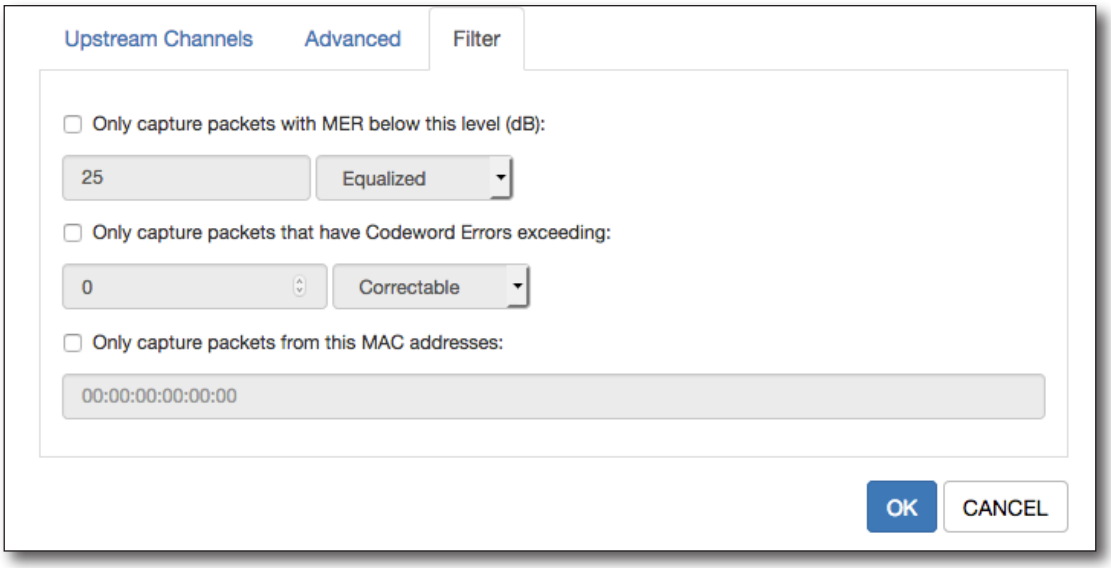


Filter tab

QAMTrakAnalyzer supports filtering based on the following settings. Default values are used if these are not set.

- **Only capture packets with MER below this level (db)** – The defaults are set to 25 MER and type *Equalized*, with the option to change it to *Un-equalized*.
- **Only capture packets that have codeword errors exceeding** – The defaults are set to 0 and type is set to *Total,* with the option of *Uncorrectable*.
- **Only capture packets from this MAC address** – If a correct MAC address is set, only the packets for the specified MAC address are captured.

When done, click **OK** to view the main screen.



Dashboard Panel

Playback Controls

Play – Starts the packet data collection and displays the live trace on the Interactive Graph.

Pause – Stops the packet data collection and pauses the live trace on the Interactive Graph.

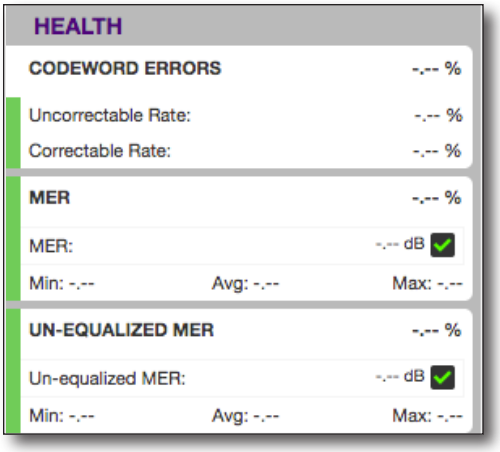
Reset – Resets the packet data collection and the live trace on the Interactive Graph.

Tile View – Displays the Impairment charts in tile view, including all recently opened charts.

3-Tier View – Displays the charts in 3-Tier view, where the bottom chart is the Strip Chart, Carrier Level Spectrum is in middle, and Micro Reflection is at the top, by default. If you have any other chart selected, it is displayed at the top.

Health Dashboard

This section displays any problems related to the overall health of the node, such as:



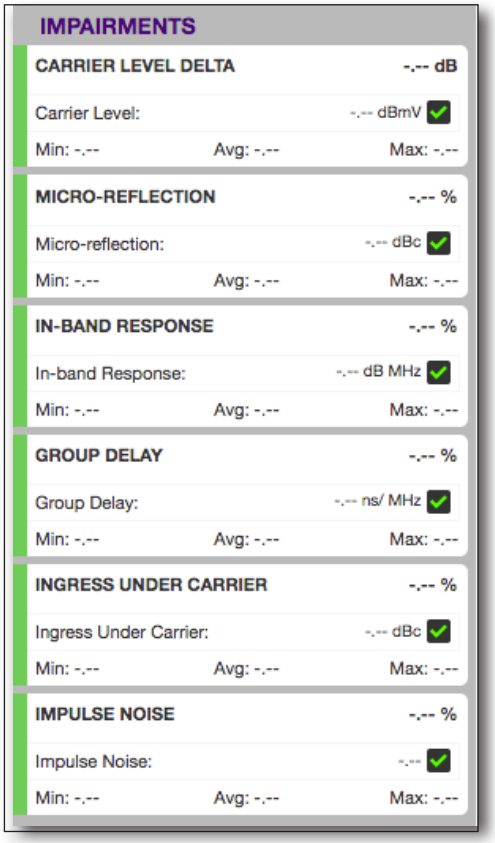
- **Codeword Errors** – A measure of the uncorrectable codeword error rate and total errored packet rate during a QAMTrak session.
    - **Codeword Errors** – Percentage of all packets in the session with codeword errors
    - **Uncorrectable Rate** – Percentage of uncorrectable codeword errors in the session
    - **Correctable Rate** – Percentage of correctable codeword errors in the session
- **MER** – Indicates whether the combination of all impairments present in a node are affecting the symbol locations within DOCSIS packets after CMTS compensation algorithms are applied.
- **Un-Equalized MER** – Indicates whether the combination of all impairments present in a node are affecting the symbol locations within DOCSIS packets as received by the CMTS.

Impairment Dashboard

This section displays the root cause of the problems related to the packet health.

Each section of the panel contains the information of the current packet from the server and the aggregate values for the packet health measurements.

The packet impairment information is displayed for the following sections:



- **Carrier Level Delta** – The difference between the highest and lowest Carrier Level measurement received during a session.
- **Micro-reflection** – The highest amplitude micro reflection measured relative to the carrier level.
- **In-Band Response** – The maximum amplitude, minus the minimum amplitude per 1 MHz span of spectrum.
- **Group Delay** – The maximum delay time of a signal in nS, minus the minimum delay time per 1 MHz span of the carrier frequency range.
- **Ingress Under Carrier** – The level of the highest ingress, relative to the carrier in the frequency band occupied by the carrier.
- **Impulse Noise** – A unitless metric measuring the worst case relative magnitude of each symbols vector error, relative to desired nominal location.

An individual panel will turn red if there is a failure for that metric during the session.

- **Min** – Minimum measurement for that metric since analyzer was started
- **Avg** – Average measurement for that metric since analyzer was started
- **Max** – Maximum measurement for that metric since analyzer was started
- **-.--%** – Percentage of packets that have failed this metric since analyzer was started
- **Checkbox** – Status of current packet for that metric
  - Green – Good packet
  - Red – Bad / failed packet

NOTE:

A failure is determined by the settings in Administration>Settings>QAMTrak Analyzer.

Packet History Chart

This section of the dashboard view includes a history chart view of previous packets received. Here you can pause the live view and use the marker to look at previous packets. When you select any one packet, all of the dashboards show data for that packet.

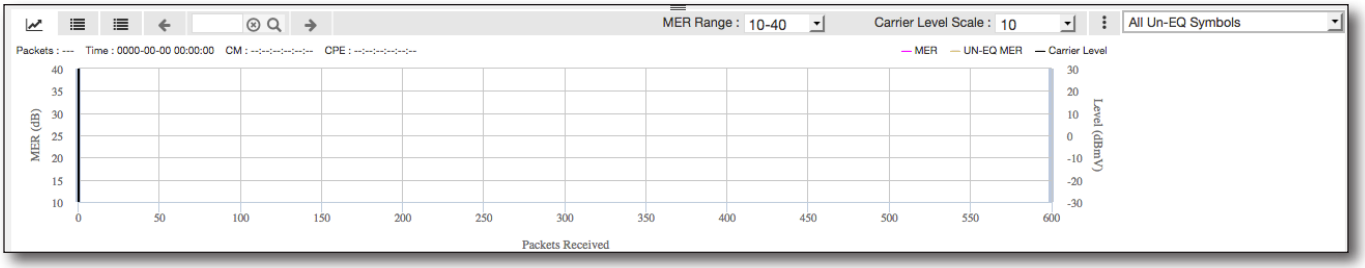
The software stores the last 600 packets in chronological order for each of the following:

- Unequalized MER in Y-axis
- Equalized MER in Y-axis
- Carrier Level in second Y-axis (shown on the right side of the chart)
- Packet count measured on the X-axis

The packet information can be displayed using the following options:

- **Packet Chart** – A chart view of the data.
- **List Received Packets** – A list of info for each packet received from the server.
- **List Received Packets by Unique CPE** – An aggregate of the data based on a unique MAC address of the CPE column.
- **MAC address search field** – Enter the MAC address you want to search.
- **Move Marker Left/Right** – Allows you to choose the next/previous packet sections.

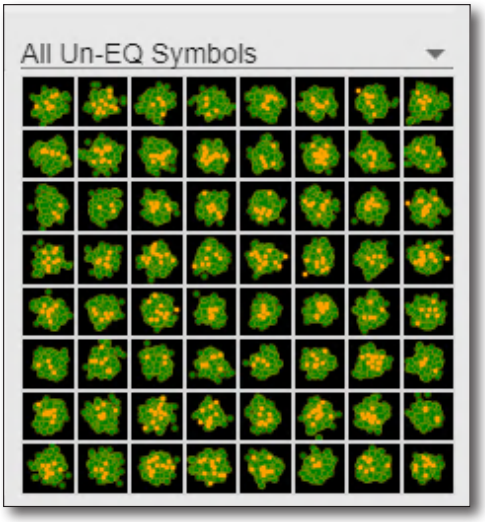
The tables can be sorted on all the columns, and you can use MER Range, carrier level scale, and symbols filters to refine the data.



Constellation Chart

This section displays a demodulated signal for bursty, upstream traffic, as well as for a steady, injected QAM signal. Data for all the packets received is displayed; old packets are green and the latest packet is yellow.

The grid size diplayed will correspond to the type of channel modulation selected (QPSK, 16/32/64 QAM).



You can choose from the following symbols charts:

- **Latest Un-EQ Symbols** – Displays the un-equalized data for the latest packet.
- **All Un-EQ Symbols** – Displays the un-equalized data for all the packets received.
- **Latest EQ Symbols** – Displays the equalized data for the latest packet.
- **All EQ Symbols** – Displays the equalized data for all the packets received.

10

Performance View

This chapter covers how to use the Performance View feature, including the following:

- "Performance View" on page 158
- "DAA Performance View" on page 159
- "Navigation" on page 161
- "Date and Settings Panel" on page 162

Performance View

The **Performance View** is used to display the history of Spectrum and MACTrak data. This is not a live view, so the data shown is a snapshot.

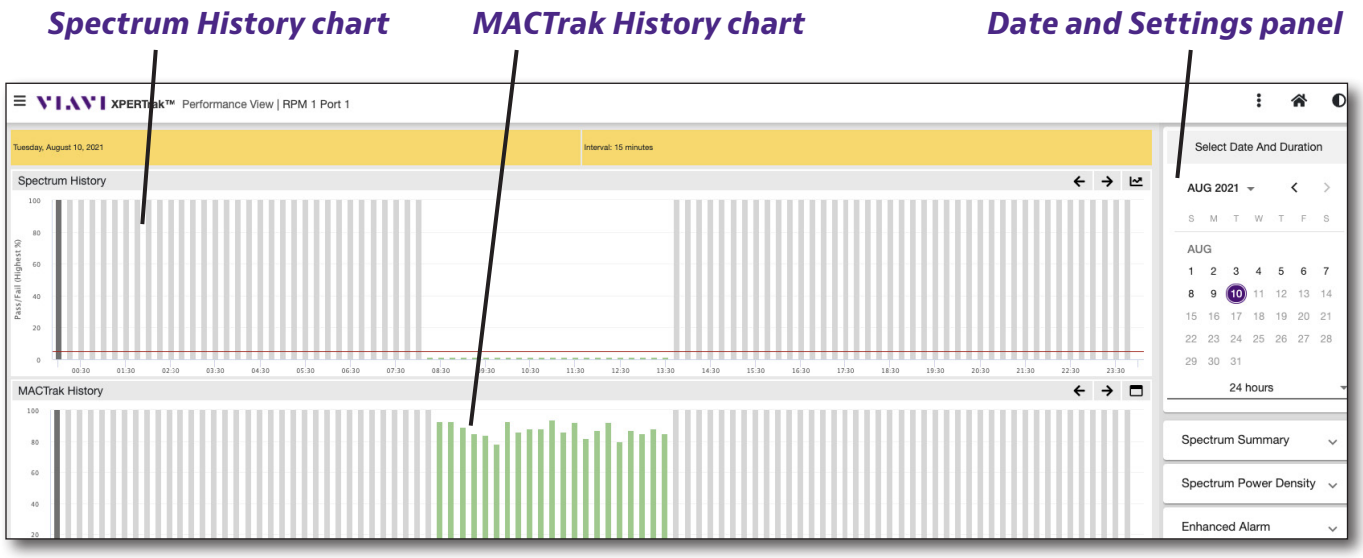
You can bring up the Performance View by:

- Selecting it from the Modules Panel from any screen.
- Selecting Performance View from the upstream area of the Node Health Analyzer or the Element Analysis view.

The **Spectrum** and **MACTrak history** data is represented as bar charts, along with the **Date and Settings panel** to the right of the screen.

For the MACTrak data, more than one bar chart is shown; the first one will always be the node score history and the rest will be channel scores.

You can hover your mouse over the bar graph elements for more information.



DAA Performance View

Similar to the Performance View, the **DAA Performance View** is used to display the history of Spectrum and MACTrak data of the CMTS upstream port. This is not a live view, so the data shown is a snapshot.

You can bring up the Performance View by:

- Selecting it from the Modules Panel from any screen.
- Selecting Performance View from the upstream area of the Node Health Analyzer or the Element Analysis view.

The **Spectrum** and **MACTrak history** data is represented as bar charts, along with the **Date and Settings panel** to the right of the screen.

For the MACTrak data, more than one bar chart is shown; the first one will always be the node score history and the rest will be channel scores.

You can hover your mouse over the bar graph elements for more information.

NOTE:

MACTrak History is based on raw data from the CMTS, not IQ data.

Spectrum History Chart

The **Spectrum History** chart is the one at the top of the screen. For each day (24 hours), there will be 96 slots (1 for every 15 minutes). The time is the x-axis. The y-axis is the spectrum score for that slot from 0 to 100.

This shows the percentage of time the RF exceeded the node ranking threshold for that 15 minute interval.

- If below threshold, the bar is green to indicate it passed.
- If above threshold, the bar is red to indicate it failed. A failure is also indicated on the Node Health Analyzer strip chart as ingress.
- The red line at the bottom is the threshold.
- If the data has not been collected yet or was unavailable at the time of collection, the bar is grey.

MACTrak History Chart

The **MACTrak History** chart contains node history and channel history (starting on the second bar chart). A node can have one to N channels; N in most cases being below 10. A channel is identified by the frequency, symbol rate, and modulation.

This shows the NPI (Node Performance Index) score, a rolled up score from all the CPI (Carrier Performance Index) scores for every upstream channel.

Note: MACTrak History requires monitoring to be enabled and an active monitoring plan deployed.

- On the left side of each channel chart there is a small box of information for the channel.
- For the NPI scores, there are 2 threshold values, marginal threshold and failed threshold. These are the 2 red lines going across.
- If above the top threshold, the bar is green to indicate it passed.
- If between the thresholds, the bar is yellow to indicate it is marginal.
- If below the thresholds, the bar is red to indicate it failed.
- If the data has not been collected yet or was unavailable at the time of collection, the bar is grey.
- X-Axis is time can have up to 96 points for a 24-hour period score. The y-axis score range is 0 to 100.

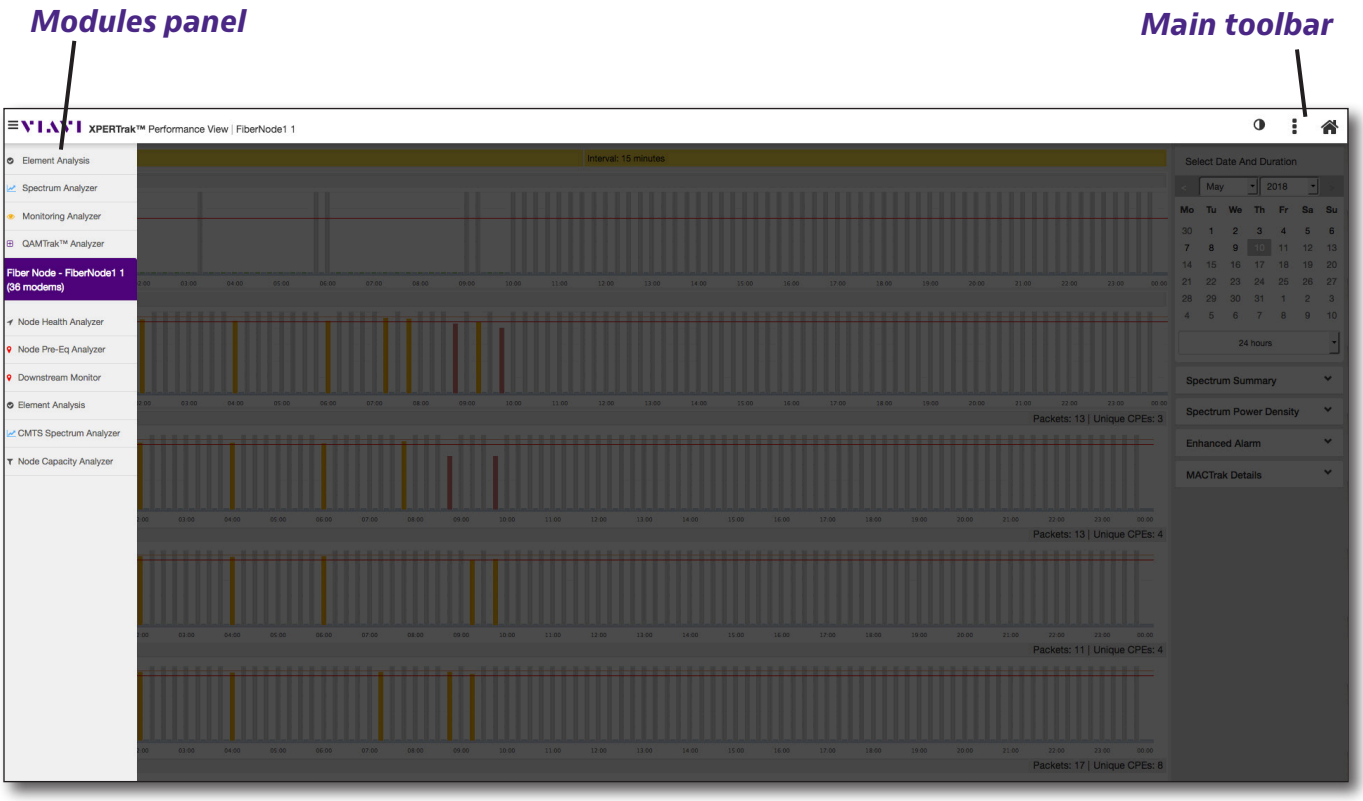
NOTE:

Failures for the Spectrum and MACTrak History Charts are determined by the settings in MACTrak Weighting.

See "MACTrak Weighting" on page 233.

Navigation

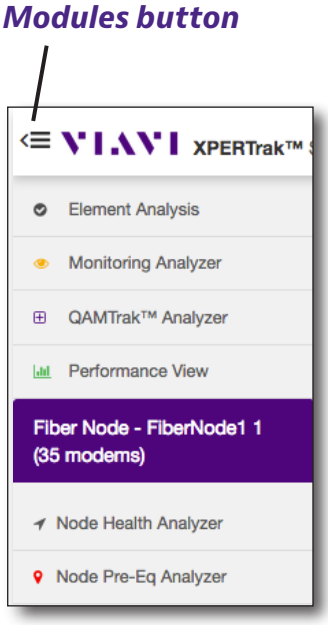
Most of the navigation in the Performance View is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.



Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

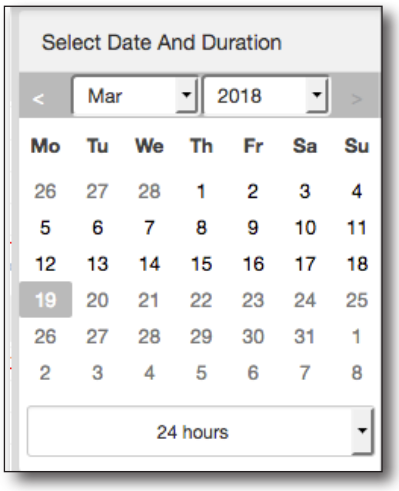
Show/Hide Date and Settings Panel – Found on the far right of the Main toolbar and shows/hides the **Date and Settings** panel along the right side of the Performance View. The Date and Settings panel is shown by default.

Home – Takes you back to the Main Dashboard.

Switch Chart Color – Toggles between light and dark themes

Date and Settings Panel

On the right side of the screen is the **Date and Settings** panel.



From here, you can set the date and time of the data you want to display, as well as additional settings for each summary screen, including:

- Spectrum Summary
- Spectrum Power Density
- Enhanced Alarm
- MACTrak Details

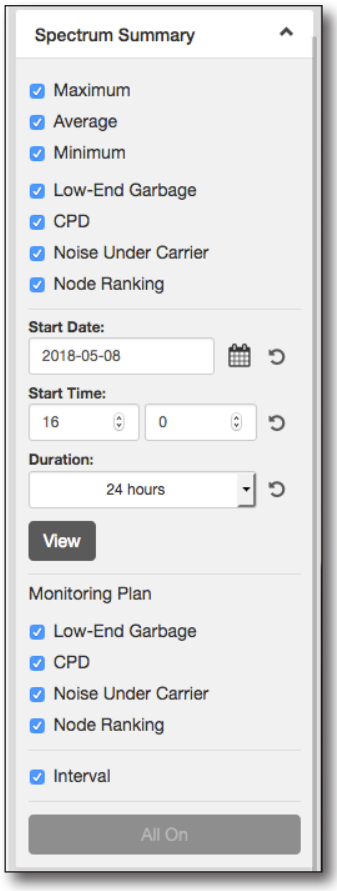
Setting the Date and Duration

Use the calendar to set the time and duration for the data you want to display.

The data is available for up to 30 days from the current day.

24 hours is set by default, with 15-minute increments displayed in the chart from midnight of the date selected. You can change this to 48 hours, as well.

Spectrum Summary Chart



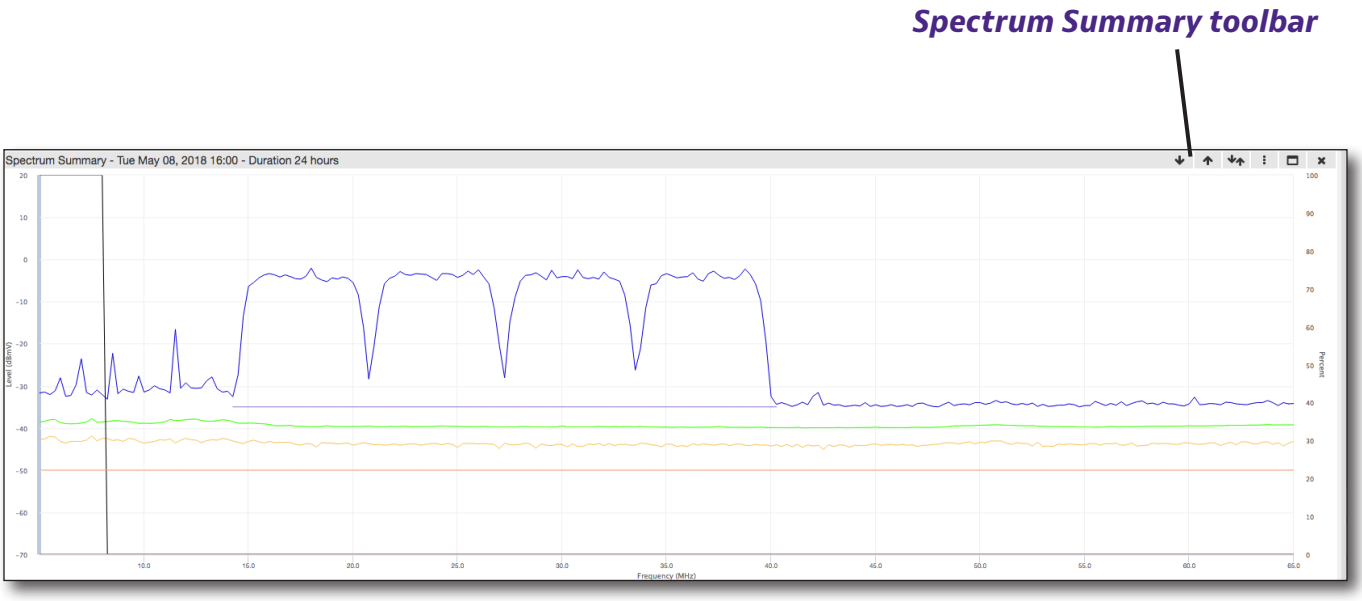
The **Spectrum Summary** is the RF spectrum level history from the monitoring plan.

Spectrum Summary labels are defined in the Admin settings.

The following settings are used for the Spectrum Summary display from the **Spectrum Summary** dropdown:

- Maximum, Average, and Minimum traces
- Low-end garbage, CPD, Noise under carrier, and Node ranking
- Start date, time, and duration
- Monitoring plan threshold views
- Interval view

Click the **View** button to open or update the chart.



Spectrum Summary chart

Spectrum Summary Toolbar

Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

Auto Reference Level – Automatically adjusts the reference level of the chart.

Vertical Scale – Allows you to change the vertical scale (2, 5, or 10 dB/div).

Full screen – Allows you to toggle full screen.

Close – Closes the chart.

Trace colors

Blue – Maximum levels for each frequency in the monitoring plan measured during the specified time span

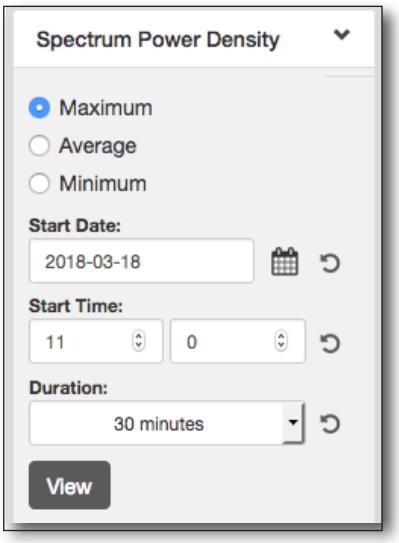
Green – Average levels for each frequency in the monitoring plan measured during the specified time span

Orange – Minimum levels for each frequency in the monitoring plan measured during the specified time span

You can choose which threshold traces you want to view using the control panel.

Spectrum Power Density Graph

The **Spectrum Power Density** is the RF level history over time from the monitoring plan represented in 3D.



The following settings are used for the Spectrum Power Density display from the **Spectrum Power Density** dropdown:

- Maximum, Average, Minimum traces
- Start date, time, and duration

Click the **View** button to open or update the graph.

You can also use your mouse wheel to zoom in and out of the graph. Click and drag your mouse in any direction to rotate.

Spectrum Power Density Toolbar

Graph type – Allows you to choose from 4 different views from the dropdown (Line, Surface, Bar, and Dot).

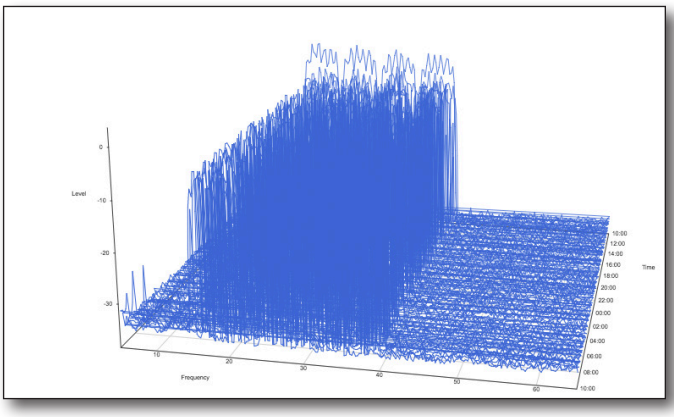
Zoom Out – Zooms out from the graph.

Zoom In – Zooms into the graph.

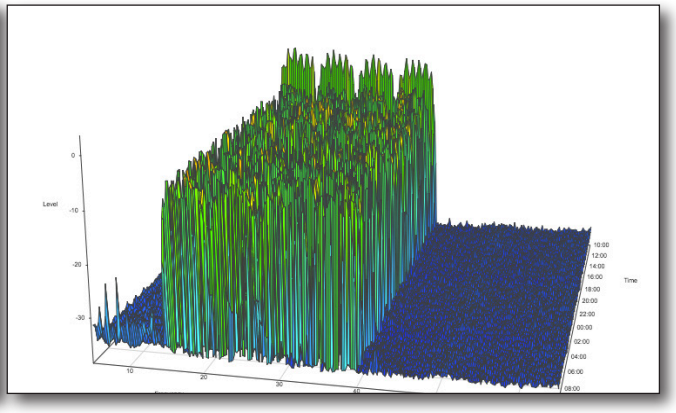
Full screen – Allows you to toggle full screen.

Close – Closes the graph.

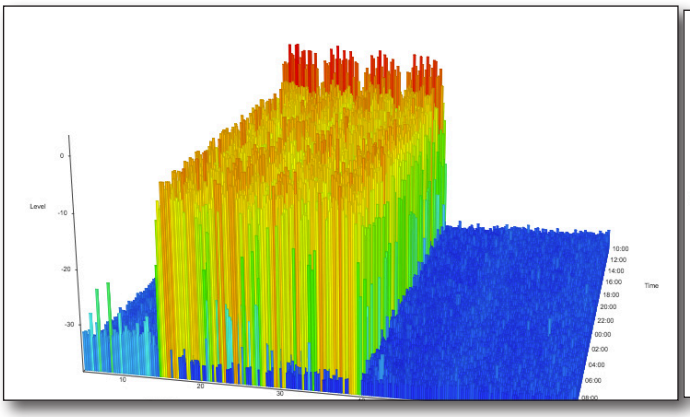
Below are examples of each of the graph types, showing the same data. Try each of them for a different perspective of the power density.



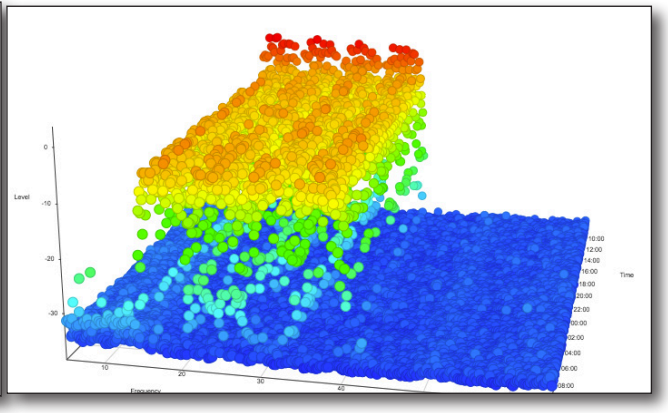
Line graph



Surface graph



Bar graph



Dot graph

- Vertical axis is the level, also represented by the colors
- Bottom axis is the frequency
- Right side axis is the time

Enhanced Alarm Chart

The Enhanced Alarm allows you to see which frequencies in the monitoring plan violate the threshold and by how much.

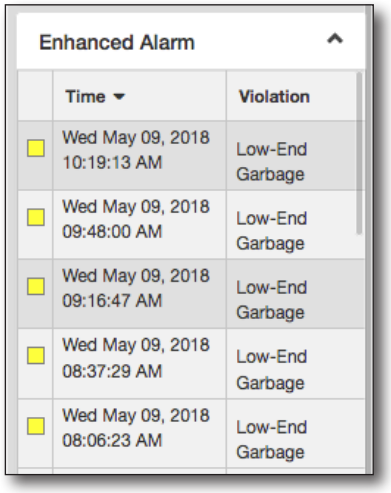
This view is available if DAA monitoring is enabled. Enhanced alarms will only show for threshold 1–4 violations, not the interval thresholds.

The red dots in the chart indicate frequencies that violated threshold. You can roll your mouse over a dot for more detail.

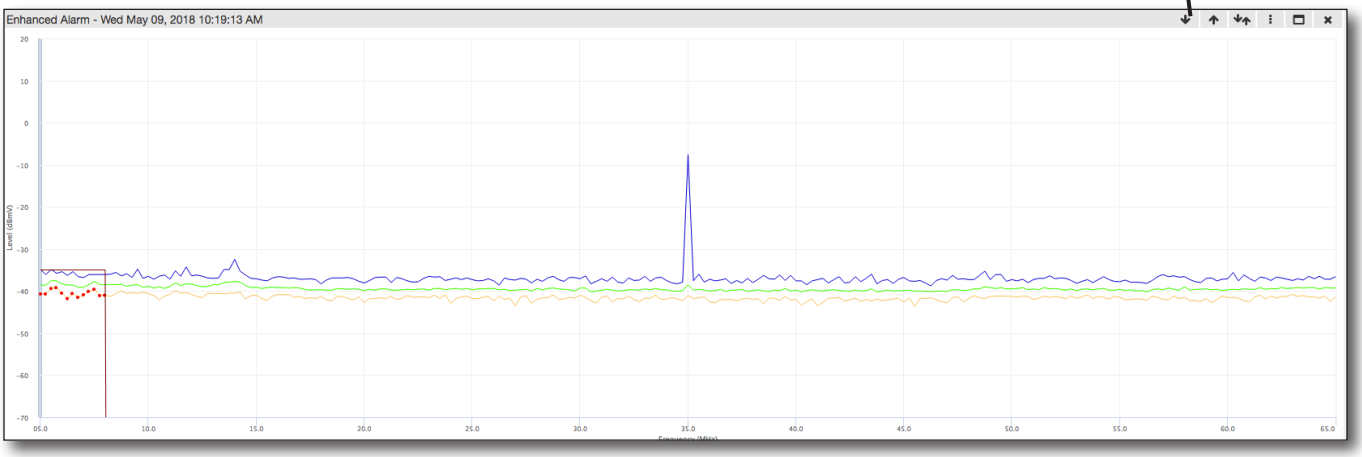
This violation would have generated an alarm from an RPM port.

The following settings are used for the Enhanced Alarm display from the **Enhanced Alarm** dropdown:

- Alarm list (including times and violations)
- Maximum, Average, Minimum traces



Enhanced Alarm toolbar



Enhanced Alarm chart

Enhanced Alarm Toolbar

Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

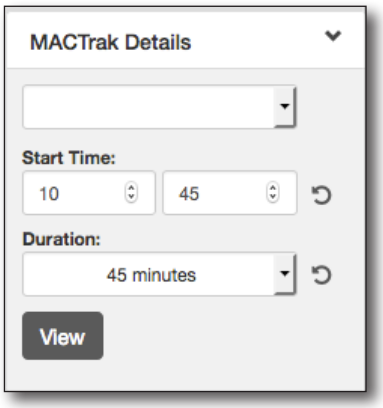
Auto Reference Level – Automatically adjusts the reference level of the chart.

Vertical Scale – Allows you to change the vertical scale.

Full screen – Allows you to toggle full screen.

Close – Closes the chart.

MACTrak Details Chart



The following settings are used for the MACTrak display from the **MACTrak Details** dropdown:

- Channel
- Start time and duration

Click the **View** button to open or update the chart.

This section of the MACTrak dashboard includes a history chart view of previous packets received. Here you can use the marker to look at previous packets. When you select any one packet, all of the charts show data for that packet.

The software stores the last 600 packets in chronological order for each of the following:

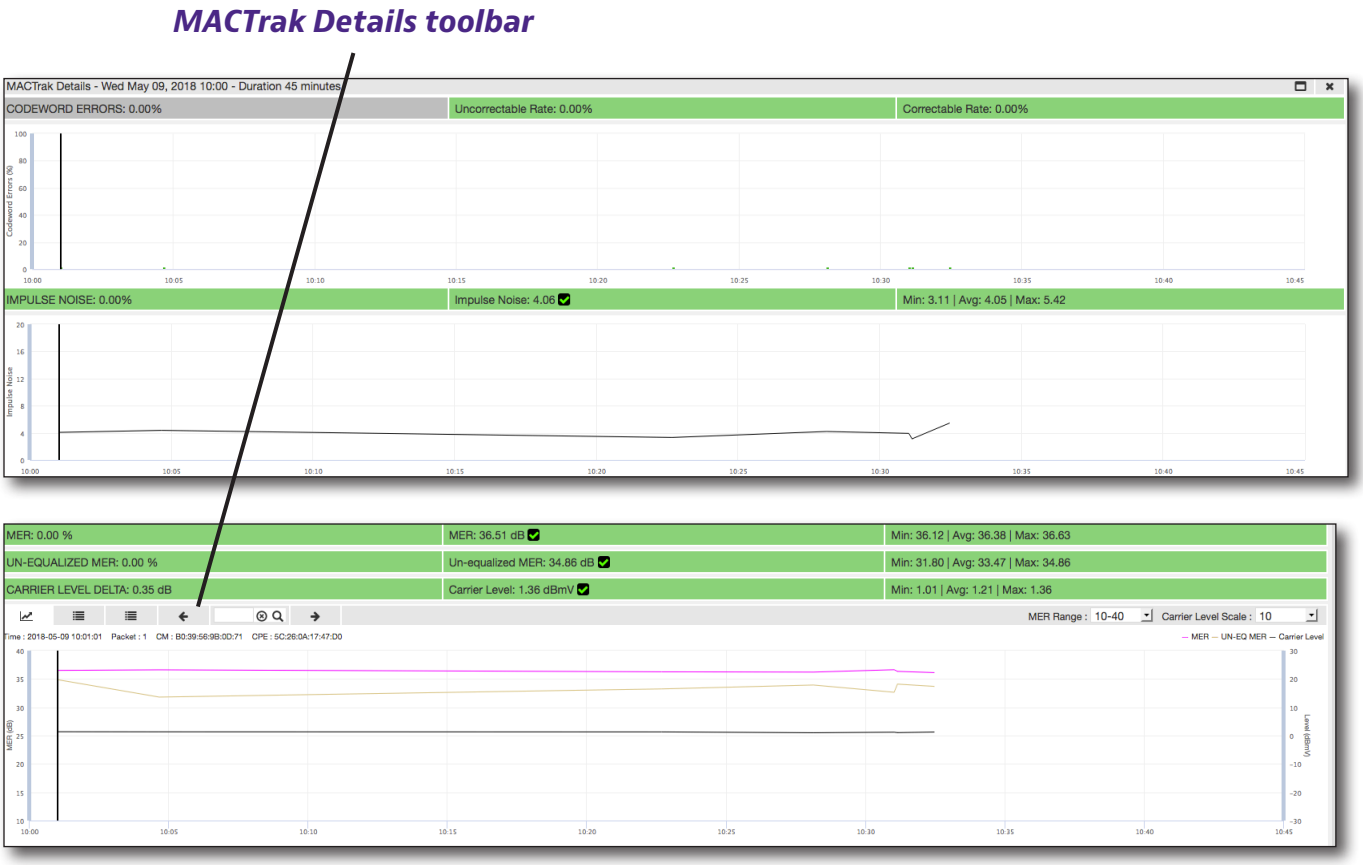
- Unequalized MER in Y-axis
- Equalized MER in Y-axis
- Carrier Level in second Y-axis (shown on the right side of the chart)
- Packet count measured on the X-axis

This is not live data and will not dynamically update. It is just a one time snapshot. 45 minutes of data is shown, 15 minutes before and 15 minutes after the current selection.

All the charts are aligned by the x-axis, which is the time period for 3 hours or less.

NOTE:

MACTrak Details does not appear for the CMTS Upstream Port Performance View.



MACTrak Details chart

MACTrak Details Toolbar

Packet Chart – A chart view of the data.

List Received Packets – A list of info for each packet received from the server.

List Received Packets by Unique CPE – An aggregate of the data based on a unique MAC address of the CPE column.

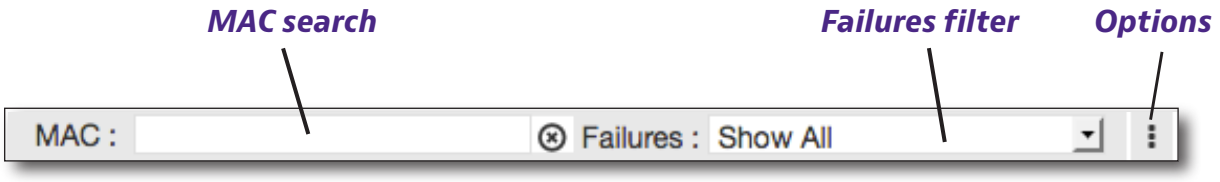
Move Marker Left/Right – Allows you to choose the next/previous packet sections.

Packet search field – Enter the packet number you want to go to.

MAC address search field – Enter the MAC address you want to search.

Failures dropdown filter – Allows you to filter which failures you want to show.

Options – Allows you to export the list to a CSV Excel file or copy the cable modem or CPE address.



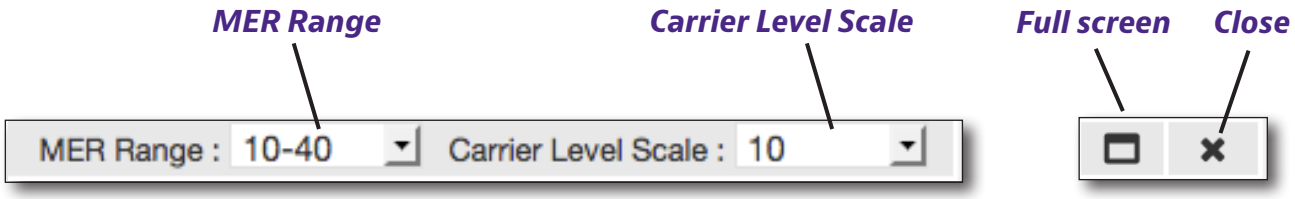
MER Range dropdown – Allows you to choose the MER range.

Carrier Level Scale dropdown – Allows you to change the carrier level scale (2, 5, or 10).

Full screen – Allows you to toggle full screen.

Close – Closes the chart.

The lists can be sorted on all the columns and some of the features are depended on whether you are viewing the packet chart or the list.



11

Heatmap

This chapter covers how to use the Heatmap feature, including the following:

- "Heatmap" on page 172
- "Navigation" on page 175
- "Measurements Panel" on page 176

Heatmap

The **Heatmap** is a graphical representation of spectrum data that uses a system of color-coding to represent signal persistence by frequency. This is a live view in XPERTrak.

This type of map is similar to weather radar. As the precipitation increases, the colors on the map change in severity from very light green for light rain, to darker green, yellow, orange, and finally red, when there is a significant amount of rain at that location.

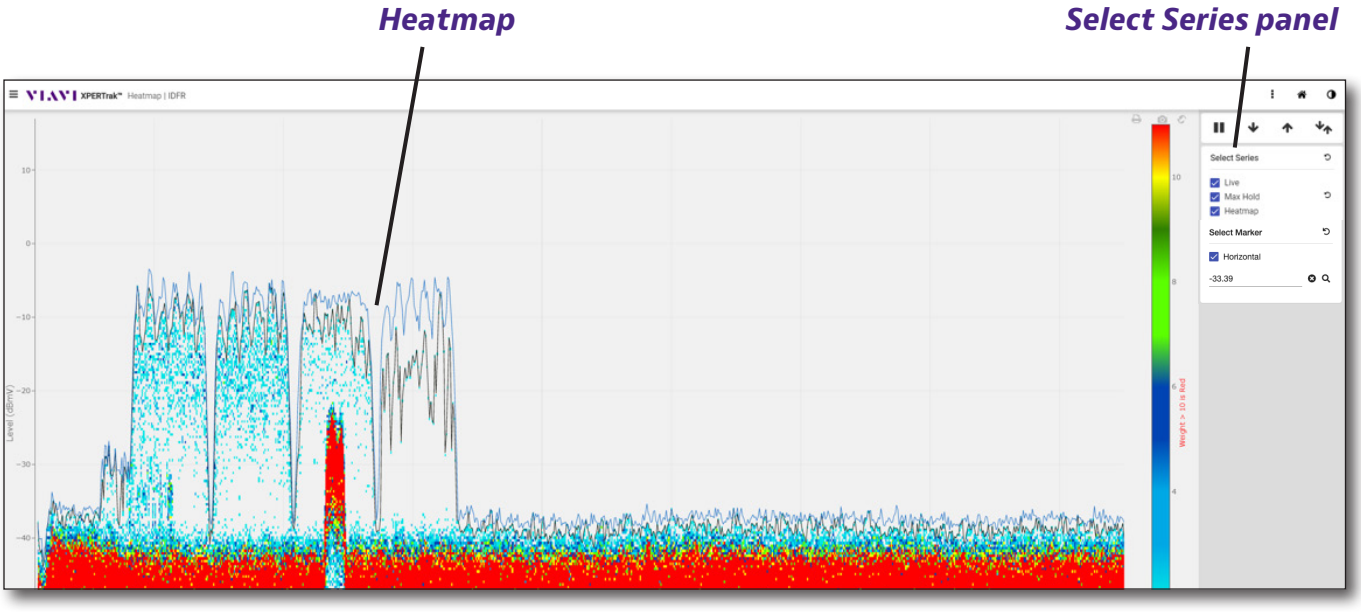
Using a heatmap for a spectrum analyzer works with the same premise. If a particular signal is red at a given level, the analyzer is measuring that signal at that level very frequently, if not continuously.

You can bring up the Heatmap by:

- Selecting it from the Modules Panel from any screen
- Selecting the Heatmap icon from the upstream area of the Node Health Analyzer or the Element Analysis view
- Selecting the Heatmap icon from XPERTrak Lite

The **Heatmap** data is represented as traces, along with the **Select Series panel** to the right of the screen.

You can hover your mouse over the chart elements for more information.



Heatmap spectrum display

Heatmap Features

Heatmap is similar to the ingress expert display on the ONX and provides an intuitive display consistent with the field instruments often used to chase ingress. In addition, heatmap is good at seeing ingress under the carriers which is intermittent.

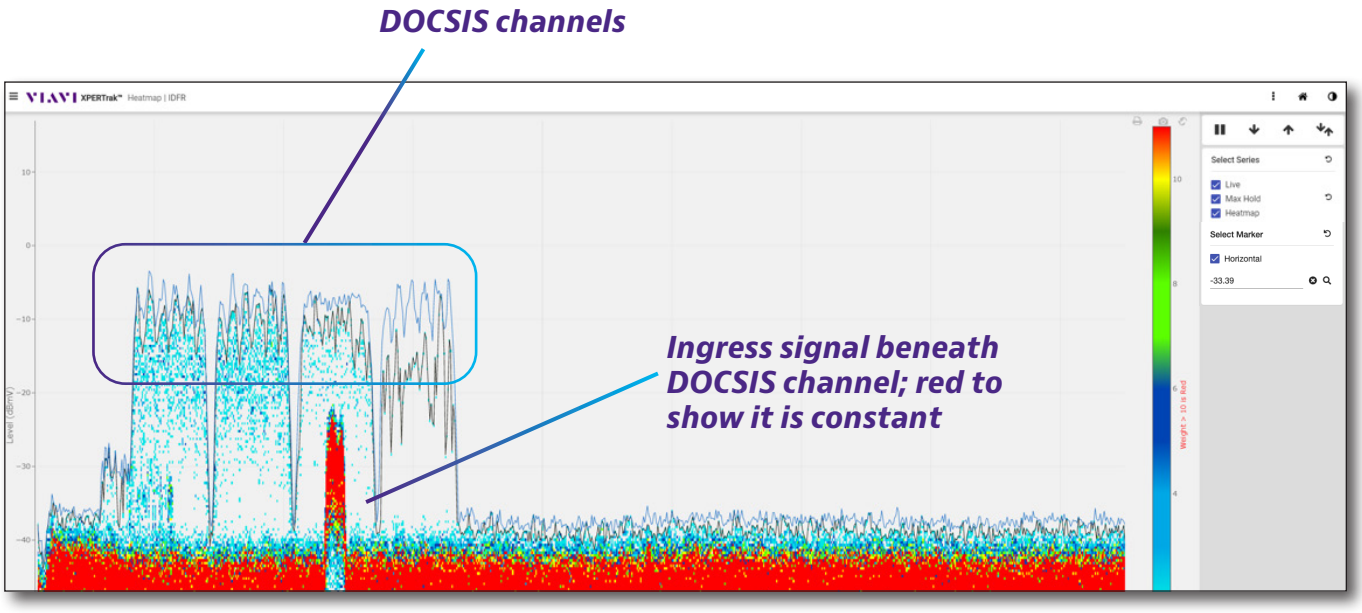
A minimum hold can show ingress under a spectrum if it is constant. However, if it occasionally goes away, the minimum hold shows the noise floor. Because heatmap shows how much ***time*** the signal spends at each level, it shows all ingress under the carriers.

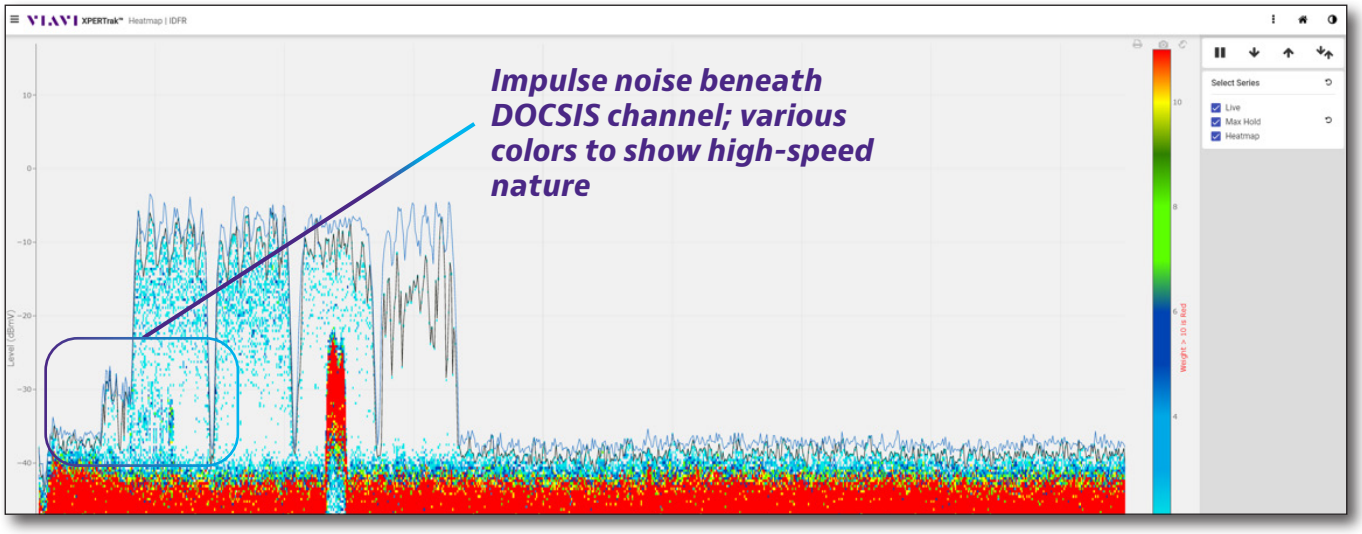
System Requirements

The heatmap feature is supported for all HCU 200s and RPM 3000s with the full option, as long as the support contract on the XPERTrak server is current.

Note: HCUs with MVME2700 SBC with only 32 MB of RAM will not be able to run the Heatmap.

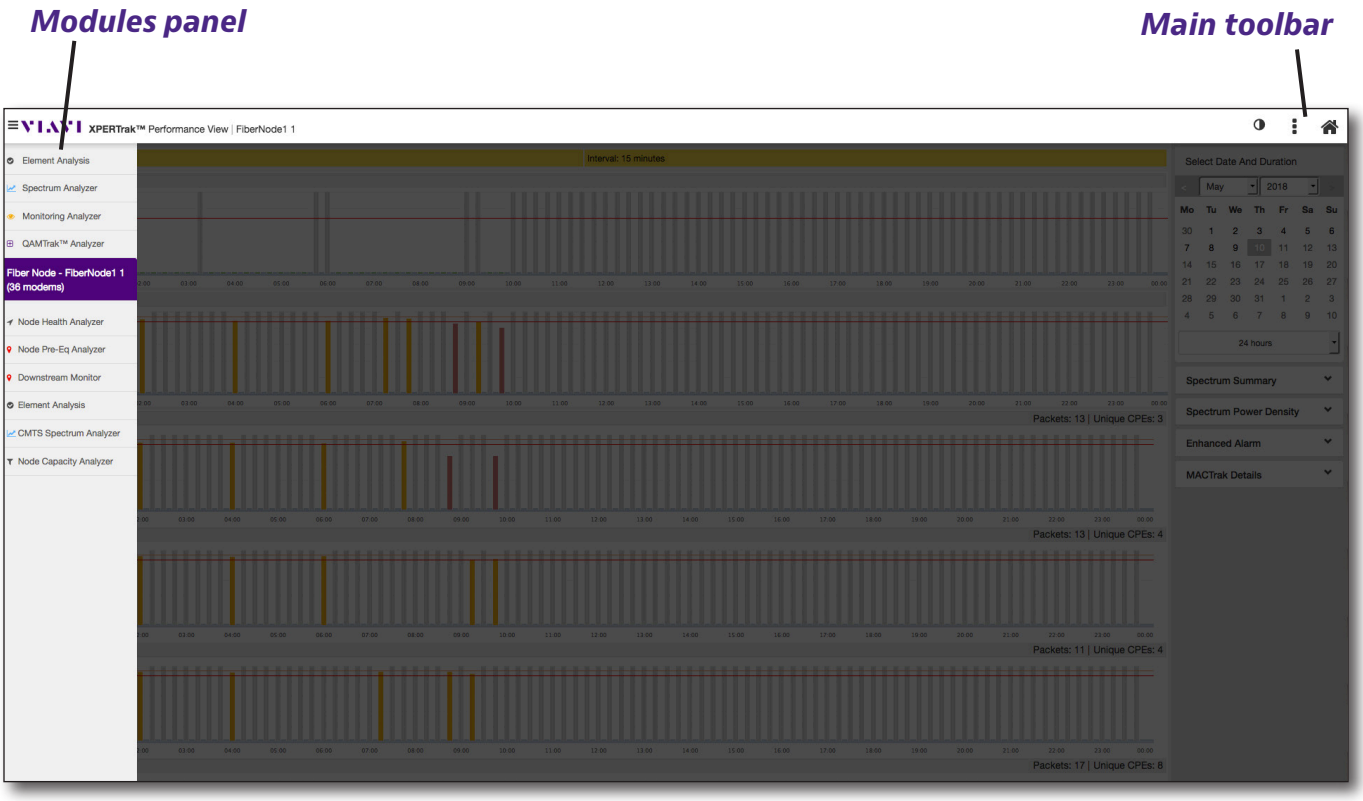
Contact your VIAVI Solutions sales representative if you need to renew your software maintenance agreement or purchase an SBC upgrade kit.




Impulse noise beneath DOCSIS channel; various colors to show high-speed nature
Select Series
Live
Max Hold
Heatmap

Navigation

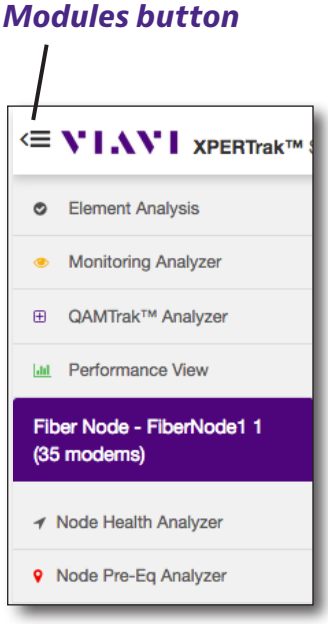
Most of the navigation in the Heatmap is done through the **Modules panel** (vertical menu on the left side of the screen) and the **Main toolbar** (horizontal menu at the top right of the screen), as shown below.



Modules Panel

You can show/hide the **Modules** panel with the **Modules** button found to the left of the VIAVI logo, as shown here.

From this area, you can access the available measurement tool modules. Just click the module to go to that screen.



Main Toolbar

This control bar is located across the top of the browser window. From this area you can perform the following actions;

Show/Hide Measurements Panel – Found on the far right of the Main toolbar and shows/hides the **Measurements** panel along the right side of the Heatmap. The Measurements panel is shown by default.

Home – Takes you back to the Main Dashboard.

Switch Chart Color – Toggles between light and dark themes

Measurements Panel

Playback Controls

Pause – Pauses the live trace on the Interactive Graph.

Trace Down – Moves the trace down and increases the reference level.

Trace Up – Moves the trace up and decreases the reference level.

Auto Reference Level – Automatically adjusts the reference level of the Interactive Graph.

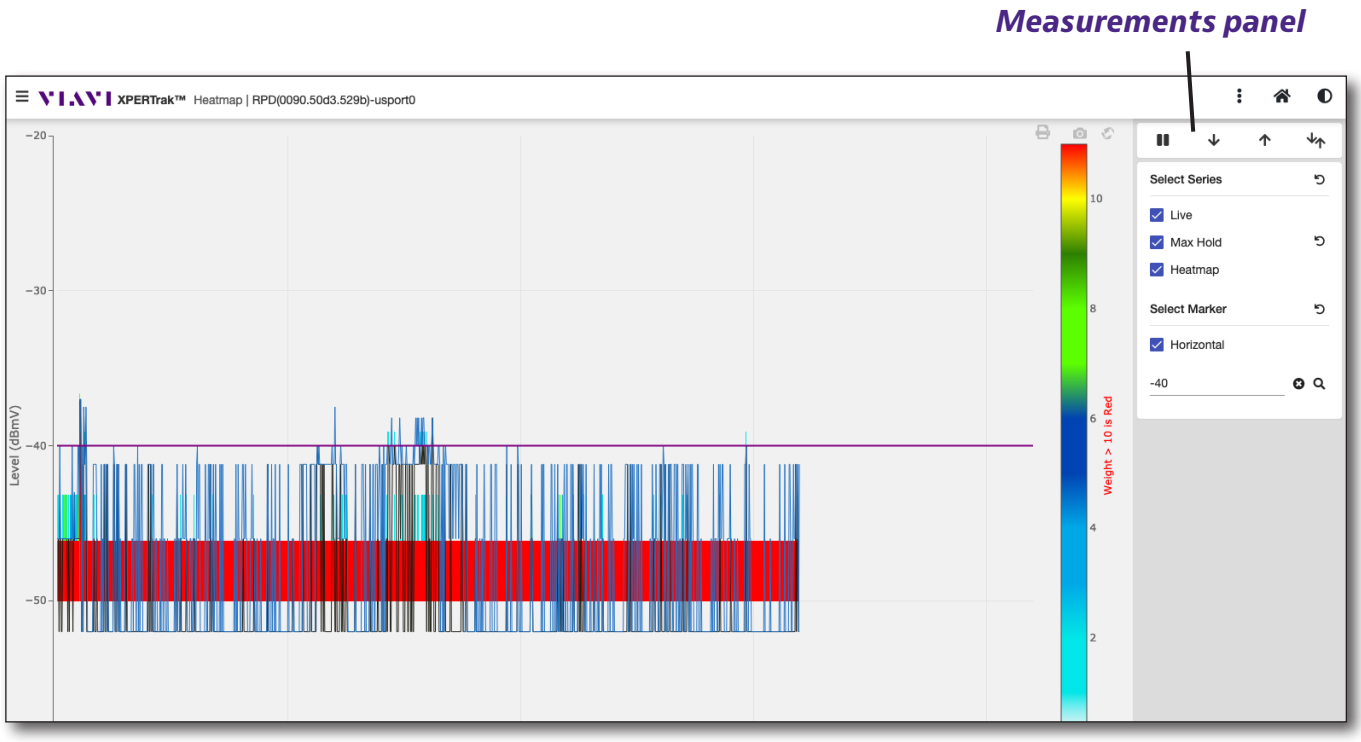
Trace colors

Blue – Maximum levels for each frequency in the monitoring plan measured during the specified time span

Green – Average levels for each frequency in the monitoring plan measured during the specified time span

Yellow – Minimum levels for each frequency in the monitoring plan measured during the specified time span

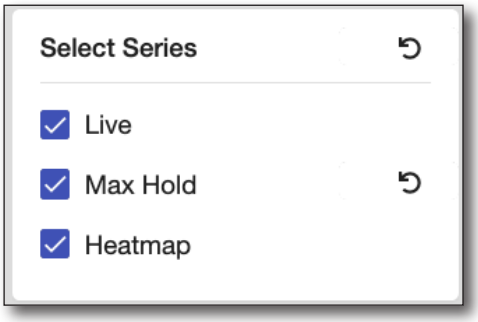
You can choose which threshold traces you want to view using the control panel.



Select Series

From this area of the control panel, you can choose which of the following Heatmap traces to display.

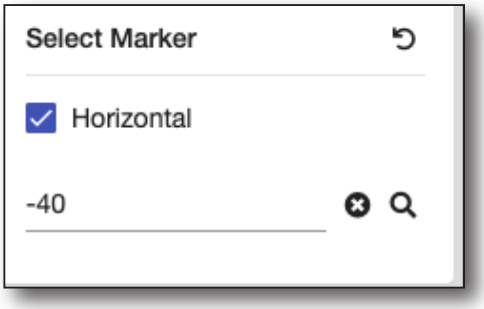
- Live (Black)
- Max Hold (Blue)
- Heatmap (Red)



Select Marker

From this area of the control panel, you can choose to display the marker.

- Horizontal (Purple)



12

Reports

This chapter covers how to generate reports in the XPERTrak System, including the following:

- "Reports" on page 180
- "Creating a Report" on page 181
- "Creating a Pre-configured Report" on page 183

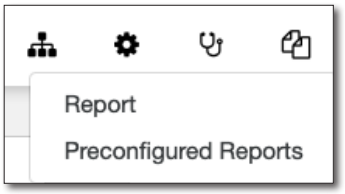
Reports

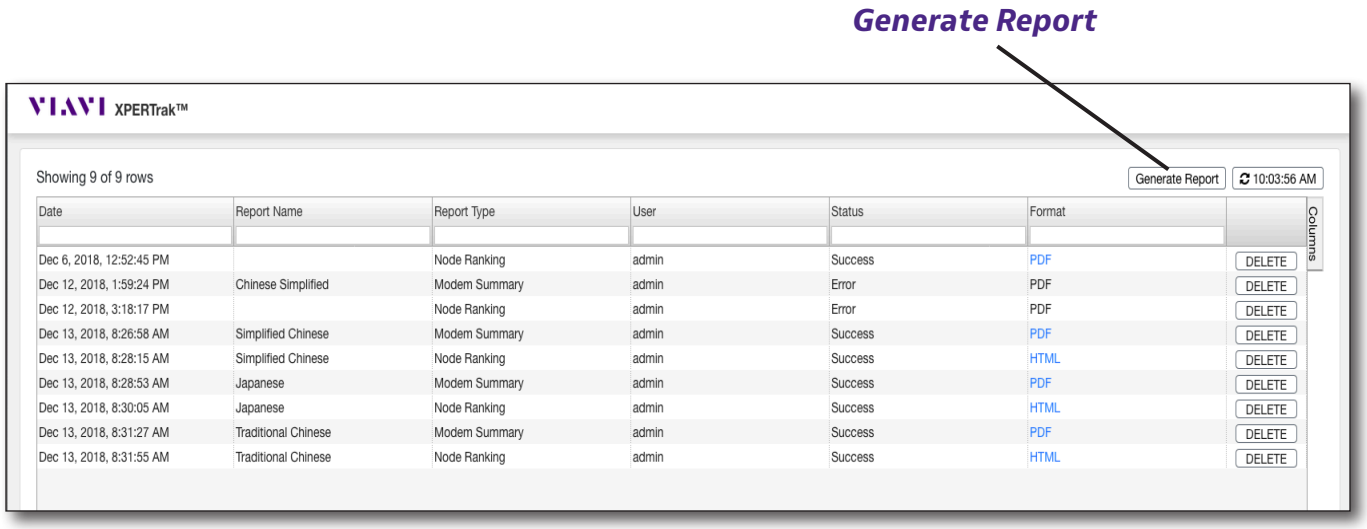
This feature is used by system administrators to run reports in XPERTrak for detailed analysis, including node ranking and modem summaries. Only admins have access to the feature.

On the top right side of the screen, select the **Reports** menu from the Main toolbar, as shown below.

From the dropdown, choose *Reports*. The **Reports Dashboard** will open in a new tab, as shown below.

You can also run pre-configured reports from here. For more information, see *"Creating a Pre-configured Report" on page 183*.

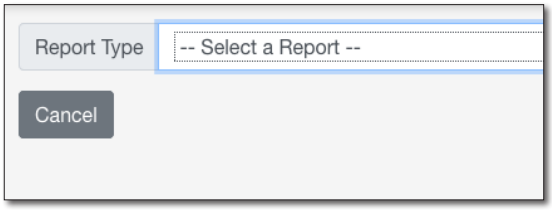




Reports Dashboard

Creating a Report

Select the **Generate Report** button on the right side to bring up the Report Type section, as shown here.



From here, you can choose from the following:

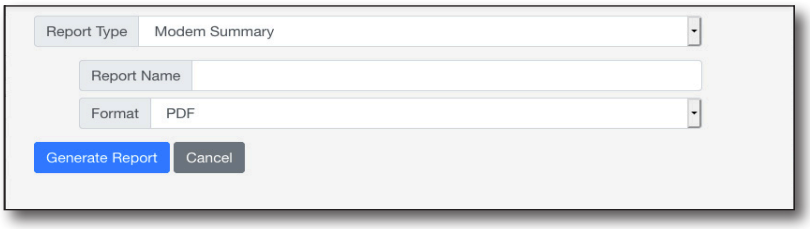
- Modem Summary
- Node Ranking

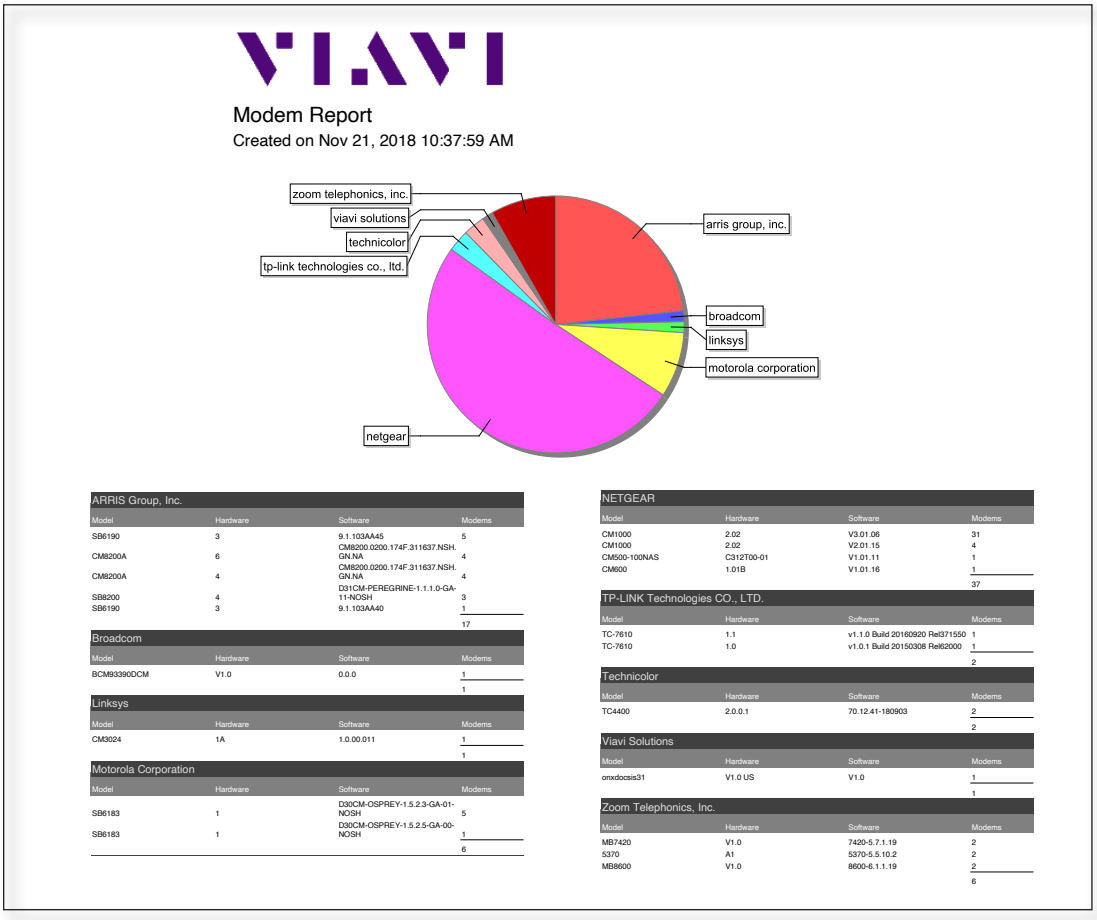
This feature allows you to set up various report settings. When done, click the **Generate Report** button at the bottom of the screen to run the report. When finished, you will be asked where you want to save the PDF or HTML file.

Modem Summary

Select *Modem Summary* for a detailed breakdown of all the modems in your network.

You can name the report and choose to export as PDF or HTML.



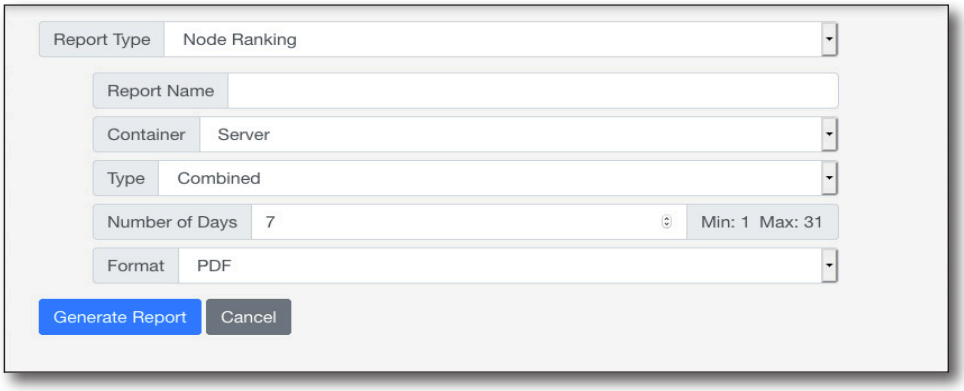


Modem Summary Report

Node Ranking

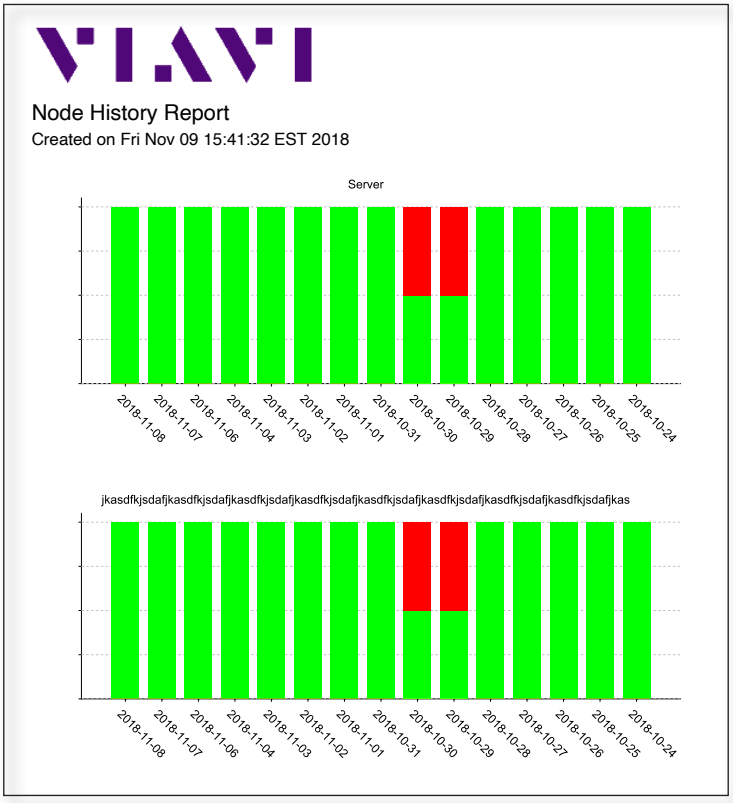
Select *Node Ranking* for a detailed breakdown of the node health ranking in your network.

You can name the report and choose to export as PDF or HTML.



You can choose from the following options:

- **Container** – Any server, node, port, or child in your network.
- **Type** – The type of report: *Combined, QoE, MACTrak,* or *Spectrum.*
- **Number of days** – The time period you want the report to cover (up to 365 days). This is limited by the settings in **Administration>Settings>Performance Data Purge** for each setting (HCU spectrum, MACTrak, Downstream, Node rank, Pre-Eq, and QoE).
- **Format** – PDF or HTML



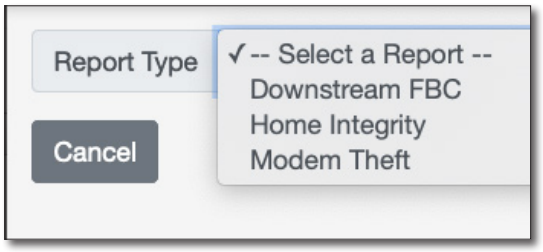
Node Ranking Report

Creating a Pre-configured Report

Like standard reports, select the **Generate Report** button on the right side to bring up the Report Type section, as shown here.

From here, you can choose from the following:

- Downstream FBC
- Home Integrity
- Modem Theft

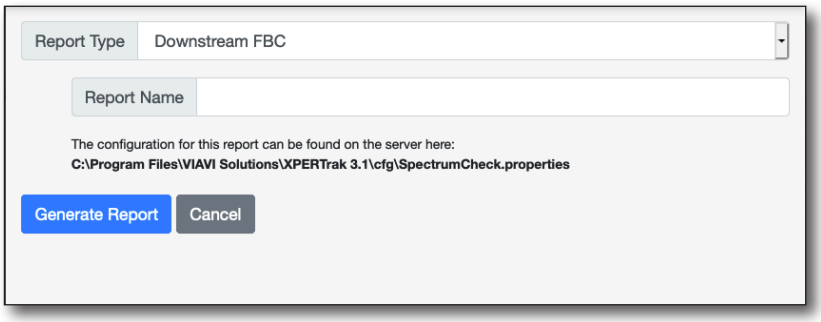


This feature allows you to set up various report settings. When done, click the **Generate Report** button at the bottom of the screen to run the report. When finished, you will be asked where you want to save the CSV file.

Downstream FBC

Select *Downstream FBC* for a detailed breakdown of the downstream FBC data in your network.

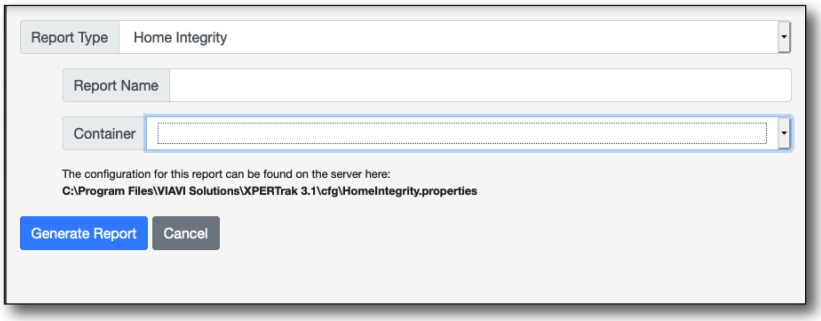
You can name the report and customize the details using the location shown here.



Home Integrity

Select *Home Integrity* for a detailed breakdown of the home integrity data in your network.

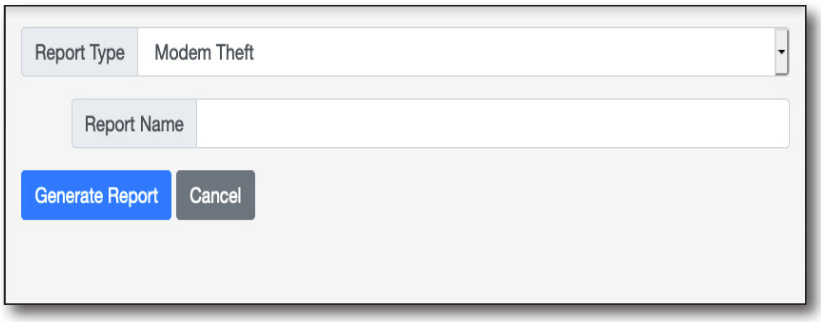
You can name the report, choose a container, and customize the details using the location shown here.



Modem Theft

Select *Modem Theft* for a detailed breakdown of the modem theft data in your network.

You can name the report and customize the details using the location shown here.



13

Configuration

This chapter covers how to configure the XPERTrak System, including the following:

- "Configuration" on page 186
- "Dashboard" on page 187
- "Alarms" on page 188
- "Headend Controll Unit (HCU)" on page 190
- "CMTS" on page 194
- "RCI" on page 200
- "OTU" on page 206
- "Containers" on page 209
- "Sites" on page 212
- "Enterprise" on page 213
- "Users" on page 218
- "Settings" on page 222
- "Information" on page 246

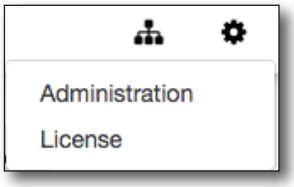
Configuration

This feature is used to access the configuration features of XPERTrak, including administration tasks, alarms, CMTS configuration, modem uploads, system settings, and license management.

This section also works based on the user who is logged in and the features that are enabled to him. If a user does not have permission for a feature, that feature is disabled but still visible.

On the top right side of the screen, select the **Configuration** menu from the Main toolbar, as shown below.

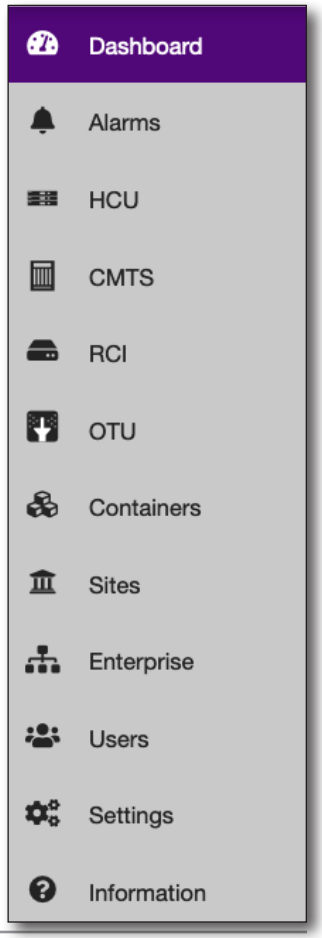
From the dropdown, choose *Administration*. The **Administration** screen will open in a new tab, showing the Dashboard.



Administration Panel

On the left side of the screen is the **Administration Panel.**

To show the name of the icons, select the **Expand/Collapse** button next to the VIAVI logo above.



- **Dashboard** – A visual summary of the equipment XPERTrak communicates with as well as alarms associated with that equipment
- **Alarms** – Management and configure of alarms
- **HCU** – Management of the HCU, RPM, Ports, and HSM
- **CMTS** – Management of the CMTS, Nodes, and Modems
- **RCI** – Management of the RCI and sweep plan
- **OTU** – Management of the OTU and Ports
- **Containers** – Management of all containers and meta tags
- **Sites** – Management of all hardware sites
- **Enterprise** – Management of regions and systems
- **Users** – Management of users, roles, and access
- **Settings** – Management of system settings
- **Information** – Basic information of the server, license, diagnostics, and triggers

Dashboard

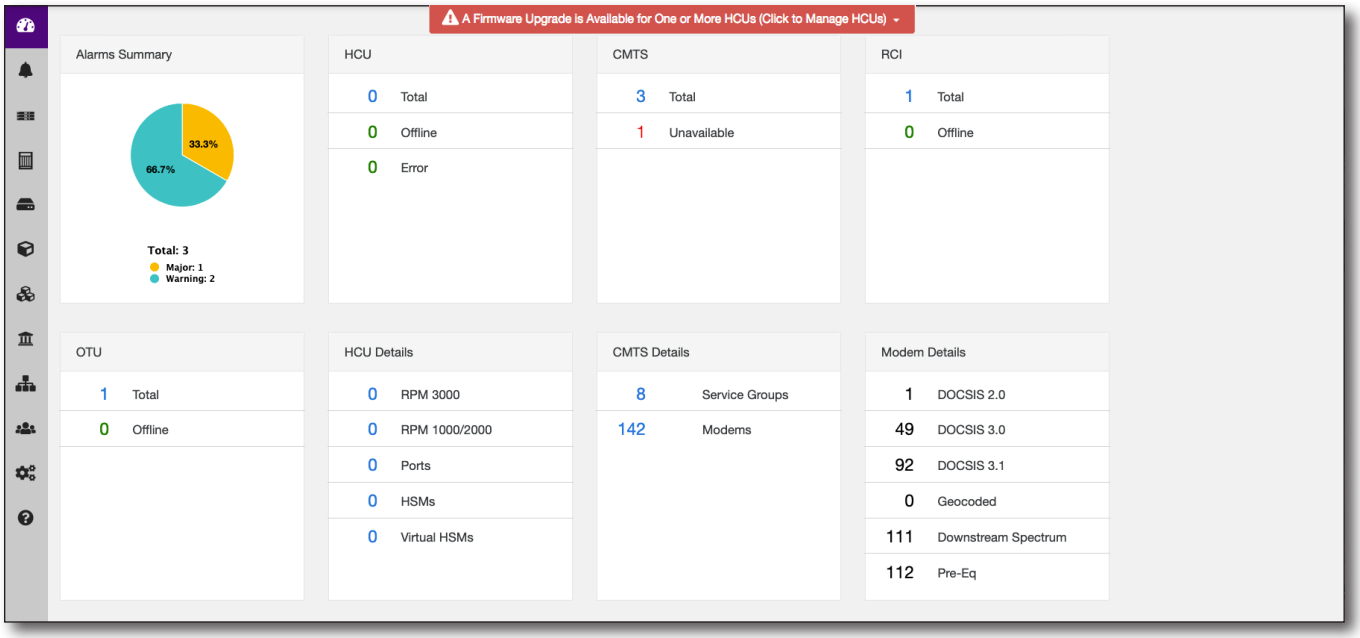
Select **Dashboard** for a summary of the alarms, and basic information of the HCUs and CMTS.

- **Alarms Summary** – A graph of the alarms in critical, major, minor, or warning. Click the graph for more detail.

  The Alarm Summary does not include spectrum monitoring, MACTrak, or PNM alarms. Only alarms for hardware performance, online/offline alerts, or communication issues are shown here.

- **HCU** – Lists HCU information, including the number of offline systems and errors. Click the numbers under each category for more information.
- **CMTS** – Lists CMTS information, including the numbers of offline systems and errors. Click the numbers under each category for more information.
- **RCI** – Lists RCI information, including the numbers of offline systems and errors. Click the numbers under each category for more information.
- **OTU** – Lists OTU information, including the numbers of offline systems and errors. Click the numbers under each category for more information.
- **HCU Details** – Lists HCU children details, including system totals for RPM 3000, RPM 1000/2000, Ports, HSMs, and virtual HSMs.
- **CMTS Details** – Lists CMTS details, including total number of nodes and modems.
- **Modem Details** – Lists modem details, including total number of DOCSIS 3.x, DOCSIS 2.x, Geocoded, and Spectrum Enabled modems.

Note: At the top of the dashboard, you may see special notifications from time to time, including new firmware or a warning that your server license is about to expire.



Admin Dashboard

Alarms

Select **Alarms** to bring up the Alarms section.

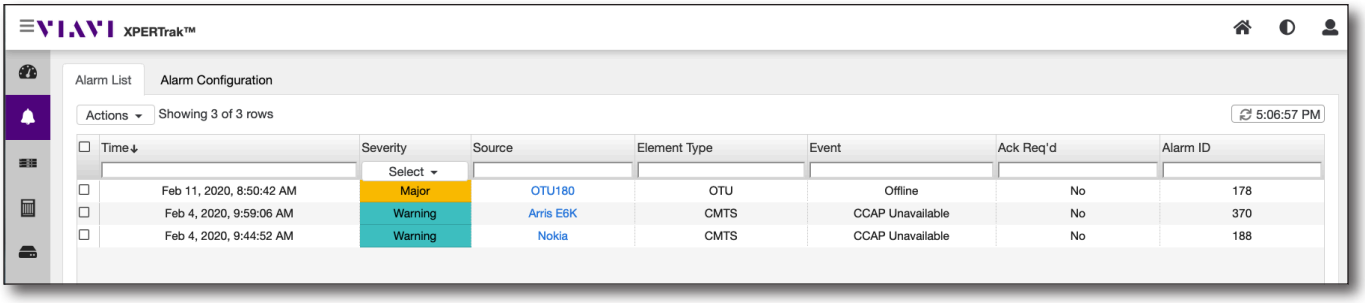
Alarm List Tab

The **Alarm List** tab will show a list of the alarms sorted by date. The user will have filter and sort capabilities.

> The Alarm List does not include spectrum monitoring, MACTrak, or PNM alarms. Only alarms for hardware performance, online/offline alerts, or communication issues are shown here.

Based on the selection, different options will be enabled in the **Actions** dropdown.

- **Export Selected** – Downloads a CSV file of the selected alarms.
- **Export All** – Downloads a CSV file of all the current alarms.
- **Clear Selected Alarms** – Clears the selected alarms.
- **Clear All Alarms** – Clears all the current alarms.

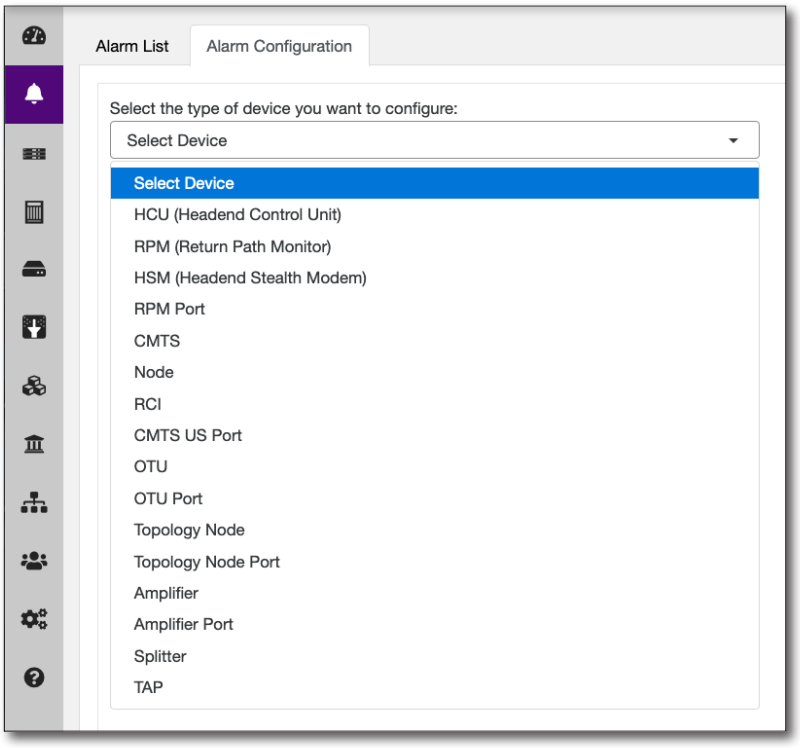


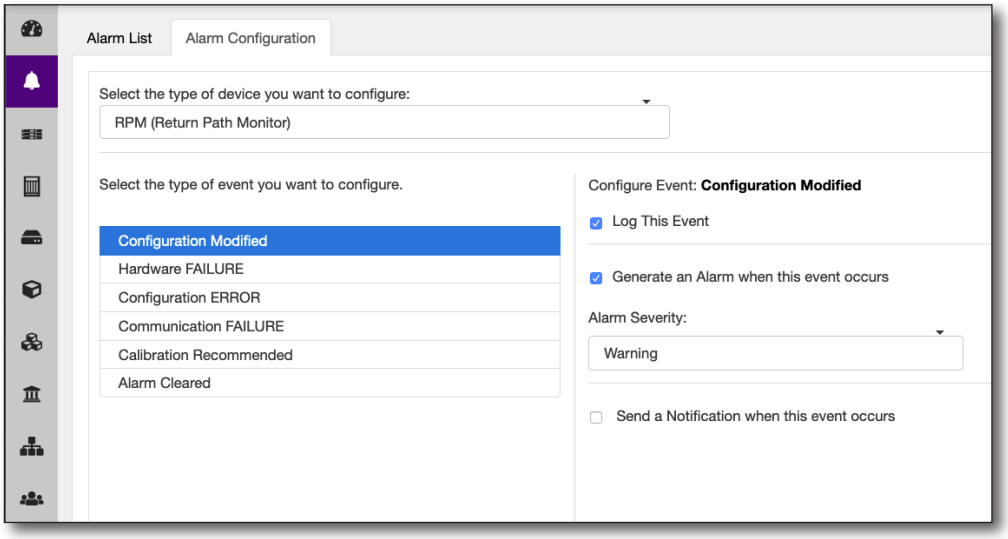
Alarm Configuration Tab

The **Alarm Configuration** tab will allow you to configure alarms based on events you select. You can choose to configure any of the following devices: HCU, RPM, HSM, Port, CMTS, Node, RCI, CMTS upstream port, OTU, OTU port, or street alarms.

Available options include:

- Log the event
- Generate an alarm when this event occurs and at what severity
- Send a notification to a user or group
- Set an alarm to automatically clear





Headend Controll Unit (HCU)

Select **HCU** to bring up the HCU section to configure the HCU and its children (e.g. all associated assets, RPM cards, HSMs, etc).

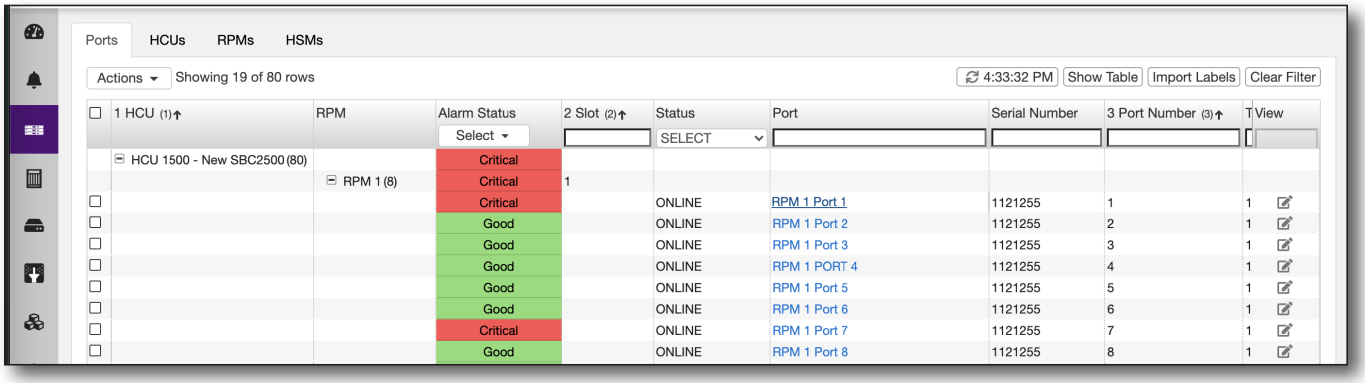
Ports Tab

The **Ports** tab will allow you to configure ports and specific options from the **Actions** dropdown. You can also use the tree view from the legacy PathTrak client.

Depending on your permissions, you can right-click a port name to launch Live Spectrum, Heatmap, QAMTrak, or Performance view. You can also click the port name to take you to the upstream analysis view.

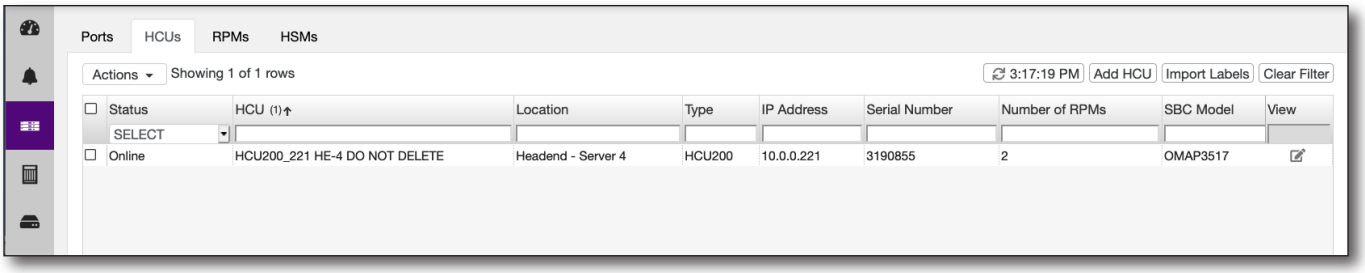
Use the **Alarm Status** column to sort by severity.

- **Add port to broadcast**
- **Remove port from broadcast**
- **View port in broadcast**
- **View MACTrak channels**
- **Repair**
- **Copy monitoring plan**
- **Import/Export Monitoring plan**
- **Paste monitoring plan**
- **View Events**
- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.
- **Show Table / Tree** – Toggles the table or tree view.
- **Import Labels** – Allows you to import custom labels from a CSV file.



HCUs Tab

The **HCUs** tab will allow you to configure the HCU and specific options.



Based on the selection, different options will be enabled in the **Actions** dropdown.

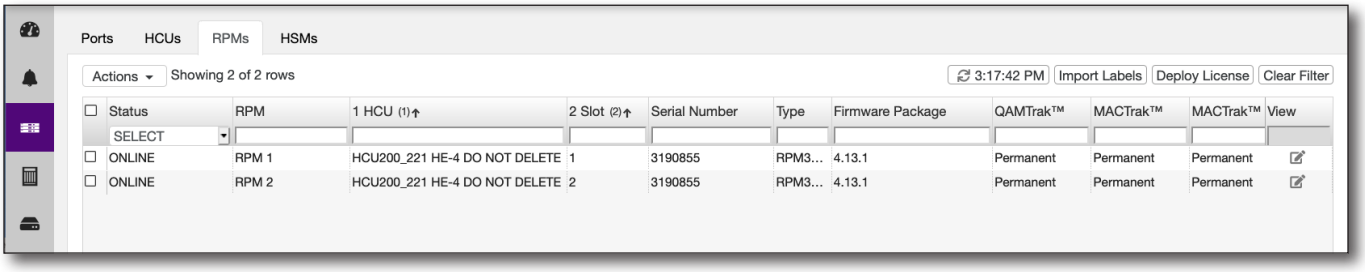
If a single selection is performed, then the following actions will be enabled:

- **Add virtual HSM** – A virtual HSM can be added to an HCU 200 which does not have an HSM in it. Any other type of HCU returns an error message. If an HSM or virtual HSM is already available, you will also get an error.
- **Test Connection** – Pings the RPC port 111 to verify the connection.
- **Sync real time clock** – Syncs the time on the HCU to match the server.
- **Reboot** – Reboots the HCU.
- **Restore** – Restores configuration data stored in the XPERTrak database to your server. This is especially useful after an HCU Clean without needing to manually reconfigure your server.
- **Repair** – Repairs the HCU database if the HCU/ RPM/ Port is in error state.
- **View Events** – Lists HCU events that you can export to a CSV file.
- **View MACTrak channels** – Lists all the MACTrak channels for the HCU.
- **Firmware Upgrade** – Lists firmware files available and has the option to check for new firmware and management.
    - **New firmware options**
    - **Delete firmware**
- **Export Selected** – Exports the selected HCUs to a CSV file.
- **Export All** – Exports the full HCU list to a CSV file.The other features that can be done without selection of the HCUs are:
- **Add HCU** – Opens a window to add an HCU.
- **Import Labels** – Allows you to import custom labels from a CSV file.

Return Path Monitoring (RPMs) Tab

The **RPMs** tab will allow you to configure RPMs and specific options from the **Actions** dropdown.

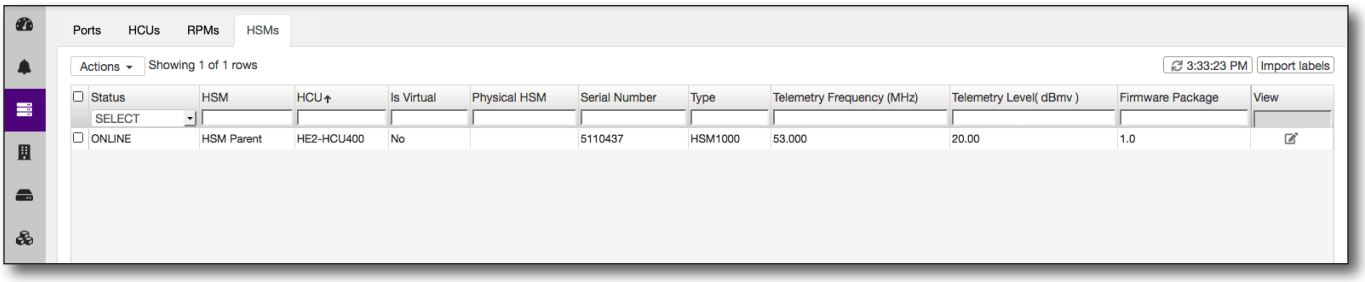
- **Repair**
- **View Events** – Open slider with the following list
- **Export Selected** – Downloads a CSV Excel file of the current list.
- **Import Labels** – This is a CSV import feature.
- **Export All HCUs** – Downloads a CSV Excel file of the current list..
- **Deploy License** – Opens a slider window to show the RPM deploy license feature.



Headend Stealth Modems (HSMs) Tab

The **HSMs** tab will allow you to configure HSMs and specific options from the **Actions** dropdown

- **Repair**
- **View Ports in Broadcast**
- **View Events**
- **Import Labels** – This is a CSV import feature. It opens a OS directory search for a CSV Excel file, then pushes it to the server. The server response back with a message which is shown in the alert box. Refresh main list after.
- **Export All** – Downloads a CSV Excel file of the current list.



CMTS

Select **CMTS** to bring up the CMTS section to configure the CMTS and its children.

CMTS Tab

The **CMTS** tab will allow you to configure the CMTS and specific options from the **Actions** dropdown.

- **Sync All**
- **Export Selected** – Downloads a CSV Excel file of the selected list.
- **Export All** – Downloads a CSV Excel file of the full list.

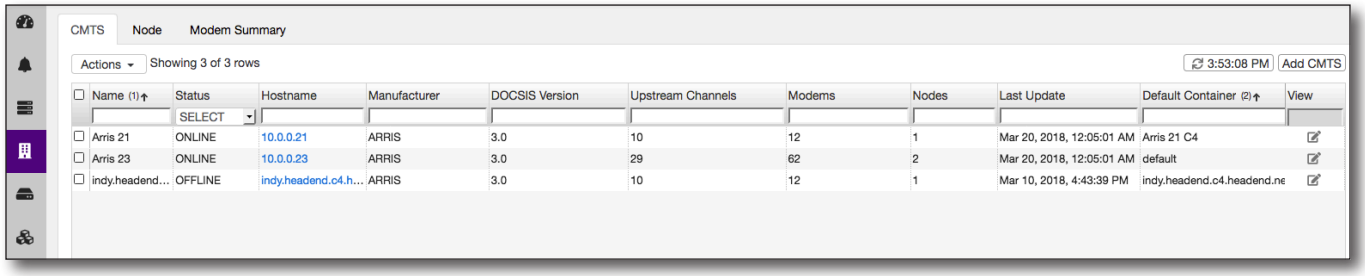
Adding a CMTS

Click the **Add CMTS** button on the right side of the screen to add a CMTS. A new widow will open to enter the hostname and name, your read and write community strings (passwords), then assign a container and site. When done, click **Save** to confirm.

To add many CMTSs at once use the **Import CMTS** button on the right side of the screen. You will be prompted for a CSV file which must contain the CMTS name, host name, default container, site, SNMP read community string, and SNMP write commmunity string.

Deleting a CMTS

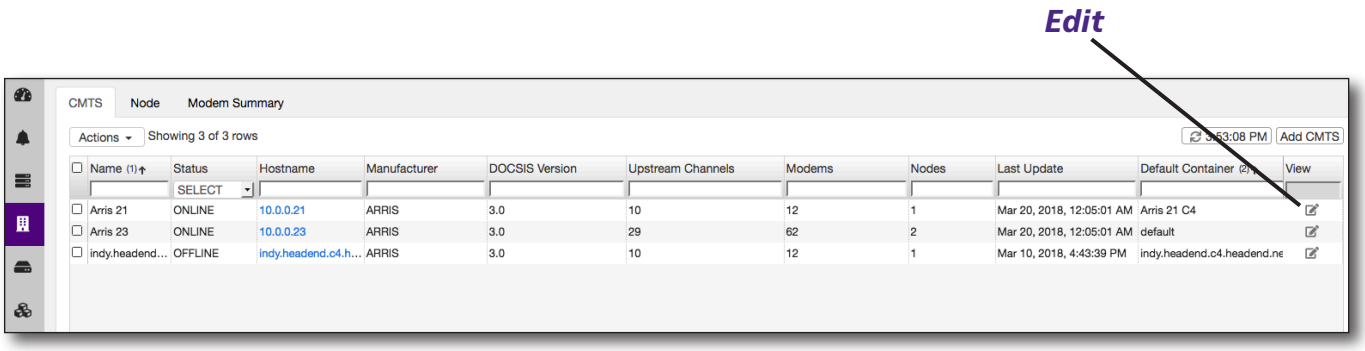
The *Delete* action from the **Actions** dropdown will delete a CMTS. Deleting a CMTS will delete all data permanently from the database for modems and nodes associated with the CMTS. A pop-up message will be displayed asking you to confirm before deleting.

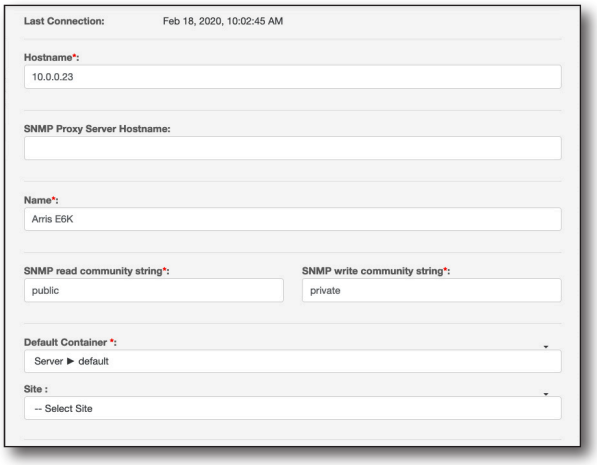


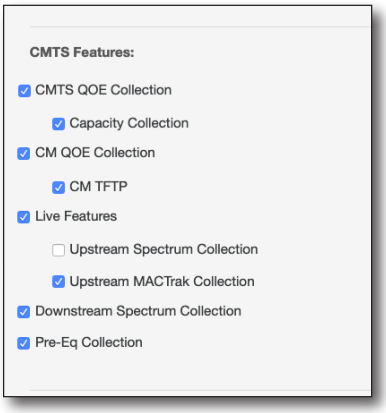
You can also click the hostname IP to bring up the CMTS diagnostic screen. Here you can select **Get**, **Get Next**, **Get Bulk**, and **Set** commands for OIDs, view SNMP results, and access a list of OIDs.

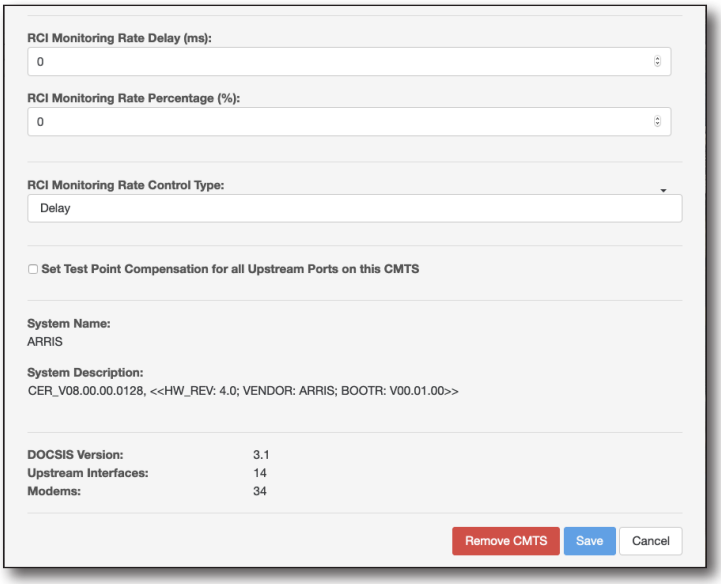
Editing a CMTS

Select the **Edit** button to the right of the CMTS name. Edit the information as needed, and click the **Save** button.







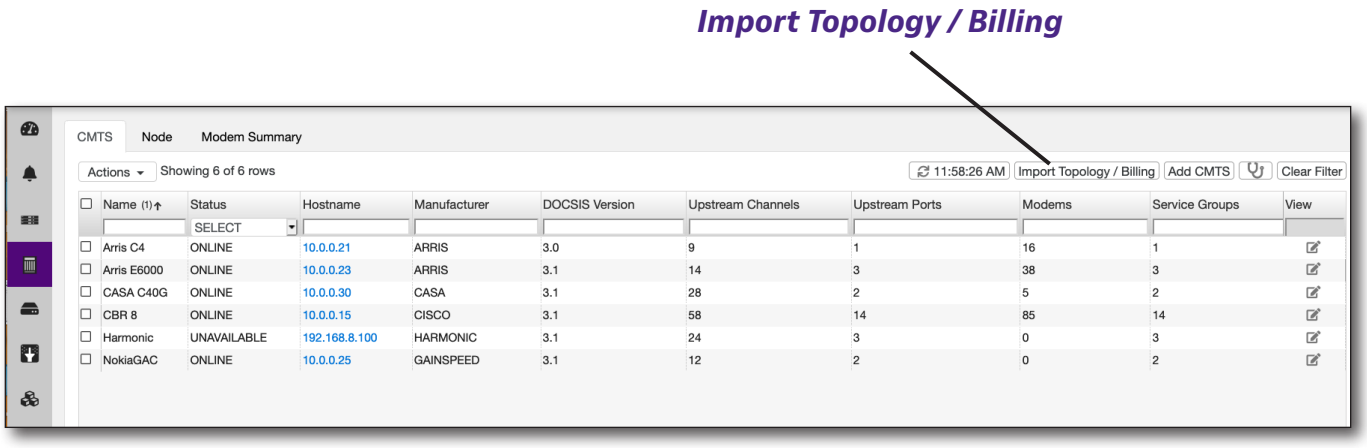


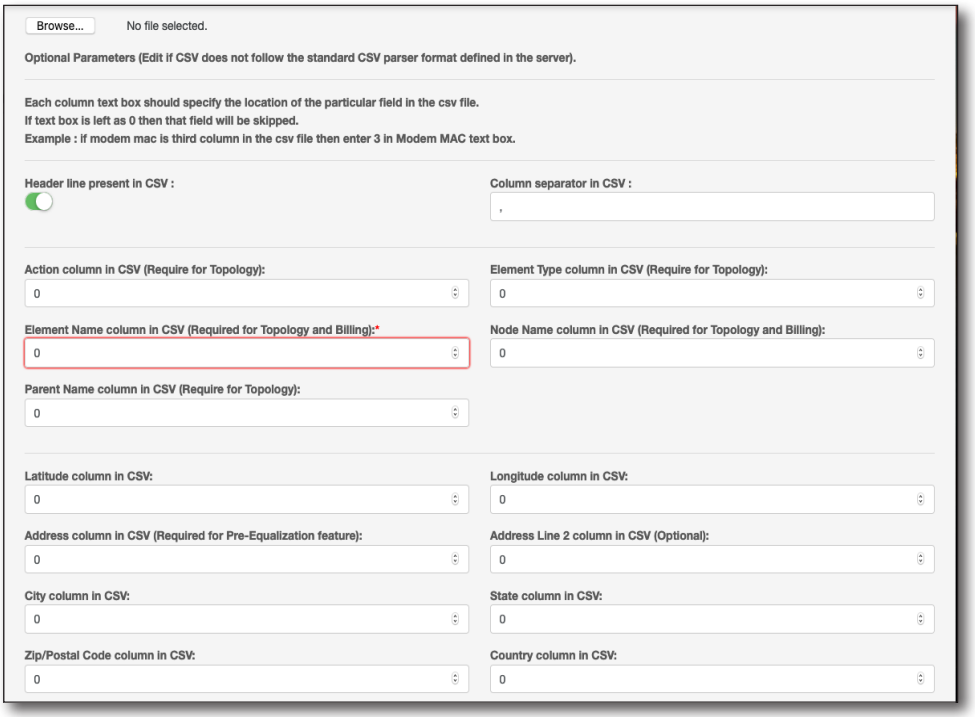
Importing Topology / Billing

Click the **Import Topology / Billing** button on the right side of the screen to import modems. A new widow will open so you can assign the fields to match the columns in your CSV Excel file. Click **Browse** at the top and find the file you want to upload.

When done, click **Upload CSV File** to upload the file.

For more information, see *"Topology and Billing Import" on page 271*.





Node Tab

The **Node** tab will allow you to configure nodes and specific options from the **Actions** dropdown. You can also see the license packages assigned to each node here.

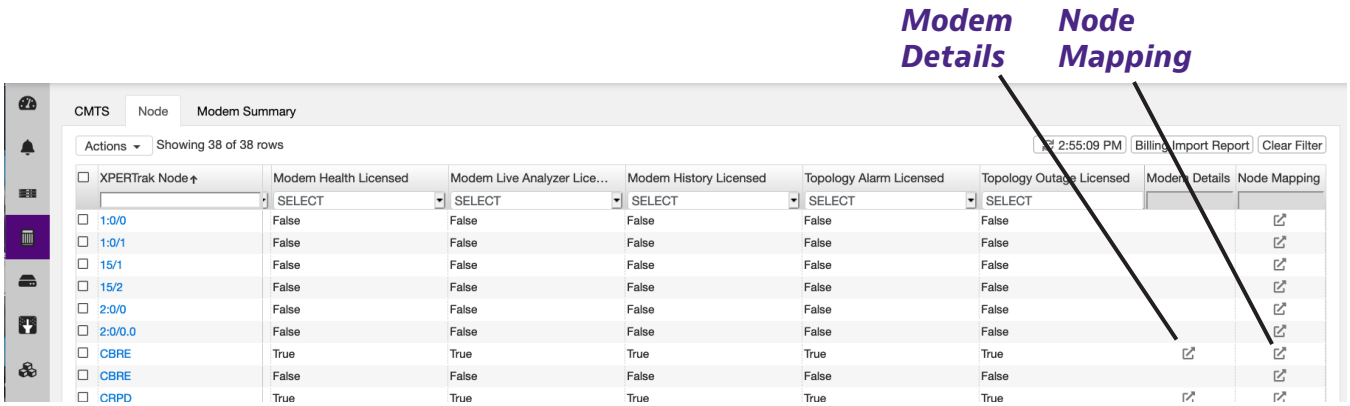
- **View Events**
- **Export Selected** – Downloads a CSV Excel file of the selected list.
- **Export All** – Downloads a CSV Excel file of the full list.

Deleting Nodes

The *Delete Node* action from the **Actions** dropdown will delete a node. A pop-up message will be displayed asking you to confirm before deleting.

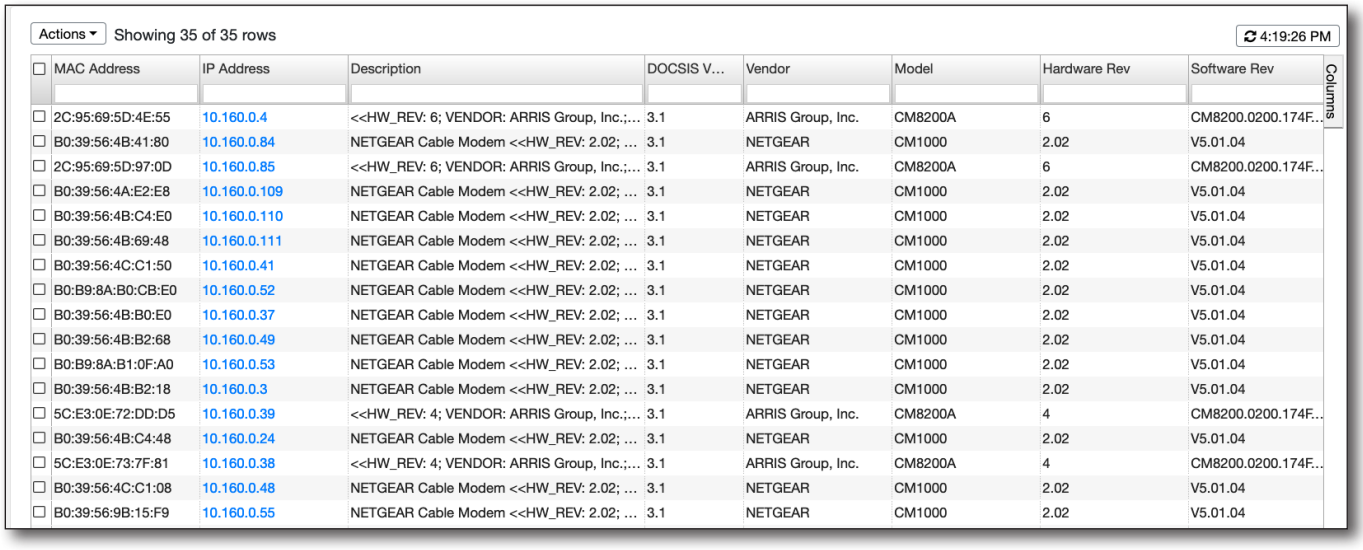
Editing Nodes

The *Edit Node* action from the **Actions** dropdown to edit a node. Edit the information as needed, and click the **Save** button.



Modem Details

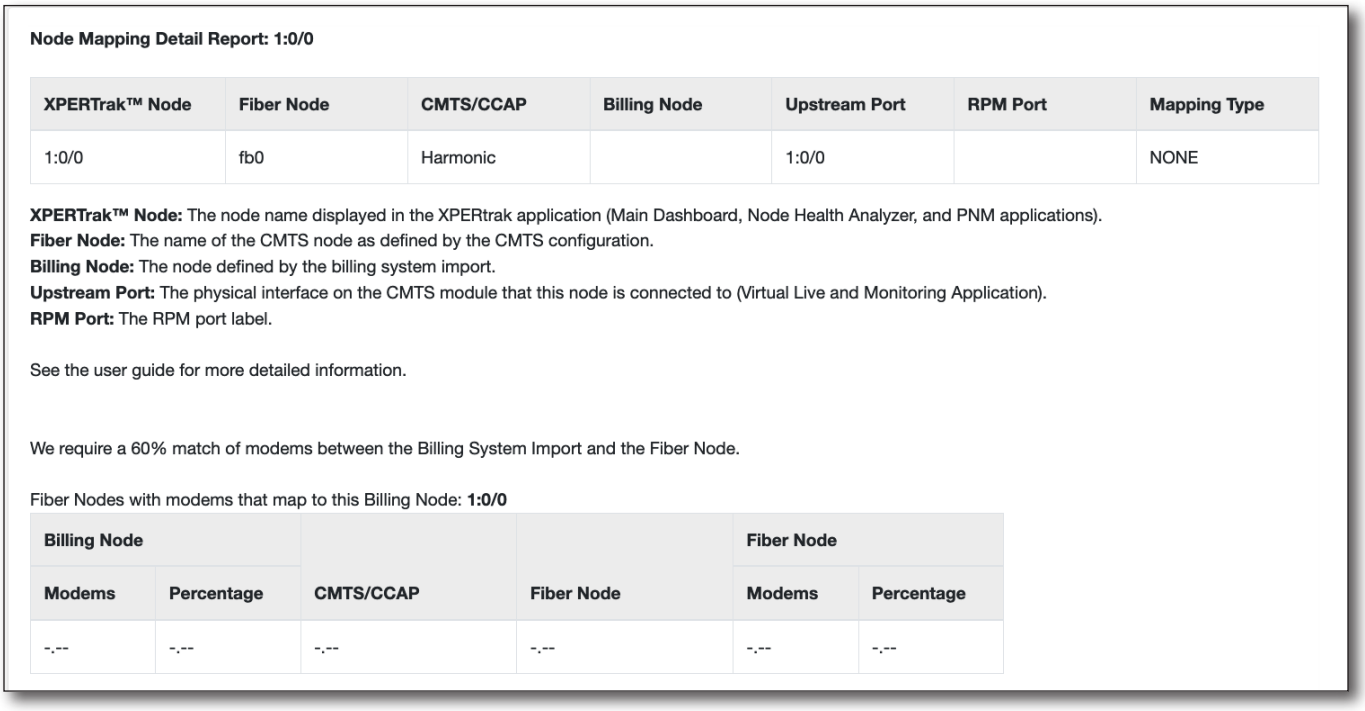
Select the **Modem Details** button to the right of the node name to bring up detailed information on all the modems in that node.



Node Mapping

Select the **Node Mapping** button to the right of the node name to bring up a node mapping detailed report.

This report details the internal mapping that XPERTrak does between RPM port name (if present), the node name from the billing system import data, and the MAC domain service group in the CMTS that the modems are a part of. This is extremely helpful in tracking down mismatches between XPERTrak node name/RPM port name/MD-SG.



Node Mapping Detail Report: 1:0/0

XPERTrak™ Node	Fiber Node	CMTS/CCAP	Billing Node	Upstream Port	RPM Port	Mapping Type
1:0/0	fb0	Harmonic		1:0/0		NONE

XPERTrak™ Node: The node name displayed in the XPERtrak application (Main Dashboard, Node Health Analyzer, and PNM applications).
Fiber Node: The name of the CMTS node as defined by the CMTS configuration.
Billing Node: The node defined by the billing system import.
Upstream Port: The physical interface on the CMTS module that this node is connected to (Virtual Live and Monitoring Application).
RPM Port: The RPM port label.

See the user guide for more detailed information.

We require a 60% match of modems between the Billing System Import and the Fiber Node.

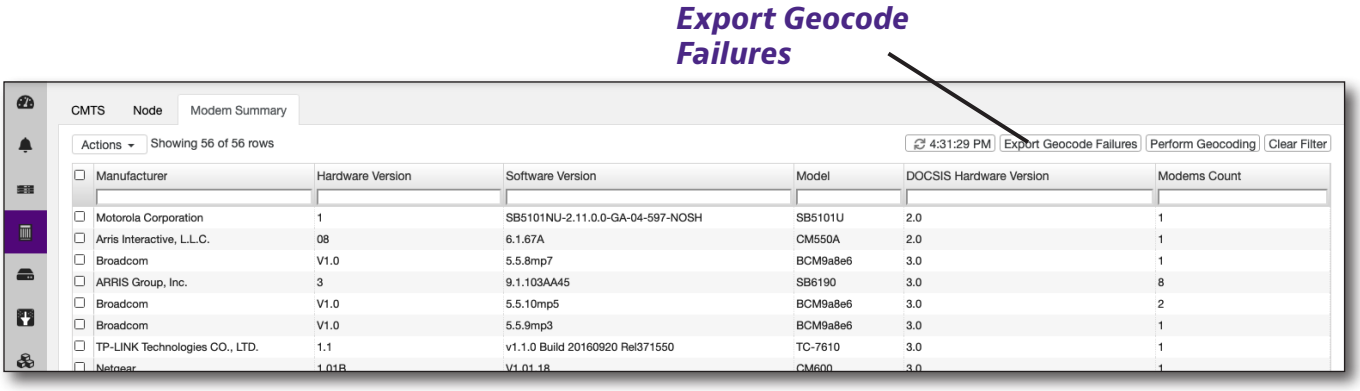
Fiber Nodes with modems that map to this Billing Node: **1:0/0**

Billing Node				Fiber Node	
Modems	Percentage	CMTS/CCAP	Fiber Node	Modems	Percentage
-.--	-.--	-.--	-.--	-.--	-.--

Modem Summary Tab

The **Modem Summary** tab will allow you to configure modems and specific options from the **Actions** dropdown.

- **Export Geocode Failure**
- **Perform Geocoding**



RCI

Select **RCI** to bring up the RCI section to configure remote PHY controllers and sweep plans.

RCI Tab

The **RCI** tab will allow you to configure remote PHY controllers from the **Actions** dropdown.

- **Reboot**
- **Firmware Upgrade**
- **Test Connection**
- **View Events**
- **Show Performance for All**
- **Export Log Message**
- **Sync Selected**
- **Sync All**
- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.

Adding an RCI

Click the **Add RCI** button on the right side of the screen to add an RCI. A new widow will open to enter the hostname, RCI service port, upgrade service port, name, option to use HTTPS, RCI sweep count, RCI spectrum count, RCI API count and associated CMTS. When done, click **Save** to confirm.

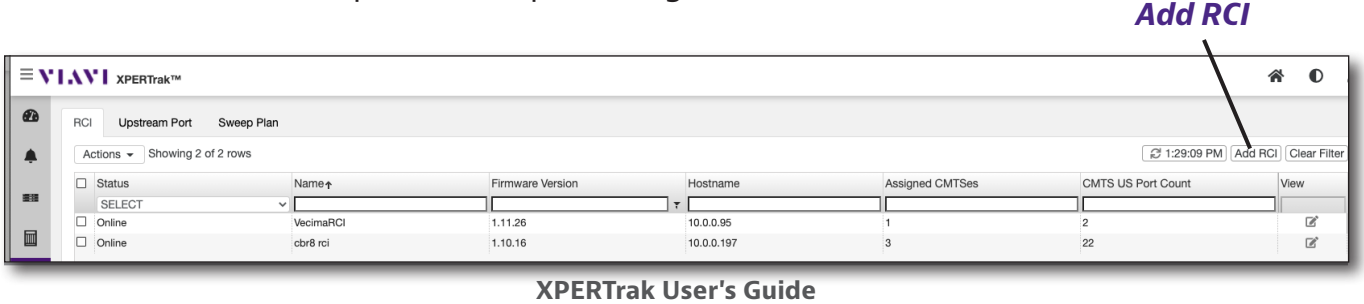
We recommend using the **Test Connection** button to ensure communication with the RCI can be established as part of the setup process.

RCI sweep count – The maximum number of ports which can be enabled for sweep at the same time on the RCI.

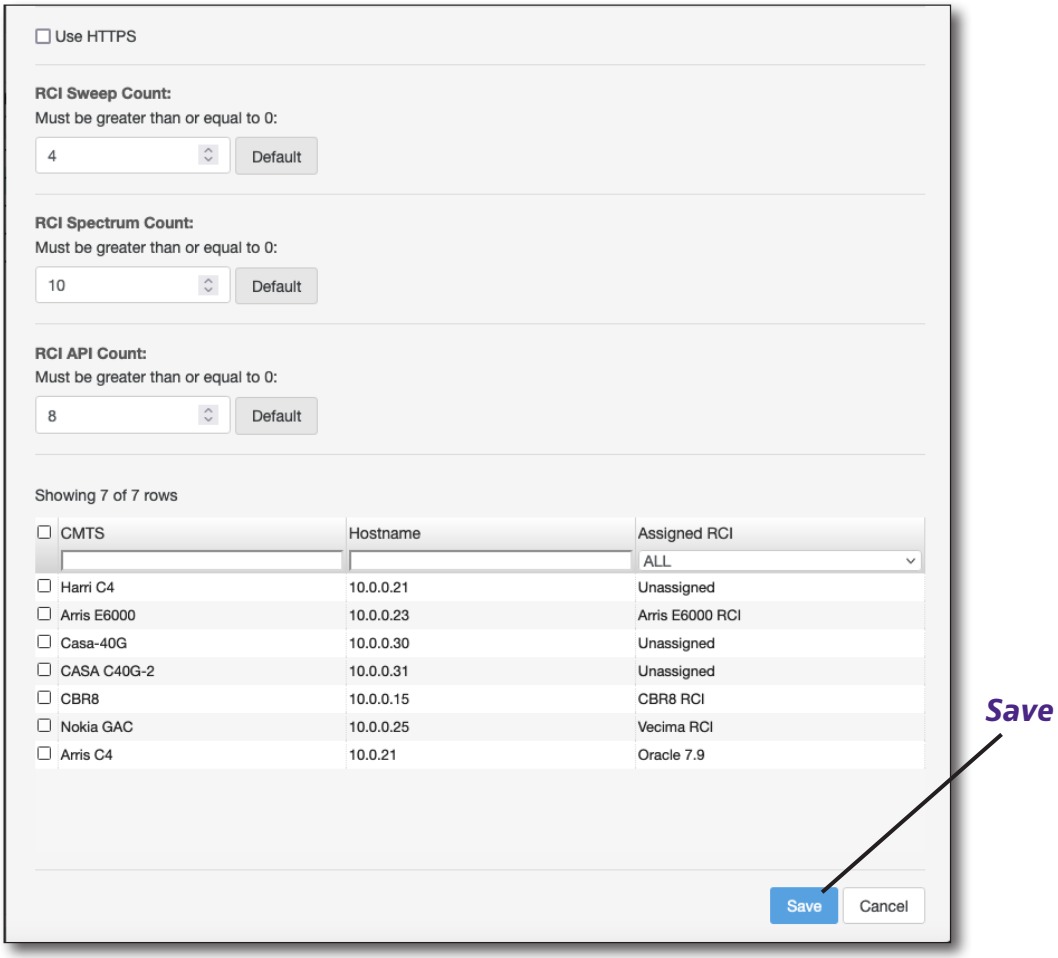
RCI Spectrum count – The maximum number of spectrum which can be requested interactively.

RCI API count – The maxmimum number of spectrum which can be requested via API at one time.

The 3 above limits are designed to allow the operator to predict the maximum load the RCI would ever experience for procseeing and I/O.



Hostname*:
RCI Service Port*:
Upgrade Service Port*:
Test Connection
Firmware Version:
Name*:
Test Connection

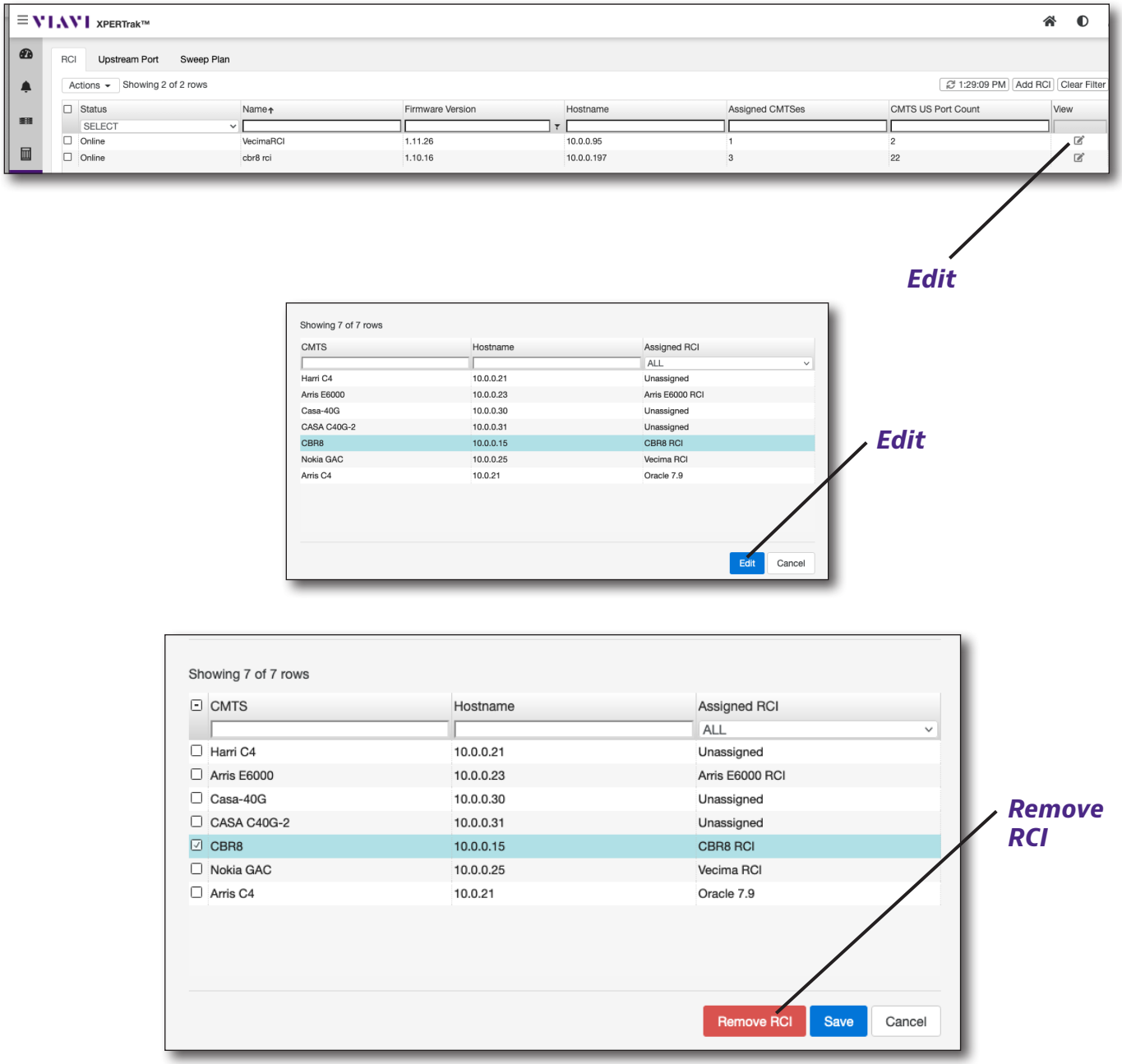

Use HTTPS
RCI Sweep Count:
Must be greater than or equal to 0:
4
Default
RCI Spectrum Count:
Must be greater than or equal to 0:
10
Default
RCI API Count:
Must be greater than or equal to 0:
8
Default
Showing 7 of 7 rows
CMTS
Hostname
Assigned RCI
ALL
Harri C4 10.0.0.21 Unassigned
Arris E6000 10.0.0.23 Arris E6000 RCI
Casa-40G 10.0.0.30 Unassigned
CASA C40G-2 10.0.0.31 Unassigned
CBR8 10.0.0.15 CBR8 RCI
Nokia GAC 10.0.0.25 Vecima RCI
Arris C4 10.0.21 Oracle 7.9
Save
Cancel
Save

Deleting an RCI

Deleting an RCI is done through the Edit menu. Select the **Edit** button to the right of the RCI name. On the Edit screen, select **Edit** again, and then **Remove RCI**. A pop-up message will be displayed asking you to confirm before deleting.

Editing an RCI

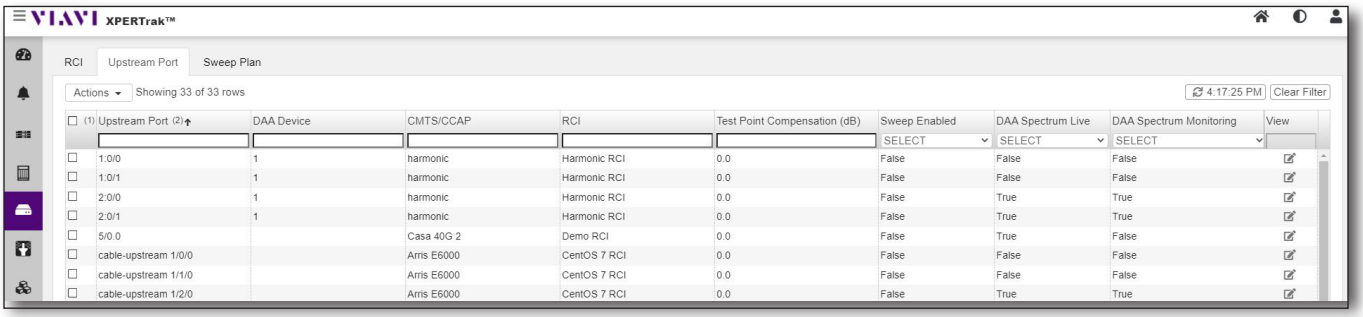
Select the **Edit** button to the right of the RCI name. Edit the information as needed, and click the **Save** button.



Upstream Port Tab

The **Upstream Port Tab** tab will allow you to configure your CMTS upstream port from the **Actions** dropdown.

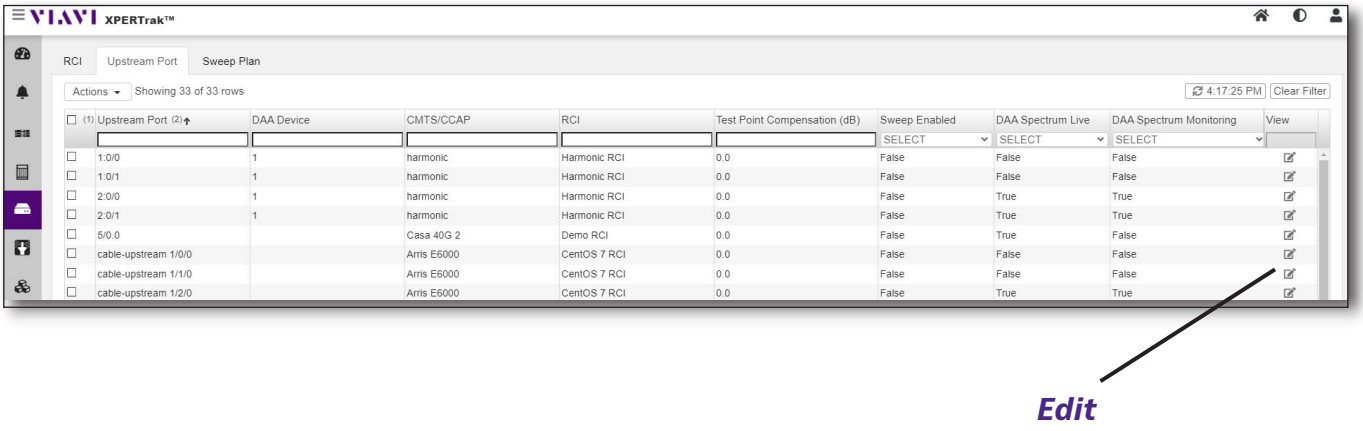
- **Copy Monitoring Plan**
- **Import/Export Monitoring Plan**
- **Paste Monitoring Plan**
- **View Events**
- **Enable / Disable Sweep**
- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.

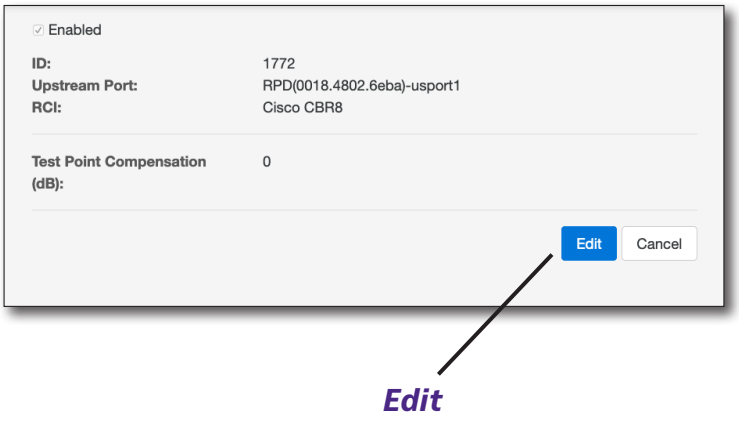


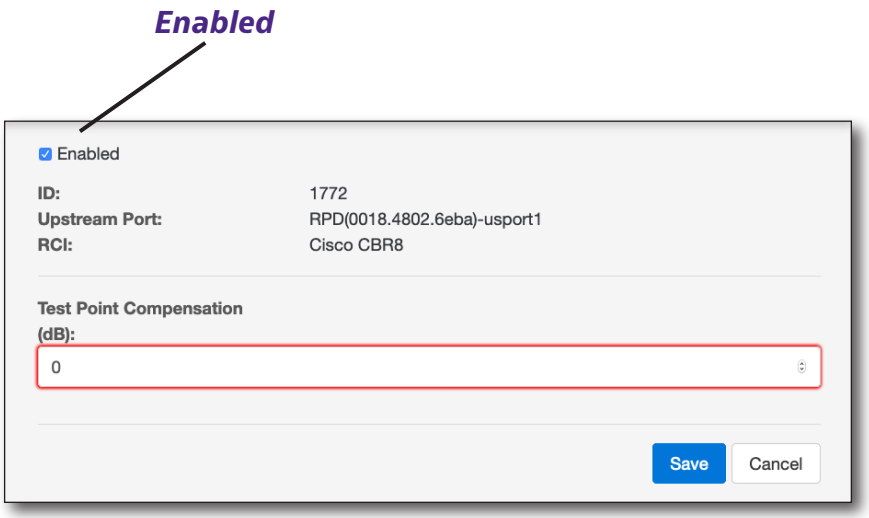
Editing an RCI Upstream Port

Select the **Edit** button to the right of the port name, then select **Edit** in the port info screen. Edit the information as needed, and click the **Save** button.

Here you can disable a node from using a DAA monitoring license. Deselect **Enabled** when there are no modems assigned to a port.



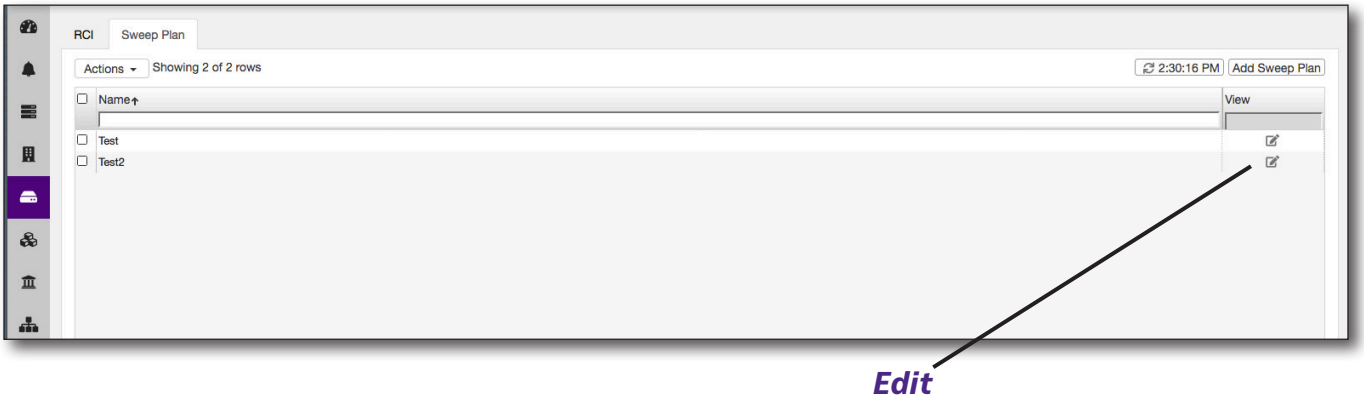




Sweep Plan Tab

The **Sweep Plan** tab will allow you to configure RCI sweep plans from the **Actions** dropdown

- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.
- **Delete Selected**

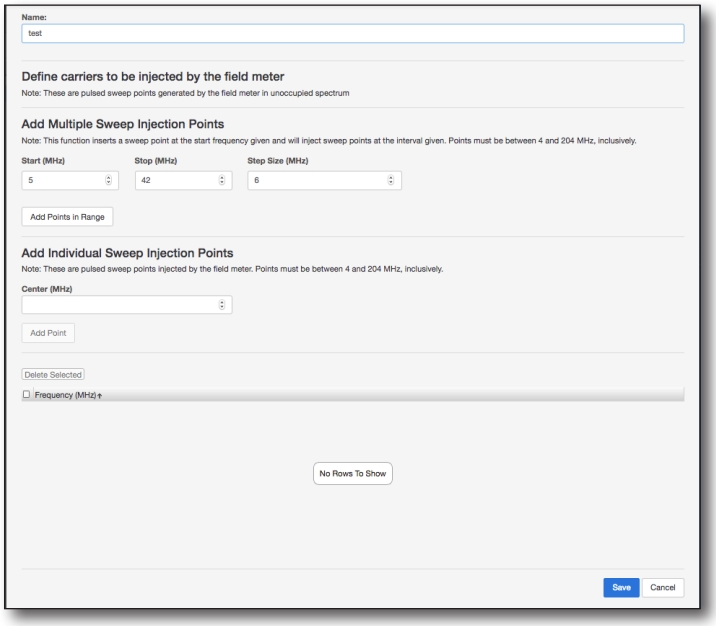


Adding Sweep Plans

Click the **Add Sweep Plan** button on the right side of the screen to add a sweep plan.

A new widow will open to enter the name and add the sweep injection points.

You can add individual or multiple in a range. When done, click **Save** to confirm.



Deleting Sweep Plans

The **Delete** action from the **Actions** dropdown will delete a sweep plan. A pop-up message will be displayed asking you to confirm before deleting.

Editing Sweep Plans

Select the **Edit** button to the right of the sweep plan name. Edit the information as needed, and click the **Save** button.

OTU

Select **OTU** to bring up the OTU section to configure smart OTUs (Optical Test Units) and OTU ports.

OTU Tab

The **OTU** tab will allow you to configure smart OTUs from the **Actions** dropdown.

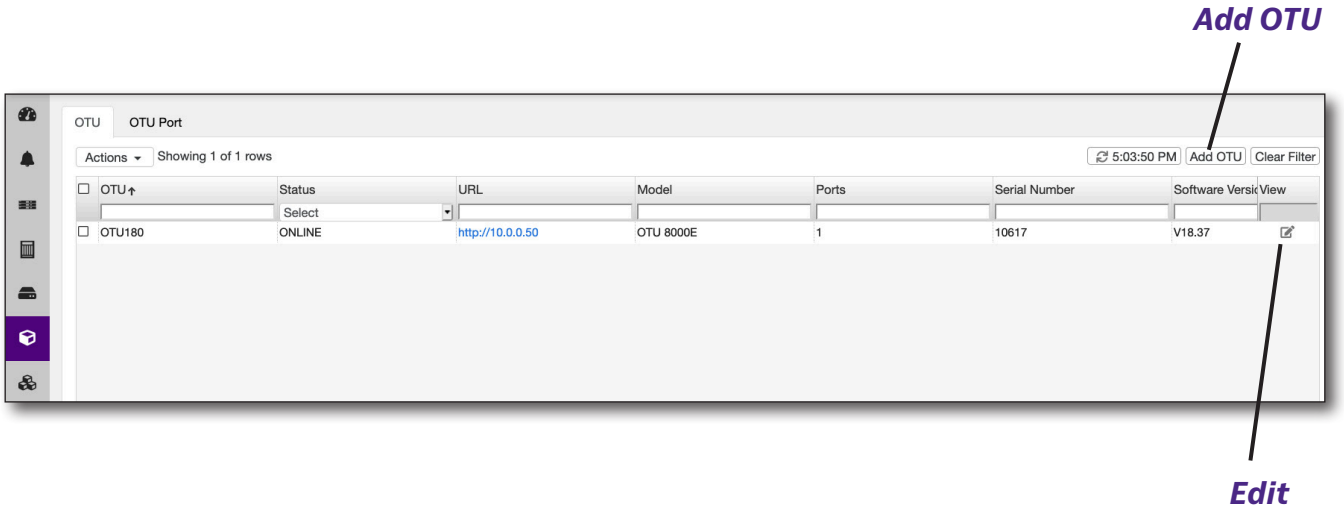
- **Sync All**
- **Sync Selected**
- **Test Connection**
- **Sync System Clocks**
- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.

Adding an OTU

Click the **Add OTU** button on the right side of the screen to add an OTU. A new widow will open to enter the OTU and location and password. You can also test the connection. When done, click **Save** to confirm.

Editing an OTU

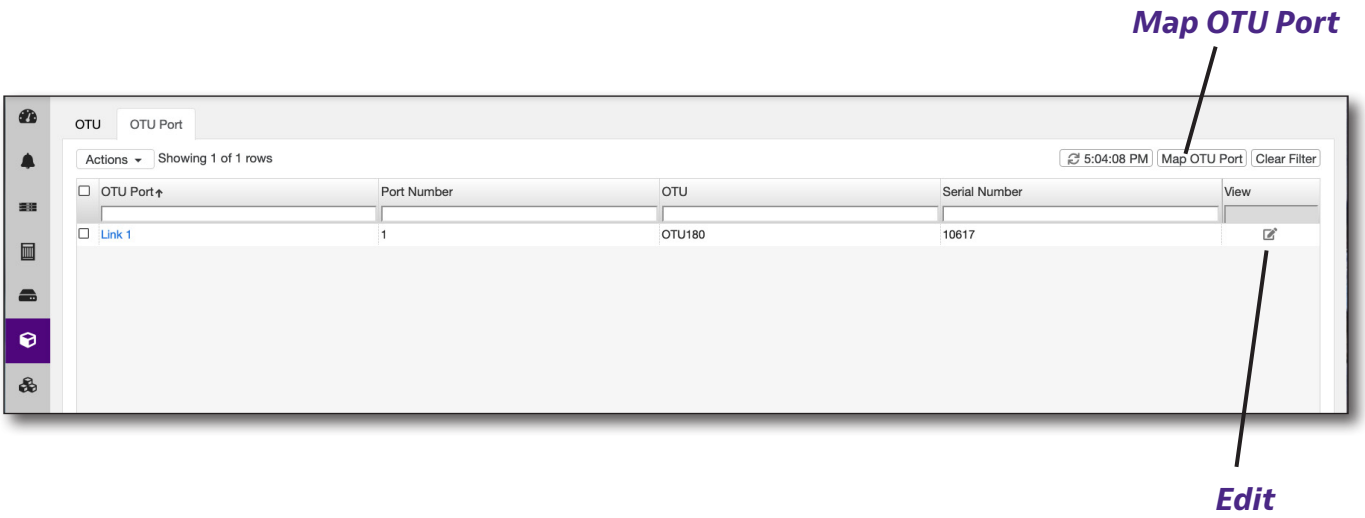
Select the **Edit** button to the right of the OTU name. Edit the information as needed, and click the **Save** button.



OTU Port Tab

The **OTU Tab** tab will allow you to configure your OTU ports from the **Actions** dropdown.

- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.



Mapping OTU Ports

Click the **Map OTU Port** button on the right side of the screen to map the OTU ports. The Associate Ports to Nodes widow will open.

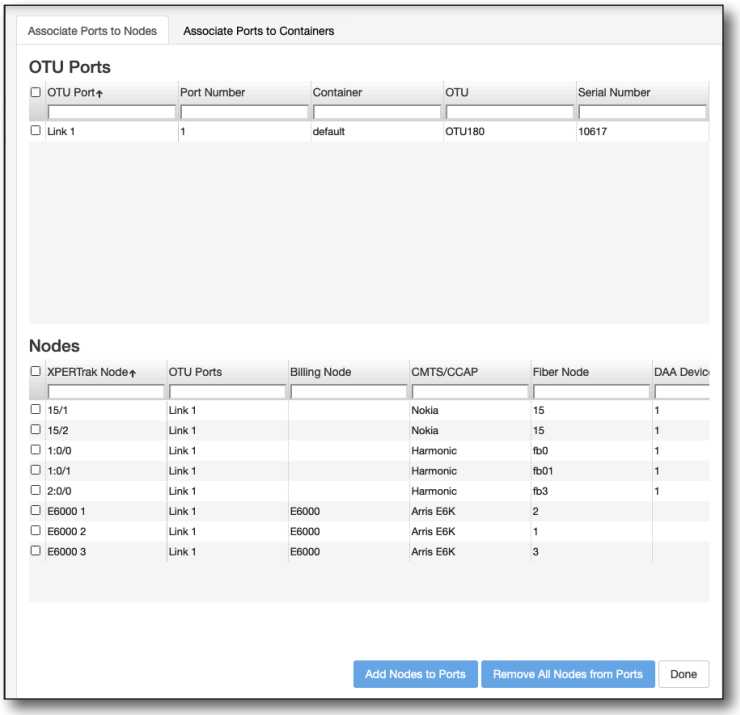
Associating Nodes to Ports

Choose which node(s) you want to associate to the OTU ports. When done, click **Add Nodes to Ports** to confirm.

Removing Nodes from Ports

Choose which node(s) you want to remove. When done, click **Remove All Nodes from Ports**.

A pop-up message is displayed asking you to confirm before removing.

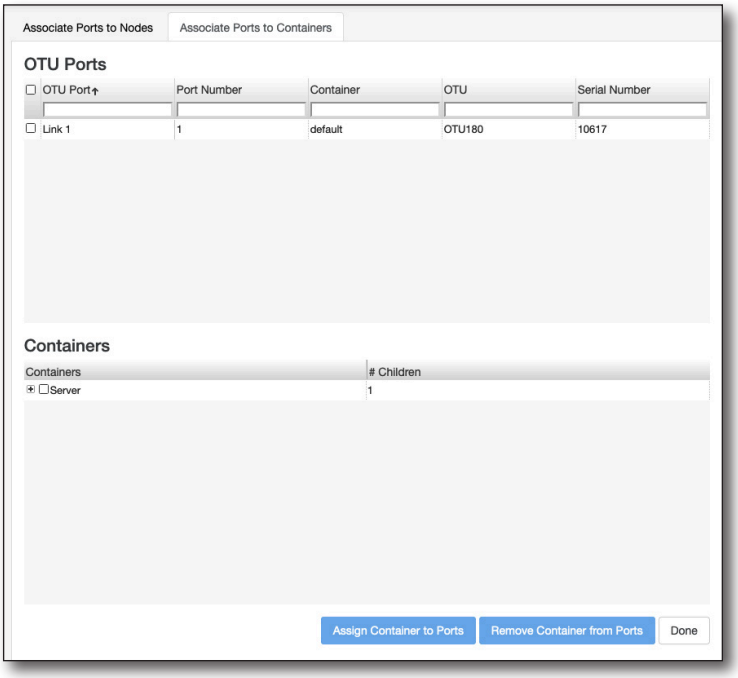


Associating Ports to Containers

Choose which OTU port(s) you want to associate to a container.

This is very useful when managing multiple containers that may contain several nodes each.

When done, click **Assign Container to Ports** to confirm.



Removing Containers from Ports

Choose which containers you want to remove. When done, click **Remove Container from Ports**.

A pop-up message is displayed asking you to confirm before removing.

NOTE:

To make management easier later, you may want to use containers whenever possible. When you add a new node, XPERTrak will associate the corresponding OTU port used by that container group.

Editing an OTU port

From the OTU port tab, select the **Edit** button to the right of the OTU port name. Edit the information as needed, and click the **Save** button.

Containers

Select **Containers** to bring up the Containers section.

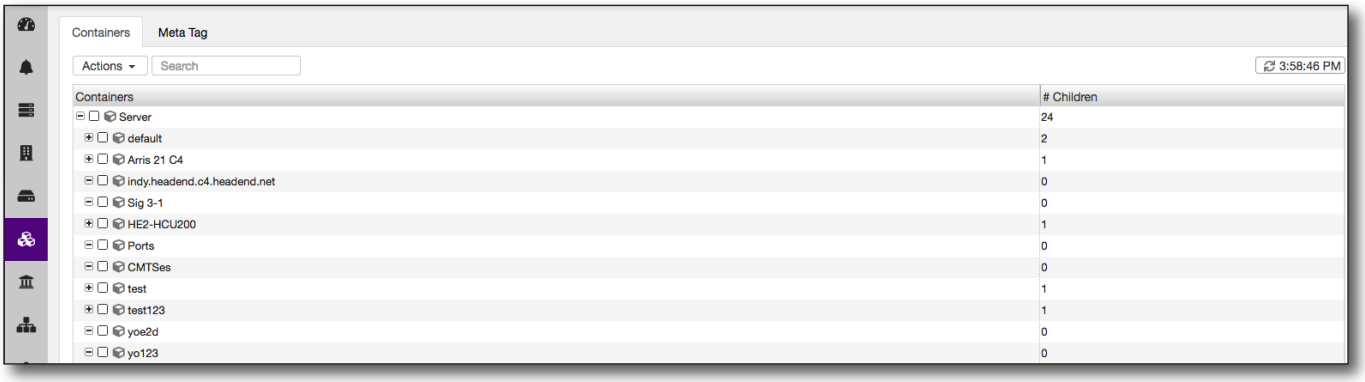
The Containers section represents the hierarchy of the element which is used for finding the physical location of the element and for generating dashboards for upper management. For example, it could represent the country, city, hub of a node.

Containers Tab

The **Containers** tab will give a table summary of the containers and how many children are in each container. The two columns are Containers and Children Count.

Each container will have a plus/minus icon besides it for expanding and collapsing to show the containers children, if the container contains children. As containers are expanded and collapsed, the Children Count rows also adjust to show the correct Children Count for the corresponding Container row. The Children Count columns will always be blank for Elements since they cannot contain children.

The first row at the top will always be the “Server” container.



Based on the selection and Child type, different options will be enabled in the **Actions** dropdown.

- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.
- **Delete Selected**

Edit

The *Edit* action from the **Actions** dropdown will open a window with the following fields to edit: Name, Meta Tag and Address. When done, click **Save** to confirm.

Move

The *Move* action from the **Actions** dropdown will open a window to choose where to save the container. When done, click **Save** to confirm.

When selecting a container to be moved, if the container contains elements, the elements will be moved along with the container.

If all children elements or containers are moved from a container and it no longer has any children, then the Children Type for that container should be changed to "undefined".

Add Container

The *Add Container* action from the **Actions** dropdown will open a window with the following fields to enter for the new container: Name, Meta Tag, and Address. You can add a meta tag to the container, as well. When done, click **Save** to confirm.

Add Nodes

The *Add Nodes* action from the **Actions** dropdown will open a window to choose the nodes to add to the container. When done, click **Save** to confirm.

Delete

The *Delete Container* action from the **Actions** dropdown will delete a container if the Children Type is "undefined," meaning the container has no children. A pop-up message will be displayed asking you to confirm before deleting.

Meta Tag Tab

The **Meta Tag** tab will allow you to configure meta tags and specific options from the **Actions** dropdown.

- **Export Selected** – Downloads a CSV Excel file of the selected list.
- **Export All** – Downloads a CSV Excel file of the full list.

Adding a Meta Tag

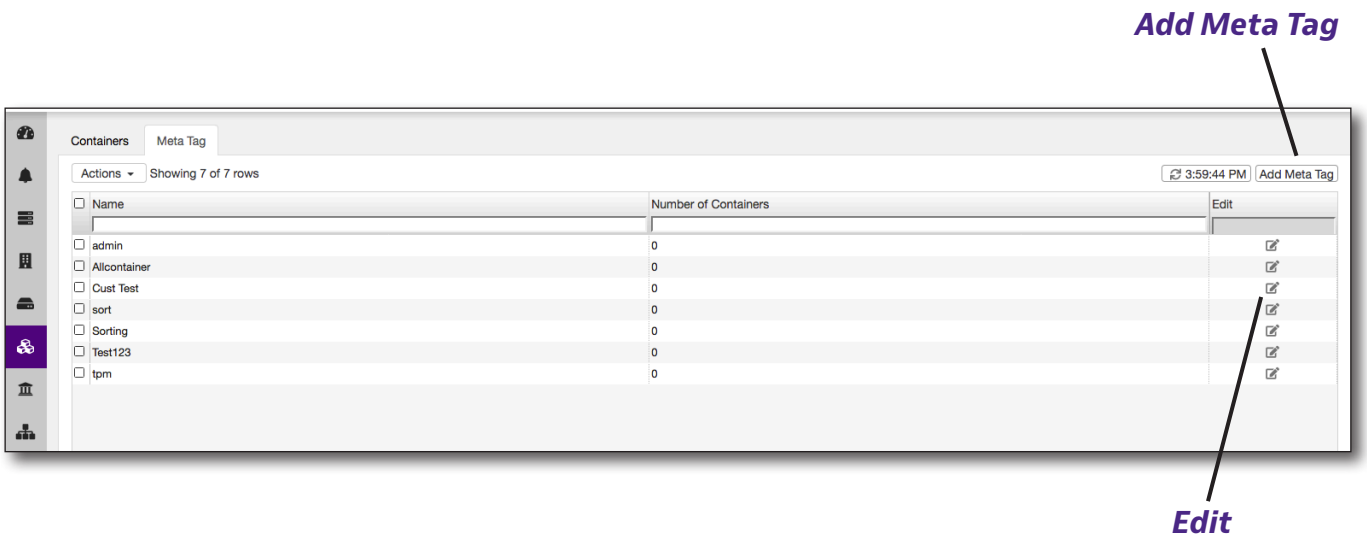
Click the **Add Meta Tag** button on the right side of the screen to add an meta tag. A new widow will open to enter the tag. When done, click **Save** to confirm.

Edit

The **Edit** action from the **Actions** dropdown will open a window in order to edit the name. When done, click **Save** to confirm.

Delete

The **Delete** action from the **Actions** dropdown will delete a meta tag. A pop-up message will be displayed asking you to confirm before deleting.



Sites

Select **Sites** to bring up the Sites section.

This feature allows you to set up physical locations of the headend sites and assign hardware to them.

Sites Tab

The **Sites** tab will allow you to configure sites and specific options from the **Actions** dropdown.

Adding Sites

Click the **Add Site** button on the right side of the screen to add a site. A new widow will come up, showing the **General** and **Hardware** tabs.

General

Here you can set up a new site. Enter the name and site address.

Hardware

Assign hardware by selecting the checkboxes for the hardware you want to associate to this site.

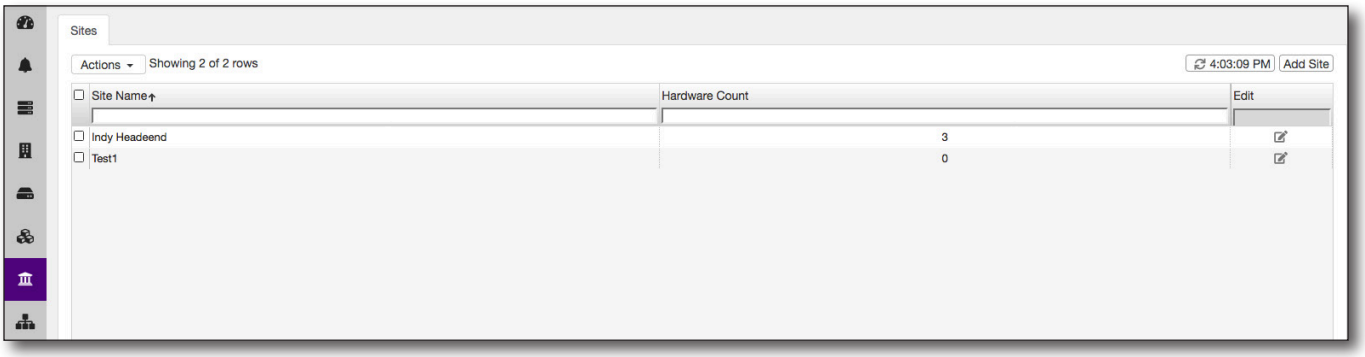
Editing Sites

Select the edit button to the right of the site name. Edit the information as needed, and click the **Save** button.

Deleting Sites

Select the checkbox next to the site(s) you want to delete. Click the **Action** dropdown, and select *Delete Selected*. A confirmation screen asks you to confirm. Click **Yes.**

All hardware must be removed from the site before it can be deleted.



Enterprise

Select **Enterprise** to bring up the Enterprise section.

The Enterprise section allows you to manage configurations for the regions and systems inside the enterprise.

Regions Tab

The Regions tab will allow you to configure regions and specific options from the **Actions** dropdown.

Adding Regions

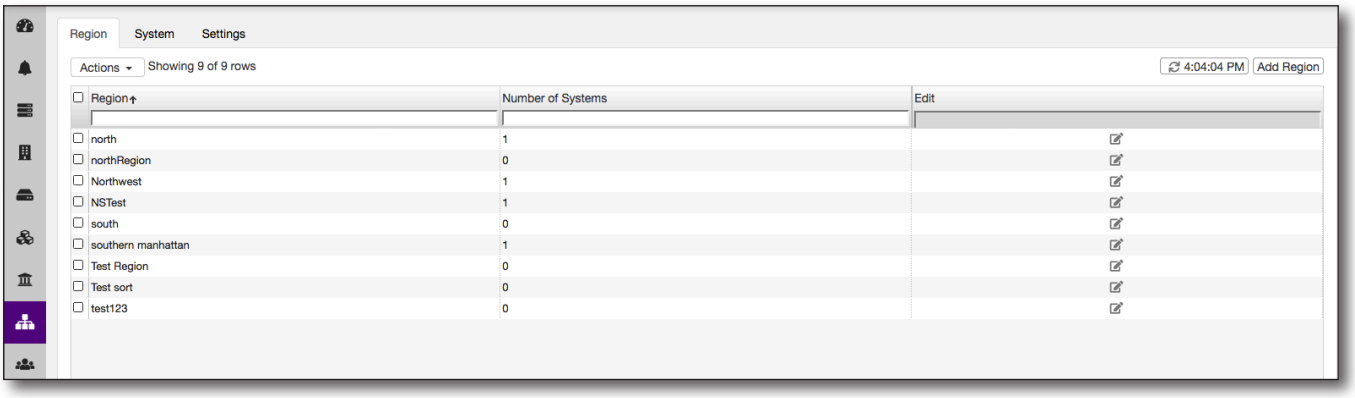
Click the **Add Region** button on the right side of the screen to add a region. A new widow will open to name the region. When done, click **Save** to confirm.

Editing Regions

Select the edit button to the right of the region name. Edit the information as needed, and click the **Save** button.

Deleting Regions

Select the checkbox next to the regions(s) you want to delete. Click the **Action** dropdown, and select *Delete Selected*. A confirmation screen asks you to confirm. Click **Yes.**



System Tab

The **Systems** tab allows selection of multiple XPERTrak servers for which a consolidated view of PathTrak hardware is desired.

Adding Systems

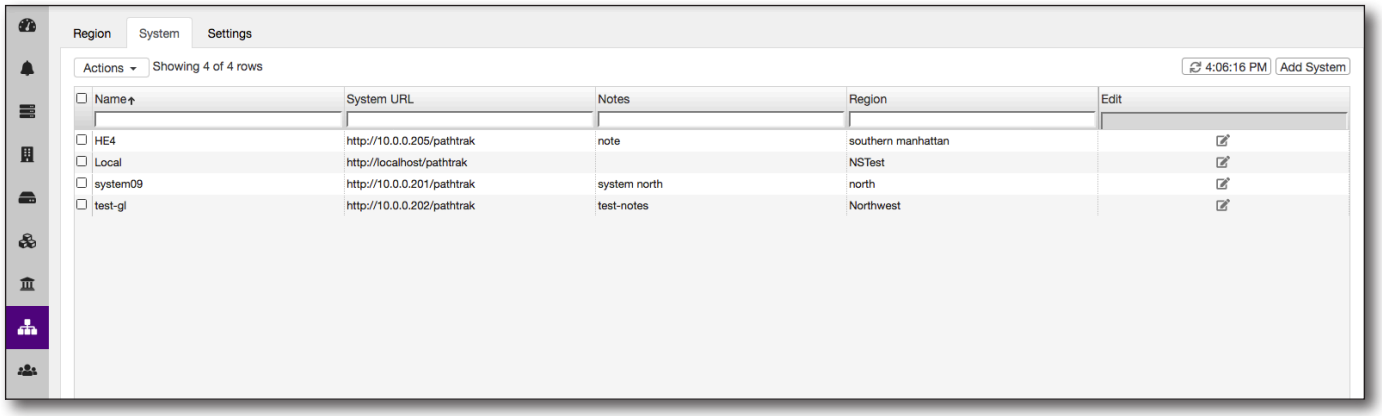
Click the **Add System** button on the right side of the screen to add a system. A new widow will open to select a region, name the system, and enter the system URL. When done, click **Save** to confirm.

Editing Systems

Select the edit button to the right of the sytem name. Edit the information as needed, and click the **Save** button.

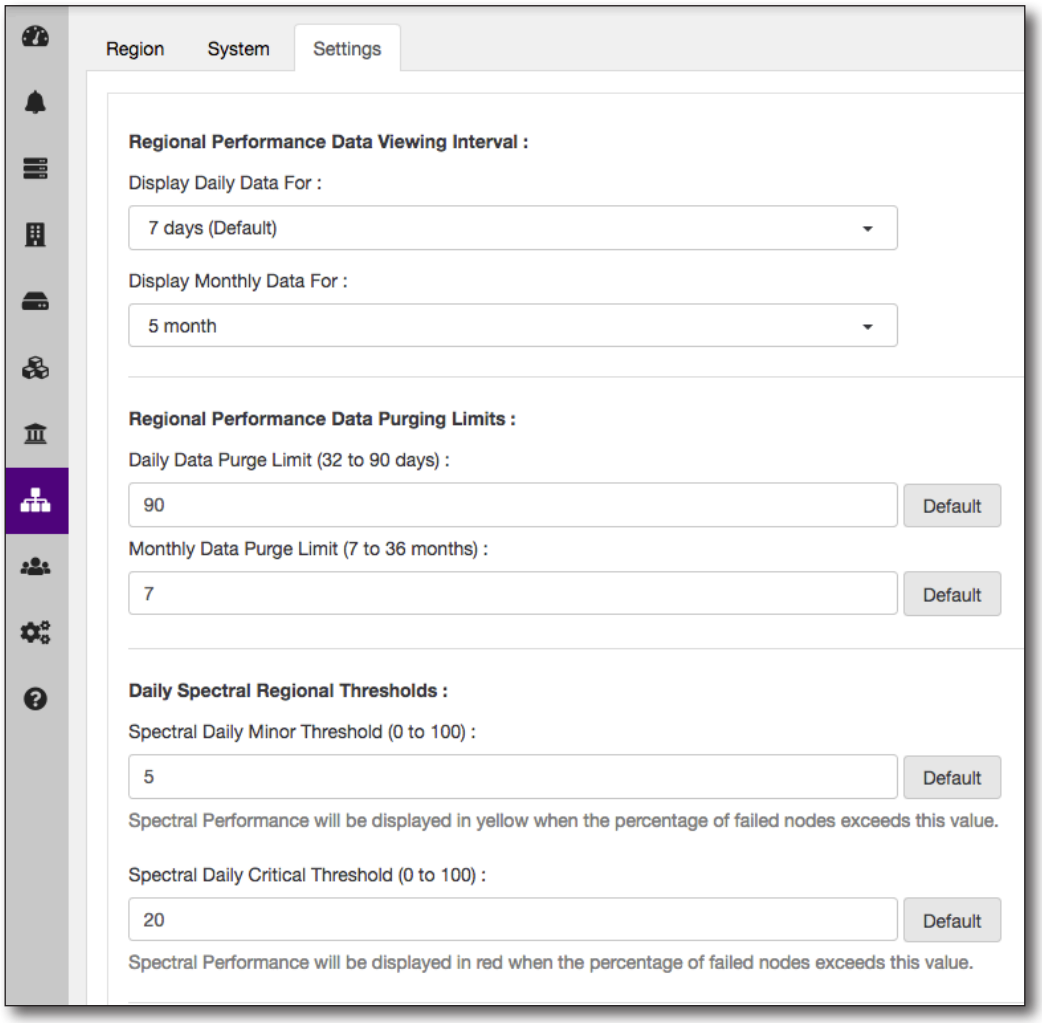
Deleting Systems

Select the checkbox next to the system(s) you want to delete. Click the **Actions** dropdown, and select *Delete Selected*. A confirmation screen asks you to confirm. Click **Yes.**



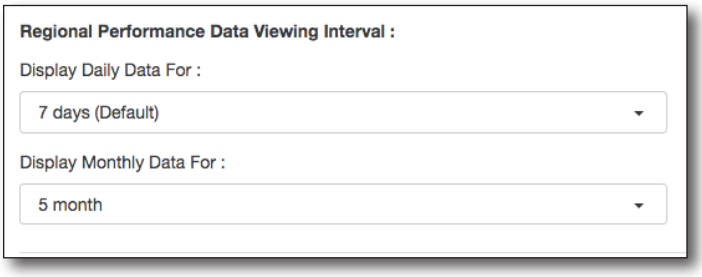
Settings Tab

This **Settings** tab allows you to set up various enterprise settings and defaults. When done, click the **Save** button to confirm your settings.



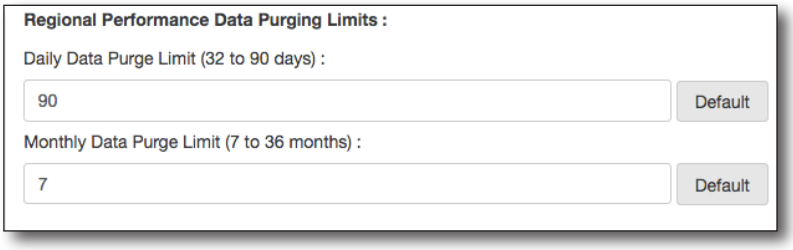
Regional Performance Data Viewing Interval

Sets the interval for what daily and monthly performance data is displayed.



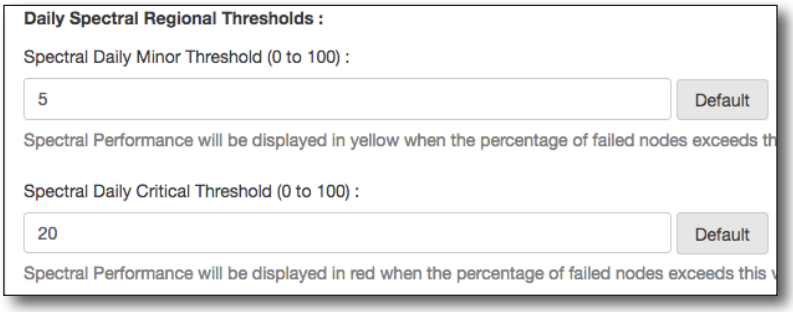
Regional Performance Data Purging Limits

Sets the purging time limits for daily and monthly performance data.



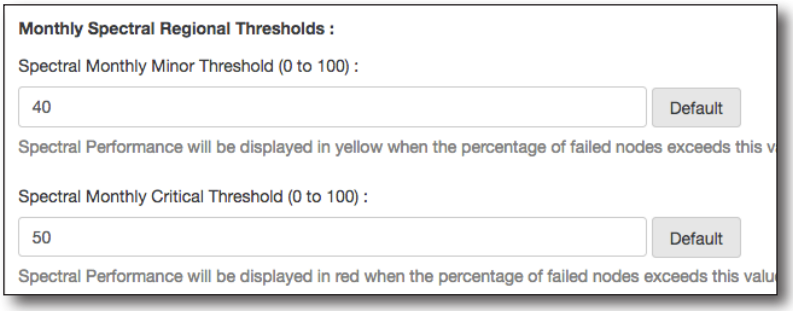
Daily Spectral Thresholds

Sets the minor and critical thresholds for daily spectral performance.



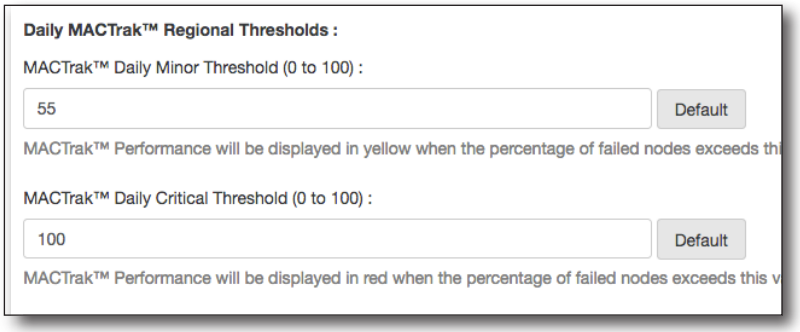
Monthly Spectral Regional Thresholds

Sets the minor and critical thresholds for monthly spectral performance.



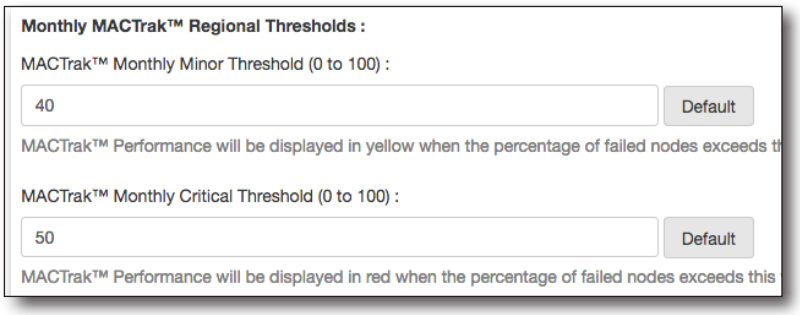
Daily MACTrak Regional Thresholds

Sets the minor and critical thresholds for daily MACTrak performance.



Monthly MACTrak Regional Thresholds

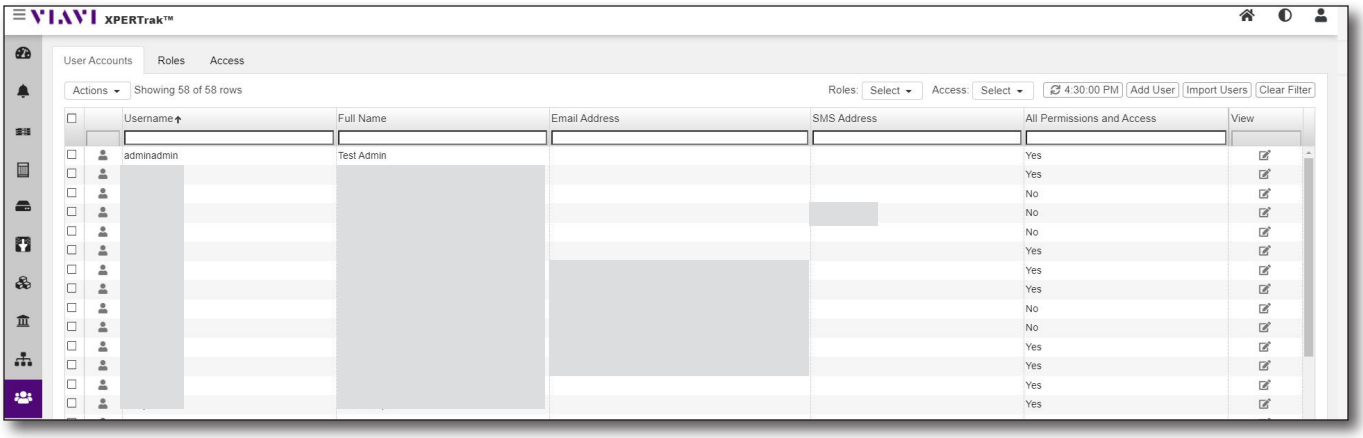
Sets the minor and critical thresholds for monthly MACTrak performance.



Users

Select **Users** to bring up the Users section.

This feature allows you to set up users and assign roles and permissons to them.



User Accounts Tab

The **User Accounts** tab will allow you to configure users and specific options from the **Actions** dropdown.

- **Export Selected** – Downloads a CSV file of the selected list.
- **Export All** – Downloads a CSV file of the full list.
- **Delete Selected**

Adding Users

Click the **Add User** button on the right side of the screen to add a user. A new window will come up, showing the **General**, **Roles**, and **Access** tabs.

General

Here you can set up a new user. Enter name, password, and contact information.

To set up the person as an admin, select the *Enable All Permissions and Access* checkbox.

Roles

Assign roles by selecting the checkboxes for the role(s) you want this user to have.

Access

Assign access by selecting the checkboxes for the access you want this user to have.

To add many users at once use the **Import Users** button on the right side of the screen. You will be prompted for a CSV file which must contain the following:

1. Username (required) – This should be unique
2. Full name (required)
3. Password (required)
4. Email address (optional)
5. SMS address (optional)
6. Role (optional) – Role name to assign
7. Access (optional) – Access name to assign
8. All permissions and access (optional) – True or false

Editing Users

Select the edit button to the right of the user name. Edit the information as needed, and click the **Save** button.

Deleting Users

Select the checkbox next to the user(s) you want to delete. Click the **Actions** dropdown, and select *Delete Selected*. A confirmation screen asks you to confirm. Click **Yes.**

Roles Tab

The **Roles** tab allows you to create roles that you can assign to users and groups from the **Actions** dropdown.

Adding Roles

Click the **Add Role** button on the right side of the screen to add a role. A new widow will come up, allowing you to name the role and select the permissions. When finished, click **Add** to create the role.

Editing Roles

Select the edit button to the right of the role. Edit the permissions or name as needed, and click the **Save** button.

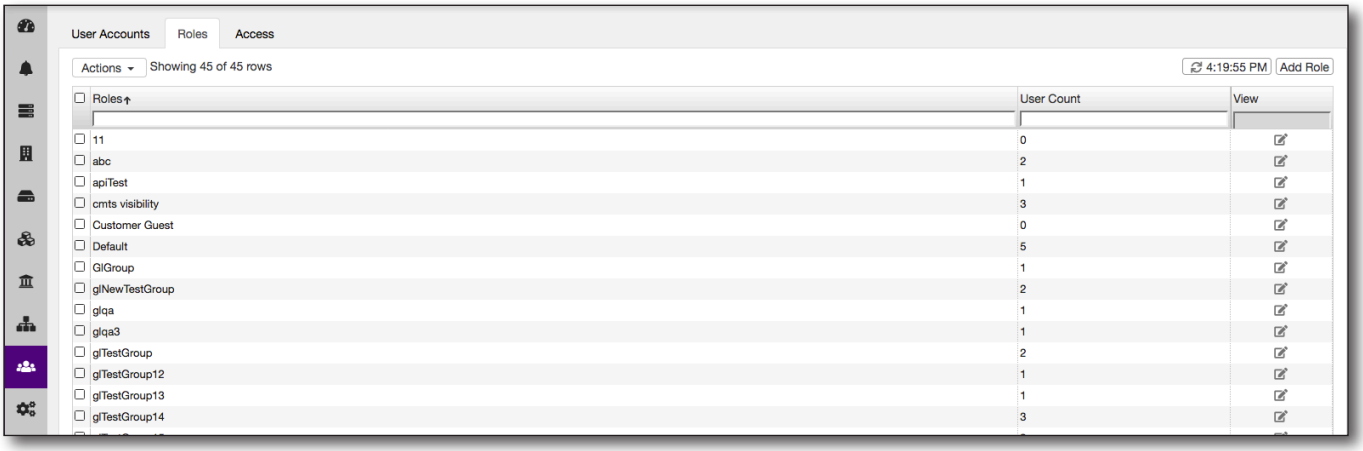
Deleting Roles

Select the checkbox next to the role(s) you want to delete. Click the **Actions** dropdown, and select *Delete Selected*. A confirmation screen asks you to confirm. Click **Yes.**

Assigning Users to a Role

Select the checkbox next to the role you want to assign users. Click the **Actions** dropdown, and select *Assign Users*. A new window will come up, allowing you to select the users to assign to the role. When finished, click **Save**.

Note: You can also later remove users from a role from this screen by unchecking the box for the user(s).



Access Tab

The **Access** tab allows you to assign containers /nodes to groups for easier visibility from the **Actions** dropdown.

Adding Access Groups

Click the **Add Access** button on the right side of the screen to add a access group. A new widow will come up, allowing you to name the group and select the containers / nodes to add. When finished, click **Add** to create the access group.

Editing Access Groups

Select the edit button to the right of the group. Edit the containers / nodes as needed, and click the **Save** button.

Deleting Access Groups

Select the checkbox next to the group(s) you want to delete. Click the **Actions** dropdown, and select *Delete Access*. A confirmation screen asks you to confirm. Click **Yes.**

Assigning Users to an Access Group

Select the checkbox next to the group you want to assign users. Click the **Actions** dropdown, and select *Assign Users*. A new widow will come up, allowing you to select the users to assign to the group. When finished, click **Save**.

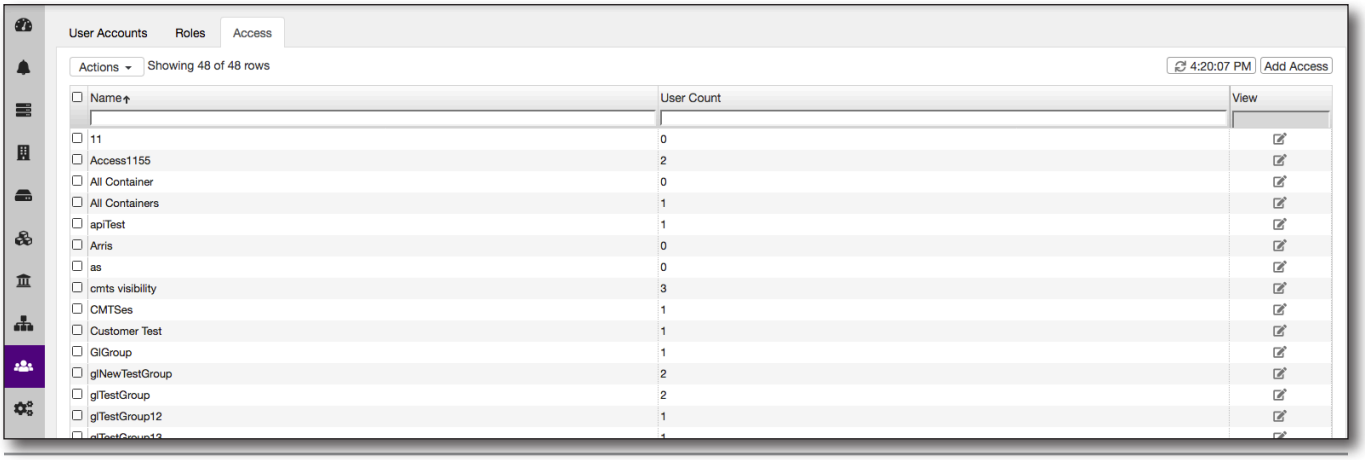
Note: You can also later remove users from a group from this screen by unchecking the box for the user(s).

Selecting a group enables some permissions in the lower part which cannot be disabled. The user will be able to select custom permission they need also.

The selection of the groups also impacts the Access tab.

In the Access view, you will be able to click on any parent or child.

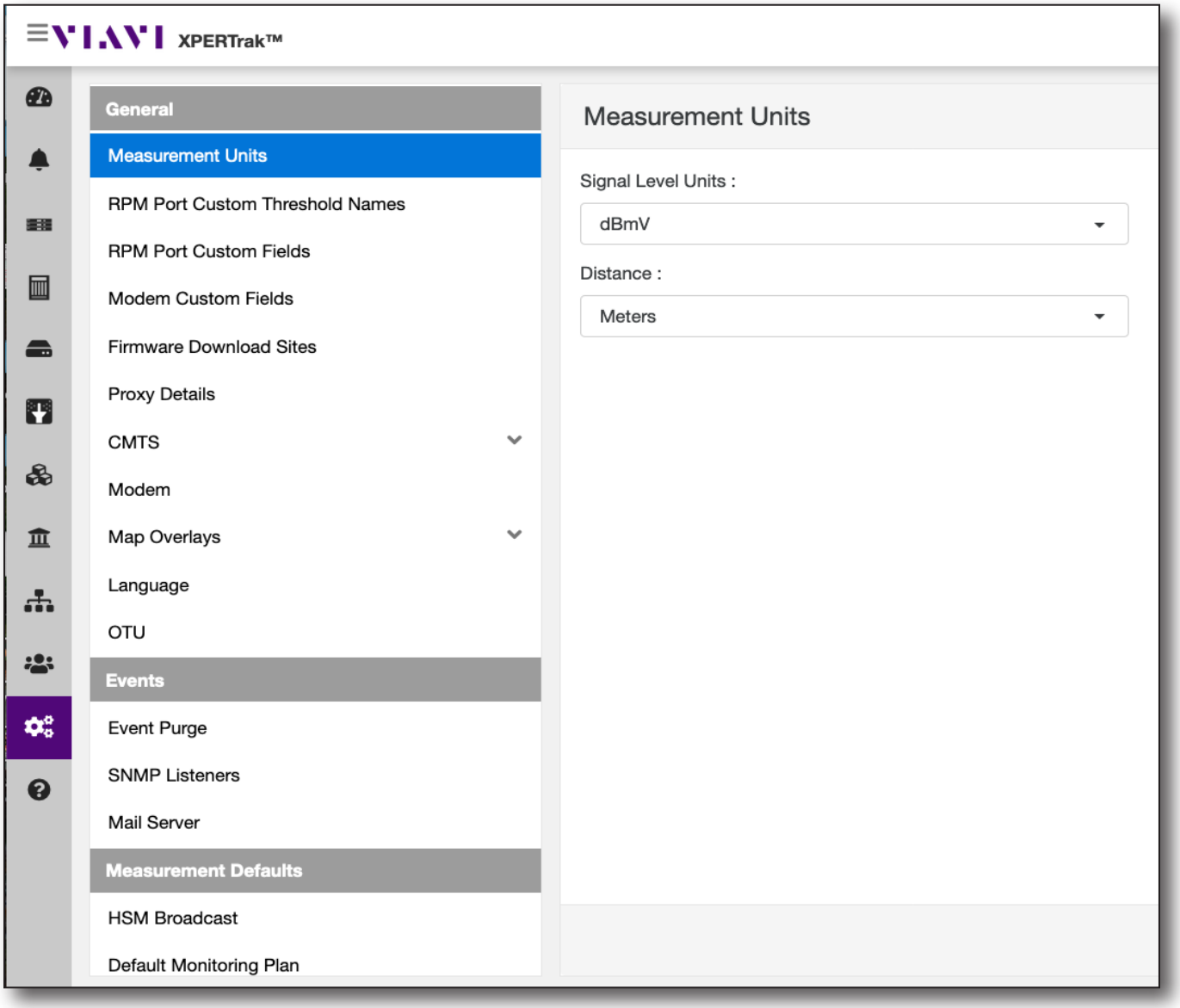
- If a child is selected, then the parent is indirectly selected.
- If the parent is selected, then all children are selected.
- If the visibility is inherited, then the checkbox cannot be modified.



Settings

Select **Settings** to bring up the System Settings section.

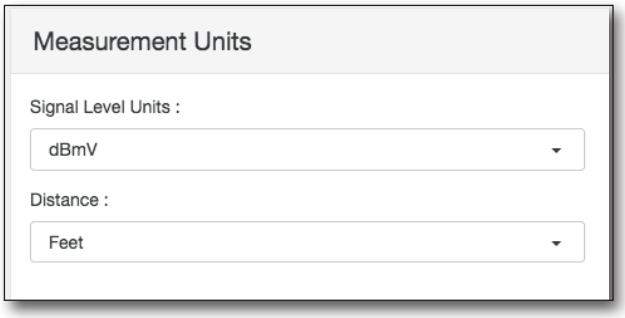
This feature allows you to set up various systems settings and defaults, including measurement units, language, map overlays, events, alarms, and thresholds. When done, click the **Save** button to confirm your settings.



General

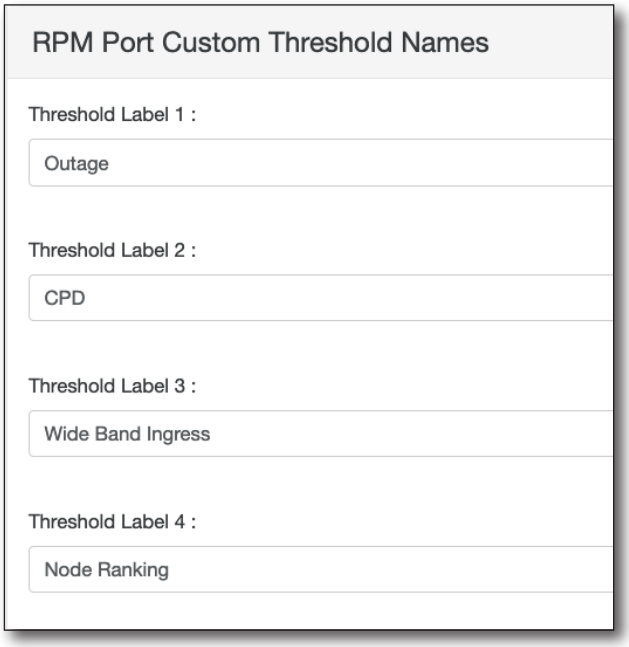
Measurement Units

Sets signal level units and distance for measurements.



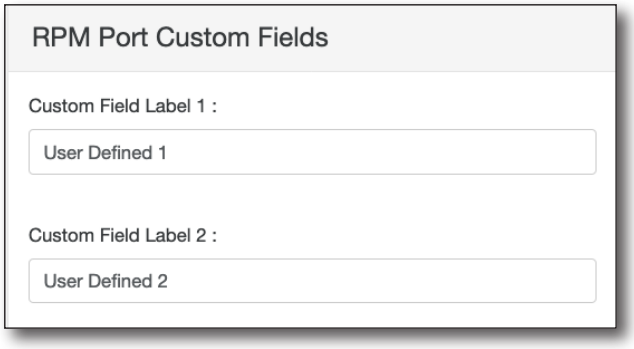
RPM Port Custom Threshold Names

Sets RPM port threshold labels 1–4 (e.g. Outage ,CPD, Wide Band Ingress, Node Ranking, etc.



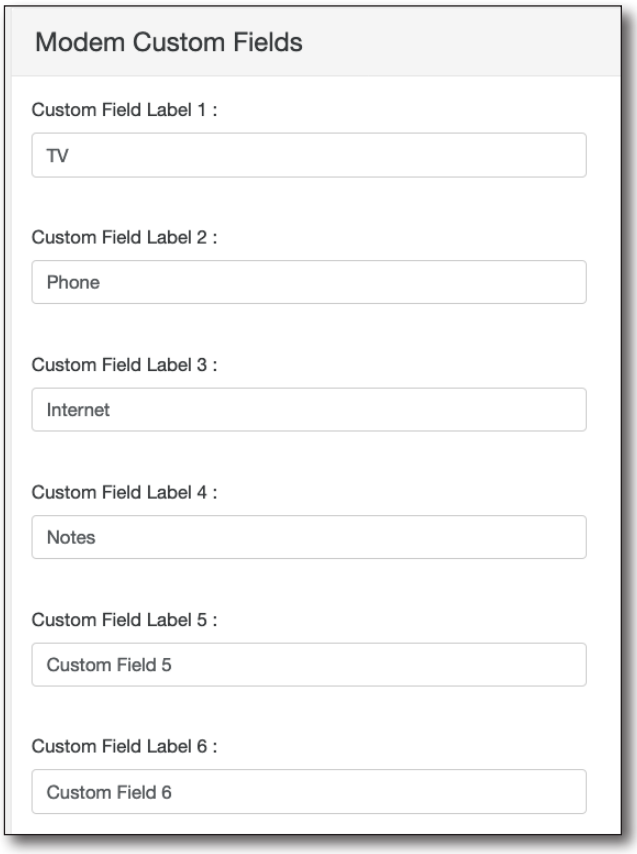
RPM Port Custom Fields

Sets port custom fields.



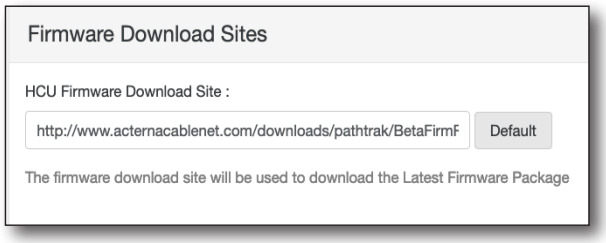
Modem Custom Fields

Sets modem custom fields to select, filter, and correlate modems.



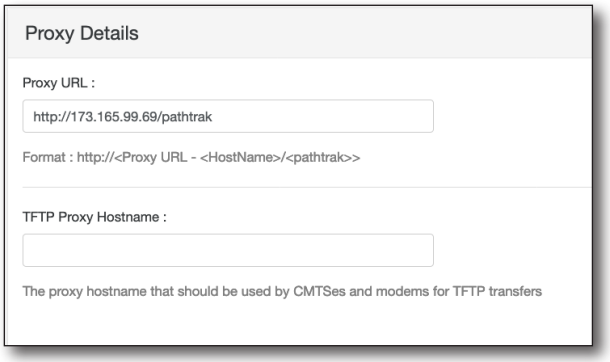
Firmware Download Sites

Sets the path to download the latest firmware package.



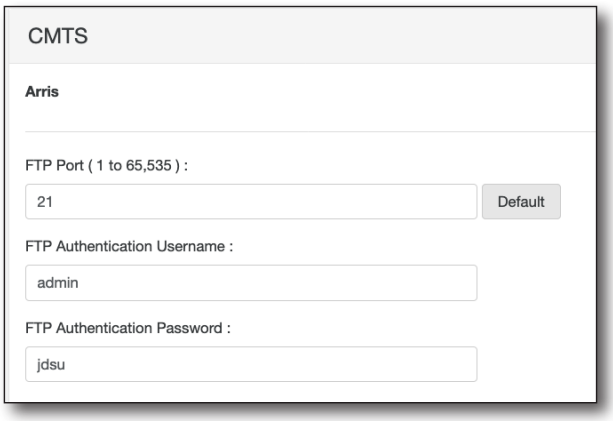
Proxy Details

Sets the proxy URL and language for notification and custom API. This will not affect your browser language setting.



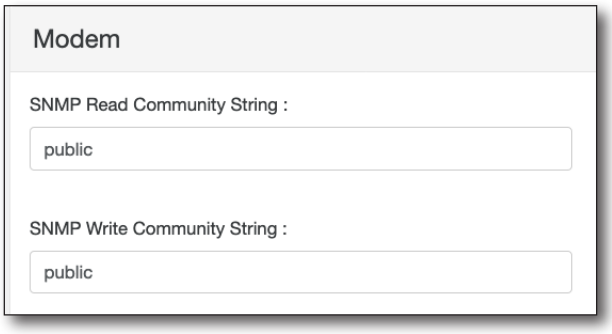
CMTS (Arris)

Sets the FTP port and login information for Arris CMTSs.



Modem

Sets the SNMP read and write community strings.



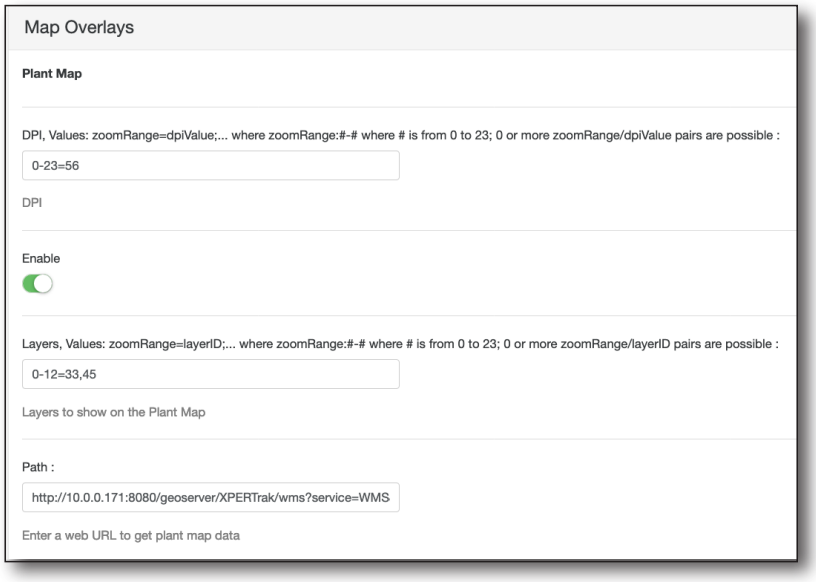
Map Overlays

Sets plant and leakage map layers and paths to download data.

Plant Map

Sets DPI, layers, and URLs for plant map data.

Use **minimum zoom to show overlay** to adjust when details are shown on the map. See *"Map toolbar" on page 57*.

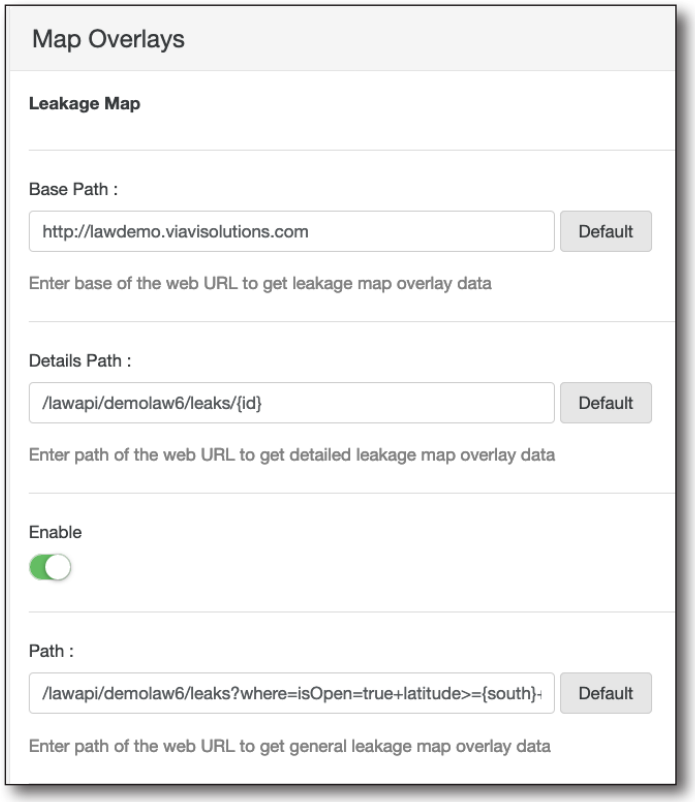


Leakage Map

Sets the base, details, and general leakage map overlay data.

Use **minimum zoom to show overlay** to adjust when details are shown on the map. See *"Map toolbar" on page 57*.

Note: For more detail on these sections, see *"XPERTrak Map Overlays Configuration" on page 279*.

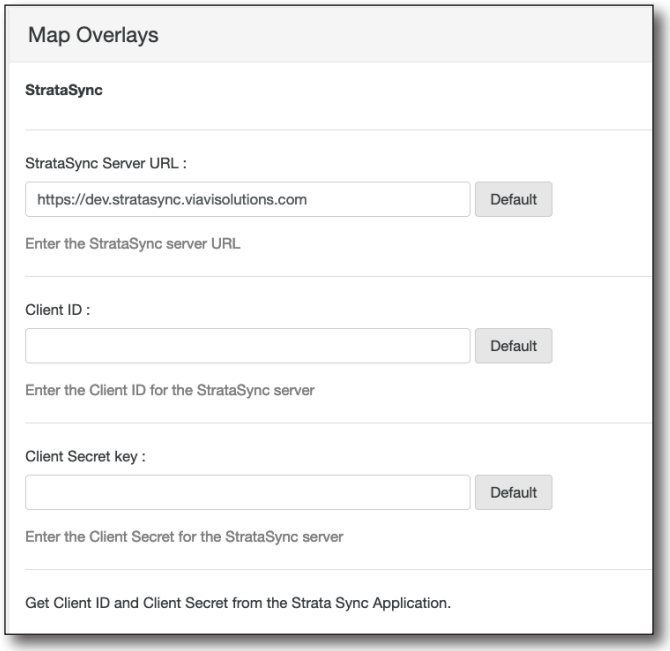


StrataSync

Sets the URL, Client ID, and Client Secret key for StrataSync data.

Use **minimum zoom to show overlay** to adjust when details are shown on the map. See *"Map toolbar" on page 57*.

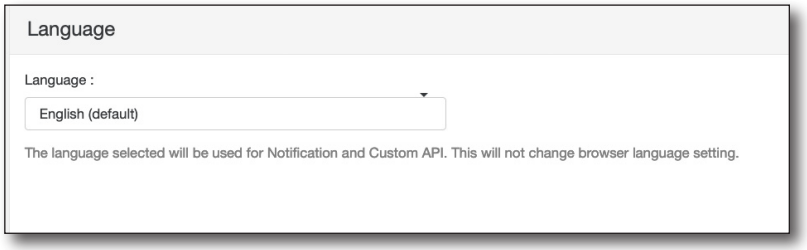
Note: Must have active Map Data API in StrataSync prior to setup.



Language

Sets the language for notifications and custom APIs.

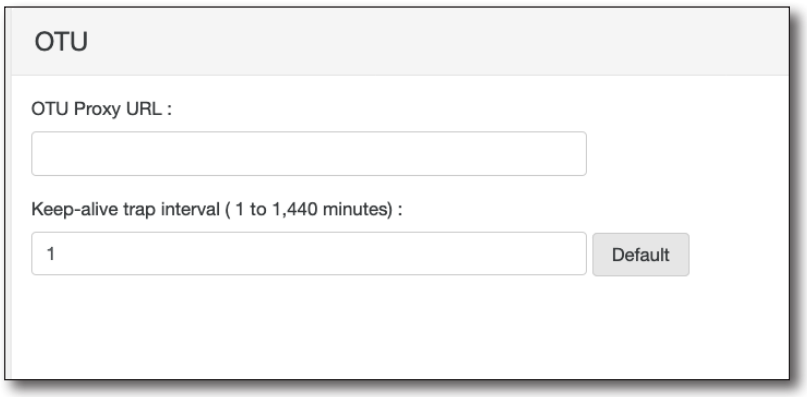
See your browser language settings to change the UI language for XPERTrak.



OTU

Sets the OTU (Optical Test Unit) proxy URL and keep-alive trap interval.

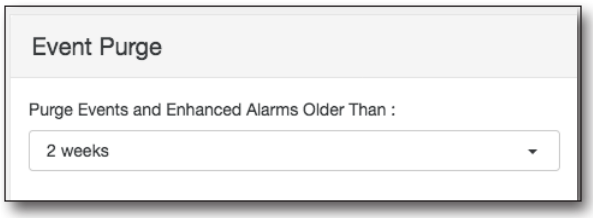
Note: Must have active Data API in Smart OTU prior to setup.



Events

Event Purge

Sets when to purge events and enhanced alarms.

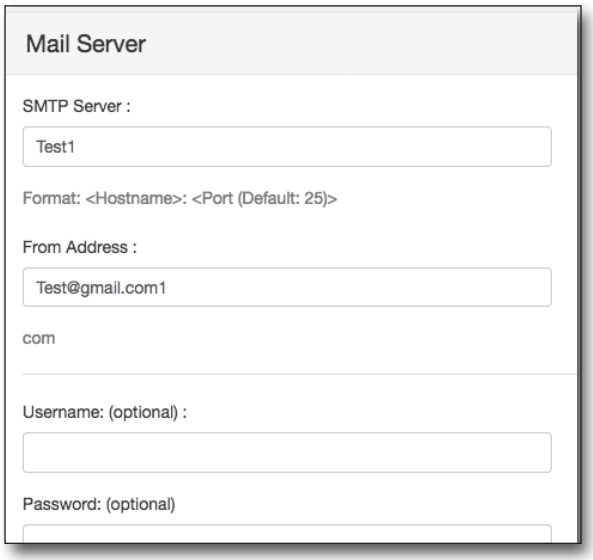


SNMP Listeners

Sets SNMP listeners.

Mail Server

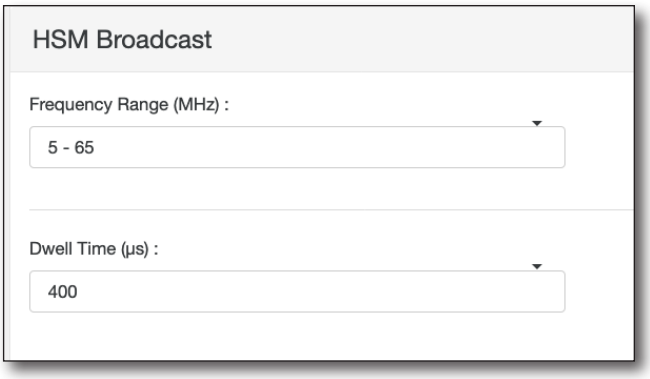
Sets the SNMP server, the address to send notifications from, and admin information for managing the server.



Measurement Defaults

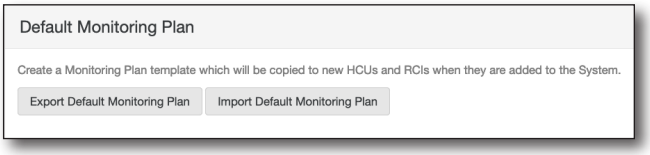
HSM Broadcast

Sets the frequency range and dwell time for HSM (Headend Stealth Modems) broadcasts.



Default Monitoring Plan

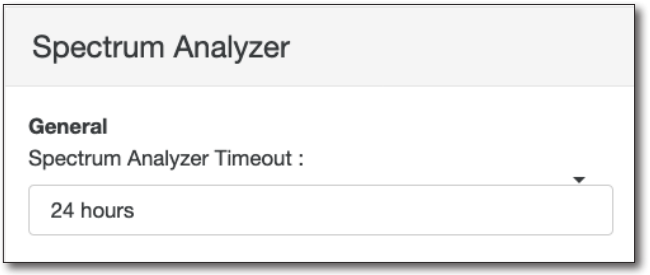
Allows you to export the monitoring plan as a CSV Excel file, so you can edit and re-import.



Spectrum Analyzer

Sets up spectrum analyzer time out, max analyzers, start and stop frequencies for RPM 1000, 2000, and 3000 systems.

Also sets resolution and video bandwith, attenuation, and dwell.



General

Spectrum Analyzer Timeout – The amount of time a spectrum analyzer will run before it automatically times out and disconnects.

Choose from 5/15/30 minutes or 1/8/24 hours. 15 minutes is the default.

HCU

Sets the max simultaneous RPM 3000 and HCU 200 spectrum analyzers, start and stop frequencies for RPM 1000, 2000, 3000, and HCU 204 systems.

Also sets resolution and video bandwith, attenuation, and dwell.

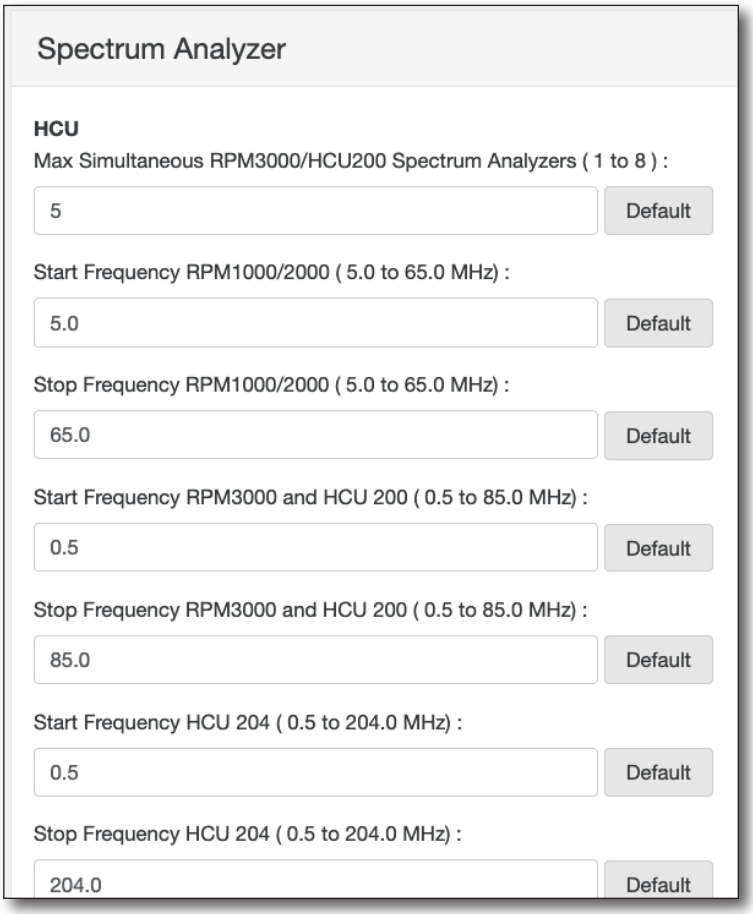
Resolution Bandwidth – Determines the RF noise floor and how close two signals can be and still be resolved by the analyzer into two separate peaks. Adjusting the bandwidth of this filter allows for the discrimination of signals with closely spaced frequency components, while also changing the measured noise floor.

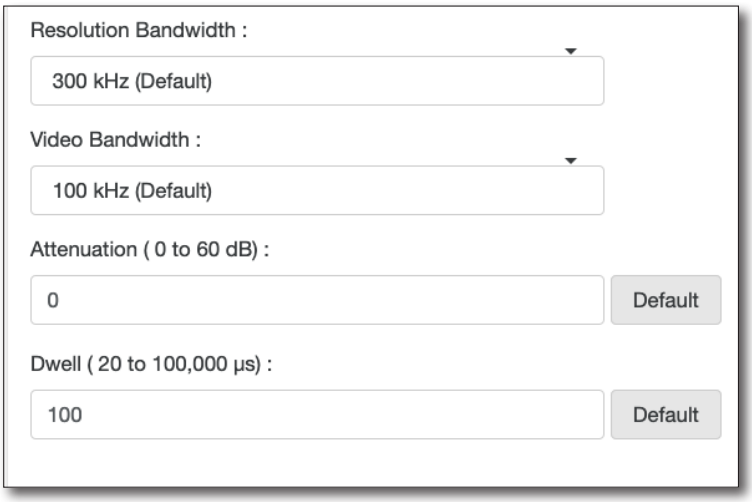
Choose from 30/300/1000 kHz. 300 kHz is the default.

Video Bandwidth – Determines the capability to discriminate between two different video power levels, and smooths the display by removing noise.

Choose from 10/30/100/300/1000 kHz. 100 kHz is the default.

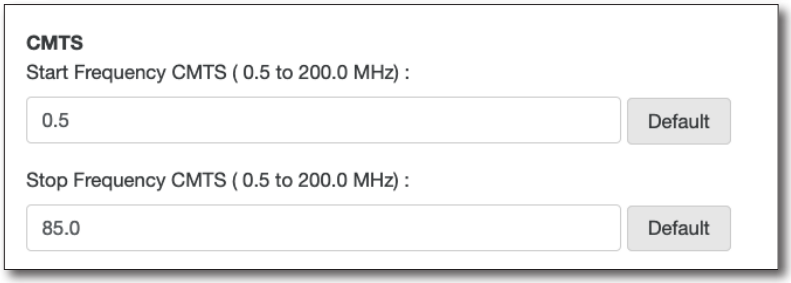
Dwell – The amount of time each frequency point is measured during a spectrum scan (20 to 100,000 µs). 100 is the default.





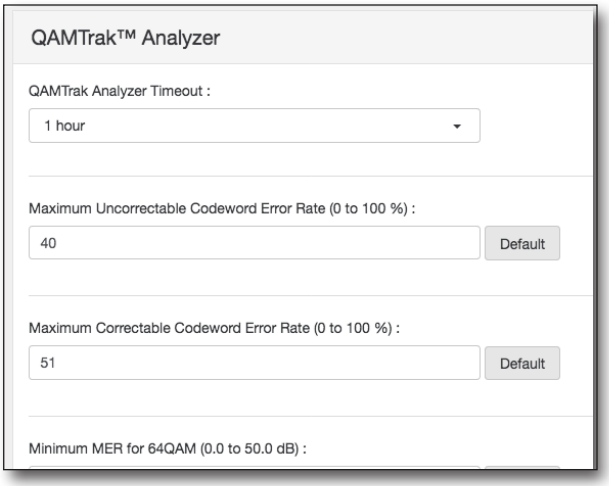
CMTS

Sets the CMTS start and stop frequencies.



QAMTrak™ Analyzer

Sets various QAMTrak default settings, including timeouts, codeword error rate, MER, and threshold settings.

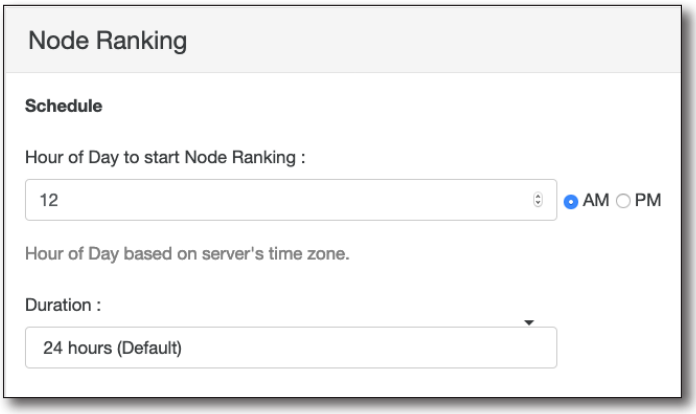


QAMTrak Analyzer Timeout – The amount of time the QAMTrak analyzer will run before it automatically times out and disconnects.

Choose from 5/15/30 minutes or 1/8/24 hours. 15 minutes is the default.

Node Ranking

Sets timing of node ranking, and node ranking for spectral, MACTrak, and QoE node ranking.

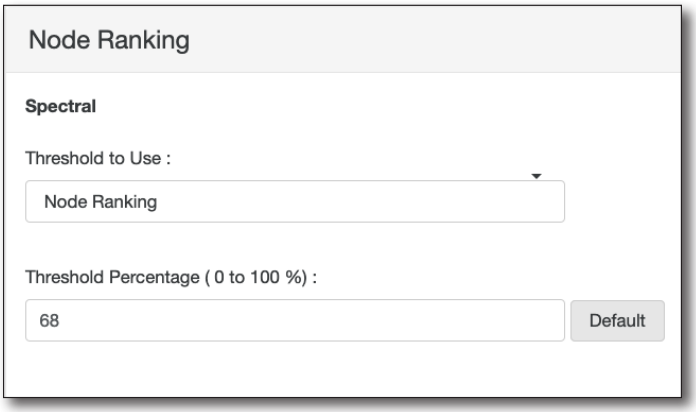


Schedule

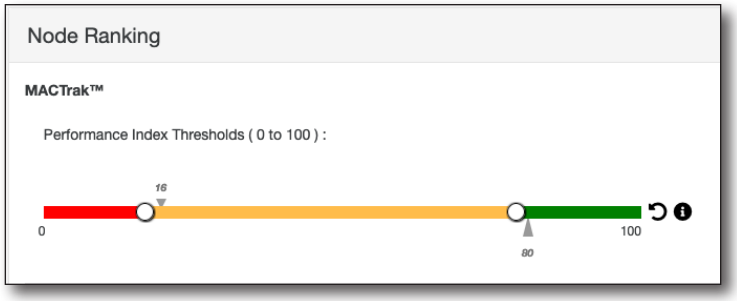
Sets the time of the node ranking and the duration.

Spectral

Sets the threshold to use and the percentage.



MACTrak



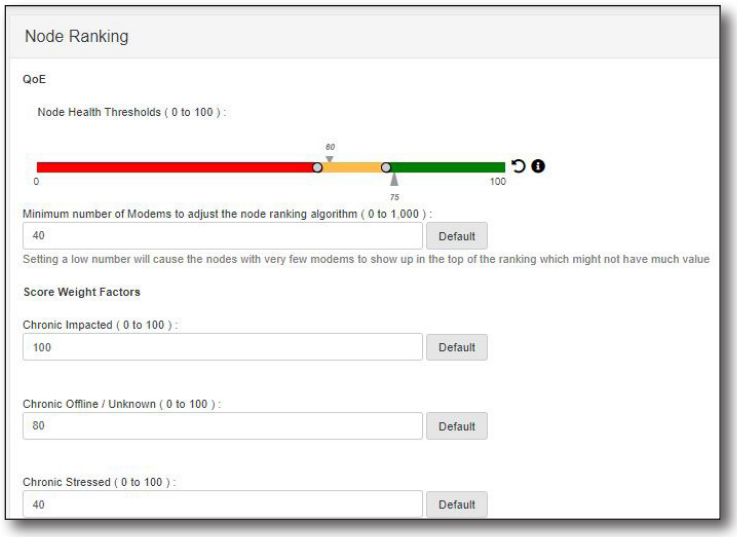
Sets the performance index fail and marginal thresholds.

Use the sliders to set the thresholds.

For the fail threshold, the performance index less than this value will be red.

For the marginal threshold, the performance index less than this value will be yellow. This value must be greater than or equal to the performance index fail threshold.

QoE



Sets the node health fail and marginal thresholds.

Use the sliders to set the thresholds.

For the fail threshold, the QoE score less than this value will be red.

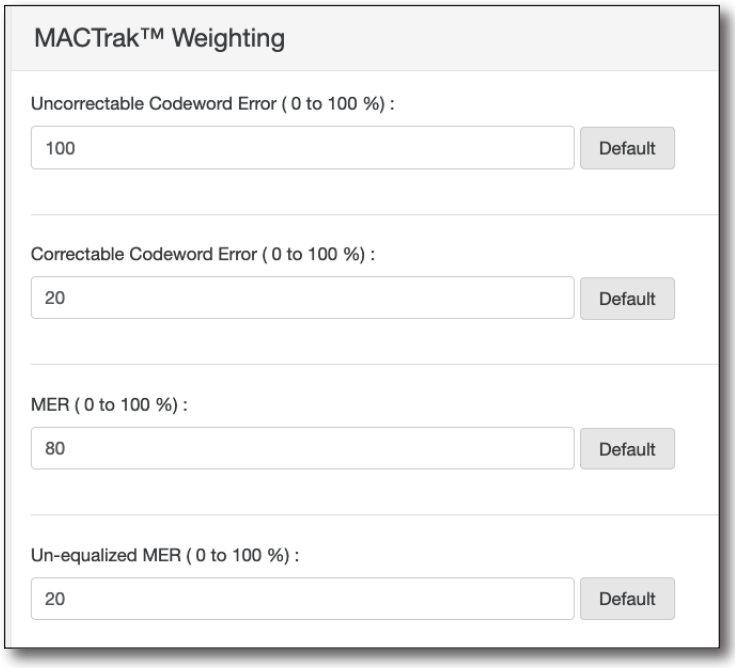
For the marginal threshold, the QoE score less than this value will be yellow. This value must be greater than or equal to the node health fail threshold.

Score weight factors allow control over the impact of modems in various states.

For example, typically a modem which is impacted is weighted high, but a modem which is chronic impacted is weighted highest. A modem which is part of an outage is weighted the same as chronic impacted.

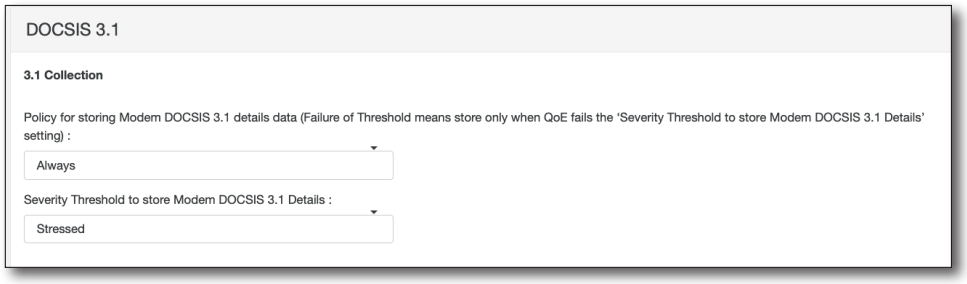
MACTrak Weighting

Sets various MACTrak default settings, including codeword error rate, MER, carrier level, and impulse noise settings.



DOCSIS 3.1

Sets policy and severity threshold for when to collect DOCSIS 3.1 such as MER per subcarrier.



Options are **Always**, **On Failure of Threshold**, or **Never**. If based on threshold, the threshold severity is selected. These options exist because the datasets for DOCSIS 3.1 are very large.

QoE

Sets various QoE stressed and impacted settings, including: upstream, stability, and downstream metrics and several thresholds settings.

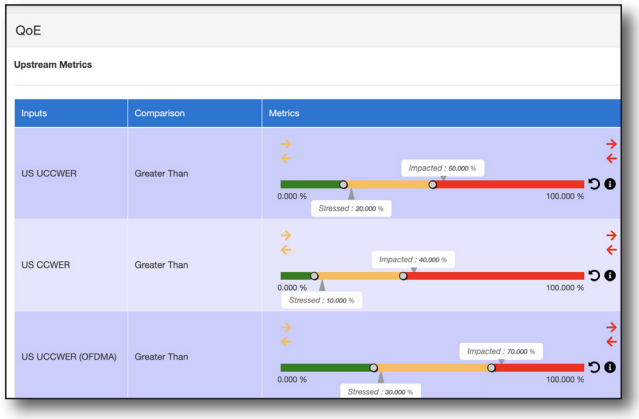
These QoE settings determine what the health of a modem is—impacted, stressed, clear, offline, or in an outage.

Upstream Metrics

Sets upstream metrics for codeword errors, SNR, and MER for SC-QAM.

For DOCSIS 3.1, it uses MEAN MER instead of SNR and it has its own error rate.

For DOCSIS 3.1, it is not appropriate to look at uncorrectable codeword error rate as a leading cause of failure, so this is not available as a QoE metric for DOCSIS 3.1 (although correctable codewords are measured).

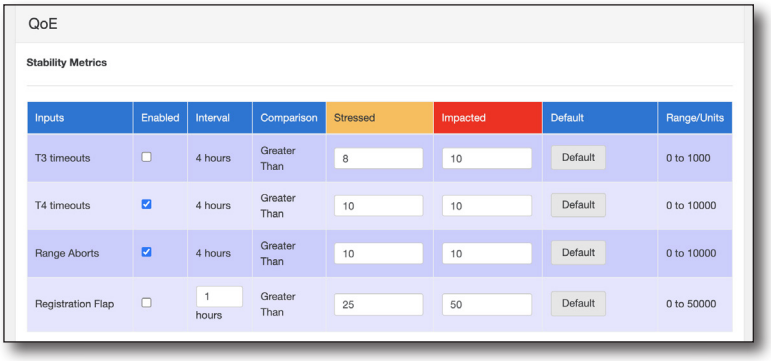


Use the sliders to set stressed and impacted ranges.

Stability Metrics

Sets stability metrics for timeouts and range aborts.

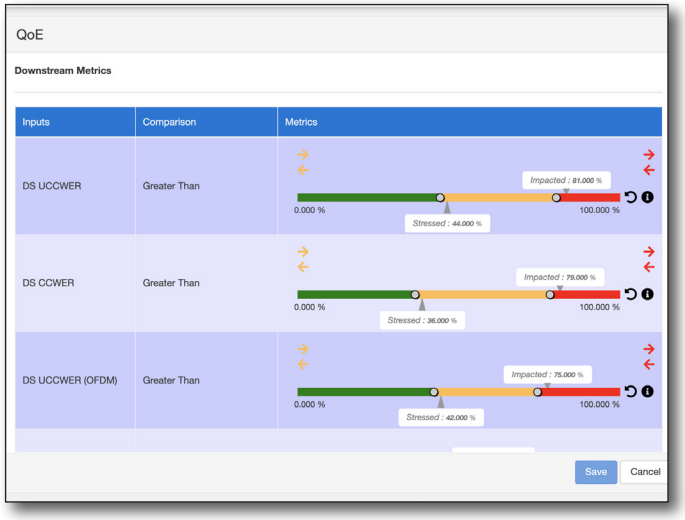
Uncheck a metric to disable it from changing modem health. If unchecked, the metric is still collected.



Downstream Metrics

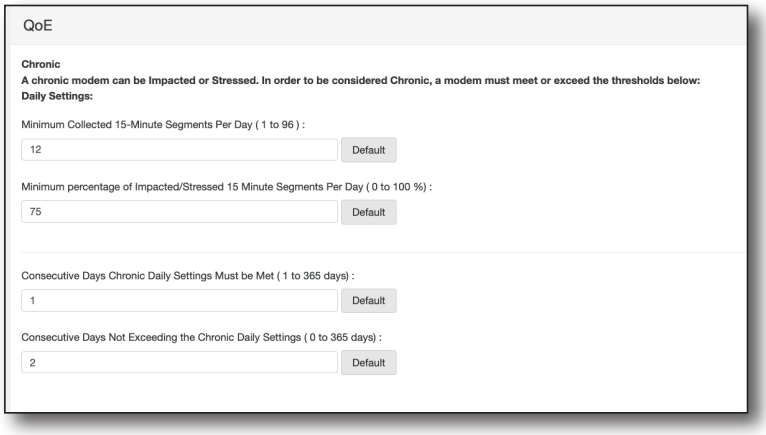
Sets downstream metrics for codeword errors, SNR, MER, NCP, and PLC.

Use the sliders to set stressed and impacted ranges.



Chronic

Sets thresholds for chronic modems, including data collection timing and percentage of impacted/ stressed modems to capture.

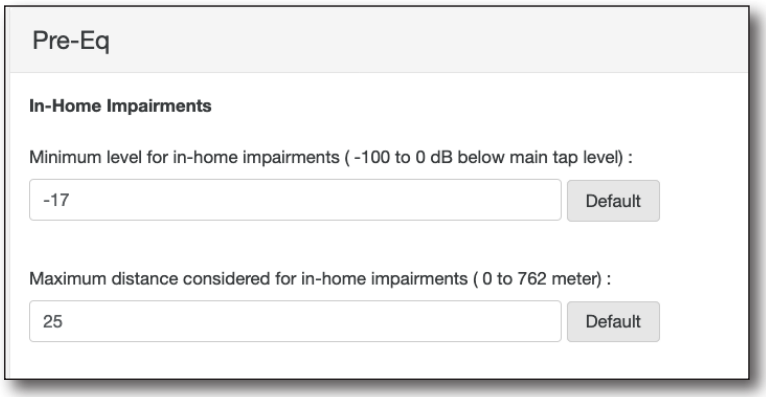


Pre-Eq

Sets various in-home impairments and pre-eq weight factor settings.

In-Home Impairments

Sets minimum level and max distance considered for in-home imparements.

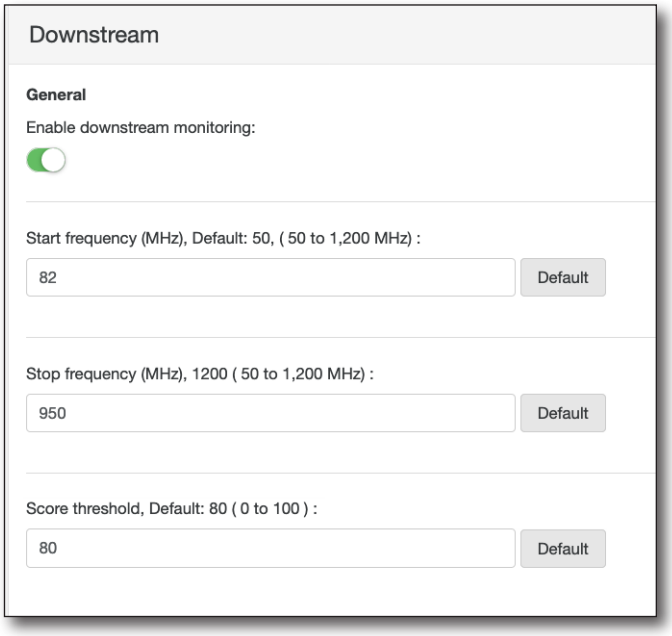


Downstream

Sets various downstream settings, including start/stop frequencies and tilt, suckout, roll off, and LTE ingress weight factors.

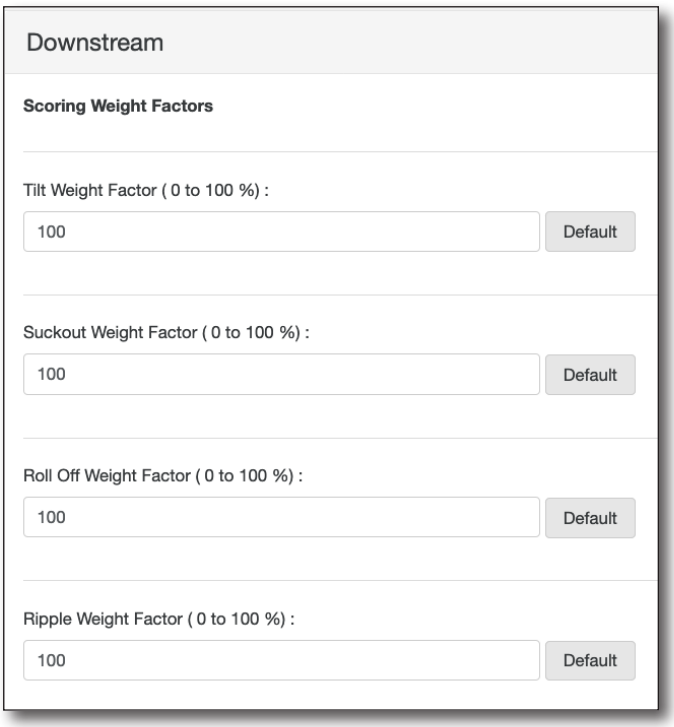
General

Sets downstream start/stop frequencies and score theshold.



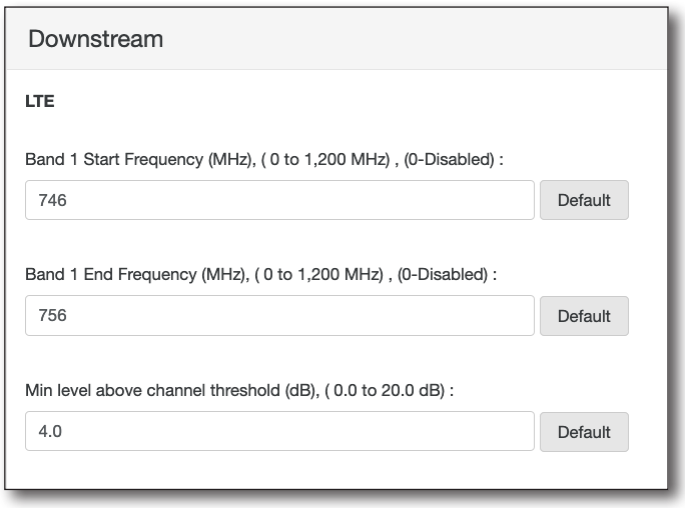
Scoring Weight Factors

Sets downstream tilt, suckout, roll off, ripple, resonate peak, adjacency, LTE, level, and FM scoring weight factors.



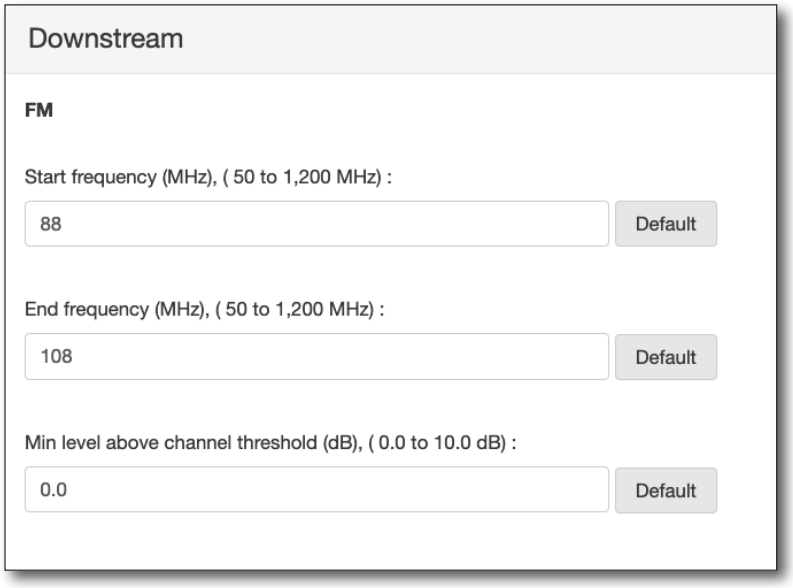
LTE

Sets LTE band start/end frequencies and min level above channel threshold.



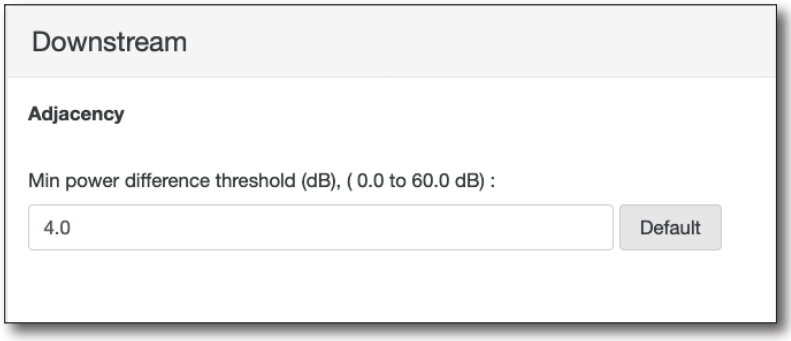
FM

Sets FM start/end frequencies and min level above channel threshold.



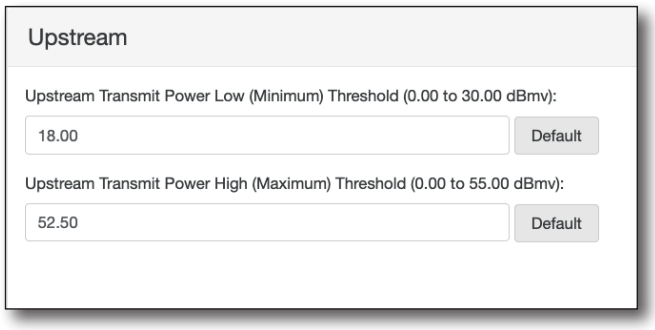
Adjacency

Sets adjacency min power difference threshold.



Upstream

Sets the upstream transmit power low and high (min/max) thresholds.



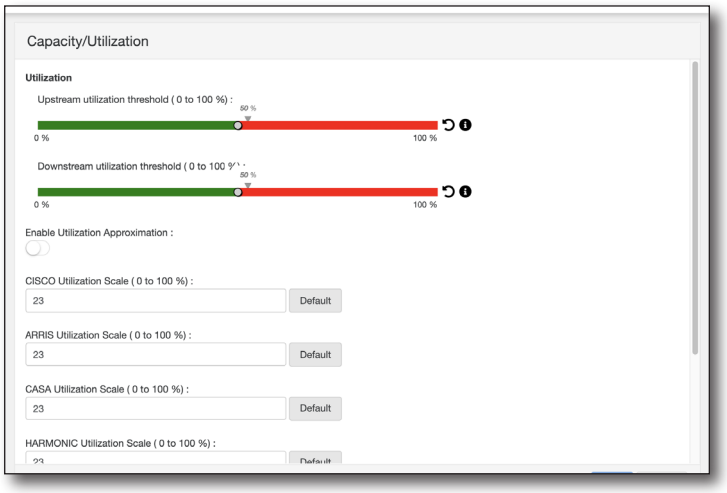
Capacity/Utilization

Sets the upstream and downstream utilization thresholds.

Use the sliders to set the thresholds.

Turn on **Enable Utilization Approximation** to use octets vs. mini slots for the capacity data. Mini slots (exact) is the default.

The utilization percent by CMTS vendor is used to approximate a fixed overhead of total utilization required by DOCSIS channels.



This percentage is subtracted from the total available overhead of a channel. For example, if a channel normally has a max throughput of 1 GB/s, then setting a scale factor of 25% would mean that 0.75 GB would be available for use.

Enter these values as needed. The default is 23%.

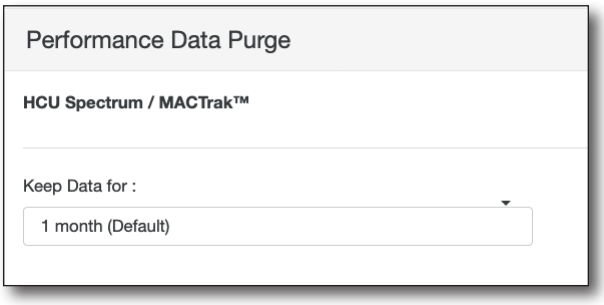
See *"RF Channel Utilization" on page 76.*

Performance Data Purge

Sets when to purge HCU spectrum/ MACTrak, downstream, node rank, pre-Eq, and QoE data sets.

HCU Spectrum / MACTrak

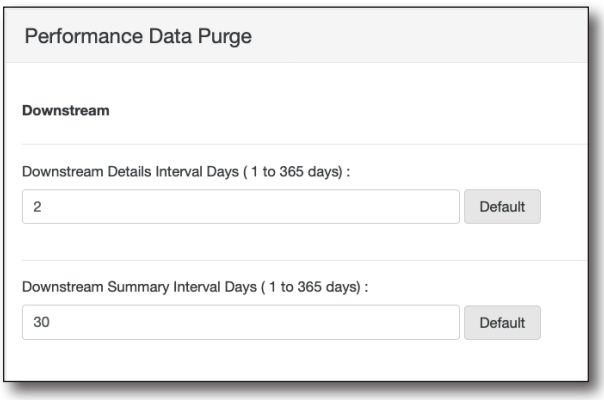
Sets how long to keep HCU spectrum / MACTrak data.



Downstream

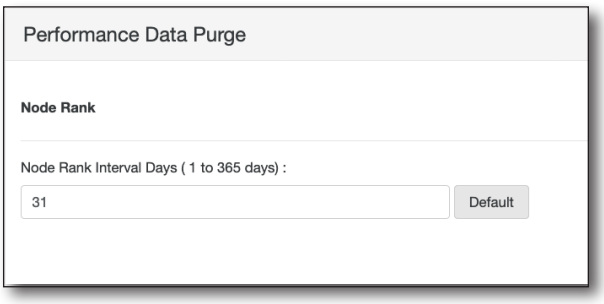
Sets how long to keep downstream details and summary data.

Note: The number of days of historical modem displays will be limited by this setting.



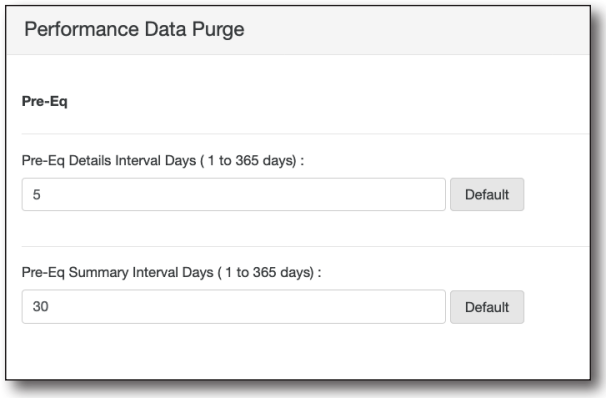
Node Rank

Sets how long to keep node rank data.



Pre-Eq

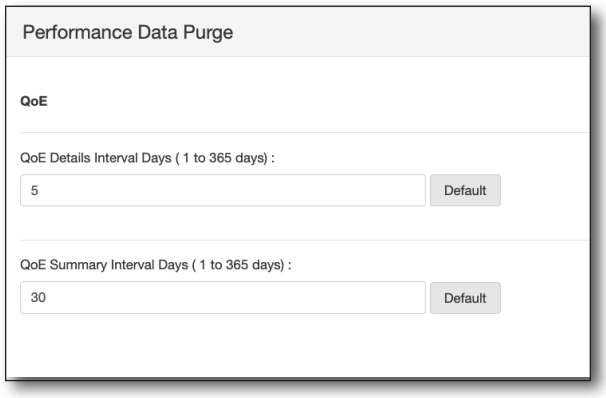
Sets how long to keep pre-eq details and summary data.



QoE

Sets how long to keep QoE details and summary data.

Note: The number of days of historical modem displays will be limited by this setting.



Alarms

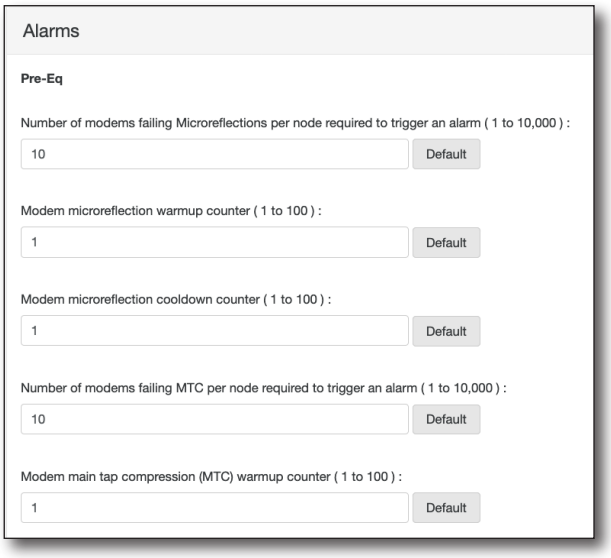
Sets when to send alarms for node health, pre-eq, node outage, MACTrak, QoE, offline, and alignment events.

Node Health

Sets the node health warmup and cooldown node health counter.

Pre-Eq

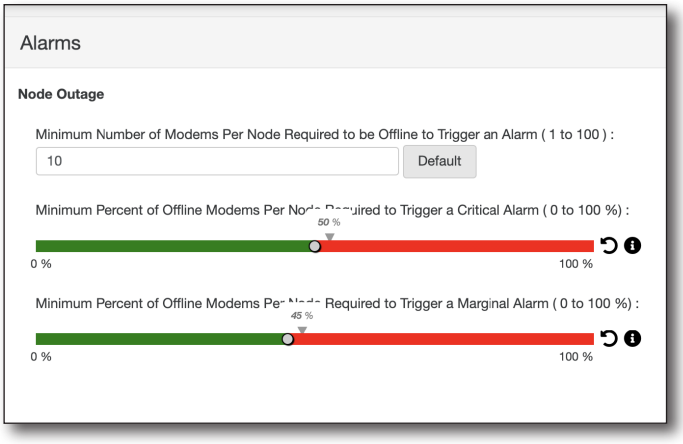
Sets various pre-eq alarms, including: modems failing microreflections per node, modem microreflection warmup/cooldown counters, modems failing MTC (main tap compression) per node, and modem MTC warmup/cooldown counters.



Node Outage

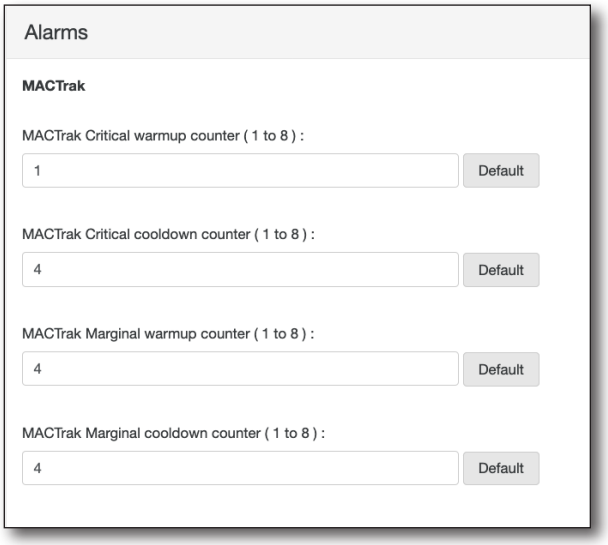
Sets various modem alarms, including: modems per node required to be offline, percent of offline modems per node for critical alarms, and percent of offline modems per node for marginal alarms.

Use the sliders to set the thresholds.



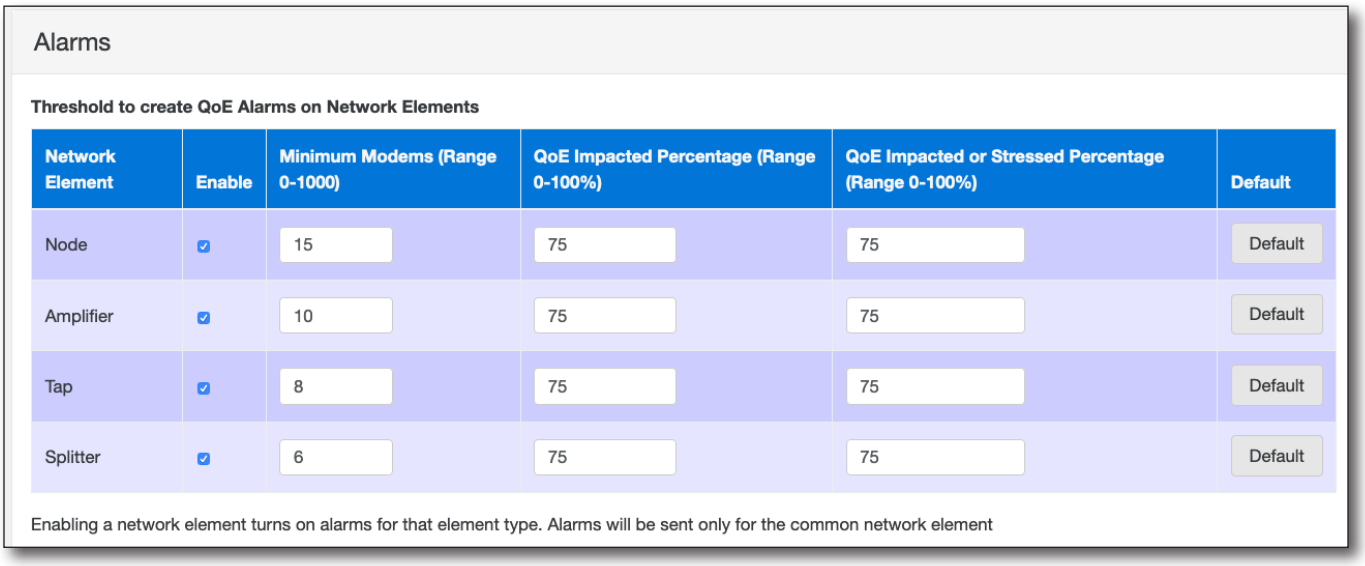
MACTrak

Sets the MACTrak critical and marginal warmup and cooldown counters.



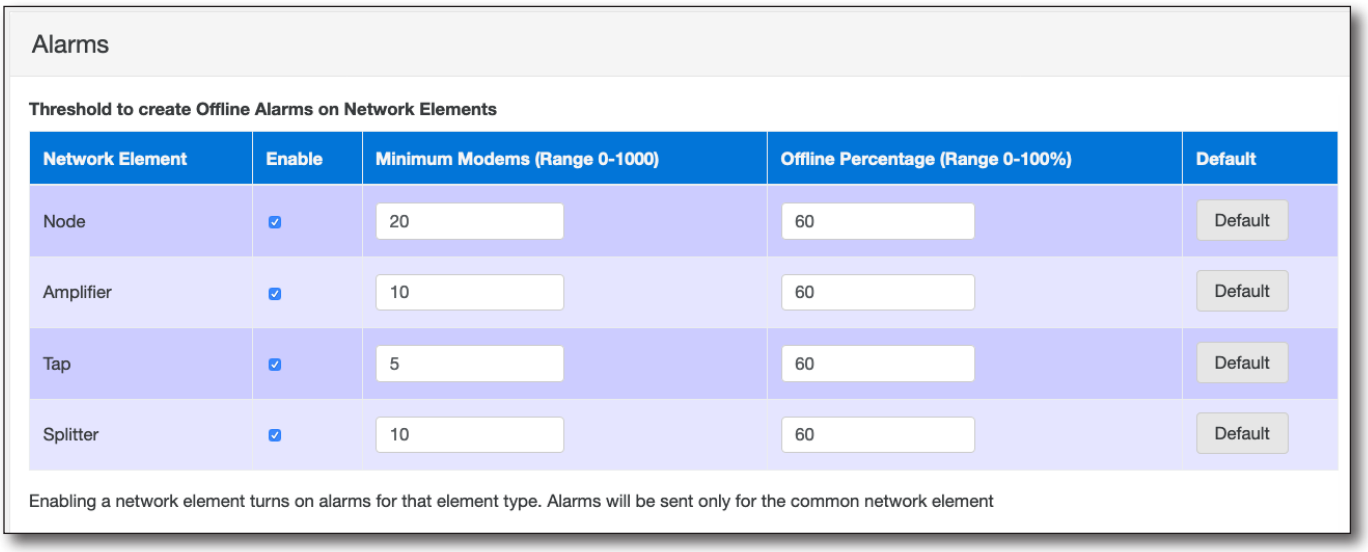
QoE

Sets the Street Alarms thresholds for QoE alarms and network elements, severity rules, and warm up and cooldown rules for alarms.



Offline

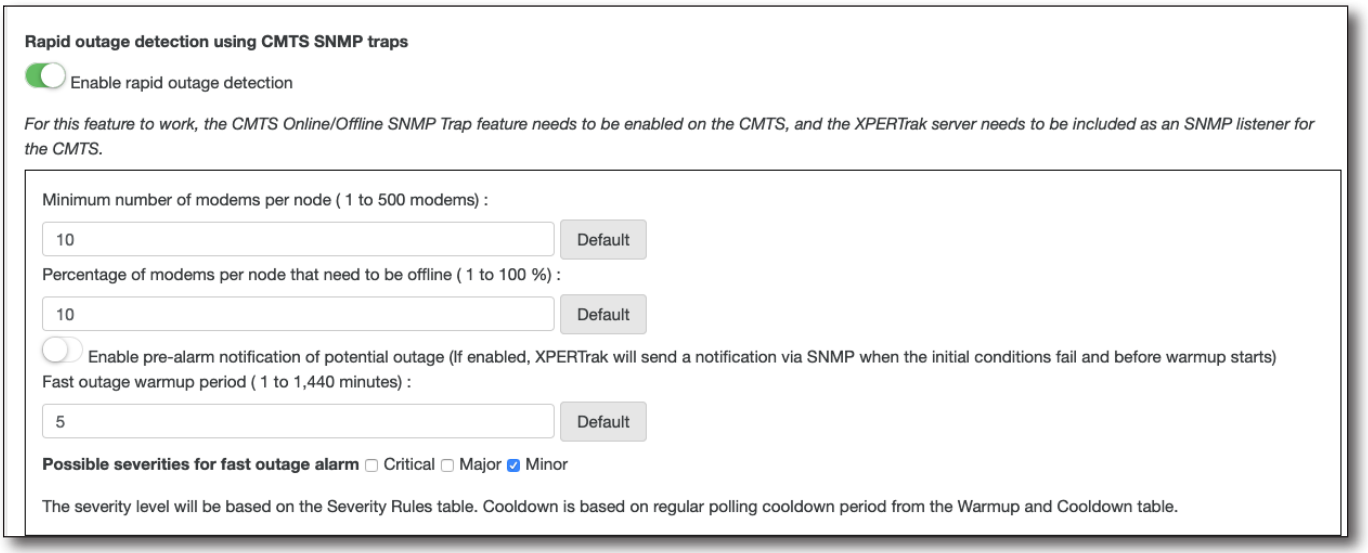
Sets the Street Alarms thresholds for offline alarms and network elements, severity rules, warm up and cooldown rules for alarms, and rapid outage detection using CMTS SNMP traps.



Rapid outage detection

Sets rapid outage detection using CMTS SNMP traps.

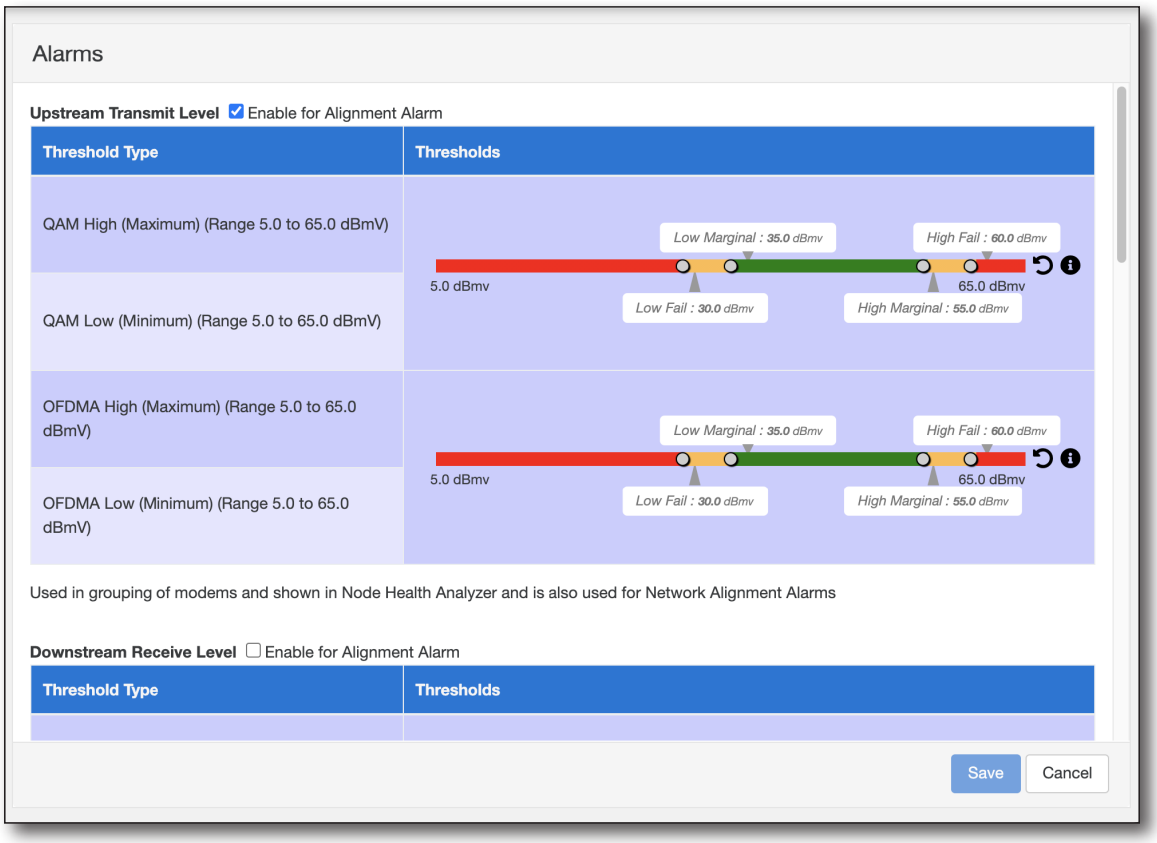
For this feature to work, the CMTS Online/Offline SNMP Trap feature needs to be enabled on the CMTS, and the XPERTrak server needs to be included as an SNMP listener for the CMTS.



Alignment

Sets the Street Alarms alignment thresholds, upstream transmit level, downstream receive level, and network elements, severity rules, and warm up and cooldown rules for alarms.

Use the sliders to set the thresholds.

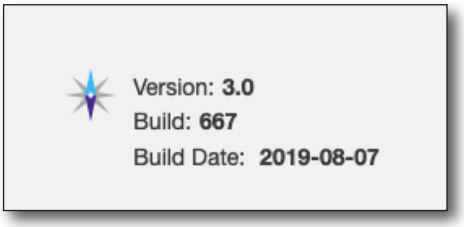


Information

This feature allows you to reference information for the XPERTrak software version, licensing, diagnostics, triggers, and logs.

Basic Information Tab

The **Basic Infiormation** tab has details about the XPERTrak version, build, and build date.



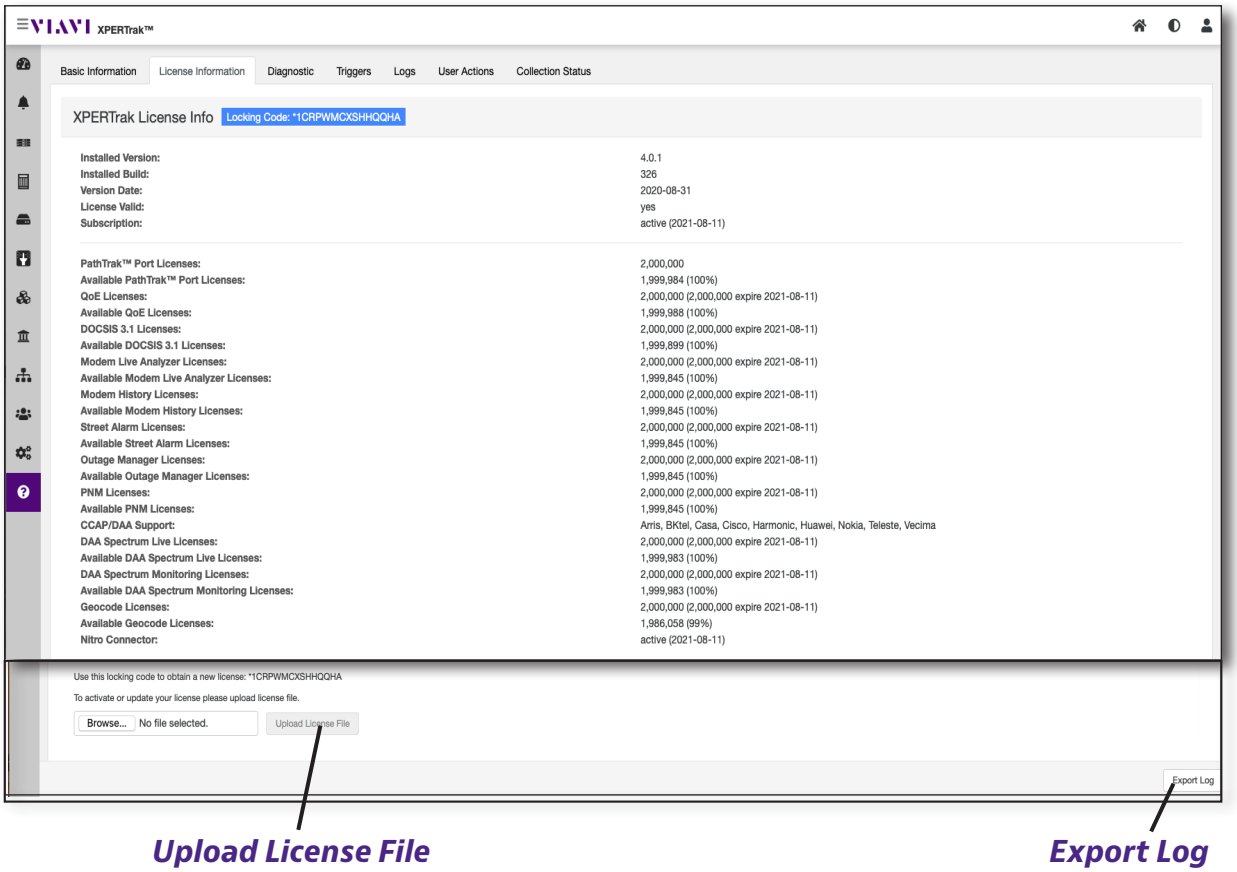
License Information Tab

The **License Information** tab has details about the server license, available licenses, and the features to upload a new server license.

To enable licensed features, a license needs to be generated in the licensing portal and then imported into XPERTrak.

To upload your license file, select **Upload License File** at the bottom and select the license file on your desktop.

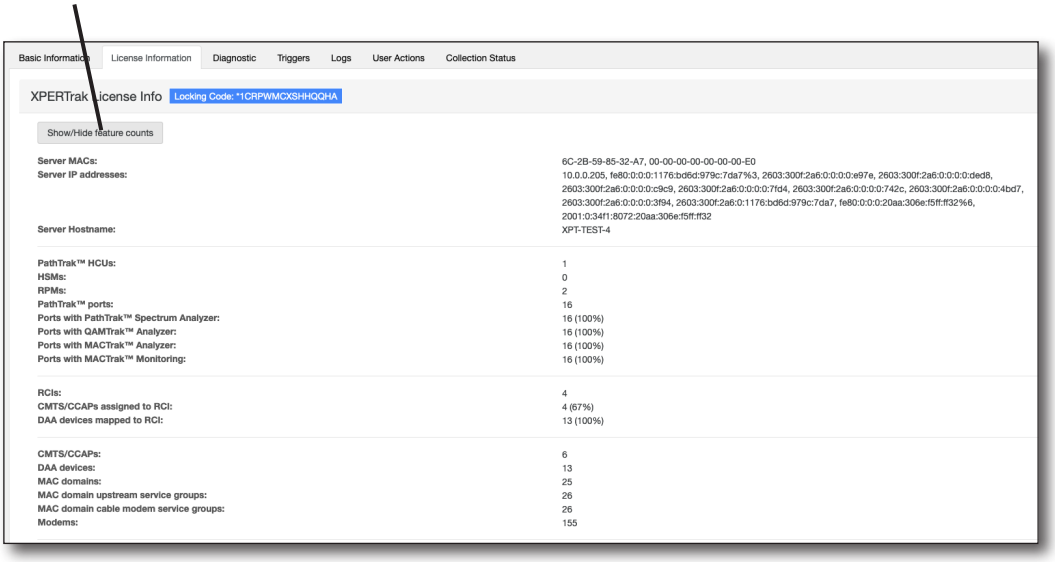
You can also select **Export Log** at the bottom right to export to a file.



To see all the detail about the devices and features associated to your account, select **Show/Hide feature counts**. This section provides great detail and is very helpful for license planning and usage.

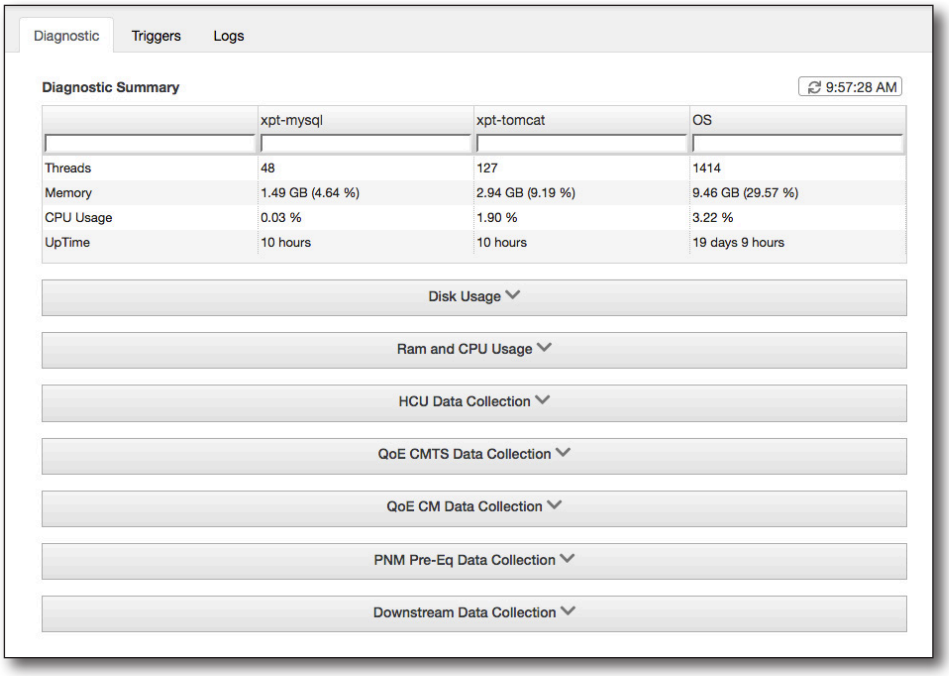
For more information, contact us at **CATVsupport@viavisolutions.com**.

Show/Hide feature counts

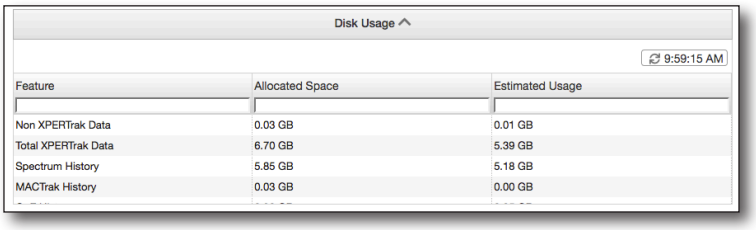


Diagnostic Tab

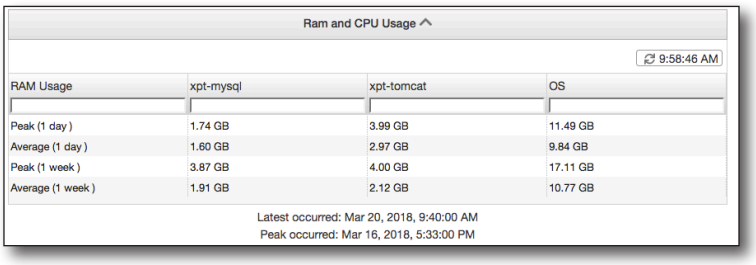
The **Diagnostic** tab summarizes hardware and data collections, including disk usage, RAM and CPU usage, and various hardware data.



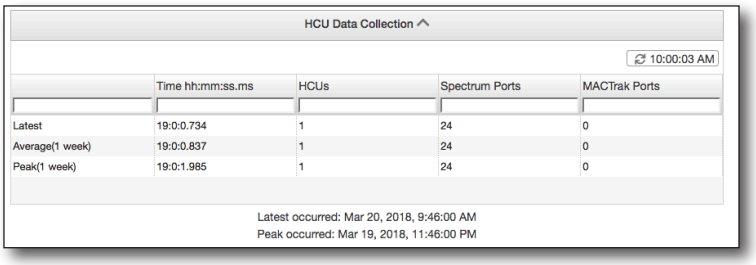
Disk Usage



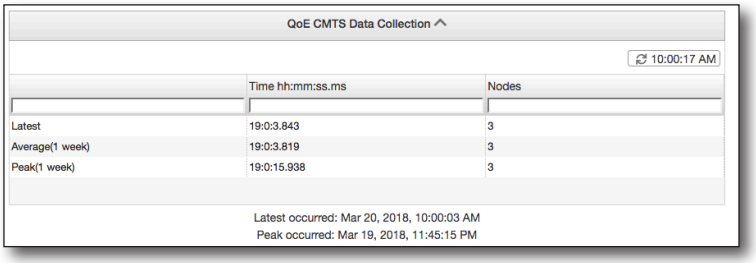
RAM and CPU Usage



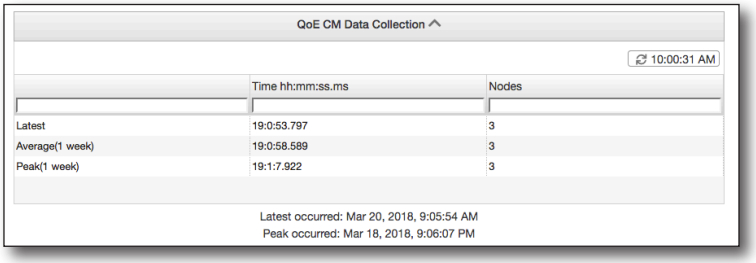
HCU Data Collection



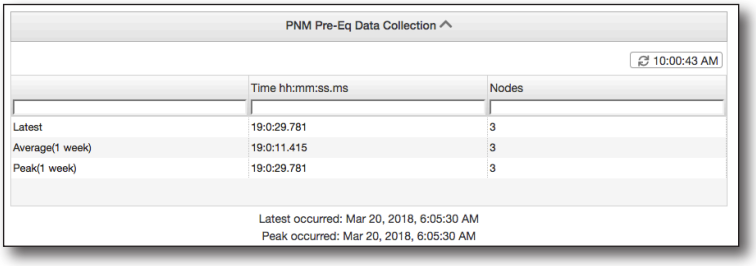
QoE CMTS Data Collection



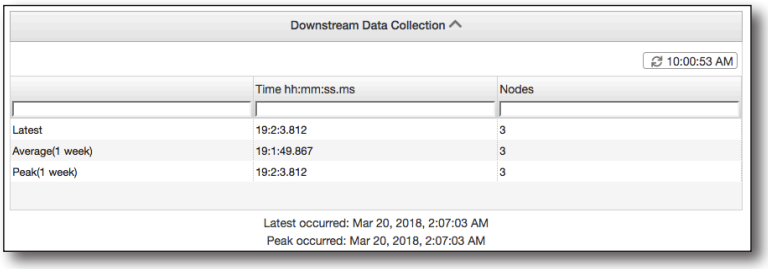
QoE CM Data Collection



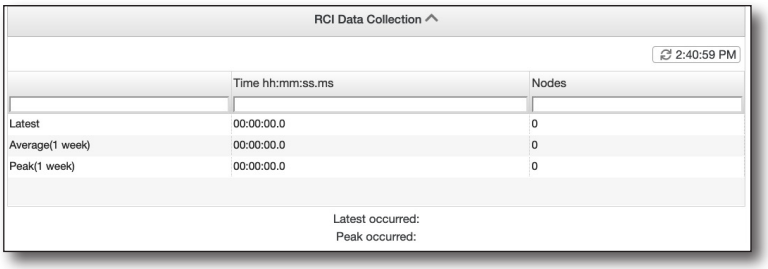
PNM Pre-Eq Data Collection



Downstream Data Collection

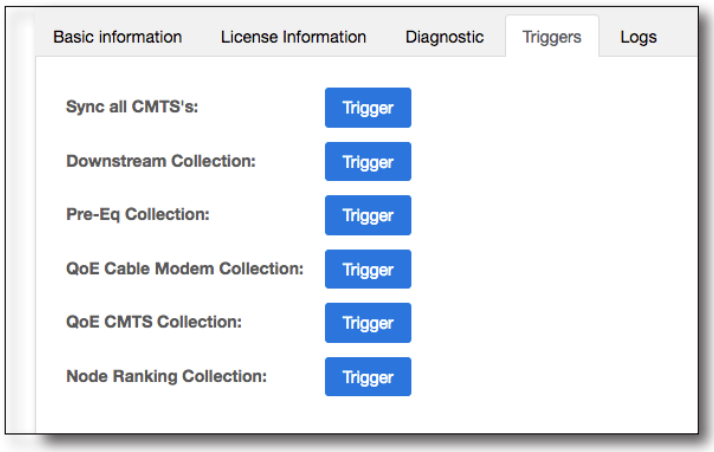


RCI Data Collection



Triggers Tab

The T**riggers** tab automatically triggers various actions for data collection immediately, rather than waiting on a scheduled time.



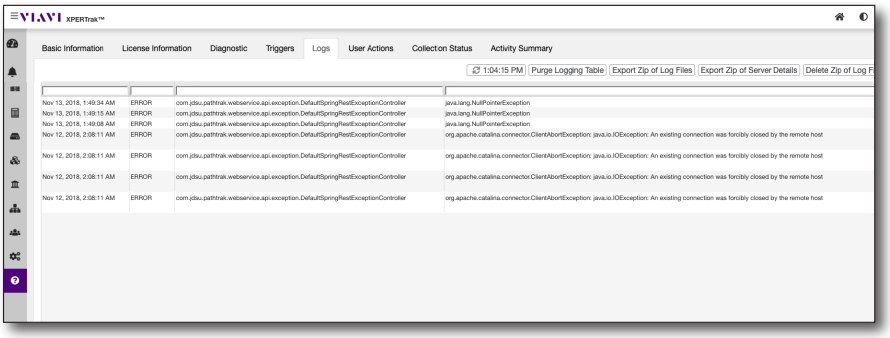
Note: We recommend this only for advanced troubleshooting.

The following are available triggers:

- **Sync All CMTSs**
- **Downstream Collection**
- **Pre-Eq Collection**
- **QoE Cable Modem Collection**
- **QoE CMTS Collection**
- **Node Ranking Collection**

Logs Tab

The **Logs** tab allows you to view server log files and export them to use for troubleshooting with VIAVI technical support.



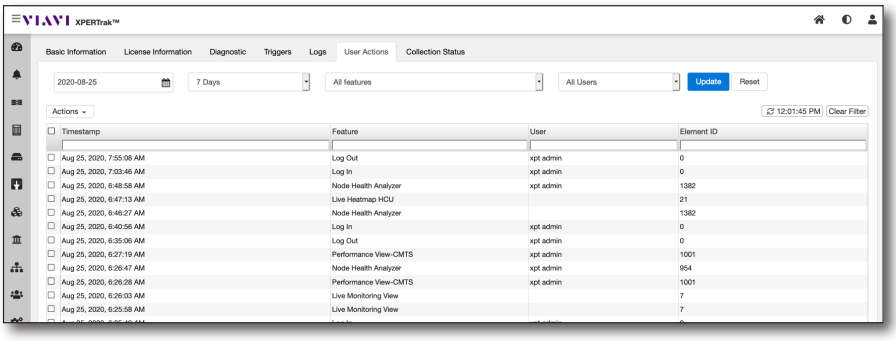
The following options are also on the right side of the screen:

- **Purge Logging Table**
- **Export Zip of Log Files**
- **Export Zip of Server Details**
- **Delete Zip of Log Files**

User Actions Tab

The **User Actions** tab allows you to view user activity on the server.

Use the calendar to filter the search from 1-7 days, features, and users.

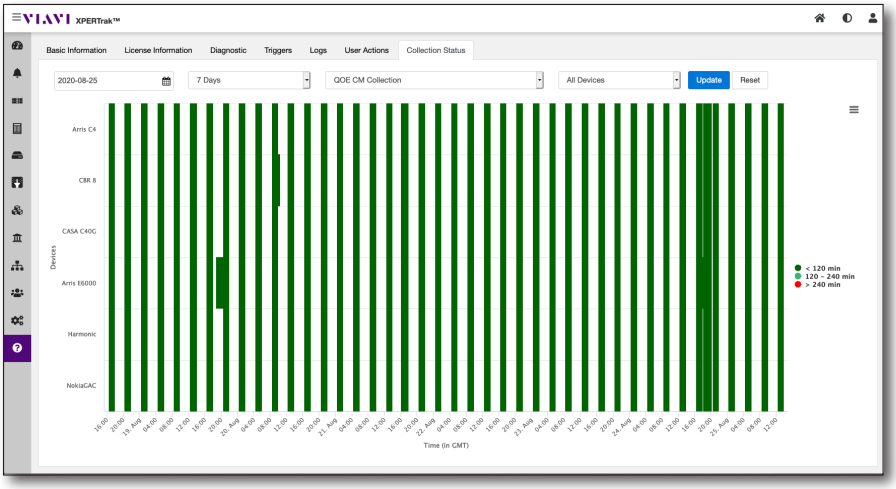


Collection Status Tab

The **Collection Status** tab allows you to view data collection status on the server.

Use the calendar to filter the search from 1-7 days, data types, and devices.

A legend on the right describes the health status.

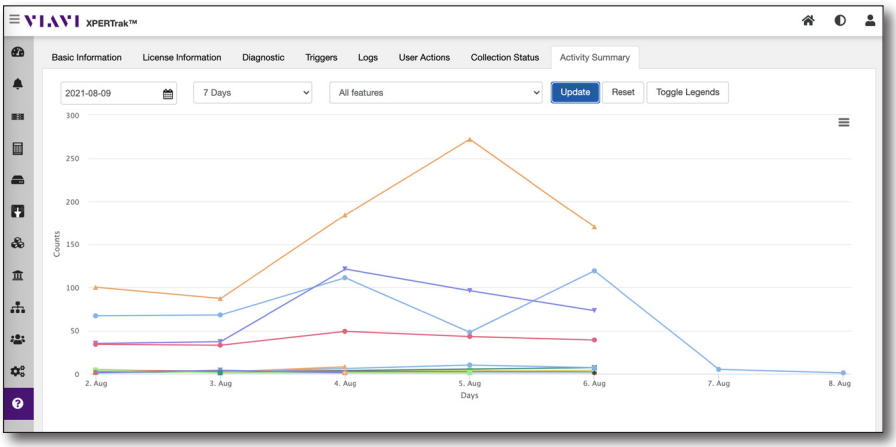


Activity Summary Tab

The **Activity Summary** tab allows you to view an activity summary on the server.

Use the calendar to filter the search from 7, 15, or 30 days and also filter the features.

A legend on the right lists the features.



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Appendix

This appendix includes supplemental information for the XPERTrak System, including the following:

- "Acronyms and Abbreviations" on page 254
- "Scoring and Measurements" on page 258
- "Modem Status" on page 259
- "Chronic Modems" on page 260
- "Downstream Impairments and Thresholds" on page 261
- "Plant Maps REST API Configuration" on page 265
- "LAW REST Leakage Data API Installation and Configuration" on page 270
- "Topology and Billing Import" on page 271
- "XPERTrak Map Overlays Configuration" on page 279
- "User Activity Log on the Server" on page 287
- "RPD to RPM Mapping" on page 288
- "Additional Information" on page 289

Acronyms and Abbreviations

The following terms are described in the CableLabs® DOCSIS 3.1 Specifications.

ACK	Acknowledge
Admin	Administrator
Atten	Attenuation
AVG	Average
BW	Bandwidth
CATV	Cable television
CCAP	Converged cable access platform
CLI	Command line interface
CM	Cable modem
CMTS	Cable modem termination system
CNR	Carrier-to-noise ratio
CRC	Cyclic redundancy check
CP	Cyclic prefix
CPD	Common path distortion
CPE	Customer premises equipment
CPU	Central processing unit
CWER	Code word error ratio
CCWE	Correctable code word error ratio
dB	Decibel
dB/div	Decibels per division
dBc	Decibels relative to carrier
dBmV	Decibel millivolt
dBµV	Decibel microvolt
DAA	Distributed access architecture
DC	Downstream channel
DOCSIS	Data-over-cable service interface specifications
DPI	Dots per inch
DS	Downstream

eTDR	Electrical time domain reflectometry
FBC	Full band capture
FEC	Forward error connection
FFT	Fast fourier transform
Ft	Feet
FTP	File transfer protocol
FM	Frequency modulation (FM radio)
GB	Giga-byte
GD	Group delay
HCU	Headend control unit
HFC	Hybrid fiber/coax system
HSM	Headend stealth modem
HTTP/S	Hypertext transfer protocol
HTTPS	Secure hypertext transfer protocol
Hz	Hertz
ID	Identification
IP	Internet protocol
IPv4	Internet protocol version 4
IPv6	Internet protocol version 6
kHz	Kilohertz
km	Kilometer
LAN	Local area network
LTE	Long term evolution
m	Meters
MAC	Media access control
Max	Maximum
MD-CM-SG	Media access control domain cable modem service group
MD-DS-SG	Media access control domain downstream service group
MD-US-SG	Media access control domain upstream service group
MER	Modulation error ratio
MHz	Megahertz
MIB	Management information base

Min	Minimum
MR	Micro-reflection
ms	Millisecond
MSO	Multiple system operator
mV	Millivolt
MTC	Main tap compression
MTR	Main tap ratio
NCP	Next codeword pointer
NMTER	Non-main tap error ratio
ns	Nanosecond
OFDM	Orthogonal frequency division multiplexing
OFDMA	Orthogonal frequency division multiplexing with multiple access
OID	Object identifier
OS	Operating system
OTU	Optical transport unit
PHY	Physical layer
PK-PK	Peak to peak
PLC	Physical link channel
PNM	Proactive network maintenance
PON	Passive optical network
PostMTE	Post-main tap energy
PostMTTER	Post-main tap to total energy ratio
PreMTTER	Pre-main tap to total energy ratio
Pre-Eq	Pre-equilizer
PSD	Power spectral density
QAM	Quadrature amplitude modulation
QoE	Quality of experience
QPSK	Quadrature phase shift keying
RAM	Random access memory
RBW	Resolution bandwidth
RCI	Remote control interface

Req'd	Required
RF	Radio frequency
RMS	Root means square
RPD	Remote phy device (node)
RPM	Return path monitor
RX	Received RF level
QAM	Single-carrier QAM
SDV	Switched digital video
SBC	Single board computer
SD	Standard deviation
SMS	Standard messaging system
SNMP	Simple network management protocol
SNMPv1	Simple network management protocol, version 1
SNMPv2	Simple network management protocol, version 2
SNMPv2c	Community-based simple network management protocol, version 2
SNMPv3	Simple network management protocol, version 3
SNR	Signal-to-noise ratio
SW	Software
SYNC	Synchronize or synchronization
TDR	Time domain reflectometer
TFTP	Trivial file transfer protocol
TP	Test point
TX	Transmitted RF level
UCD	Upstream channel descriptor
UCCWE	Un-corrrectable code word error ratio
Un-eq	Un-equalized
URL	Uniform resource locator
US	Upstream
VP or VoP	Velocity of propagation
µs	Microsecond
XPT	XPERTrak

Scoring and Measurements

We wanted to provide a few more details about how XPERTrak uses algorithms to calculate scores and measurements for the system and device dashboards.

- Each day the chronic modem list is calculated.
  - At each scan, the modems statuses are classified as impacted, stressed, offline or good.
  - A modem is chronic if it has been in an impacted state for X% of scans, every day, for Y days.
- Node ranking/status is driven by impacted/stressed/chronic subscriber counts.
  - This allows weighting on each of these categories to “tune” proactive vs. reactive.
  - Chronic modems that are critical most of the time impact the node health the most.

XPERTrak was designed to allow you complete flexibility in defining modem QoE limits to determine modem status stored for each poll.

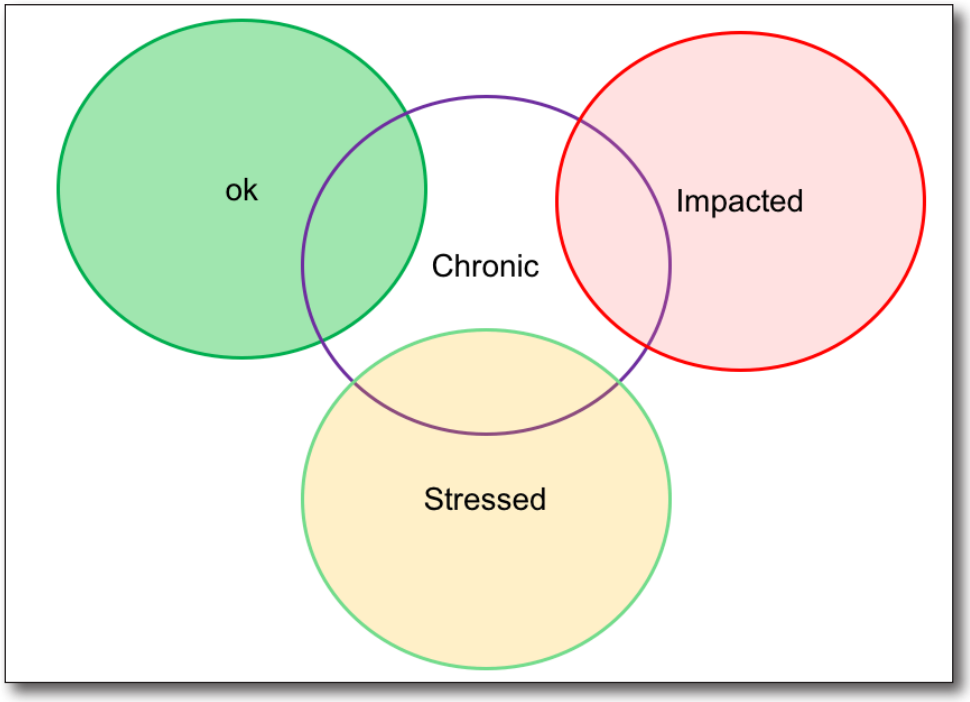
See the chart below for more detail.

Inputs	Impacted	Stressed
US UCCWER	>5%	> 2%
DS UCCWER	>5%	> 2%
T3 timeouts	> 3	> 1
T4 timeouts	> 3	>1
Range Aborts	> 3	> 1
US CCWER	> 50 %	> 5%
DS CCWER	> 50%	> 5%
US SNR	Depends on Mod	Depends on Mod
DOCSIS SNR	Depend on Mod	Depends on Mod

Modem Status

The modem status at a selected time determines the modem color in the map and is stored at every poll. A daily modem status is also stored, averaging status across the day.

Chronic state is an independent attribute from modem status, so a chronic modem can be ***any color*** for a given poll.



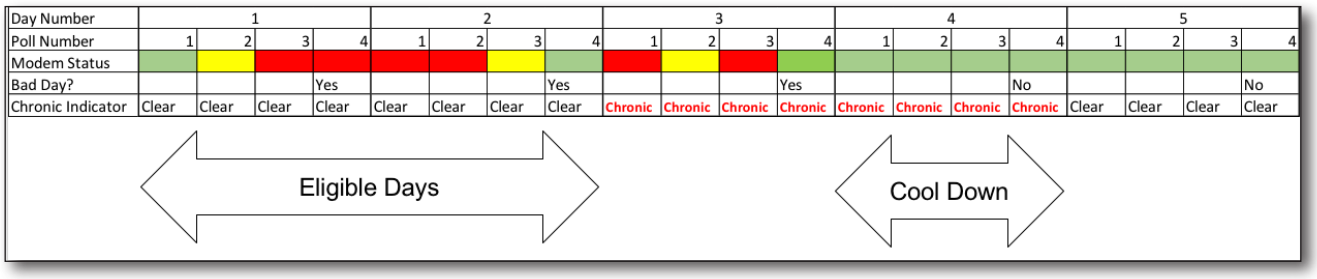
Chronic Modems

Every modem/CMTS dataset is examined to determine the modem status for each poll.

If a modem status is “impacted” more than a configured % of polls in a day, the modem has had a “bad day”.

After a configurable number of consecutive “bad days”, a modem is chronic.

If a chronic modem has a configurable number of consecutive days which are not “bad days”, the modem is taken off the chronic list.



In the above example:

- Eligible days = 2 days
- Cool down = 1 day
- Forty percent critical threshold (more than 40% of the intervals in a day must be impacted to be considered a "bad day").

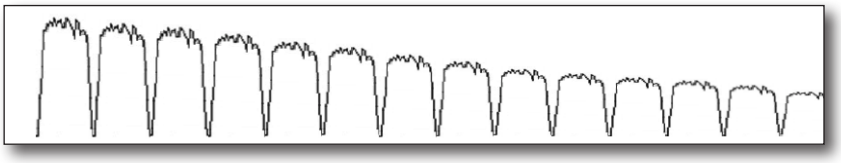
Only 8 intervals are shown per day above for illustration – a 15 minute poll will have 96 intervals/day.

Downstream Impairments and Thresholds

Spectral Low Power

Spectral Low Power impairment is detected when the total power level is below the minimum threshold. The spectral power is the sum of all the level values across the full spectrum.

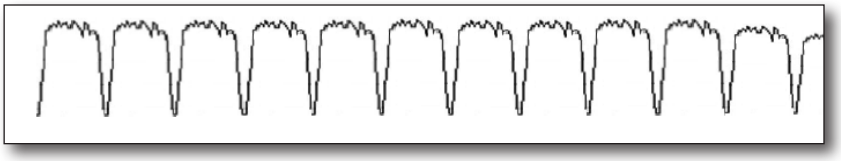
Tilt



Spectral Tilt is the overall slope of the spectrum power level. It is the absolute difference between power level values at the low and high frequency/channel across the full spectrum. When the absolute power level difference is above the minimum threshold, the system would indicate tilt impairment.

This is set in the database and not in the XPERTrak UI.

Roll Off

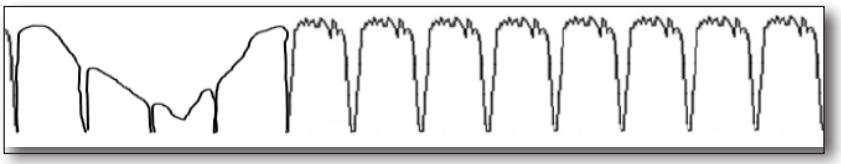


Roll Off is the right skewedness or difference between power level values of the lowest and highest frequency/channel across the specified set of roll off channels.

A roll off impairment is detected when the following conditions are satisfied:

- A minimum of 3 channels are detected
- Number of roll off channels is greater than roll off threshold
- Pre-roll off channels satisfy a specified channel flatness threshold (e.g.: channel tilt below a minimum threshold)
- A specified majority percentage of pre-roll off channels satisfies the flatness test
- Roll off power difference is below required threshold

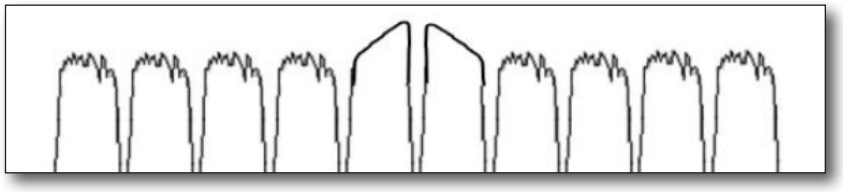
Suck Out



Suck Out is the low level drop across contiguous channel block below a specified level threshold.

One or more suck out impairments is detected when the difference between the average level and global minimum level inside a contiguous channel block exceeds the minimum suck out level drop threshold.

Resonant Peak

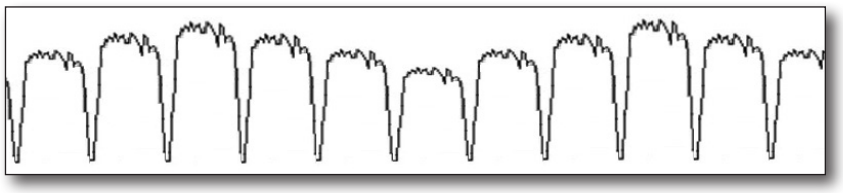


Resonant Peak is detected when a level at specific frequencies exceeds the nominal conditions.

The impairment is detected when the following conditions are satisfied for one or more channels:

- Channels are non-adjacent
- The difference between the minimum level right and left of maximum channel level is below threshold
- The difference of the maximum peak level and average of before/after levels is greater than the minimum peak rise threshold

Ripple (standing wave)



Ripple/ Standing Wave is detected when there are peaks not consistent with the periodic channel boundaries.

The impairment is detected when the following conditions occur:

- When the required decreasing harmonic threshold is true and max level exceeds the global max level. Or at least one of maximum harmonic level exceeds the minimum non-harmonic level
- Percentage of first harmonic exceeds the threshold

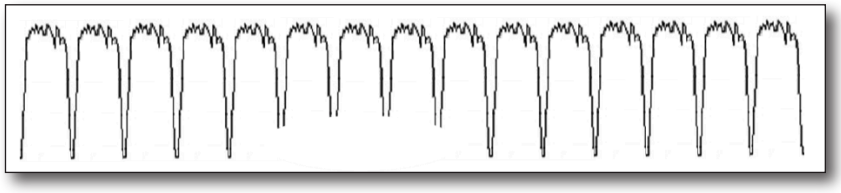
FM Ingress

Useful only when FM are not broadcasted in the HFC network.

FM Ingress is detected when all the following conditions are satisfied within a given frequency band:

- The power per Hertz is above the threshold
- Required channel level is increase by channel level offset threshold
- Peak level is above the peak level threshold

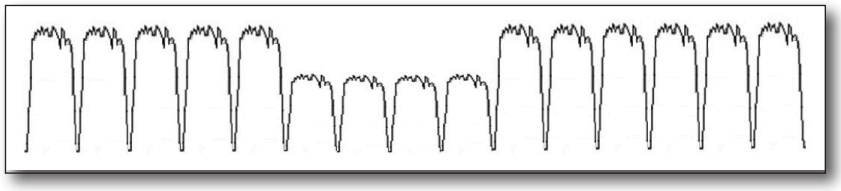
LTE Ingress



LTE Ingress is detected when all the following conditions are satisfied within a given frequency band:

- The power per Hertz is above the threshold
- Required channel level is increased by channel level offset threshold
- Peak level is above the peak level threshold

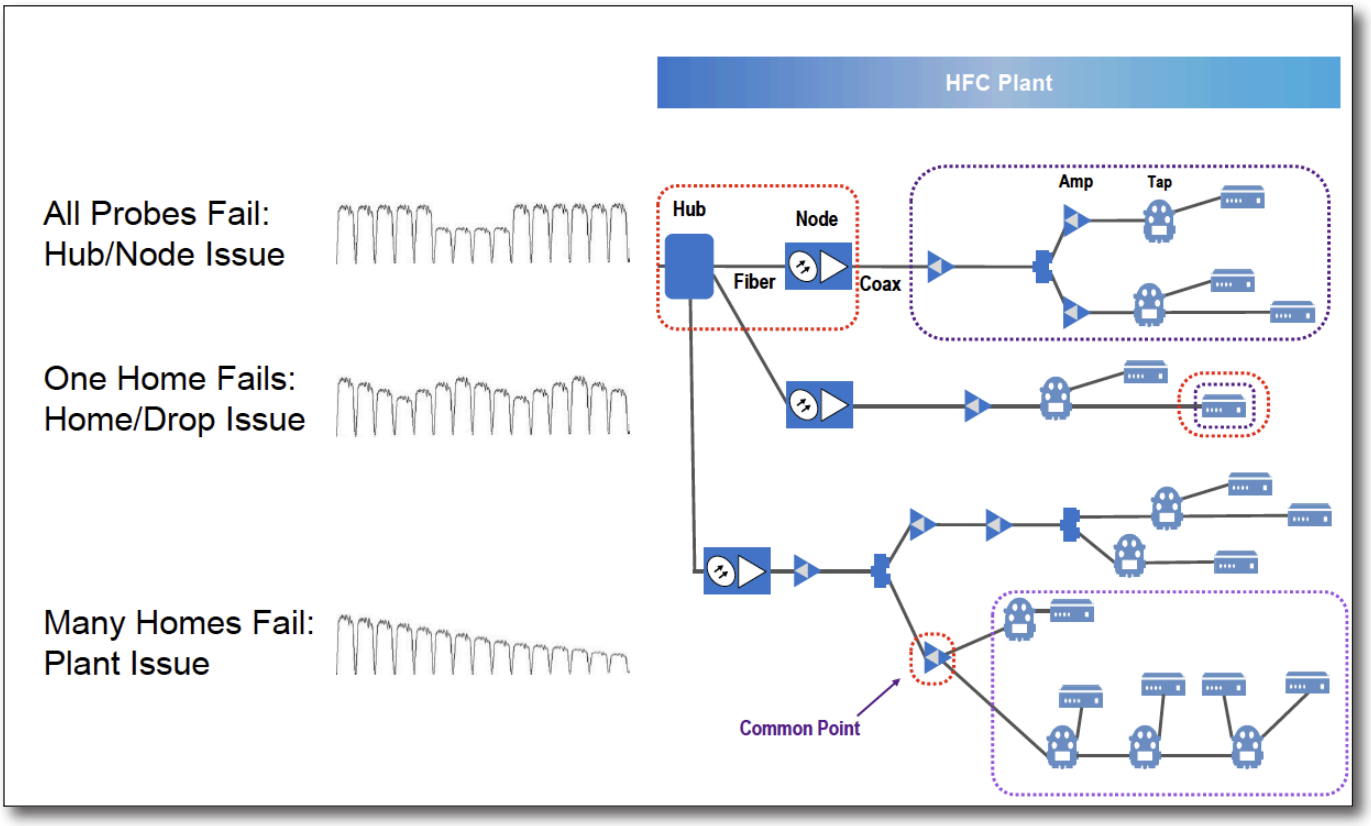
Adjacency



Adjacency is the relative power difference between two adjacent channels.

One or more adjacent impairments is detected when the following conditions are satisfied:

- A minimum of 6 channels is required to test channels
- Adjacent channels satisfy the flatness threshold (e.g.: tilt is less than mostly flat channel threshold or power exceeds a set value)
- Majority or percent of test channels are flat
- Power difference between the adjacent channels exceeds the specified threshold



Headend/Hub, Plant, Home/Drop Segmentation

Plant Maps REST API Configuration

When XPERTrak draws a map for PNM or Downstream Monitoring, it can make a REST API call to a GIS system to retrieve a plant map overlay that will match the geo-spatial dimensions of the XPERTrak map, regardless of the size of the map. The requested overlay image needs to be in .***png format*** with a ***transparent*** background.

To allow XPERTrak to work with a variety of GIS systems the structure of the API call can be customized.

Details of the API call

The API call must include the following information:

- GIS system host name or IP address
- Path to the GIS data
- Pixel height of the returned image = {imgHeight}
- Pixel width of the returned image = {imgWidth}
- West longitude value of the displayed map (WGS84 coordinate system) = {west}
- East longitude value of the displayed map (WGS84 coordinate system) = {east}
- South latitude value of the displayed map (WGS84 coordinate system) = {south}
- North latitude value of the displayed map (WGS84 coordinate system) = {north}
- Which layers are displayed (layers can add different elements or even utilities to the map)
- The image file format
- The image resolution in DPI (dots per inch)
- The API call response format (image or webpage)

URL for the API call

The XPERTrak system administrator must define a template URL that includes both static components that will be the same every time the API call is made as well as the dynamic components that the XPERTrak system will calculate and replace with proper numerical values based on where the map is and what size it will be on the user's screen.

Building the template URL

The first part of the URL is the static info that points to the GIS server and data path. Once set, this should probably never need to change. An example would be:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export?

- **http://10.128.36.49:6080** = GIS server address
- **/arcgis/rest/services/G1/G1PlantMapping/MapServer/export?** = Path to GIS data

Next comes what is known as the Bounding Box, or bbox. The bounding box defines the exact area of the map. This is a dynamic component as it will change to match the XPERTrak map location and size. Since the map is ever changing, the exact geo-coordinates that set the bounding box are determined by what is displayed on the map in use by the given XPERTrak user. The URL must include which boundaries to calculate for the API call. The template URL would look like this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export?bbox={west},{south},{east},{north}

- **bbox={west},{south},{east},{north}** = Sets the Bounding Box as a rectangle using the west, south, east, and north geo-coordinates using the XPERTrak map as a reference

Again there is no need to put actual geo-coordinates into the bbox parameters as the XPERTrak system will determine them based on the system map.

Next are the layers. This is a setting based on the GIS system and just how much data is necessary to add to the plant map overlay. If no layer numbers are included, all available layers will be added. This may be the best way to start. From there unneeded data can be backed out and only the layer numbers that contain data relevant to the HFC plant can be included. These are static components so once they are figured out there should not be a need to change them. If we determine that layers 3,4,5,6,7,8, and 9 are required to give us the necessary data, the URL would contain this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9

- **&layers=3,4,5,6,7,8,9** = Layers required to show all necessary data on plant map image

The next addition to the URL template is the size of the image. Like the Bounding Box, the size of the image is dynamic. It's going to change based on the device being used to view it as well as the resolution it's being displayed in. Since these are dynamic there is no need to include specific pixel sizes for the width & height of the image. The XPERTrak system will determine those values and add them to the API call. Adding the image width and height parameters to the URL template looks like this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9&size={imgWidth},{imgHeight}

- **&size={imgWidth},{imgHeight}** = Sets the image width and height using the XPERTrak map as a reference

The next 3 components of the URL template deal with the format of the image to be overlaid on the XPERTrak map. These are static and once set should not change. The API call must include the image format itself (Currently only .png is supported by XPERTrak), the format of the image background (Transparent), and the resolution of the image (96 DPI). Adding these on to the URL template gives us this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9&size={imgWidth},{imgHeight}&format=png&transparent=true&dpi=96

- **&format=png** = Sets the image type as .png
- **&transparent=true** = Sets the image background to be transparent
- **&dpi=96** = Sets the images resolution to 96 DPI

The final component in the API call is the format of the data being returned that for XPERTrak must be an image. That makes the final URL template for the API call look like this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9&size={imgWidth},{imgHeight}&format=png&transparent=true&dpi=96&f=image

- **&f=image** = Tells the API call to return an image file

Without the colors the URL template would look something like this:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9&size={imgWidth},{imgHeight}&format=png&transparent=true&dpi=96&f=image

This URL would be entered into the XPERTrak system settings by clicking on the "Configuration" icon (The gear) in the upper right of the QoE Dashboard landing page and selecting "Settings". From the pull-down menu in the General Setting table (The 1st one) select "Plant Map Overlay: Path, Default:" then enter or paste the URL template into "Value" field on the right side and click the "Update" button. The value field will turn green if the URL was accepted.

The above URL may look like this after it is dynamically created by GIS system using the API call:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export?bbox=-86.10301042756652,39.67936778880516,-86.03250051698302,39.71116731020368&layers=3,4,5,6,7,8,9&size=1643,963&format=png&transparent=true&dpi=96&f=image

The values in red were calculated by the XPERTrak system using the map on screen and added to the URL for the API call.

How it works

When XPERTrak displays a map, the software calculates the size of the image and the GPS coordinates of the displayed map, and replaces the variables with the actual values of the displayed map. Using the newly constructed URL the browser sends a "get" request to the GIS server. The GIS server looks up the plant map content in the requested area and creates a transparent image file of the plant map in that area. The file is then returned to the browser and overlaid on the displayed map.

Dynamic fields

- Bounding box (bbox={west},{south},{east},{north} defines the exact location and area of the map
- Size (size={imgWidth},{imgHeight} defines the returned image size

Static fields

- GIS server hostname or IP and port
- Path to the proper data (/arcgis/rest/services/G1/G1PlantMapping/MapServer/)
- Layers (layers=3,4,5,6,7,8,9) controls what plant map layers to include
- Image format (format=png&transparent=true)
- Dpi (dpi=96)
- Response format (f=image)
- *Spatial reference (ImageSR=SAD69) This value can be used to map to a different special reference

*XPERTrak uses Google mapping technology. Google Maps uses the World Geodetic System and the latest revision of the standard, WGS84, for establishing latitude and longitude coordinates for a location. However, not all GIS systems have fully migrated to this revision of the standard at this moment. It is possible to use GIS data that is based on a different or older spatial reference. To use a spatial reference standard other than WGS84, that reference identifier must be added to the URL template used to make the API call to the GIS server. As shown above simply add &ImageSR= along with the number for the spatial reference in use to the end of the URL. Example:

http://10.128.36.49:6080/arcgis/rest/services/G1/G1PlantMapping/MapServer/export? bbox={west},{south},{east},{north}&layers=3,4,5,6,7,8,9&size={imgWidth},{imgHeight}&format=png&transparent=true&dpi=96&f=image&ImageSR=SAD69

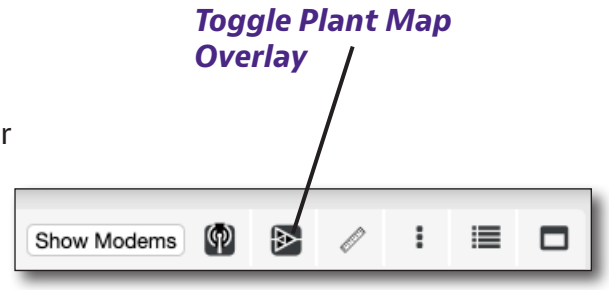
- **&ImageSR=SAD69** = In this case the API would be calling for the South American Datum from 1969 standard

More details on WGS84 and many other geo-reference standards available here: https://en.wikipedia.org/wiki/World_Geodetic_System

More details on ArchGIS parameters can be found at: http://resources.arcgis.com/en/help/rest/apiref/index.html?exportimage.html

Using Plant Maps

Once you have your plant maps configured through the API, you can toggle the plant map overlay by selecting **Toggle Plant Map Overlay** in the upper right of the PNM, QoE, or DS Monitoring views.



NOTE:

Plant map overlays are not enabled by default. You'll need to enable them in the Configuration settings.

See "XPERTrak Map Overlays Configuration" on page 279.

LAW REST Leakage Data API Installation and Configuration

This section provides the steps to install the LAW REST API and configure both XPERTrak and the API to pull leakage data into XPERTrak from a LAW database.

LAW REST API Installation

The API is intended to be installed on the PC where the LAW server application resides.

> ***NOTE:***
>
> ***This API and XPERTrak require Windows Server 2016 R2 or later.***
>
> ***LAW servers that are currently running on a Windows Server OS older than 2016 R2 will need to be upgraded prior to integrating with XPERTrak.***

1. Contact VIAVI Technical Support for the latest LAW REST API file.
2. Place the **LAWRestApiSetup.exe** file on the LAW Server and run the setup.
   - If the SQL database is installed locally on the LAW Server, there are no configuration changes needed on the LAW server.
   - If the SQL database is installed externally, the LAW Server will need to be reconfigured by manually editing the configuration file after installation.

   Find the installation folder at *C:\Program Files (x86)\VIAVI Solutions\Leakage REST API\lawapi* and edit the JSON file **appSettings.config** to the following:

   Change the connection strings in the “ConnectionString” and “MultiTenantConnectionStringTemplate” keys for the server value from “(local)” to the IP address or DNS name of the SQL Server host. You may also need to change the “user id” and “password” values, if an alternate login was used.
3. After the installation is complete, it can be tested by opening a browser and navigating to **http://<name_or_ip_address/lawapi/ping**.

You should receive a JSON result of: {“status”:”The API is running.”}

Topology and Billing Import

This section provides the steps to configure and import your plant topology and billing information into XPERTrak to present advanced mapping and field data.

The new Street Alarms feature and Topology View in XPERTrak 4.0 require a significant change in the data that is imported into the XPERTrak database that defines the details of each modem, and with the new capabilities, each tap and amp in the system.

It is important to note that Street Alarms and Topology View are licensed features, and if your system has not been licensed for them, there is no change required in the data required for PNM and QoE to work.

With all of the new data fields available for import for the Topology View, we are also going to begin recommending that the newly named "topology-import-api" become the primary method of importing all modem/node/topology data. Of course, the old inbox-mode folder and manual CSV import will still be there, but the API simplifies things. The API allows for both importing files in JSON format or the familiar CSV format.

What new data is required/available for Street Alarms/Topology View?

Street Alarms and Topology View require a hierarchy of the devices on each leg of a node. Think of it as plant map flow chart—a way to associate every device in the plant to its "parent" device. A very simple example would be: "These modems are connected to this tap, which is connected to this amplifier, which is connected to this node." To make that happen, the following ***new data*** is required in addition to the billing data imported in the past.

Element Type – Topology Element Type - NODE, NODE_PORT, AMP, AMP_PORT, SPLITTER, TAP or MODEM. Default will be Modem if not specified. Can be left at 0 if using Billing Import, if using topology import then this action will be needed.

Name – Name of element. If using old billing import, then this is the modem MAC. If topology is imported, then it will be the name of the element.

Parent Name – Used to build the topology hierarchy.

Make – Make/manufacturer of element hardware. (Optional)

Model – Model of the element hardware. (Optional)

Power Supply – Power supply info (Optional)

CustomerID – Customer ID#. Saved only for modems. (Optional)

NOTE:

This API and XPERTrak require Windows Server 2016 R2 or later.

Customer Name – Customer name. Saved only for modems. (Optional)

Phone Number – Customer/account phone number. Saved only for modems. (Optional)

Service Tier – Account service info. Saved only for modems. (Optional)

Custom Field 1 – Customer defined info. Saved only for modems. (Optional)

Custom Field 2 – Customer defined info. Saved only for modems. (Optional)

Custom Field 3 – Customer defined info. Saved only for modems. (Optional)

Custom Field 4 – Customer defined info. Saved only for modems. (Optional)

Custom Field 5 – Customer defined info. Saved only for modems. (Optional)

Custom Field 6 – Customer defined info. Saved only for modems. (Optional)

There is one data field that must be imported for both billing data only and billing data + Street Alarms/Topology View.

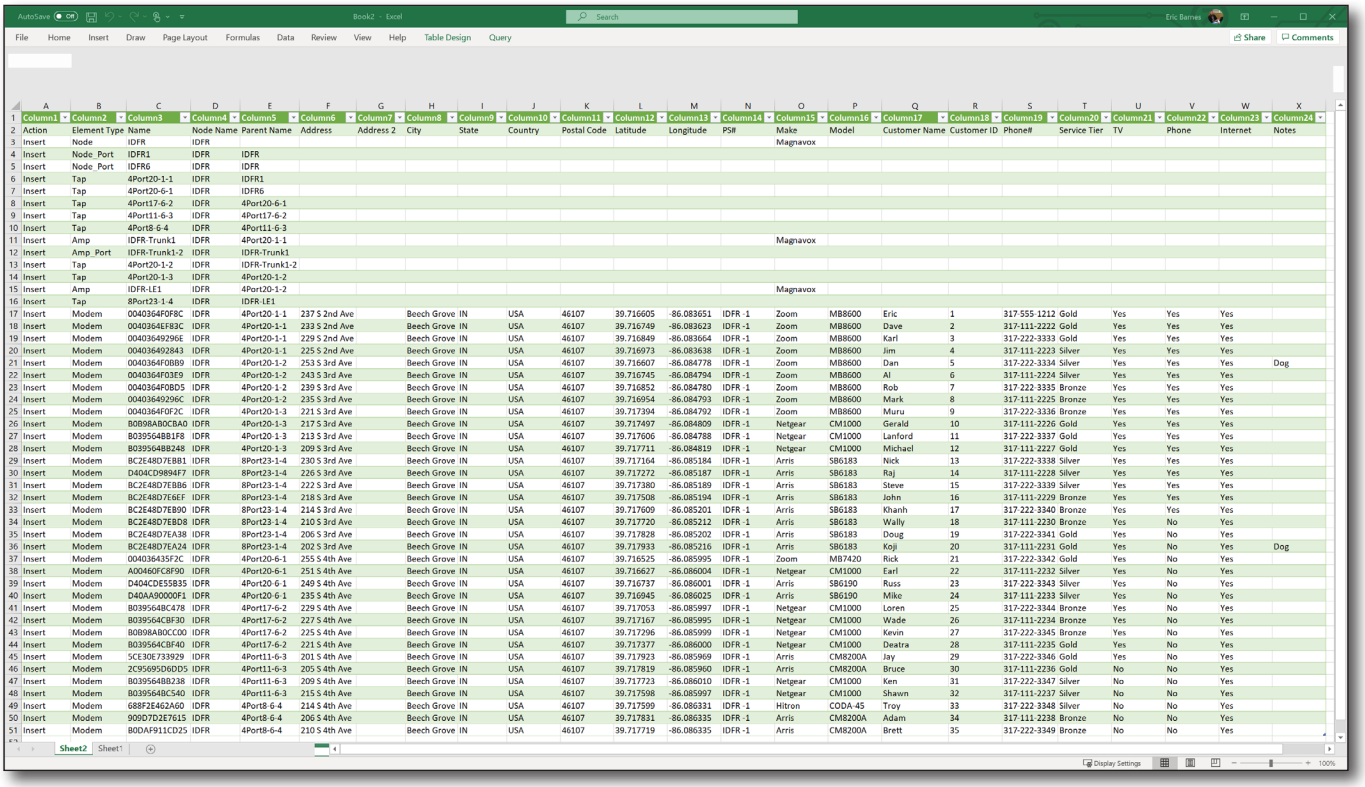
Node Name – Fiber Node Name. Must be included regardless.

The screen shot below shows how the new data is arranged for the hierarchical relationship of the network elements. The Action column tells the system to insert or delete the element. (The 6 custom fields have been omitted, but would be columns 15-20).

Column1	Column2	Column3	Column4	Column5	Column8	Column9	Column10	Column11	Column12	Column13	Column14
Action	Element Type	Name	Node Name	Parent name	Make	Model	Power Supply	Customer Name	Phone	Service Tier	Customer ID
Insert	Node	Node1	Node1		Magnavox	MG100	PS101				
Insert	Node_Port	Node1-1	Node1	Node1							
Insert	Amp	Amp1	Node1	Node1-1	C-Cor						
Insert	Amp_Port	Amp1-1	Node1	Amp1							
Insert	Splitter	Splitter1	Node1	Amp1-1							
Insert	Tap	Tap1	Node1	Splitter1							
Insert	Modem	12:34:56:78:9A:BC	Node1	Tap1				John Smith	1 317 555 1212	Gold	1234

The import data for Street Alarms/Topology View can be uploaded as a separate CSV file from the normal billing data required in all XPERTrak versions prior to V4.0, or you can create a new combined CSV file and upload everything at once.

Here is the complete file for the IDFR node in the VIAVI lab.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	Column18	Column19	Column20	Column21	Column22	Column23	Column24
2	Action	Element Type	Name	Node Name	Parent Name	Address	Address 2	City	State	Country	Postal Code	Latitude	Longitude	PS#	Make	Model	Customer Name	Customer ID	Phone#	Service Tier	TV	Phone	Internet	Notes
3	Insert	Node	IDFR	IDFR											Magnavox									
4	Insert	Node_Port	IDFR1	IDFR	IDFR																			
5	Insert	Node_Port	IDFR6	IDFR	IDFR																			
6	Insert	Tap	4Port20-1-1	IDFR	IDFR1																			
7	Insert	Tap	4Port20-6-1	IDFR	IDFR6																			
8	Insert	Tap	4Port17-6-2	IDFR	4Port20-6-1																			
9	Insert	Tap	4Port11-6-3	IDFR	4Port17-6-2																			
10	Insert	Tap	4Port8-6-4	IDFR	4Port11-6-3																			
11	Insert	Amp	IDFR-Trunk1	IDFR	4Port20-1-1										Magnavox									
12	Insert	Amp_Port	IDFR-Trunk1-2	IDFR	IDFR-Trunk1																			
13	Insert	Tap	4Port20-1-2	IDFR	IDFR-Trunk1-2																			
14	Insert	Tap	4Port20-1-3	IDFR	4Port20-1-2																			
15	Insert	Amp	IDFR-LE1	IDFR	4Port20-1-2										Magnavox									
16	Insert	Tap	8Port23-1-4	IDFR	IDFR-LE1																			
17	Insert	Modem	0040364F0F8C	IDFR	4Port20-1-1	237 S 2nd Ave		Beech Grove	IN	USA	46107	39.716605	-86.083651	IDFR -1	Zoom	MB8600	Eric	1	317-555-1212	Gold	Yes	Yes	Yes	
18	Insert	Modem	00403664F83C	IDFR	4Port20-1-1	233 S 2nd Ave		Beech Grove	IN	USA	46107	39.716749	-86.083623	IDFR -1	Zoom	MB8600	Dave	2	317-111-2222	Gold	Yes	Yes	Yes	
19	Insert	Modem	004036492966	IDFR	4Port20-1-1	229 S 2nd Ave		Beech Grove	IN	USA	46107	39.716849	-86.083664	IDFR -1	Zoom	MB8600	Karl	3	317-222-3333	Gold	Yes	Yes	Yes	
20	Insert	Modem	004036492843	IDFR	4Port20-1-1	225 S 2nd Ave		Beech Grove	IN	USA	46107	39.716973	-86.083638	IDFR -1	Zoom	MB8600	Jim	4	317-111-2223	Silver	Yes	Yes	Yes	
21	Insert	Modem	0040364F0BB9	IDFR	4Port20-1-2	253 S 3rd Ave		Beech Grove	IN	USA	46107	39.716607	-86.084778	IDFR -1	Zoom	MB8600	Dan	5	317-222-3334	Silver	Yes	Yes	Yes	Dog
22	Insert	Modem	0040364F03E9	IDFR	4Port20-1-2	243 S 3rd Ave		Beech Grove	IN	USA	46107	39.716745	-86.084794	IDFR -1	Zoom	MB8600	Al	6	317-111-2224	Silver	Yes	Yes	Yes	
23	Insert	Modem	0040364F0BD5	IDFR	4Port20-1-2	239 S 3rd Ave		Beech Grove	IN	USA	46107	39.716852	-86.084780	IDFR -1	Zoom	MB8600	Rob	7	317-222-3335	Bronze	Yes	Yes	Yes	
24	Insert	Modem	004036492960	IDFR	4Port20-1-2	235 S 3rd Ave		Beech Grove	IN	USA	46107	39.716954	-86.084793	IDFR -1	Zoom	MB8600	Mark	8	317-111-2225	Bronze	Yes	Yes	Yes	
25	Insert	Modem	0040364F0F2C	IDFR	4Port20-1-3	221 S 3rd Ave		Beech Grove	IN	USA	46107	39.717394	-86.084792	IDFR -1	Zoom	MB8600	Muru	9	317-222-3336	Bronze	Yes	Yes	Yes	
26	Insert	Modem	B0B98AB0CBA0	IDFR	4Port20-1-3	217 S 3rd Ave		Beech Grove	IN	USA	46107	39.717497	-86.084809	IDFR -1	Netgear	CM1000	Gerald	10	317-111-2226	Gold	Yes	Yes	Yes	
27	Insert	Modem	B039564BB1F8	IDFR	4Port20-1-3	213 S 3rd Ave		Beech Grove	IN	USA	46107	39.717606	-86.084788	IDFR -1	Netgear	CM1000	Lanford	11	317-222-3337	Gold	Yes	Yes	Yes	
28	Insert	Modem	B039564BB248	IDFR	4Port20-1-3	209 S 3rd Ave		Beech Grove	IN	USA	46107	39.717711	-86.084819	IDFR -1	Netgear	CM1000	Michael	12	317-111-2227	Gold	Yes	Yes	Yes	
29	Insert	Modem	BC2E48D7EBB1	IDFR	8Port23-1-4	230 S 3rd Ave		Beech Grove	IN	USA	46107	39.717164	-86.085184	IDFR -1	Arris	SB6183	Nick	13	317-222-3338	Silver	Yes	Yes	Yes	
30	Insert	Modem	D404CD9894F7	IDFR	8Port23-1-4	226 S 3rd Ave		Beech Grove	IN	USA	46107	39.717272	-86.085187	IDFR -1	Arris	SB6183	Raj	14	317-111-2228	Silver	Yes	Yes	Yes	
31	Insert	Modem	BC2E48D7EBB6	IDFR	8Port23-1-4	222 S 3rd Ave		Beech Grove	IN	USA	46107	39.717380	-86.085189	IDFR -1	Arris	SB6183	Steve	15	317-222-3339	Silver	Yes	Yes	Yes	
32	Insert	Modem	BC2E48D7E6EF	IDFR	8Port23-1-4	218 S 3rd Ave		Beech Grove	IN	USA	46107	39.717508	-86.085194	IDFR -1	Arris	SB6183	John	16	317-111-2229	Bronze	Yes	Yes	Yes	
33	Insert	Modem	BC2E48D7EB90	IDFR	8Port23-1-4	214 S 3rd Ave		Beech Grove	IN	USA	46107	39.717609	-86.085201	IDFR -1	Arris	SB6183	Khanh	17	317-222-3340	Bronze	Yes	Yes	Yes	
34	Insert	Modem	BC2E48D7EBD8	IDFR	8Port23-1-4	210 S 3rd Ave		Beech Grove	IN	USA	46107	39.717720	-86.085212	IDFR -1	Arris	SB6183	Wally	18	317-111-2230	Bronze	Yes	No	Yes	
35	Insert	Modem	BC2E48D7EA38	IDFR	8Port23-1-4	206 S 3rd Ave		Beech Grove	IN	USA	46107	39.717828	-86.085202	IDFR -1	Arris	SB6183	Doug	19	317-222-3341	Gold	Yes	No	Yes	
36	Insert	Modem	BC2E48D7EA24	IDFR	8Port23-1-4	202 S 3rd Ave		Beech Grove	IN	USA	46107	39.717933	-86.085216	IDFR -1	Arris	SB6183	Koji	20	317-111-2231	Gold	Yes	No	Yes	Dog
37	Insert	Modem	004036435F2C	IDFR	4Port20-6-1	255 S 4th Ave		Beech Grove	IN	USA	46107	39.716525	-86.085995	IDFR -1	Zoom	MB7420	Rick	21	317-222-3342	Gold	Yes	No	Yes	
38	Insert	Modem	A00460FC8F90	IDFR	4Port20-6-1	251 S 4th Ave		Beech Grove	IN	USA	46107	39.716627	-86.086004	IDFR -1	Netgear	CM1000	Earl	22	317-111-2232	Silver	Yes	No	Yes	
39	Insert	Modem	D404CDE55B35	IDFR	4Port20-6-1	249 S 4th Ave		Beech Grove	IN	USA	46107	39.716737	-86.086001	IDFR -1	Arris	SB6190	Russ	23	317-222-3343	Silver	Yes	No	Yes	
40	Insert	Modem	D40AA90000F1	IDFR	4Port20-6-1	235 S 4th Ave		Beech Grove	IN	USA	46107	39.716945	-86.086025	IDFR -1	Arris	SB6190	Mike	24	317-111-2233	Silver	Yes	No	Yes	
41	Insert	Modem	B039564BC478	IDFR	4Port17-6-2	229 S 4th Ave		Beech Grove	IN	USA	46107	39.717053	-86.085997	IDFR -1	Netgear	CM1000	Loren	25	317-222-3344	Bronze	Yes	No	Yes	
42	Insert	Modem	B039564CBF3D	IDFR	4Port17-6-2	227 S 4th Ave		Beech Grove	IN	USA	46107	39.717167	-86.085995	IDFR -1	Netgear	CM1000	Wade	26	317-111-2234	Bronze	Yes	No	Yes	
43	Insert	Modem	B0B98AB0CC00	IDFR	4Port17-6-2	225 S 4th Ave		Beech Grove	IN	USA	46107	39.717296	-86.085999	IDFR -1	Netgear	CM1000	Kevin	27	317-222-3345	Bronze	Yes	No	Yes	
44	Insert	Modem	B039564CBF40	IDFR	4Port17-6-2	221 S 4th Ave		Beech Grove	IN	USA	46107	39.717377	-86.086000	IDFR -1	Netgear	CM1000	Deatra	28	317-111-2235	Gold	Yes	No	Yes	
45	Insert	Modem	5CE30E733929	IDFR	4Port11-6-3	201 S 4th Ave		Beech Grove	IN	USA	46107	39.717923	-86.085969	IDFR -1	Arris	CM8200A	Jay	29	317-222-3346	Gold	Yes	No	Yes	
46	Insert	Modem	2C95695D6DD5	IDFR	4Port11-6-3	205 S 4th Ave		Beech Grove	IN	USA	46107	39.717819	-86.085960	IDFR -1	Arris	CM8200A	Bruce	30	317-111-2236	Gold	No	No	Yes	
47	Insert	Modem	B039564BB238	IDFR	4Port11-6-3	209 S 4th Ave		Beech Grove	IN	USA	46107	39.717723	-86.086010	IDFR -1	Netgear	CM1000	Ken	31	317-222-3347	Silver	No	No	Yes	
48	Insert	Modem	B039564BC540	IDFR	4Port11-6-3	215 S 4th Ave		Beech Grove	IN	USA	46107	39.717598	-86.085997	IDFR -1	Netgear	CM1000	Shawn	32	317-111-2237	Silver	No	No	Yes	
49	Insert	Modem	688F2E462A60	IDFR	4Port8-6-4	214 S 4th Ave		Beech Grove	IN	USA	46107	39.717599	-86.086331	IDFR -1	Hitron	CODA-45	Troy	33	317-222-3348	Silver	No	No	Yes	
50	Insert	Modem	909D7D2E7615	IDFR	4Port8-6-4	206 S 4th Ave		Beech Grove	IN	USA	46107	39.717831	-86.086335	IDFR -1	Arris	CM8200A	Adam	34	317-111-2238	Bronze	No	No	Yes	
51	Insert	Modem	B0DAF911CD25	IDFR	4Port8-6-4	210 S 4th Ave		Beech Grove	IN	USA	46107	39.717719	-86.086335	IDFR -1	Arris	CM8200A	Brett	35	317-222-3349	Bronze	No	No	Yes	

As you can see, **Address**, **Address 2**, **City**, **State**, **Country**, **Post Code**, **Latitude**, and **Longitude**, all from the CSV file used for XPERTrak V1.0 through V3.1 are included.

Reminder: If latitude and longitude are not used, a Geo-coding license is required to get the location of the modems to show up properly on the map.

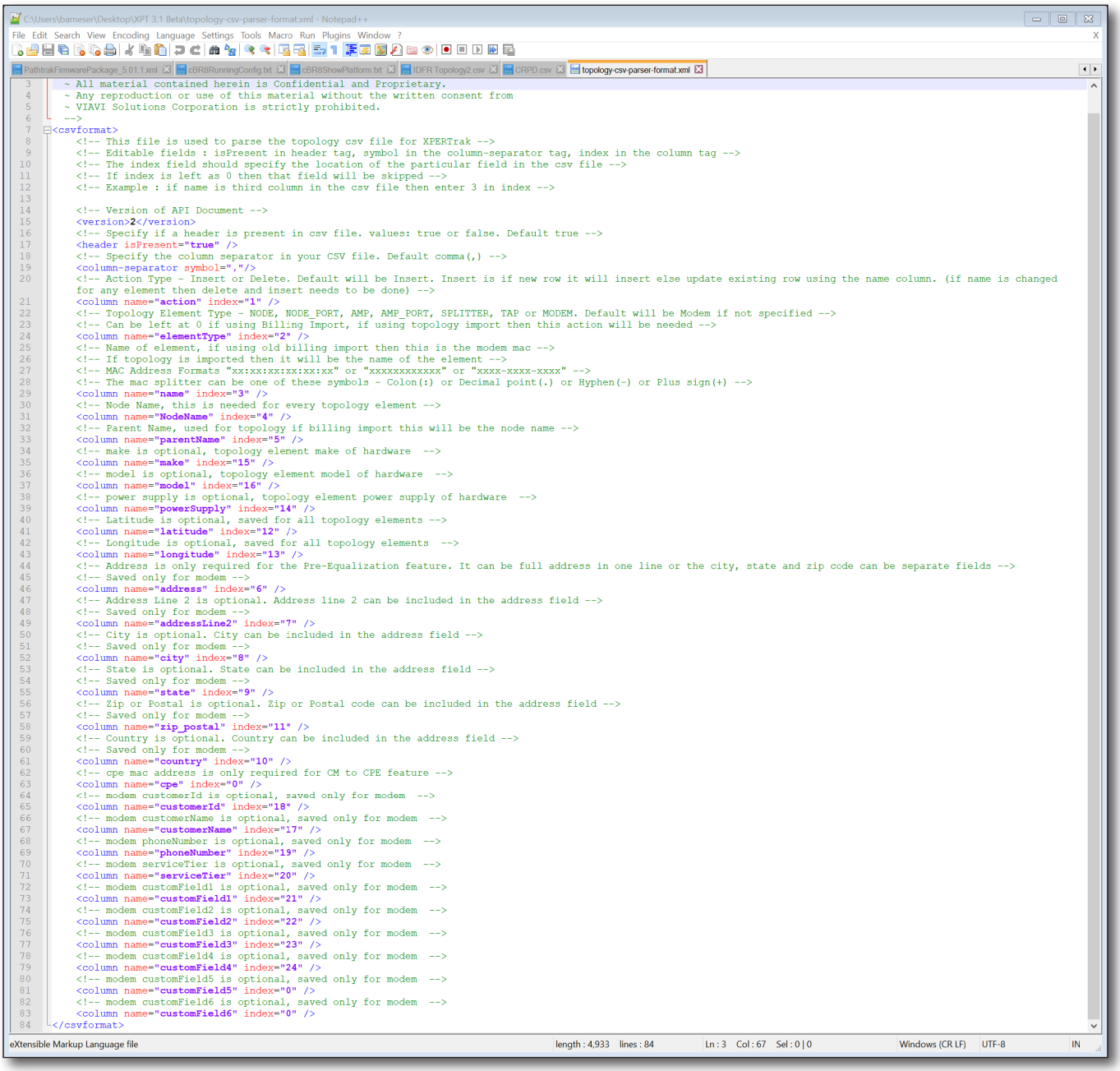
When saving the file after editing using Microsoft Excel, make sure to delete the first row and save as a MS-DOS CSV file.

Setting the topology import parser file in XPERTrak 4.0

No matter what import method you are using, the manual CSV import from the CMTS admin page or the CSV import API, you should configure the CSV parser config file to tell the XPERTrak server which data is in what column number in your file. This presumes that whatever is creating the topology import file, be it manual or automatic, will give the same output every time.

The file to edit is ***\Program Files\VIAVI Solutions\XPERTrak 4.0\cfg\topology-csv-parser-format.xml***.

The file can be edited with any text editor. The file will allow you to set the column number for all imported data. Below is the file used in the VIAVI lab.



The file contains instructions and descriptions for each field. The column for the data is specified by setting the "index number of that data parameter to match the column in the CSV file.

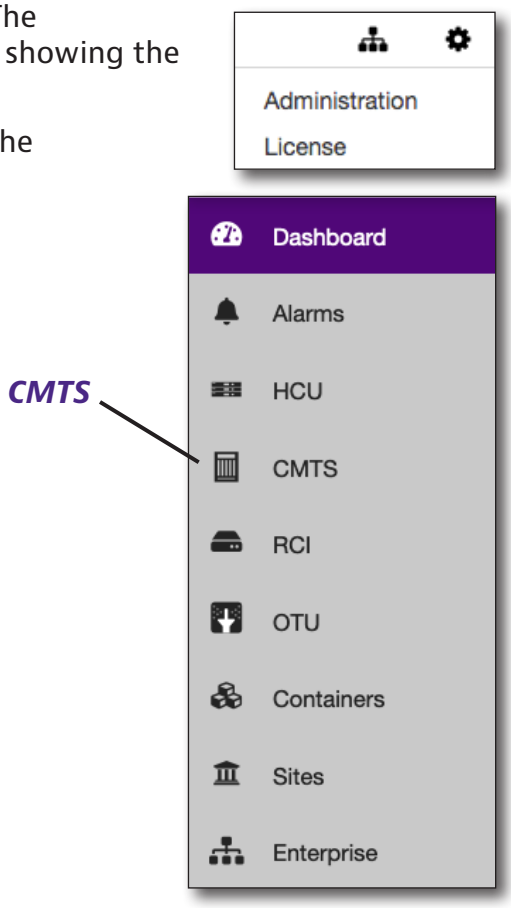
Importing the CSV file

There are several ways to import a topology/billing data CSV file. All are simplified drastically by properly configuring the ***topology-csv-parser-format.xml*** file and ensuring the CSV file itself always has the data in the same columns. The process can be automated or done manually. If you chose to do it manually, you must be a system administrator to perform the import.

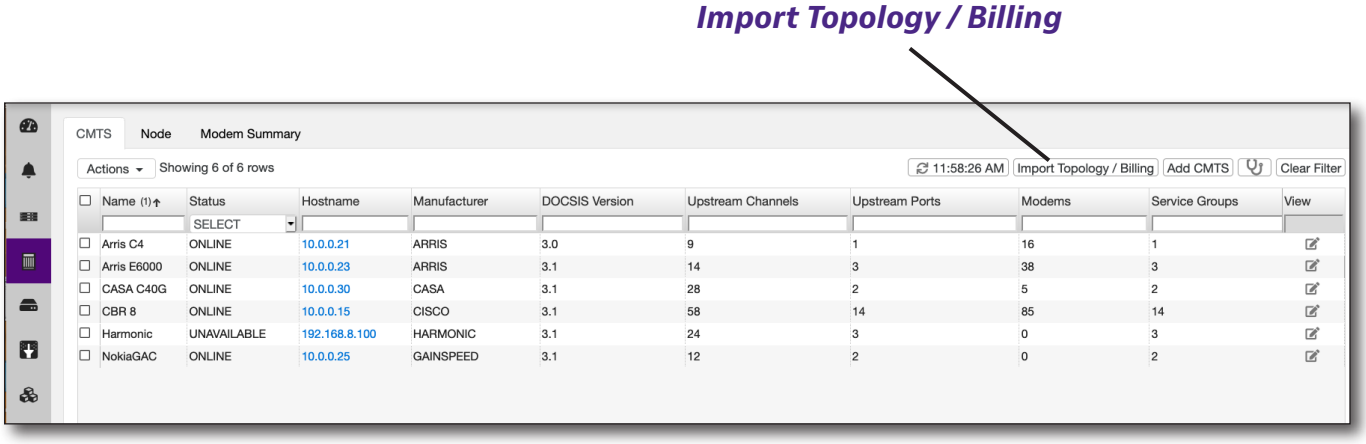
Manual Method #1 – Using the import tool on the CMTS admin page

1. Log in as an XPERTrak administrator
2. On the top right side of the screen, select the **Configuration** menu from the Main toolbar, as shown here.

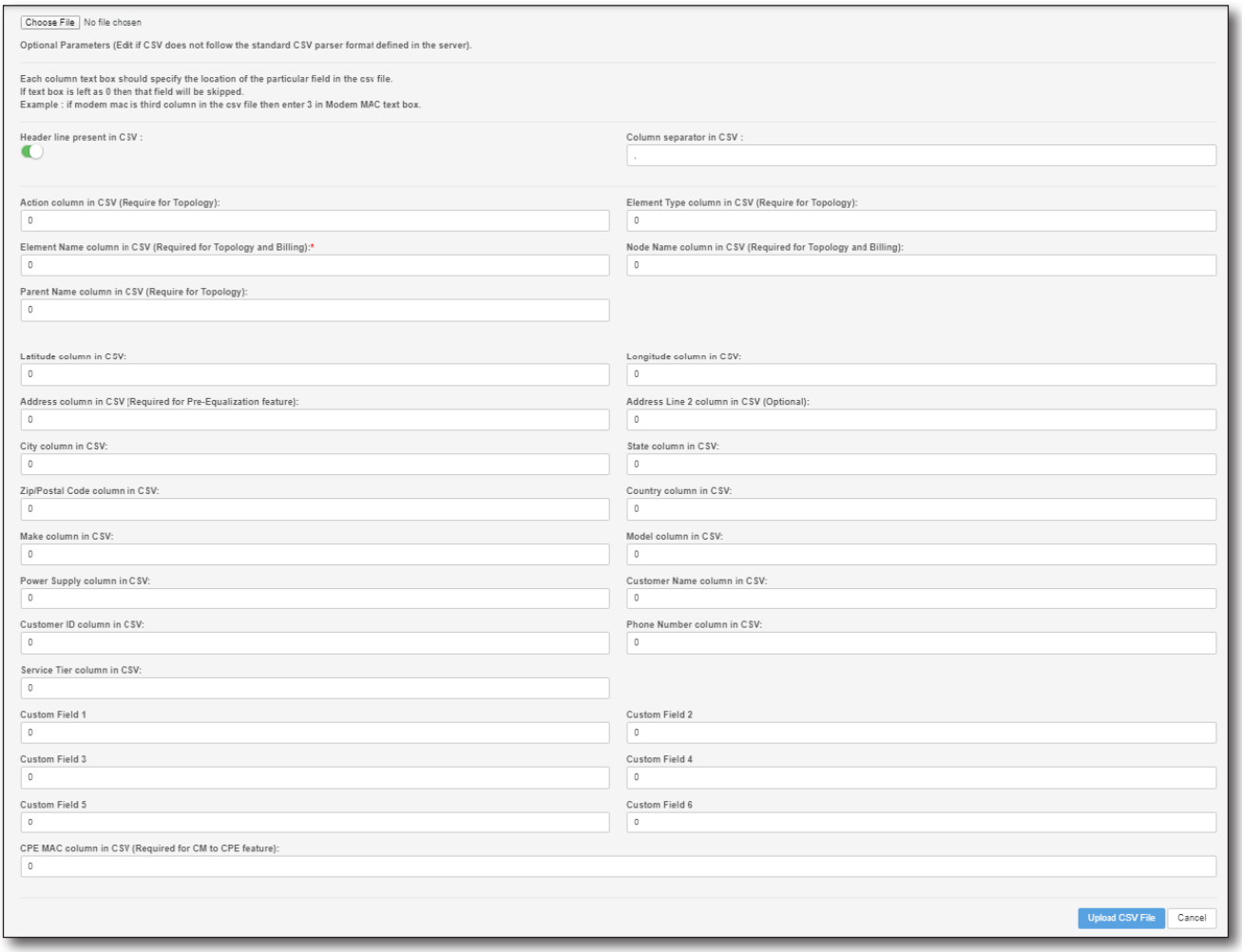
3. From the dropdown, choose ***Administration***. The **Administration** screen will open in a new tab, showing the Dashboard.
4. Select **CMTS** to bring up the CMTS section of the Dashboard.



5. Click the **Import Topology/Billing** button (this button was previously on the Modem Summary page labeled **Import Modems**.)



Below is the new Import Topology/Billing app screen.

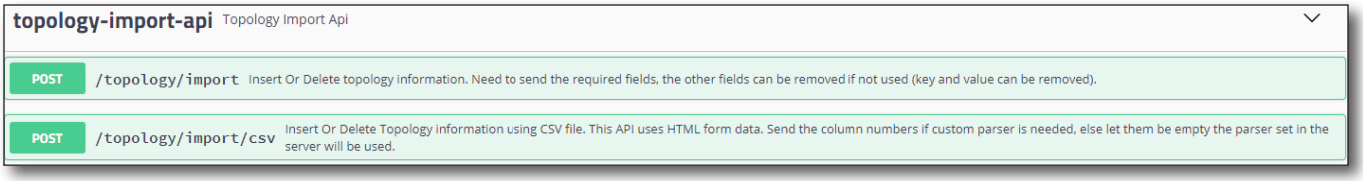


Make sure to properly set the “Header Line Present” switch. Choose the CSV file and upload. You will get a response informing you of success or failure. Should you need to change a column number to something other than what is set in the parser file, you can do it on this page.

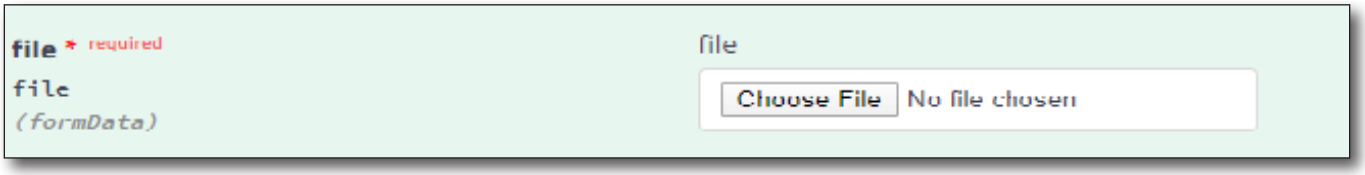
Manual Method #2 – Using the API

1. Log in as an XPERTrak administrator
2. Navigate to the XPERTrak API page
3. Locate the topology-import-api and click it

You should see these items:



The top line is for importing JSON formatted files, the bottom is for CSV. Click the “POST” button on the CSV import line. The list of parameters will appear. Click the “Try it out” button in the upper right. If you scroll to about the mid-point of the list you will see this:



Choose the CSV file, scroll a bit further down the page and click the big blue “Execute” bar. Should you need to change a column number to something other than what is set in the parser file, you can do it on this page as well.

Method #3 – Using the inbox-modem folder

This method allows the XPERTrak server to automatically import the CSV file within 5 minutes of it being placed in the ***\Program Files\Viavi Solutions\XPERTrak 4.0\inbox-modem*** folder. The file can be placed there manually at any time or can be automatically copied there by an external source.

NOTE:

If using this method, the file destination path will change with each major XPERTrak release.

Example: XPERTrak 3.0 to XPERTrak 3.1 to XPERTrak 4.0, etc. This method also requires the parser XML file be correct.

NOTE:

***For additional help, contact* 1-844-GO-VIAVI /1-844-468-4284 or *CATV@viavisolutions.com*.**

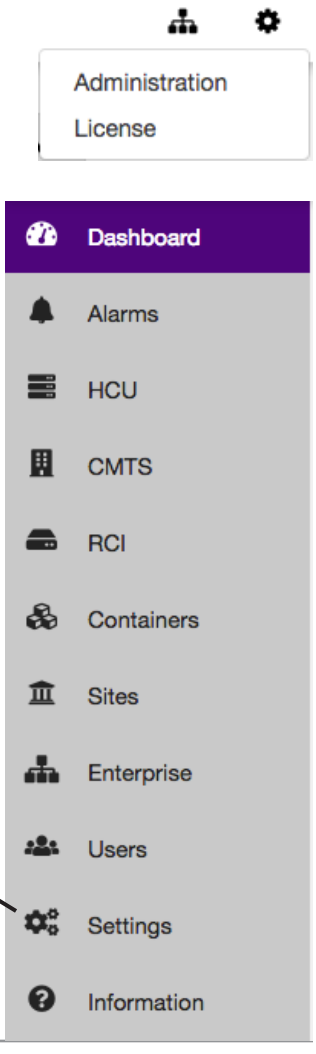
XPERTrak Map Overlays Configuration

NOTE:

This configuration must be done by an XPERTrak administrator.

1. Log into XPERTrak with an admin account.
2. On the top right side of the screen, select the **Configuration** menu from the Main toolbar, as shown here.

3. From the dropdown, choose ***Administration***. The **Administration** screen will open in a new tab, showing the Dashboard.
4. Select **Settings** to bring up the Settings section of the Dashboard.



Plant Map

Here you can configure the plat map DPI value, layers to show on the map, and the URL to get plant map data. Plant maps are disabled by default in XPERTrak.

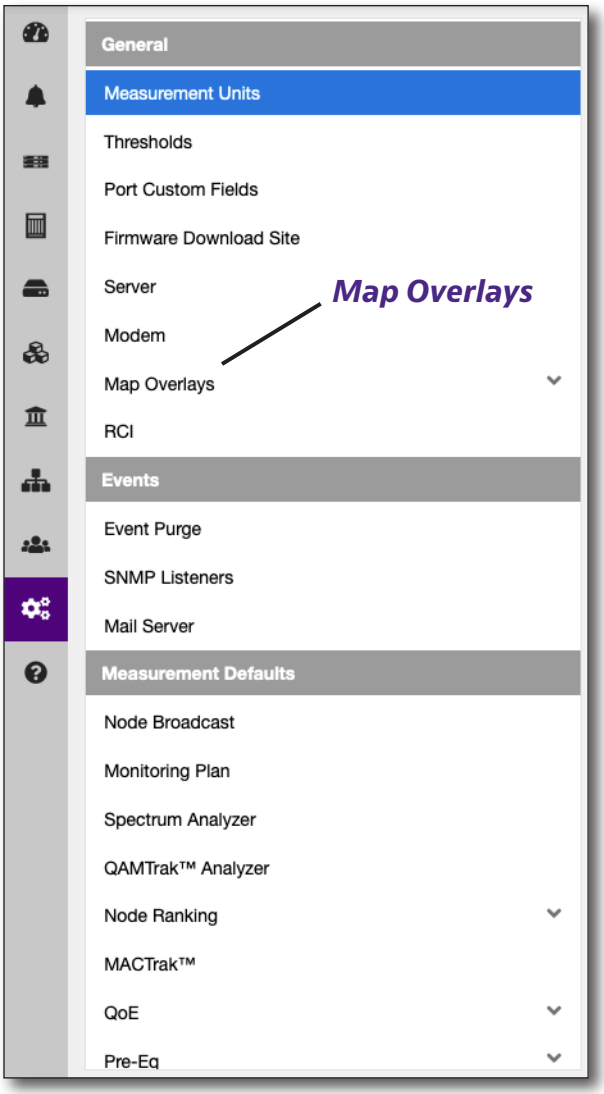
1. Navigate to the ***Administration > Settings*** *menu.*
2. Under the **General** section, select ***Map Overlays > Plant Map*** to bring up the settings below:

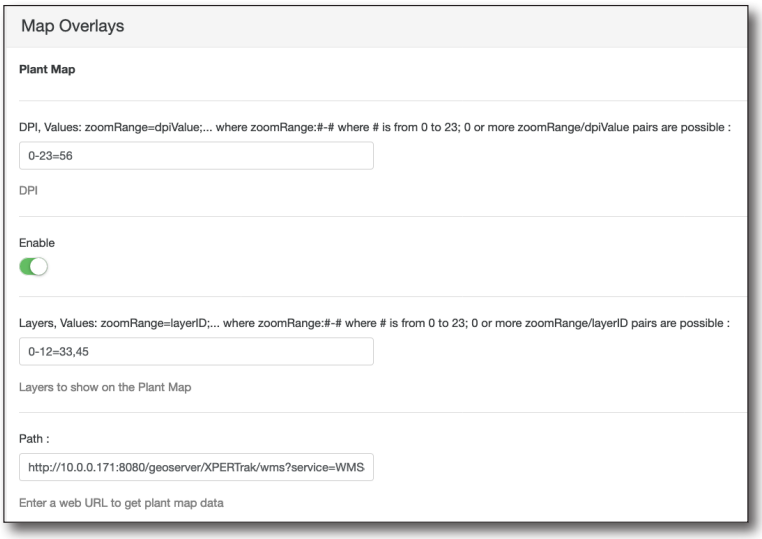
   DPI – Adjust the zoom range and DPI image resolution as you zoom in or out. The default DPI is 56.

   Layers – Adjust the zoom range and visability of the layers as you zoom in or out. The default layer pairs are 33 and 45.

   Path – Enter a web URL to get plant map data.

   Minimum zoom – Adjust the minimum zoom to show the map overlay as you zoom in or out.





3. Select **Enable** and **Show On Load**, as shown above.
4. When finished, click **Save** to confirm your settings.

NOTE:

For additional help, contact 1-844-GO-VIAVI /1-844-468-4284 or CATV@viavisolutions.com.

Leakage Map

Here you can configure the base, details, and overlay leakage map data. Leakage maps are disabled by default in XPERTrak.

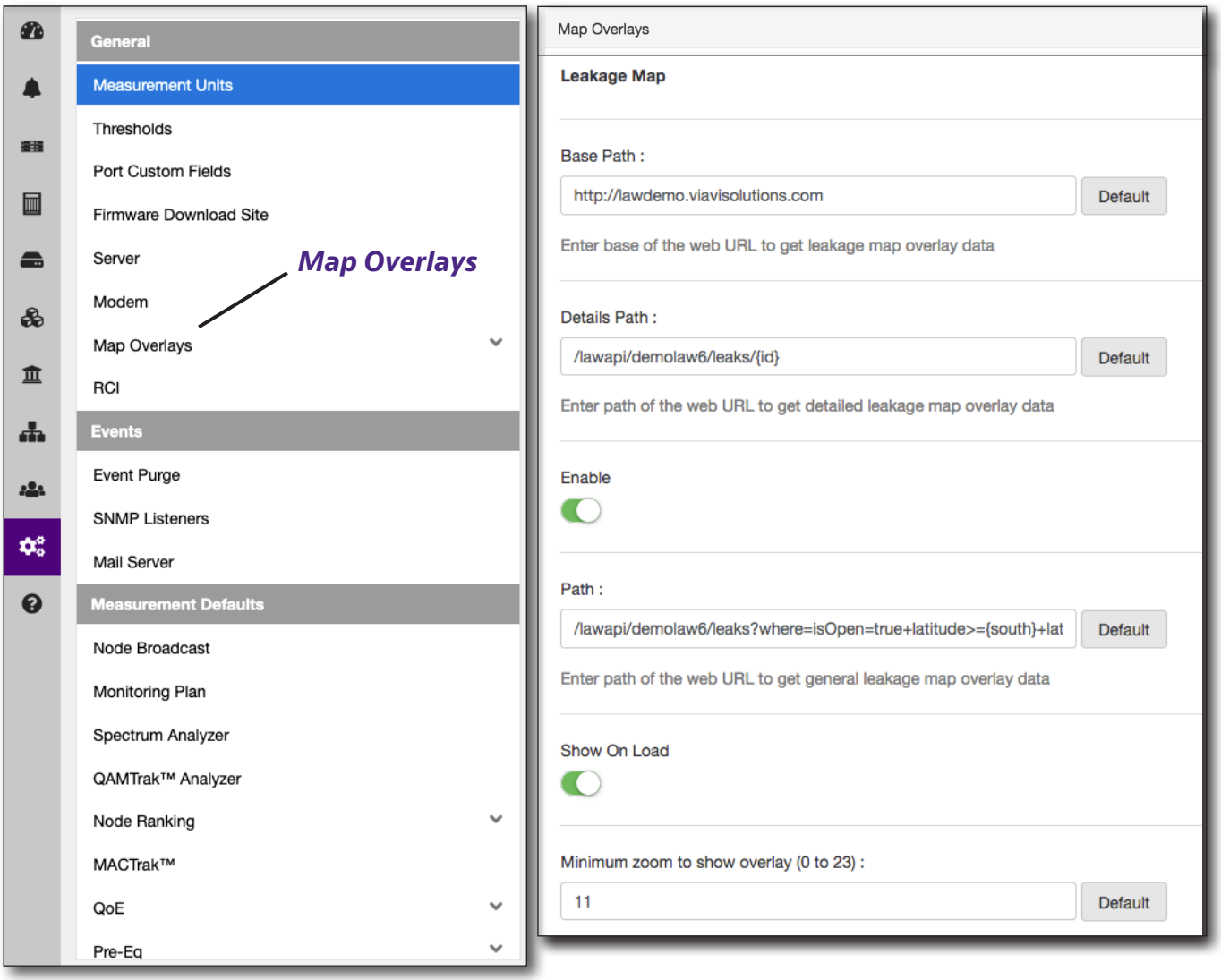
1. Navigate to the ***Administration > Settings*** *menu.*
2. Under the **General** section, select ***Map Overlays >Leakage Map*** to bring up the settings below:

   Base Path – The default is http://localhost. Needs to be changed to the DNS name of the LAW server. Example: *http://SD3.Viavisolutions.com*

   Details Path – The default is /lawapi/leaks/{id}. Needs to include the LAW instance name. Example: */lawapi/instance name/leaks/{id}*

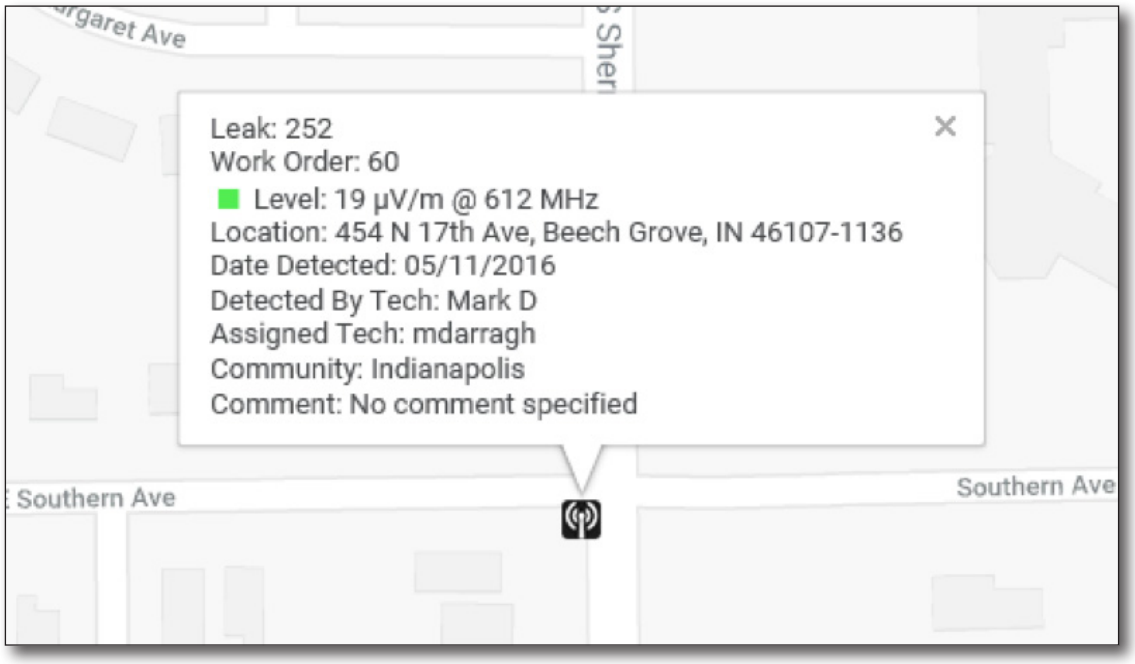
   Path – Needs to include the LAW instance name as in the example below.

   /lawapi/instancename/leaks?where=isOpen=true+latitude>= {south}+latitude<={north}+longitude> ={west}+longitude<={east}



3. Select *Enable* and *Show On Load,* as shown above.
4. When finished, click **Save** to confirm your settings.

The LAW leaks indicated by will now overlay the maps in XPERTrak as follows:



NOTE:

For additional help, contact 1-844-GO-VIAVI /1-844-468-4284 or CATV@viavisolutions.com.

StrataSync Map

In order to set up and use the StrataSync map overlays, set up is needed in three areas: on the instruments, in StrataSync, and in XPERTrak. We'll walk through each one.

Instrument setup

1. Refer to the instrument User Guides for enabling BLUETOOTH and MOBILE SW options (most instruments are enabled by default). Contact VIAVI TAC or local support for assistance.
2. Download the VIAVI Mobile Tech app from the App Store/Google Play to the mobile device(s) and log in to the StrataSync account.
3. Enable VIAVI Mobile Tech on the instrument.
4. Verify Bluetooth pairing to the instrument and mobile cellular/WiFi connectivity.
5. Verify GPS is enabled on the mobile device.
6. Run instrument tests following the system requirements.
7. Upload test results to StrataSync using Mobile Tech app (this will attach geo-location info to the work order and is required to populate StrataSync info in XPERTrak).

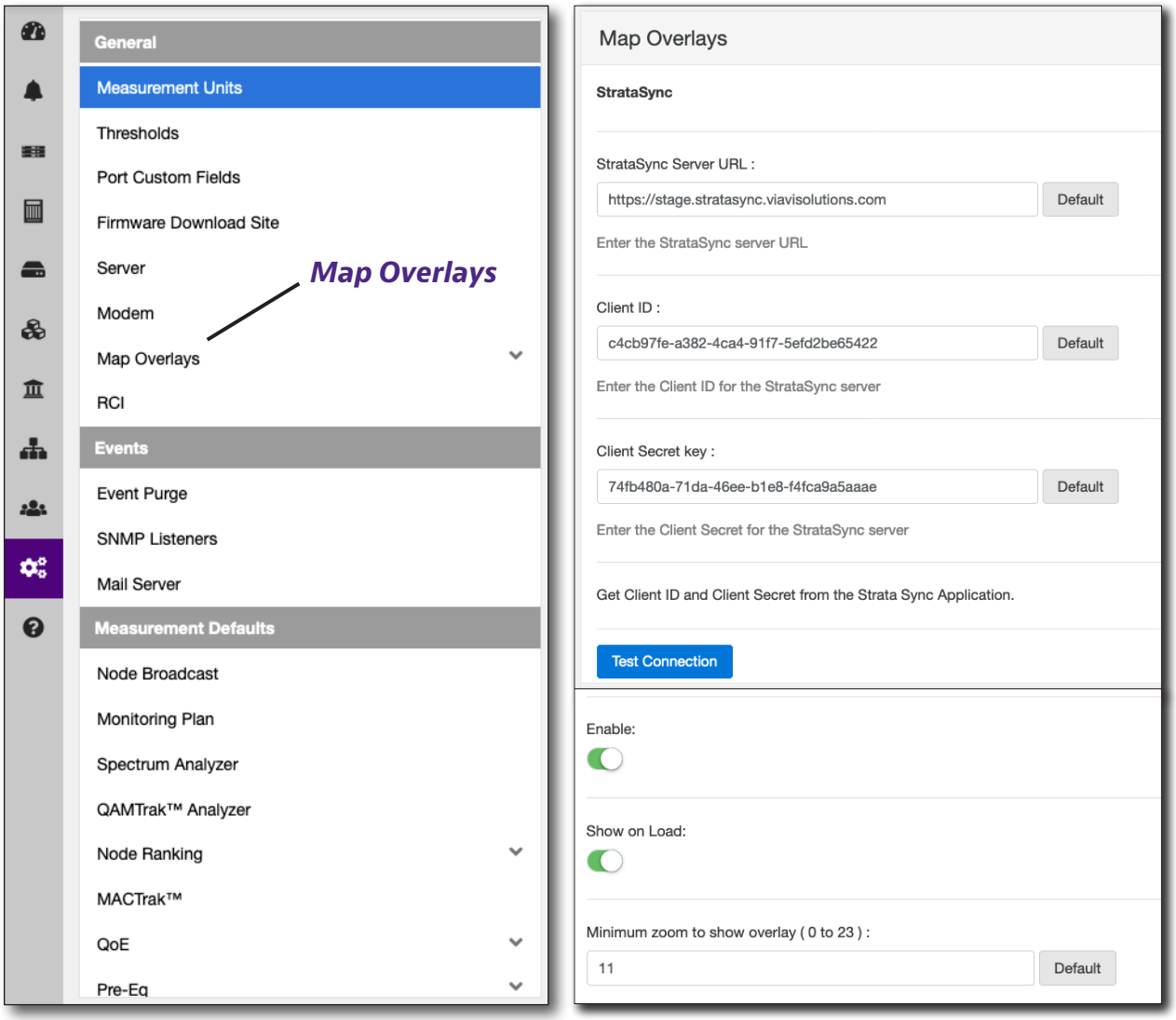
StrataSync Admin setup

1. Ensure that the techs and instruments are active in StrataSync.
2. The Test Data API needs to be purchased and authenticated through VIAVI. For a quote to enable Test Data API, please contact your local VIAVI sales rep.
    - If the Test Data API is not enabled in StrataSync, XPERTrak will not be able to import instrument data.
    - The StataSync API is based on an annual license and the amount of data exchanged. If the time or data size is exceeded, the API will stop working and no data will be sent to XPERTrak.
3. Contact VIAVI TAC or your local support partner for a Client ID and Secret Key. VIAVI TAC will respond within 7 business days.
    - Provide the Service User account info that has access to the test data and any additional account IDs.

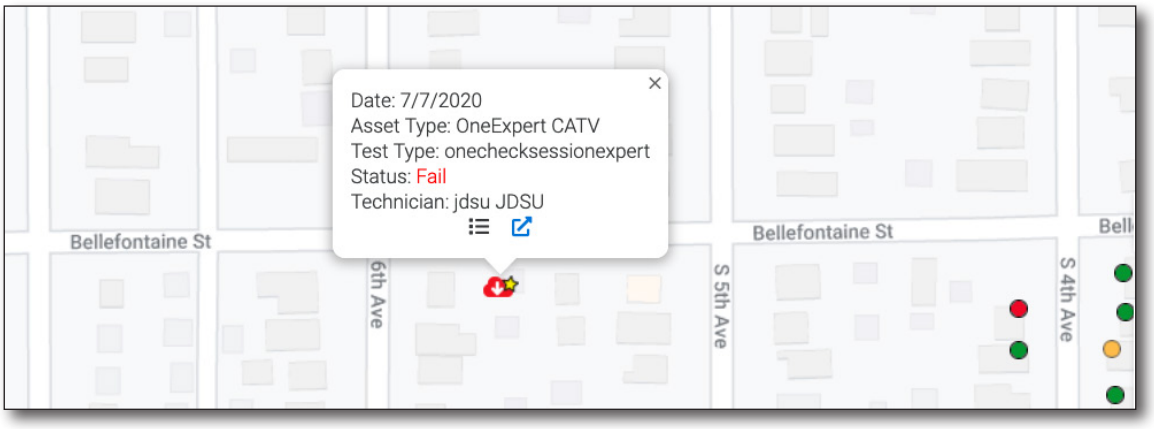
XPERTrak setup

Here you can configure the StrataSync server URL, Client ID, and Client Secret key for StrataSync data. StrataSync maps are disabled by default in XPERTrak.

1. Navigate to the ***Administration > Settings*** *menu.*
2. Under the **General** section, select ***Map Overlays >StrataSync*** to bring up the StrataSync settings.
3. Enter the **StrataSync URL**.
4. Enter the **Client ID** and **Secret Key** provided by VIAVI TAC.
5. Select **Enable** and **Show On Load**, as shown below.
6. Set the minimum zoom to show the map overlay as you zoom in or out.
7. When finished, click **Save** to confirm your settings.



The StrataSync data indicated by will now overlay the maps in XPERTrak as follows:



NOTE:

For additional help, contact 1-844-GO-VIAVI /1-844-468-4284 or CATV@viavisolutions.com.

User Activity Log on the Server

The XPERTrak user activity log can be found on your server at:

C: \Program Files\Viavi Solutions\XPERTrak 2.1\logs\keep\stats-xpt-user.log

The log includes information on the following:

User login / logout – Login for every user, every time; logout (when available)

View access – Log line will mention user ID, feature, and element ID on which the view was launched

Spectrum Live by device type (CMTS, CM, or HCU spectrum)

Monitoring View Live

QAMTrak Live

Performance View

Node Health Analyzer

Node Capacity

PNM Pre-Eq

PNM Downstream

Features – Log line will mention user ID, feature, and element ID on which the feature was launched

Add port to broadcast

Administration – Log line will mention user ID, feature, and element ID on which the operation was performed

HCU – Add, Edit, or Delete

CMTS – Add, Edit, or Delete

RCI – Add, Edit, or Delete

RPD to RPM Mapping

1. Stop tomcat service.
2. Open the Windows command prompt and go to the path of MySQL bin (*Usually C:/Program Files/VIAVI solutions/XPERTrak 4.0/mysql/bin*).
3. Type *mysql -uroot* and hit enter.
4. Run the following SQL queries:

   Use pathtrak; (Press enter)

   update SystemAttribute set value = "true" where name = "enable_rpd_to_rpm_mapping"; (Press enter)
5. Close the command prompt.
6. Start tomcat service.

NOTE:

This only needs to be done once and will remain in the database for all future updates.

Additional Information

For more detailed information, contact us at **CATVsupport@viavisolutions.com** for these additional XPERTrak documents.

Quick Start Guide

Application Notes

Software Release notes (including system requirements and OIDs)

API Developer's Guide

RCI Software Installation Guide

Backup and Restore Processes

Server Configuration Instructions

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English

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