



Pulse® 1.00
User Guide

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Technical Support Information

To obtain product information, technical support, or provide comments on this guide, contact us using our Web site or email.

Resource	Contact Information
Pulse Technical Support	Support web site: www.telestream.net/telestream-support/video/support.htm Support e-mail: videosupport@telestream.net
Telestream	Web site: www.telestream.net Sales and Marketing Email: info@telestream.net
Telestream Technical Writers	e-mail: techpubs-comments@telestream.net

Overview

Pulse is a software-defined waveform monitoring and timing analysis platform designed specifically for modern ST 2110 IP-based broadcast environments. Built on Telestream's decades of expertise in broadcast test and measurement, Pulse transitions trusted monitoring capabilities into a flexible, centralized software platform.

Key Benefits

With Pulse, customers can:

- **Accelerate Troubleshooting:** By consolidating media signals, network transport, and timing synchronization into a single platform, broadcast teams can diagnose issues faster without jumping between multiple fragmented systems.
- **Enable Multi-User Collaboration:** Pulse allows multiple operational roles to access the same monitoring environment simultaneously.
- **Scale Cost-Effectively:** Pulse allows facilities to scale their monitoring capabilities across multiple users and signals with software licensing.
- **Future-Proof Operations:** Pulse prepares facilities for future broadcast architectures, seamlessly supporting the rising demand for remote production and distributed operations.

Key Features

Pulse includes the following main features:

- **Multiuser customizable dashboards:** A highly flexible drag-and-drop interface allows a variety of users to build personalized monitoring layouts.
- **ST 2110 signal and PTP timing monitoring:** Provides real-time analysis alongside deep visualization.
- **Integrated waveform and vector scopes:** Incorporates familiar, industry-standard broadcast scope tools directly into the software interface.
- **GPU-accelerated performance:** Leverages GPU acceleration to offload processing, ensuring responsiveness and enabling seamless access.
- **Alarm management and event logging:** Features real-time alerting with historical event tracking, metrics, and SDP files.
- **Detailed view of streams on the network interface:** A flow table and support for the Layer Description Protocol (LLDP) provide visibility into switch-port connectivity.
- **Comprehensive audio monitoring:** Visualizes multichannel audio levels and silence and clip alarms.

- **Closed caption and subtitle decoding:** Displays embedded ancillary data across various global standards to ensure content integrity and compliance.
- **Role-based access control:** Securely manages different access levels for administrators, managers, and users to protect system configurations while enabling safe workflows.

Standards Supported

Pulse supports a variety of IP-based broadcast and network standards.

- Core media transport:
 - SMPTE ST 2110-20: Uncompressed video
 - SMPTE ST 2110-310: PCM audio
 - SMPTE ST 2110-31: AES3 Transparent Transport
 - SMPTE ST 2110-40: Ancillary data
- Network redundancy:
 - SMPTE ST 2022-7: Dual-network redundancy model
- Timing and synchronization:
 - Precision Time Protocol (PTP): Based on the IEEE 1588 and SMPTE ST 2110 standards to maintain precise timing across workflows
- Device discovery and control:
 - AMWA NMOS (IS-04 and IS-05): For automatic device discovery, registration, and connection management by external broadcast controllers

Get Started

This chapter describes how to get started with Pulse.

Topics

- [Requirements](#)
- [Sign in](#)
- [Keyboard Shortcuts](#)
- [Sign out](#)

Requirements

Here are the system and hardware requirements for using Pulse:

- **Monitor and interface requirements:** The Pulse web-based user interface requires a screen resolution of at least 1,920 x 1080 pixels. The responsive UI is designed with the potential to scale to larger monitor walls or multidisplay setups. For supported browsers, refer to the *Pulse Release Notes*.
- **Hardware and chassis specifications:** The entire system—including all compute, GPU, and network interfaces—must reside in a single chassis fitting within a maximum of 2RU rack space.
The system software must be compatible with on-premise containerized infrastructure.
- **Network interface requirements:** Dual QSFP28 100G interfaces are required for ST 2110 media traffic ingestion and to support the ST 2022-7 redundancy model (Media 1 and Media 2 network paths).
A dedicated 1G or RJ-45 management interface is required for general connectivity and control.
A dedicated 1G RJ-45 for IPMI or BMC port is optional for Out-of-Band (OOB) hardware management.
- **Signal capacity requirements:** The system can support monitoring for up to 8 simultaneous 4K/UHD HDR ST 2110 input signals. Each of these inputs can support a waveform and vector-style trace display.
- **Ports:** Pulse services are preconfigured with the following default port numbers. To enable network communications between Pulse services, ensure that there are no port number conflicts or blockages between the applications on each Pulse server. If these ports are not open, you might experience issues with connecting via the web browser or receiving information within the Pulse application.

TCP Ports

Pulse Service	Ports
Web application	HTTPS: 443
NMOS Node API	HTTP: 3212
NMOS Connection API	HTTP: 3215
WebSocket for WebRTC signaling traffic	8981

UDP Ports

Pulse Service	Ports
WebRTC Media Traffic (TURN)	3478
mDNS (NMOS discovery)	5353

Sign in

Pulse has a default administrator sign-in username and password that you can use to easily manage the system. You should use the administrator sign in only if you have been assigned overall administrative privileges; otherwise, use the sign-in name and password assigned by your administrator.

The default administrator username is **admin** and the password is **admin**.

Note: Usernames and passwords are case-sensitive. In this case, you must type **admin** and **admin** in lowercase characters.

To sign into Pulse:

1. Open a web browser window (such as Mozilla Firefox or Google Chrome) and type the IP address or URL of the Pulse server.
2. Sign into Pulse. First-time users, type **admin** as the username and **admin** as the password, and then click **Sign In**.

For information about managing users, see [Manage Users](#).

Keyboard Shortcuts

Keyboard shortcuts are keys or combinations of keys that provide an alternative way to do something that you'd typically do with a mouse. You can use the following keyboard shortcuts in Pulse.

Clipboard Keyboard Shortcuts

Press this key:	To do this action:
Ctrl + C	Copy tile(s)
Ctrl + X	Cut tile(s)
Ctrl + V	Paste tile(s)

Tile Keyboard Shortcuts

Press this key:	To do this action:
Ctrl + A	Select all tiles
Click + drag, Ctrl + click, or Shift + click	Select multiple tiles
Ctrl + click	Add/remove tile from selection

Arrange and Resize Keyboard Shortcuts

Press this key:	To do this action:
Click tile + F	Resize selected tile to full size
Click tile + H	Resize selected tile to half size
Click tile + Q	Resize selected tile to quarter size
Arrow keys	Nudge tile(s)
Shift + arrow keys	Give tile(s) a big nudge
Ctrl +]	Bring tile to front
Ctrl + [	Send tile to back

Editing Keyboard Shortcuts

Press this key:	To do this action:
Ctrl + Z	Undo
Ctrl + Shift + Z	Redo

Dashboard Keyboard Shortcuts

Press this key:	To do this action:
Ctrl + S	Save dashboard
Ctrl + Shift + S	Save dashboard as

Navigation Keyboard Shortcuts

Press this key:	To do this action:
Click tile + Enter	Open tile config
Click tile + Tab	Select the next tile
Click tile + Shift + Tab	Select the previous tile
Shift + 1	View a pinned dashboard
Shift + 2 through Shift + 0	View a favorite dashboard

General Keyboard Shortcuts

Press this key:	To do this action:
Esc	Close menus/clear selection
Ctrl + K	View online help

Sign out

To sign out of Pulse, click your Username icon on the bottom left and click **Log Out**.

Configure Pulse

To configure Pulse, you must be logged in as the administrator, or your account must be in the administrator group.

Topics

- [Manage Users](#)
- [Configure the Network Interface](#)
- [Configure Alarm Profiles](#)
- [Manage Utilities](#)
- [Configure NMOS](#)

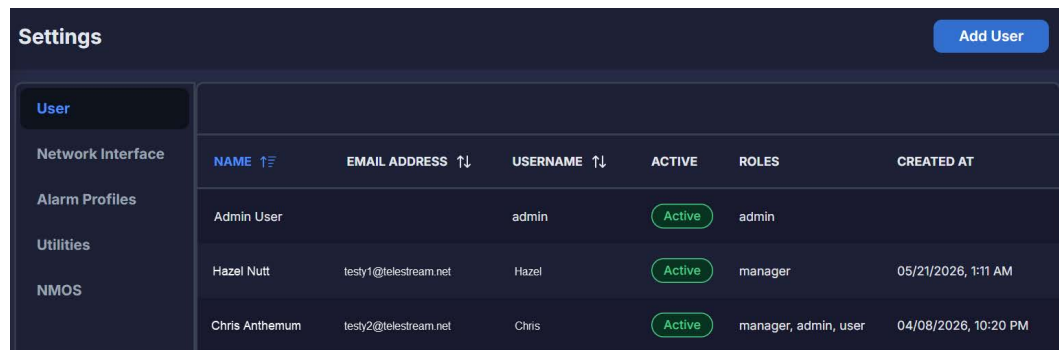
Manage Users

A user's role determines which features and menus are available when the user logs in. To configure Pulse, you must be logged in as the administrator.

Each user can be assigned one or more of the following roles:

- **Admin:** Admins have full control over user management. The admin role is the only one with the inherent permission to add, edit, or delete user accounts, change passwords, and set roles.
- **Manager:** Users with the Manager role typically have read-only access to user accounts and groups. They are not allowed to create or delete accounts unless an admin explicitly delegates that privilege to them.
- **User:** Standard users have a "view-only" role for system operations and cannot make configuration changes or alter user accounts.

To manage users, click **User** on the **Settings** menu.



Settings							Add User	
User								
Network Interface								
Alarm Profiles								
Utilities								
NMOS								
	NAME ↑⇅	EMAIL ADDRESS ↑↓	USERNAME ↑↓	ACTIVE	ROLES	CREATED AT		
	Admin User		admin	Active	admin			
	Hazel Nutt	testy1@telestream.net	Hazel	Active	manager	05/21/2026, 1:11 AM		
	Chris Anthemum	testy2@telestream.net	Chris	Active	manager, admin, user	04/08/2026, 10:20 PM		

Add a User

To add a user:

1. Click **Add User**.
2. In the **First Name** box, type the user's first name.
3. In the **Last Name** box, type the user's first name.
4. In the **Email Address** box, type the user's email address.
5. In the **Username** box, type the user's username, which must be unique to that user.
6. In the **Password** box, type a password.
7. In the **Confirm Password** box, type the password again.
8. From the **Roles** list, select one or more roles: **admin**, **manager**, and/or **user**.
9. Click **Create**.

Create User

First name*

The user's first name.

Last name*

The user's last name(s).

Email Address*

The user's email address. This will be used for notifications.

Username*

The user's username. This must be unique.

Modify a User

To modify a user:

1. Click the user's name.
2. Click **Edit User**.
3. Edit the user's account as necessary and click **Update**.
 - To disable a user, turn off the **Enabled** toggle.

4. To change a user's password:
 - a. Click **Change Password**.
 - b. In the **New Password** box, type a new password.
 - c. In the **Confirm New Password** box, type the new password again.
 - d. Click **Change Password**.

Delete a User

To delete a user:

1. Click the user's name.
2. Click **Delete User**.
3. Click **Delete** to confirm that you want to delete the user.

Configure the Network Interface

On the Network Interface page, you can review and configure the network connections that Pulse uses. Pulse includes a management interface for remote access to the web-based application interface, along with two dedicated media interfaces for ST 2110 traffic. Each interface can be customized with a user-defined alias and assigned color, making it easier to identify and distinguish interfaces throughout the application. The second network interface cannot be used to stack more bandwidth.

The management interface is assigned during the initial installation and setup process. If the management network configuration needs to be changed after installation, those updates are made from the Network Interface page.

The two media interfaces are intended to support ST 2110 media traffic across primary and secondary network paths in an ST 2022-7 redundancy model. In this configuration, Media 1 is typically used for the primary network, and Media 2 is used for the secondary network. If ST 2022-7 redundancy is not being used, the Media B interface is not required and may remain unused.

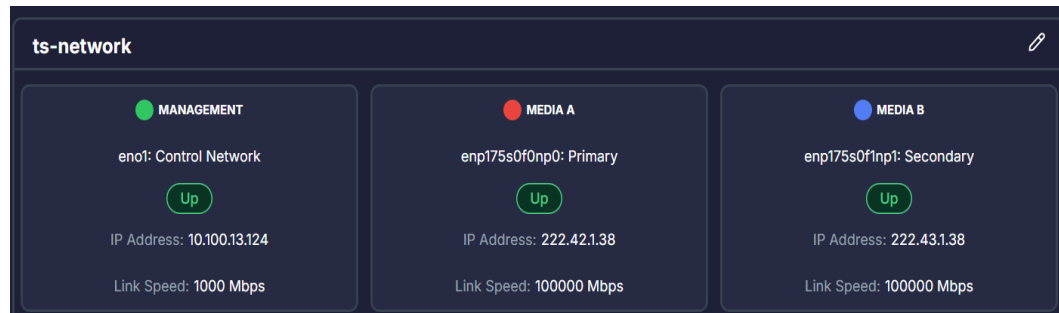
This section describes how to configure the network interface settings and how to view SFP information.

Network Interface Settings

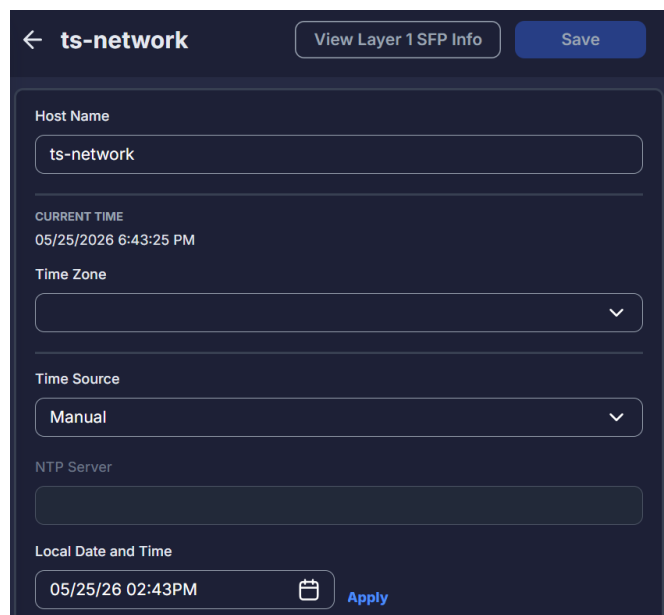
To configure the network interface settings:

1. On the **Settings** menu, click **Network Interface**. The following information is displayed for each network interface:
 - **Type:** The type of interface: management or media.
 - **Name:** The name of the network interface.
 - **Alias:** The alias of the interface (if one has been configured).
 - **Status of the network interface:** Up or Down.

- **IP Address:** The IP address of the interface.
- **Link Speed:** The link speed of the interface.



2. Click the Edit icon (✎).



3. In the **Host Name** box, type a lowercase name.
4. From the **Time Zone** list, select your local time zone.
5. To enable or disable a Daylight Savings Time offset:
 - a. Turn on the **Daylight Savings** toggle.
 - b. From the **Scheduled Mode** list, select one of the following:
 - **Automatic:** Pulse receives the time from an NTP server that you specify.
 - **Disabled:** The Daylight Savings Time offset is disabled.
 - **Once:** The Daylight Savings Time offset occurs once. From the **Offset** list, select the time offset. In the **Once Date/Time** box, click the calendar icon and select the date and time that the offset will occur.
 - **Recurring:** the Daylight Savings Time offset occurs on a recurring basis. For example, you could schedule it to start every year on the second Sunday in

March. Select the start and end **Interval**, **Day**, **Month**, and **Time** for the recurrence.

6. From the **Time Source** list, select one of the following for the time source:
 - a. **NTP** – In the **NTP Server** box, type the IP address or domain name of the NTP server.
 - b. **Manual** – In the **Local Date and Time** box, click the calendar icon, select the local date and time, and then click **Apply**.
7. Specify the following for the Management Interface, Media A, and Media B:
 - **Alias:** Type an alias for the interface.
 - **Assign Color:** Select a color to easily identify the interface.
 - **FEC Auto:** When this toggle is on, Pulse automatically selects the best Forward Error Correction (FEC) mode based on the connected media. If you disable FEC Auto, select the FEC method from the list: **Off**, **BaseR** (BASE-R FEC, as defined in IEEE 802.3 Clause 74), or **RS** (RS Reed-Solomon, as defined in IEEE 802.3 Clause 91).
 - **Enable DHCP:** Turn this toggle on if you want to use the Dynamic Host Configuration Protocol (DHCP) on the interface. If your network does not use DHCP, you must manually enter the address for the instrument. To get a fixed address, talk to your LAN administrator. If you turn this toggle off, specify the following:
 - **IP Address** – Enter the four octets of the IPv4 address, in dotted decimal notation. If DHCP is enabled, the IPv4 address supplied by the DHCP server is displayed instead and cannot be edited.
 - **Subnet Mask/Prefix** – Enter the four octets of the subnet mask, in dotted decimal notation. If DHCP is enabled, the subnet mask supplied by the DHCP server is displayed instead and cannot be edited.
 - **Gateway** – Enter the four octets of the gateway address for this subnet, in dotted decimal notation. If DHCP is enabled, the gateway address supplied by the DHCP server is displayed instead and cannot be edited.
 - **DNS** – Enter the four octets of the Domain Name System (DNS) server address, in dotted decimal notation. To specify multiple DNS addresses, enter a comma-separated list.
 - **Domain** – Enter the domain name portion of the Fully Qualified Domain Name (FQDN). Valid characters for the domain name include alphanumeric characters (A-Z, a-z, and 0-9), the hyphen character, and the "dot" character (to separate levels in the domain hierarchy). The first character must be a letter or numeral. If DHCP is enabled, the domain name supplied by the DHCP server is displayed instead and cannot be edited. A comma-separated list of DNS domains. To specify multiple domains, enter a comma-separated list.
 - **MAC Address** – This is a read-only value of the Media Access Address (MAC) of the network interface.

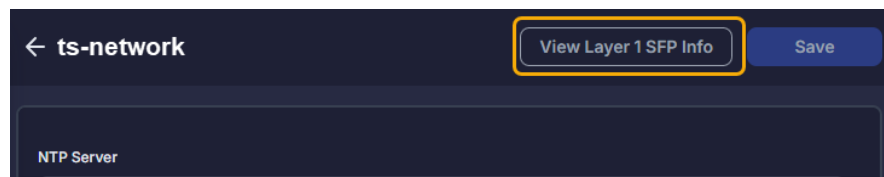
- **Advanced Settings – VF IP Range (SR-IOV)** – For Media 1 and Media 2, if you have a routed (L3) media network that validates the IGMP source subnet, specify the following settings:
 - **Subnet (CIDR)** – Enter the four octets of the subnet (CIDR) mask, in dotted decimal notation.
 - **Range Start** – Enter the four octets of the start of the range, in dotted decimal notation.
 - **Range End** – Enter the four octets of the end of the range, in dotted decimal notation.

8. Click **Save**.

Management	Media A	Media B
Link Speed 1000 Mbps	Link Speed 100000 Mbps	Link Speed 100000 Mbps
Alias Control Network	Alias Primary	Alias Secondary
Assign Color Green	Assign Color Red	Assign Color Blue
☐ FEC Auto Not supported	☒ FEC Auto	☒ FEC Auto
FEC Select	FEC off	FEC off
☐ Enable DHCP	☐ Enable DHCP	☐ Enable DHCP
IP Address 10.100.	IP Address 222.42	IP Address 222.43.

View Diagnostic Metrics

To view diagnostic metrics and hardware details, click **View Layer 1 SFP Info**.



The Interface Monitor appears. See [Interface Monitor](#).

Configure Alarm Profiles

Alarm profiles are reusable, structured monitoring policies that organize alarms into functional suites. Profiles provide a centralized way to define which conditions should trigger an alert for a given signal.

Note: Profiles organize alarms logically and providing sensible default thresholds, helping to cut through the noise so you can focus on actual problems.

The Alarm Profiles configuration organizes alarms logically and when applicable, providing sensible default thresholds and helping to cut through the noise for simple configuration. Profiles allow you to set up complex format comparisons, ensuring that the detected signal characteristics match the expected metadata (such as SDP or VPID) without requiring complex manual setup.

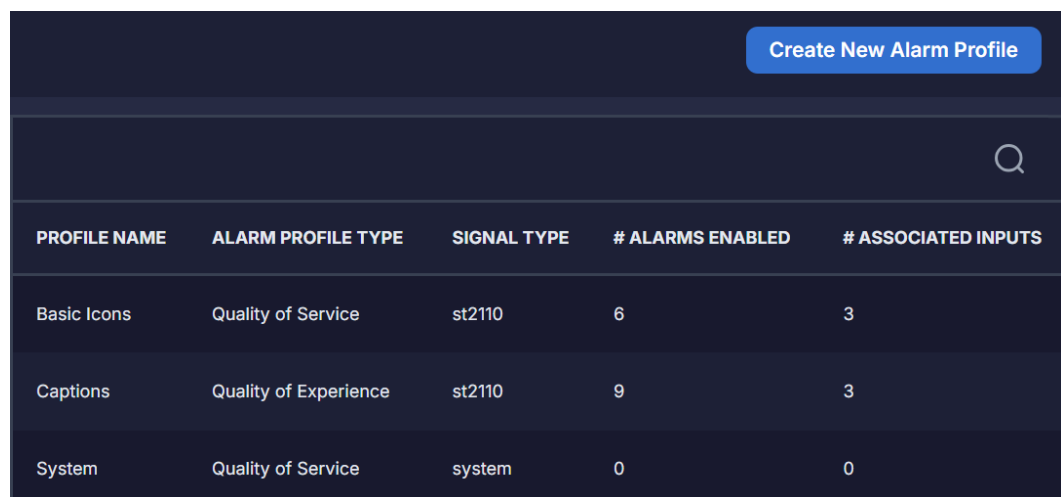
Pulse separates profiles into two categories, enabling users to see the alarms that are relevant to their responsibilities:

- **Quality of Service (QoS) Alarm Profiles:** Track technical signal integrity and transport health.
- **Quality of Experience (QoE) Alarm Profiles:** Monitor viewer-facing media quality, such as frozen video or silence.

Alarm profiles are reusable. You can build a standard profile and apply it easily during input configuration. Changes to a profile are automatically propagated to all associated inputs.

This section describes how to create, copy, modify, and delete an alarm profile, as well as how to filter alarm profiles and view alarm profile details.

To view alarm profiles, on the **Settings** menu, click **Alarm Profiles**.



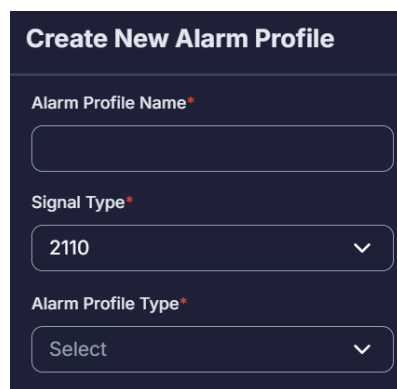
Create New Alarm Profile				
Q				
PROFILE NAME	ALARM PROFILE TYPE	SIGNAL TYPE	# ALARMS ENABLED	# ASSOCIATED INPUTS
Basic Icons	Quality of Service	st2110	6	3
Captions	Quality of Experience	st2110	9	3
System	Quality of Service	system	0	0

To search for an alarm profile, click the Search icon () and type some or all of the profile name.

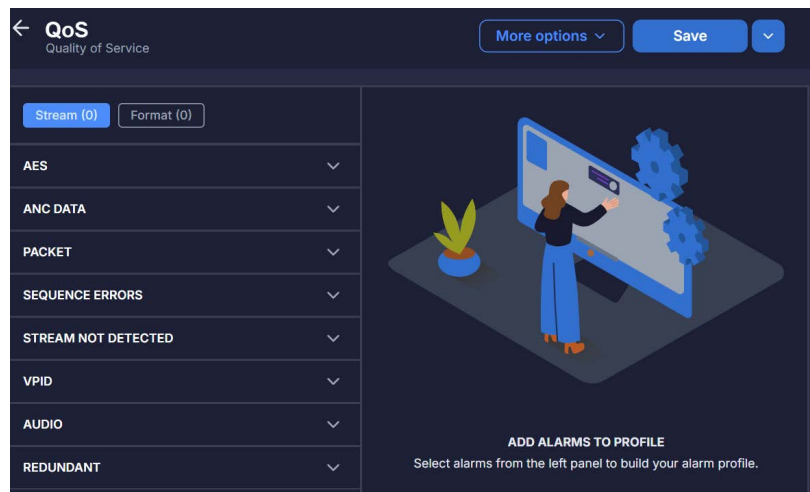
Create an Alarm Profile

To create an alarm profile:

1. Click **Settings**, and then click **Create New Alarm Profile**.
2. In the **Alarm Profile Name** box, type a name for the alarm profile.
3. From the **Signal Type** list, select **2110**.
4. From the **Alarm Profile Type** list, select a profile type:
 - **Quality of Service**: Stream and Format alarm profiles.
 - **Quality of Experience**: Audio, Caption, and Video alarm profiles.
5. Click **Create**.



Pulse displays a list of available profile types and alarm categories.



Do one of the following:

- To configure a **Quality of Service** alarm: Click the **Stream** or **Format** tab.
- To configure a **Quality of Experience** alarm: Click the **Audio**, **Captions**, or **Video** tab.

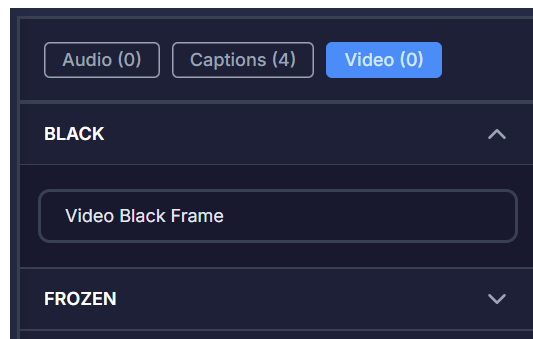
The profile types for Quality of Service alarm profiles are as follows:

- Stream alarm profile types:
 - AES
 - ANC Data
 - Packet
 - Sequence Errors
 - Stream Not Detected
 - VPID
 - Audio
 - Redundant
- Format alarm profile types:
 - Mismatch
 - Redundant

The profile types for Quality of Experience alarm profiles are as follows:

- Audio alarm profile types:
 - Levels
- Captions alarm profile types:
 - Captions
- Video alarm profile types:
 - Black
 - Frozen

Click an alarm category (such as Video), and then click the arrow beside a category to view the available alarms in that category.



To configure an alarm:

1. Click the alarm name. Pulse displays the available alarm parameters. For descriptions of the available alarms and parameters, see [Alarms Overview](#).
2. Configure the desired parameters for the alarm.
 - **Count:** Specify the allowed variance or set exact value limits (for example, bitrate limits or allowed variance for format mismatches).

- **Severity:** Set the alert level to Critical (active service-impacting conditions) or Informational (system events or state changes for operational awareness).
- **Duration:** Define the number of seconds the condition must persist before the alarm is triggered.
- **SDP or VPID checkboxes:** Specify the parameters to ignore in case of difference.
- **Expected Value:** Specify the value for the alarm assertion criteria.
- **Epsilon:** Specify the maximum difference from the expected value before an alarm is asserted due to minor measurement noise. Click **Save**.

The enabled alarms are displayed in the right pane. To filter the list by alarm name, click the Search icon (🔍) and type some or all of an alarm name. Toggle between **Expand All** and **Collapse All** to view all enabled alarms for the selected category,

Rename an Alarm Profile

To rename an alarm profile:

1. From the Settings page, click **Alarm Profiles**.
2. Click the Edit icon (⋮) to the right of the profile name and click **Edit Name**.
3. Type a new name for the profile and press **Enter**.

View Alarm Profile Details

To view details for an existing alarm profile:

1. From the Settings page, click **Alarm Profiles**.
2. Click the Edit icon (⋮) to the right of the profile name and click **View Details**.

Copy an Alarm Profile

You can copy an existing alarm profile and then modify it. To copy an alarm profile:

1. From the Settings page, click **Alarm Profiles**.
2. Click the Edit icon (⋮) to the right of the profile name and click **Duplicate**.

Modify an Alarm Profile

To modify an alarm profile:

1. From the Settings page, click **Alarm Profiles**.
2. Click the **Action icon (...)** to the right of the profile name and click **View Details**.
3. Modify the alarm profile as necessary and click **Save**.

Delete an Alarm Profile

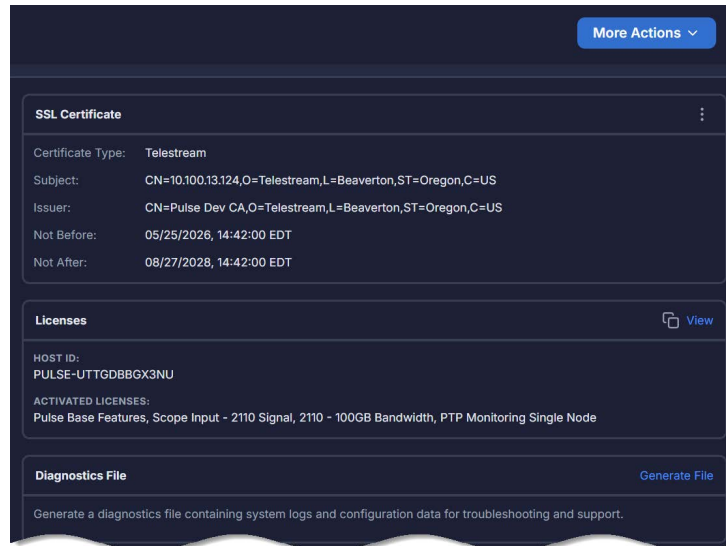
To delete an alarm profile:

1. From the Settings page, click **Alarm Profiles**.
2. Click the **Action icon (...)** to the right of the profile name and click **Delete**.
3. Click **Delete** to confirm that you want to delete the profile.

Manage Utilities

On Utilities page, you can manage SSL certificates and system licenses, troubleshoot system services, update Pulse, and restart Pulse.

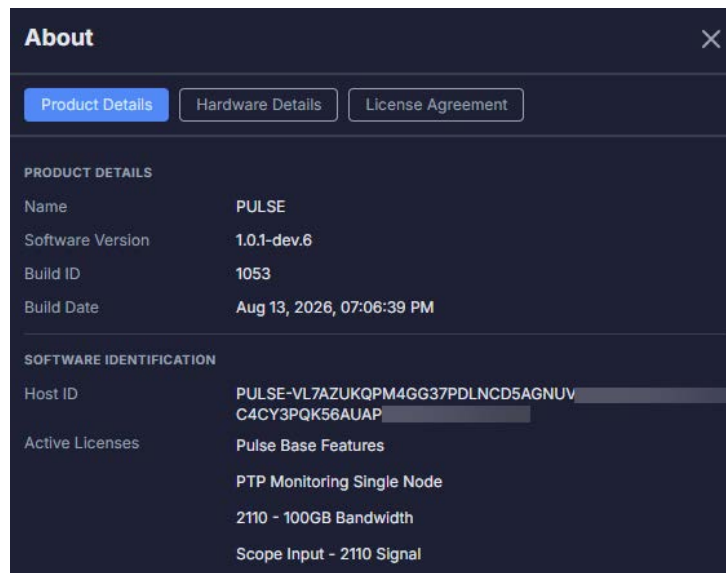
To view the Settings Utilities page, click **Utilities** on the **Settings** menu.



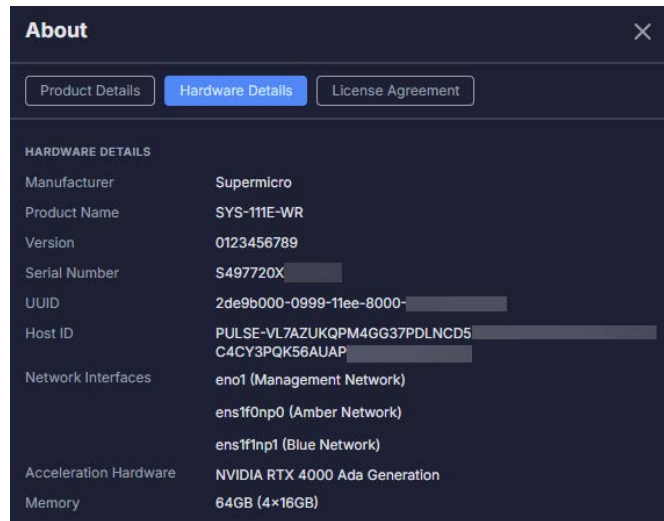
View Version Details

To view version details:

1. Click **More Actions**, and then click **About**.
2. The Product Details tab displays information about the software version, the build ID and date, and software identification information.



3. Click the **Hardware Details** tab to view hardware identification information.

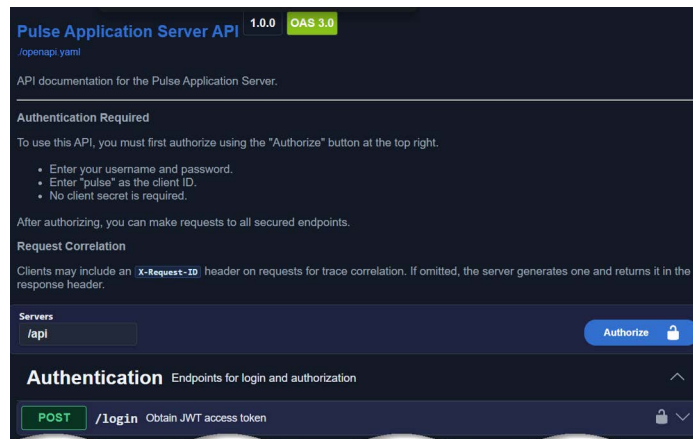


4. Click the **License Agreement** tab to view the license agreement. To view the full licensing terms, open the API Help and review the system documentation package installed with this release. See [View API Help](#).

View API Help

To view the API Help documentation:

1. Click **More Actions**, and then click **API Help**. The API Help opens in a separate window or tab.
2. Click **Authorize**.
3. In the **Username** box, type your username and password.
4. In the **Password** box, type your password.
5. In the **client_id** box, type **pulse**.
6. (Optional) In the **client_secret** box, type your client secret.
7. Click **Authorize**.



NMOS APIs

To view the NMOS API Help documentation, click **More Actions**, and then click **NMOS APIs**. The NMOS API Help opens in a separate window or tab.

Restart Pulse Services

If you need to restart Pulse services for network troubleshooting purposes, click **More Actions**, and then click **Restart**.

After about 5 minutes, the services will restart and inputs and video thumbnails will automatically return.

SSL Certificates

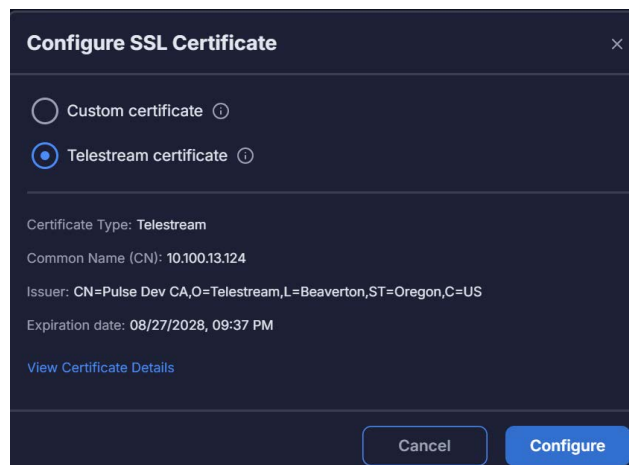
For initial setups, a Telestream certificate can be used to provide immediate HTTPS support. If your organization wants to generate a specific certificate within your network, you can configure a custom certificate.

For a secure connection to the browser, your IT administrator might need to generate a Secure Sockets Layer certificate.

Configure a Telestream SSL Certificate

To configure a Telestream SSL certificate:

1. In the SSL Certificate section, click the Edit icon (⚙️) and click **Configure**.
2. Select **Telestream certificate**.
3. Click **Configure**.



Configure a Custom SSL Certificate

To configure a custom SSL certificate:

1. In the SSL Certificate section, click the Edit icon (⚙️) and click **Configure**.

2. Select **Custom certificate**.

3. You will need to upload two or three files from your local computer:

- **SSL Certificate (.crt):** This file should contain the PEM format certificate chain for the server, any intermediate certificates, and the CA certificate.
- **SSL Certificate Key (key):** The private key file (.key) in PEM format that corresponds to the server certificate.
- **SSL Password File (optional):** A text file (.txt) that is only required if the key file uses passphrases.

To upload the files, click **Click to upload**, or drag and drop the certificate files.

4. Click **Configure**.

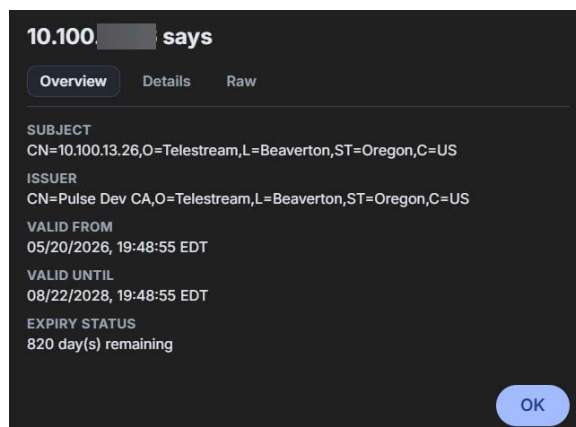
The screenshot shows a 'Configure SSL Certificate' window. It has a dark theme. At the top, there's a title bar with a close button. Below it, there are two radio buttons: 'Custom certificate' (which is selected) and 'Telestream certificate'. Underneath, there are three sections. The first is 'SSL CERTIFICATE' with a file icon and the name 'pulse124.crt'. The second is 'SSL CERTIFICATE KEY' with a file icon and the name 'pulse124.key'. The third is 'SSL PASSWORD FILE (OPTIONAL)' with a large button that says 'Click to upload' and the text 'or drag and drop' and '.txt files are accepted'. At the bottom of the window, there are two buttons: 'Cancel' and 'Configure'.

View SSL Certificate Details

You can view SSL certificate details such as object/issuer, validity and expiry status, fingerprints, key usage, subject alternative names, and the raw PEM.

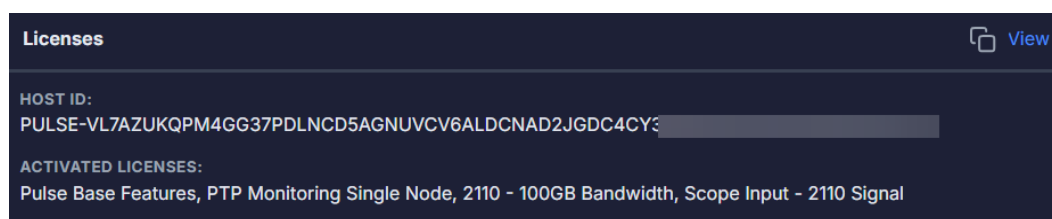
To view SSL certificate details:

1. In the SSL Certificate section, click the Edit icon (⋮) and click **View Certificate Details**.
2. Click **OK**.



Licenses

The Pulse host ID and activated licenses are displayed in the Licenses section.



To view license details, click View in the Licenses section. The Licenses page lists the installed licenses, the quantity, status, expiration date, and installation date.

← Licenses [Install New Licenses](#)

LICENSE NAME	QUANTITY	STATUS	EXPIRATION DATE	INSTALLED BY
Pulse Base Features	1	Active	Perpetual	admin
PTP Monitoring Single Node	1	Active	Perpetual	admin
2110 - 100GB Bandwidth	1	Active	Perpetual	admin
Scope Input - 2110 Signal	8	Active	Perpetual	admin

Install Pulse License

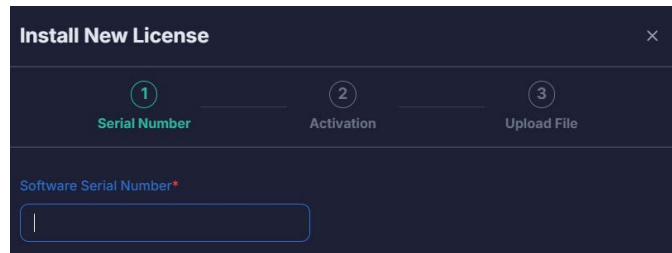
You can install a Pulse license via the software serial number or via a license file.

Install a License via Serial Number

To install a license via a serial number:

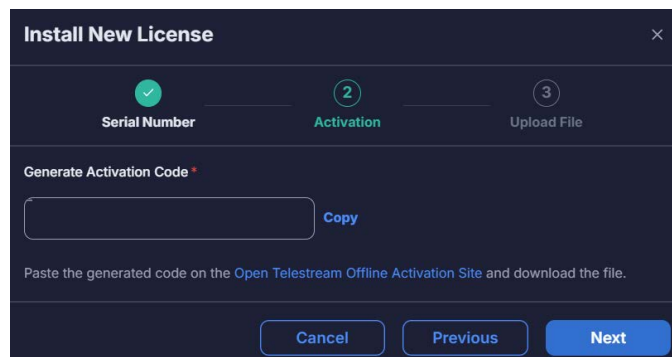
1. Click **Install New Licenses**, and then click **Install using software serial number**.

2. In the **Software Serial Number** box, type the serial number that you received by email from Telestream. This is different from the Product Serial Number. Click **Next**.



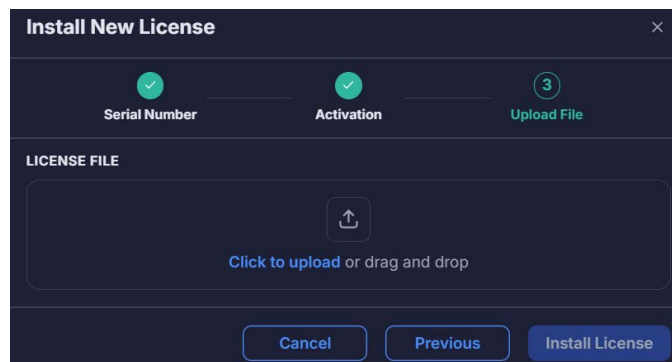
The screenshot shows the 'Install New License' dialog box with a close button (X) in the top right corner. At the top, there are three steps: 1. Serial Number (highlighted in green), 2. Activation, and 3. Upload File. Below the steps, there is a text input field labeled 'Software Serial Number*'. The field is currently empty.

3. Click **Generate Activation Code**, and then click **Copy**.



The screenshot shows the 'Install New License' dialog box with a close button (X) in the top right corner. At the top, there are three steps: 1. Serial Number, 2. Activation (highlighted in green), and 3. Upload File. Below the steps, there is a text input field labeled 'Generate Activation Code*'. To the right of the field is a 'Copy' button. Below the field, there is a note: 'Paste the generated code on the [Open Telestream Offline Activation Site](#) and download the file.' At the bottom, there are three buttons: 'Cancel', 'Previous', and 'Next'.

4. Click **Open Telestream Offline Activation Site**. Pulse opens a new window or tab and goes to this URL:
`https://cws.telestream.net/offlineactivation.aspx`
5. In the **Offline Activation Code** box, paste the code that you copied in the previous step, and then click **Submit**.
6. The file will download automatically or prompt you to save it. If prompted, save the activated license file locally.
7. On the Install New License(s) screen, click **Next**.
8. Click the **License File** box to upload the license file, or drag and drop it.



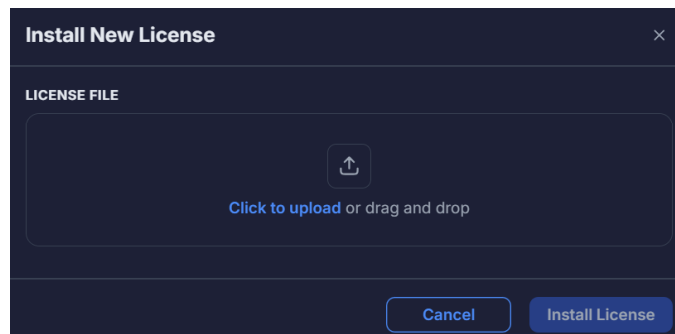
The screenshot shows the 'Install New License' dialog box with a close button (X) in the top right corner. At the top, there are three steps: 1. Serial Number, 2. Activation, and 3. Upload File (highlighted in green). Below the steps, there is a section labeled 'LICENSE FILE'. Inside this section, there is a large rectangular area with a central icon of a document with an upward arrow. Below the icon, there is a note: 'Click to upload or drag and drop'. At the bottom, there are three buttons: 'Cancel', 'Previous', and 'Install License'.

9. Click **Install License**.

Install via License File

To install a license via a license file:

1. Click **Install New Licenses**, and then click **Install using license file**.
2. Click the **License File** box to upload the license file that you received by email from Telestream, or drag and drop it.
3. Click **Install License**.



Diagnostic Files

For troubleshooting and support, you can view the following files:

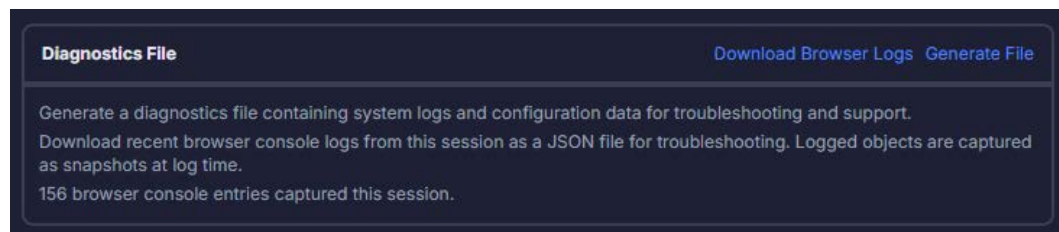
- a JSON file of recent browser console logs from the current session; and
- a diagnostics file containing system logs and configuration data.

To download a browser console log file:

1. Click **Download Browser Logs**.
2. Navigate to the location where you want to store the log file and save it.

To generate a .gz diagnostics file:

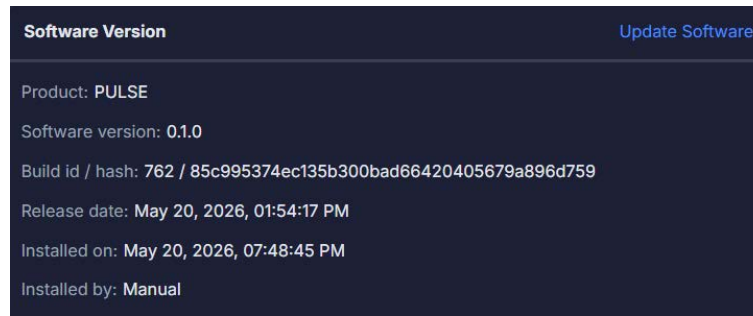
1. Click **Generate File**.
2. Navigate to the location where you want to store the diagnostics file and save it.



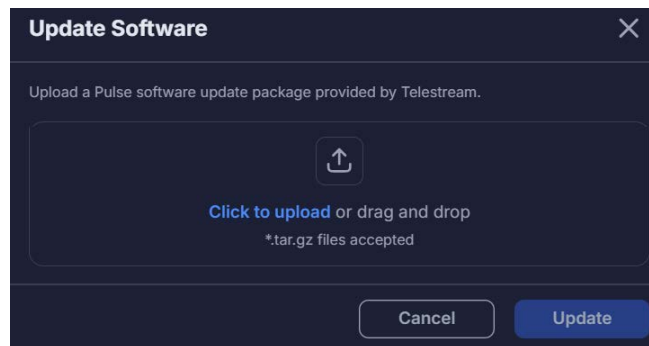
Update Pulse Software

To update Pulse:

1. Click **Update Software**.



2. Click the **Update Software** box to open the dialog box and upload the Pulse software update package that you received from Telestream, or drag and drop it.
3. Click **Update**.



Configure NMOS

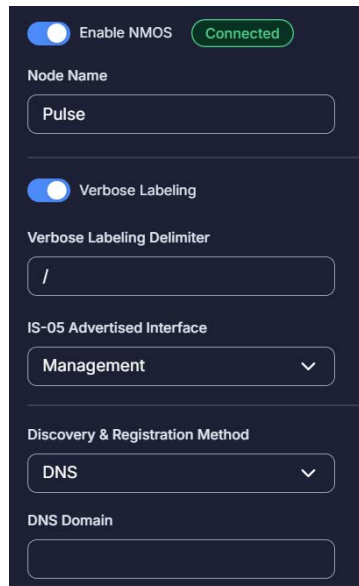
Pulse has adopted the following mapping model for the implementation of the NMOS IS-04 specification:

- The Pulse appliance is mapped to/is registered as an NMOS node.
- Each Pulse NMOS-capable input (each Pulse monitoring endpoint that can monitor the media belonging to a content source) is mapped to/is registered as an NMOS device. That device is associated with the Pulse NMOS node for that appliance.
- Each media that a Pulse NMOS-capable input can monitor is mapped to/is registered as an NMOS receiver associated with the NMOS device for that monitoring group. A Pulse device (for example, NMOS-enabled input) can have the following:
 - one video receiver;
 - one or more audio receivers; and
 - one or more data receivers.

To configure NMOS support in Pulse:

1. From the **Settings** menu, click **NMOS**.
2. Turn on the **Enable NMOS** toggle. By default, Pulse has its NMOS functionality disabled.

3. In the **Node Name** box, type a name/label that is assigned to the Pulse appliance in the NMOS registry (such as the NMOS label associated with the NMOS node corresponding to the Pulse appliance). By default, the NMOS Node name is Pulse.
4. You can configure how Pulse generates the labels (names) for Pulse objects that are registered in the selected NMOS registry.
Do one of the following:
 - Turn on the **Verbose Labeling** toggle to enable verbose labeling. For details, see [Verbose Labeling](#).
 - Turn off the **Verbose Labeling** toggle to disable verbose labeling. The default is off.
5. By default, a slash (/) is used as a delimiter between the components of the receiver name. If you want to use another character as the delimiter, type the character in the **Verbose Labeling Delimiter** box.
6. In the **IS-05 Advertised Interface** list, select **Management**, **a media port**, or **All**.
7. From the Discovery & Registration Method list, do one of the following:
 - Select **DNS** if you want Pulse to check for DNS registry announcements to find a server. In the **DNS Domain box**, type the search domain. Multicast DNS is enabled by default if you set the NMOS search domain to "local." When Unicast DNS is enabled, the probe searches only a single domain for NMOS registries. Unicast DNS is configured by entering the domain in the **DNS Domain** box.
 - Select **Registry Servers** if you want to manually enter the NMOS (Networked Media Open Specifications) registry IP address and port. You can add up to five registry servers for redundancy. For each server, click **Add Server** and type the server's IP address and port number.



The screenshot shows a configuration panel for Pulse with the following settings:

- Enable NMOS:** Toggled on, with a green **Connected** status indicator.
- Node Name:** Text box containing "Pulse".
- Verbose Labeling:** Toggled on.
- Verbose Labeling Delimiter:** Text box containing "/".
- IS-05 Advertised Interface:** Dropdown menu set to "Management".
- Discovery & Registration Method:** Dropdown menu set to "DNS".
- DNS Domain:** Empty text box.

Monitor Your 2110

Pulse provides multiple tools for monitoring the health of a ST 2110 network:

- **Dashboards:** You can create a customizable, single pane of glass workspace by arranging flexible tiles, such as live video previews, waveform and vector traces, audio bars, and network metric graphs—to continuously oversee multiple signals and correlate real-time telemetry.
- **PTP Monitor:** This tool provides real-time and historical visibility into network timing and synchronization health, allowing engineers to track grandmaster changes, message rates, and offsets from the leader.
- **Interface Monitor:** A diagnostic interface for observing real-time network interface health, traffic utilization, and hardware status on a node.
- **Input Monitoring:** Designed as a centralized mosaic dashboard, Input Monitoring allows you to view live signal thumbnails and color-coded alarm status indicators at a glance. From here, you can drill down into specific inputs to inspect deeper network-level diagnostics like IP Session data, Stream Status bandwidth, and IP Graphs, Format Information, and Media Applications.
- **Event Log:** Serving as a comprehensive historical record, the Event Log captures alarms and system state changes. This allows you to perform forensic analysis and correlate different events to identify the root causes of intermittent network faults.
- **Alarm Summary:** This tool is action-oriented interface for managing active, unresolved, and unacknowledged alarms. By filtering out historical noise, it helps operators quickly triage, prioritize, and respond to urgent network and signal events.
- **System Status:** Provides real-time diagnostic visibility into the hardware performance, resource utilization, and operational health of the Pulse platform.

Topics

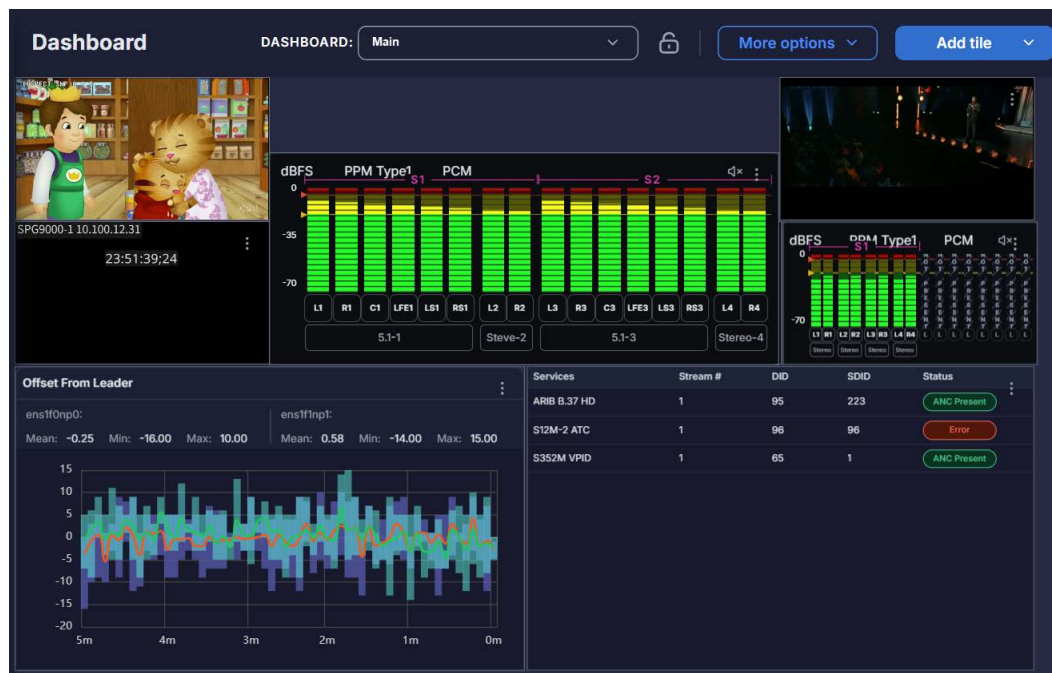
- [Dashboards](#)
- [PTP Monitor](#)
- [Interface Monitor](#)
- [Input Monitoring](#)
- [Alarm Summary Pane](#)
- [Event Log](#)
- [Alarm Summary](#)
- [Monitor System Status](#)

Dashboards

You can create fully customizable monitoring layouts by freely arranging, resizing, and overlaying various application tiles, such as live video previews, waveform traces, and audio bars. The Dashboard page unifies historically separate tools into a “single pane of glass” interface to streamline real-time troubleshooting and broadcast operations.

To view the Dashboard page:

1. Click **Dashboard**.



2. Each dashboard that you can access is listed in the Dashboard list. To view a different dashboard, select it from the list.



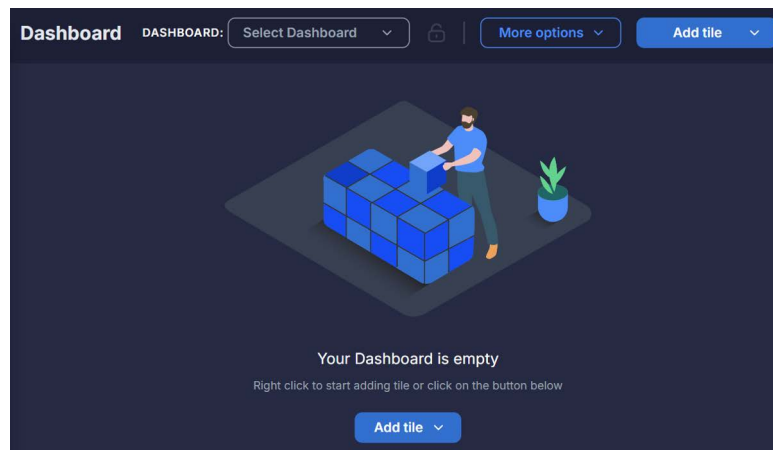
For details about adding tiles to dashboards, see [Configure a Tile](#).

Create a Dashboard

You can create one or more dashboards, and dashboards can be created in either free-form mode or grid mode. In free-form mode, you add individual tiles to a blank canvas manually. In grid mode, you apply a predefined layout (such as a 4x3 grid) to quickly add a bunch of similarly sized windows.

Create a Free-form Dashboard

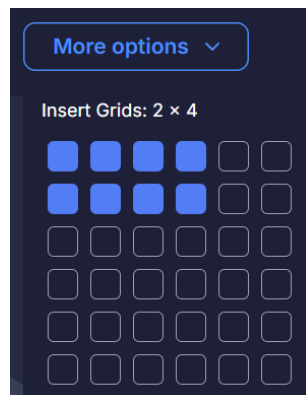
To create a dashboard in free-form mode, click **More options**, hover over **New Dashboard**, and click **Start New**.



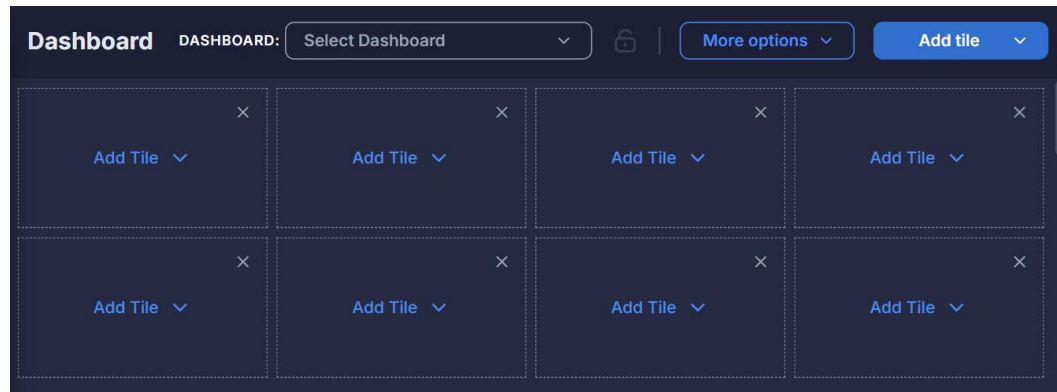
For details about assigning inputs to tiles, see [Configure a Tile](#).

Create a Grid Dashboard

1. To create a dashboard in grid mode, click **More options**, hover over **New Dashboard**, and click **Insert Grid**.
2. Select the number of rows and columns to include in the grid. In the following example, two rows and four columns will be included.



Pulse creates a grid with the specified number of rows and columns.



For details about assigning inputs to tiles, see [Configure a Tile](#).

Manage Tiles

This section describes how to add a tile to a dashboard and configure it, how to view tile titles, group tiles together, and how to move and resize them.

Add a Tile

To add a tile to a dashboard, do one of the following, depending on whether your dashboard uses a free-form layout or a grid layout. For a description of the tiles, see [Configure a Tile](#).

- To add a tile to a free-form layout, click **Add Tile**, and then select the tile to add.
- To add a tile to a grid layout: click **Add Tile** on the grid square where you want to add the tile, and then select the tile to add.

After you add a tile, you can click on the tile's borders and drag to resize it. In addition, you can click and drag on the tiles to rearrange them.

Configure a Tile

This section describes the types of tiles that are available and how to configure them.

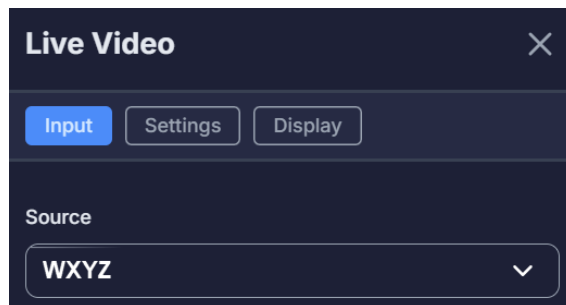
Live Video Tile

A Live Video tile displays a real-time visual picture of the incoming video stream and customizable overlays.



To configure a Live Video tile:

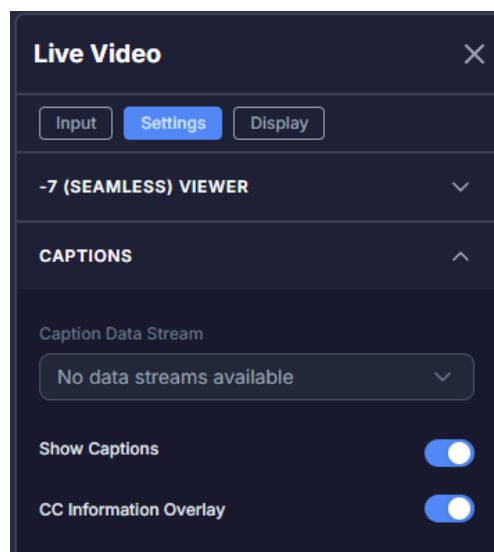
1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select the input source from the from the **Source** list on the **Input** tab.



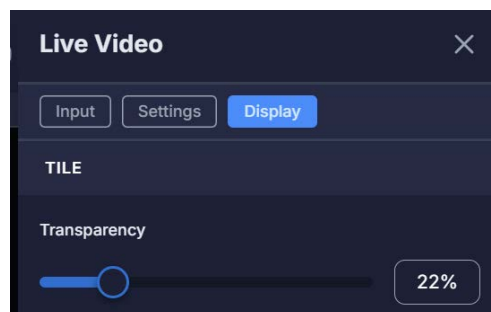
3. On the **Settings** tab, select a **-7 (Seamless) Viewer** from the **Video Selector** list to view the video of either path 1 or path 2.
4. In the **Captions** section, you can configure the following settings:
 - **Caption Data Stream:** Select the ancillary stream to decode information on.
 - **Show Captions:** Turn this toggle on to view captions in the tile.
 - **CC Information Overlay:** Turn this toggle on to view an overlay containing Closed Caption information, such as the format, transport stream, and service.
 - **CEA608:** Turn on this toggle to view decoded CEA608 captions and their associated information. From the **Channel** list, select the number of channels to display.
 - **CEA708:** Turn on this toggle to view decoded CEA708 captions and their associated information. From the **Channel** list, select the number of channels to display.
 - **OP-47:** Turn on this toggle to view decoded OP-47 Teletext and associated information. From the **Page** list, select the OP-47 pages to display.

- **SMPTE 2031:** Turn on this toggle to view decoded SMPTE-2031 teletext and associated information. From the **Page** list, select the SMPTE-2031 pages to display.
- **ARIB:** Turn on this toggle to view decoded Association of Radio Industries and Businesses (ARIB) captions and their associated information. From the **Type** list, select the ARIB type to display.

On the Settings tab, when more than one transport stream is enabled, Pulse arranges the streams automatically. The transport stream at the top of the list will be decoded if it is present. If the stream is not present, Pulse decodes the next stream on the list. You can arrange the caption transport streams in order of importance. Click and drag a transport stream to change the order.



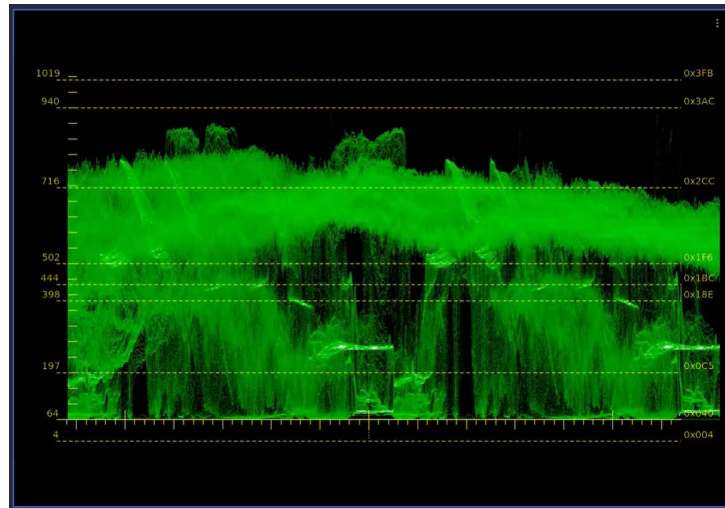
5. In the **Transparency** section on the **Display** tab, move the slider to set the transparency of the live video displayed in the tile.



Waveform Tile

A waveform monitor plots video signal levels over time. Horizontal position maps to line position, and vertical position maps to signal level. A waveform monitor is the primary tool for checking legal video levels, confirming correct exposure, and catching highlights that clip.

The Waveform tile provides a high-resolution, signal-level-versus-time display of an incoming video signal.



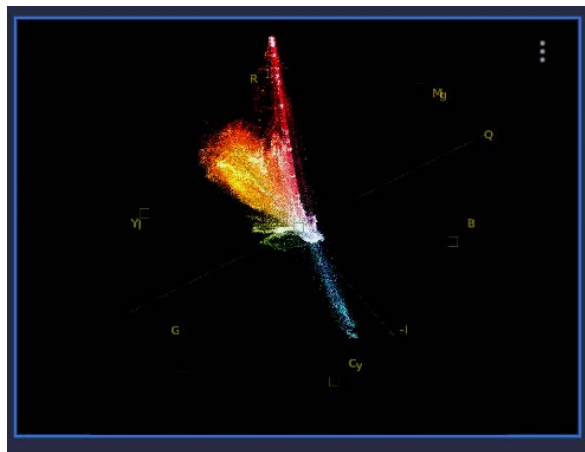
To configure a Waveform tile:

1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select the input source from the **Source** list on the **Input** tab.
3. On the **Settings** tab, you can configure the following settings:
 - **Display Mode:** Select up to four of the following:
 - **Y:** Display the input as White (Y) for the luma component (overall brightness). This display is the YRGB mode with the Red (R), Green (G), and Blue (B) components turned off.
 - **Cb:** Display the input as blue-difference (Cb) components.
 - **Cr:** Display the input as red-difference (Cr) components.
 - **R:** Display the input as R for the red components.
 - **G:** Display the input as G for the green components.
 - **B:** Display the input as B for the blue components.
 - **Filter:** Waveform filters are useful for isolating a specific characteristic of the input. For example, you can enable a Low Pass filter for quick camera exposure setting. Select one of the following:
 - **Flat:** Displays the full available bandwidth.
 - **Low Pass:** Displays only the low-frequency part of the signal, which is ideal for evaluating noise reduction and camera exposure settings.
 - **Line Select:** You can view the waveform for the entire image (All Lines) or isolate a specific raster line (1 Line) for targeted analysis. Set **Line Select** to **On** to select 1 Line or **Off** to select All Lines.
 - **Line:** Specify the number of lines to display.

- If the video format is interlaced, you can select the field to display.
When Line Select is enabled, the Waveform tile indicates that the tile is in line select mode and includes the current line and field for interlaced formats.
- **Gain:** Select the trace gain range: **x1**, **x2**, **x5**, or **x10**.
- **Variable Gain (25-200%):** Set **Variable Gain** to **On** and select the gain amount for fine gain control from 25 percent to 200 percent relative to the fixed gain setting. On the **Display** tab, you can configure the following settings:
 - **Trace Intensity:** Select the intensity of the trace elements and the tile background to reduce visual distractions and enhance visibility in any overlapping modes.
 - **Graticule Intensity:** Select the intensity of the graticule.
 - **Graticule Transparency:** Select the transparency of the graticule.
 - **Tile Transparency:** Select the transparency of the tile.

Vector Tile

The Vector tile provides an X-Y plot of color difference signals, allowing the operator to match skin tones and color of ITU-R BT 709 or 2020 color space.



To configure a Vector tile:

1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select the input source from the from the **Source** list on the **Input** tab.
3. On the **Settings** tab, you can configure the following settings:
 - **IQ Axis:** IQ Axis is used for inputs configured for Rec. 709 color gamuts. Select **IQ Axis** to turn the IQ axis on or off.
 - **SDI Compass Rose:** Select **SDI Compass Rose** to turn on the compass rose overlay in the Vector tile on or off.
 - **Line Select: Line Select:** Select the picture lines to monitor in the display. Select **All Lines** to monitor the entire image or **1 Line** to isolate a specific raster line using adjustable cursor placement.

- **Line:** Specify the line number to display.
When Line Select is enabled, the Vector tile indicates that the tile is in line select mode and includes the current line and field for interlaced formats.
- **Gain:** Select the magnification of the trace vector: **1.0x**, **1.5x**, **2.0x**, **2.5x**, **5.0x**, or **10.0x**.
- **Bar Targets (%):** Select the scaling of the vector display: **75%** or **100%**. On the **Display** tab, you can configure the following settings:
- **Trace Intensity:** Select the intensity of the trace elements and the tile background to reduce visual distractions and enhance visibility in any overlapping modes.
- **Graticule Intensity:** Select the intensity of the graticule.
- **Graticule Thickness:** Select the thickness of the graticule.
- **Graticule Transparency:** Select the transparency of the graticule.
- **Tile Transparency:** Select the transparency of the tile.

Audio Bar Tile

The Audio Bars tile is a scalable audio visualization and control surface designed for the real-time monitoring of audio activity within a Pulse Input. It gives operators and engineers a clear, organized view of all active streams, groups, and channels associated with an input, and provides interactive controls to rearrange, show, hide, solo, or mute any of these elements.



The vertical bar graphs are level meters. The height of the bar indicates the amplitude of the audio program in the corresponding input channel. The meter levels are color-coded based on their relationship to the Test level and Peak Program level indicators:

- Between the Test level and the Peak Program level, the meter bars are displayed in yellow.
- Above the Peak Program level, the meter bars are displayed in red.

By default, the units are in dB relative to full scale (dBFS). The 0 dB mark is digital Full scale.

Click the Mute icon (🔇) to mute or unmute all audio channels.

To isolate and identify an unexpected noise in a stream, select a channel to listen to it separately.



To change the playout channel, toggle the channel button.

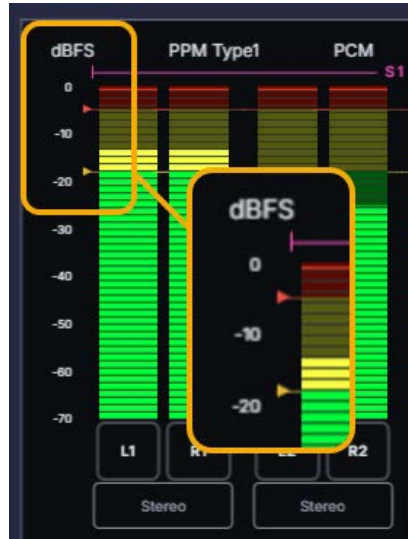
To play the entire audio program, toggle the audio program button.

A blue ring or button indicates that the audio is selected for playout if the speaker icon is enabled.

To configure an Audio Bar tile:

1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select the input source from the from the **Source** list on the **Input** tab.
3. Select the input source from the from the **Source** list on the **Input** tab.
4. On the **Settings** tab, you can configure the following settings:
 - **Ballistics:** To view the ballistics for the level-meter dynamic response, select **PPM Type1**, **PPM Type2**, or **True Peak**.
 - **Dbfs View:** Select **Logarithmic** or **Linear**.
5. **5.1 Channel Order:** You can change the order in which the right and center channels in any 5.1 surround program are displayed in the level meters. To configure the order, select **LCR** or **LRC**. The level meter reorders to left-center-right or left-right-center. This setting affects all 5.1 surround programs. If you select a second 5.1 surround program, both programs are set to LCR or LRC.

- **Peak Program (Red):** This level is marked by the red arrow in the Audio application. Audio above this mark is shown in red. This audio is above the peak level.



To change the Peak Program Level (dBFS) number, enter the number on the keypad or select the up or down arrows.

- **Test Level (Yellow):** The Test level, which is also called the reference or line-up level, is the yellow arrow in the Audio application. Audio above this mark is shown in yellow. This audio is between the test and peak levels.

To change the Test level (dBFS) number, enter the number on the keypad or select the up or down arrows.

Note: You cannot set the Test level above the Peak Program level. If the peak is set to -5, then the test cannot be -4. If the test is set to -4 (through the arrows or the keypad), the peak is set automatically to -4.

- **Audio Tile Indicators:** Turn on the toggles for the audio tile indicators to display in the Audio Bar tile: **Audio Type**, **Ballistics Indicator**, **Channel Name**, **Group Name**, and **Stream Divider**. To disable all audio indicators, click **Disable All**.

1. On the **Visibility** tab, you can select the channels to display in the Audio Bar tile. To view a channel, turn on the toggle for the channel. To view channels that are not present, turn on the **Not Present Channels** toggle.

2. On the **Display** tab, you can configure the following setting:

- **Tile Transparency:** Select the transparency of the tile.

ANC Session Tile

On the ANC (Ancillary Data) Session tile, you can examine the ancillary data in a signal. The instrument continually monitors the signal and notifies you of changes in the presence of data.

Services	Stream #	DID	SDID	Status	
S2016-3 AFD-Bar	1	65	5	ANC Present	
S334-2 CDP(708)	1	97	1	ANC Present	
S334/RP207 Prog Desc	1	98	1	ANC Present	
S352M VPID	1	65	1	ANC Present	

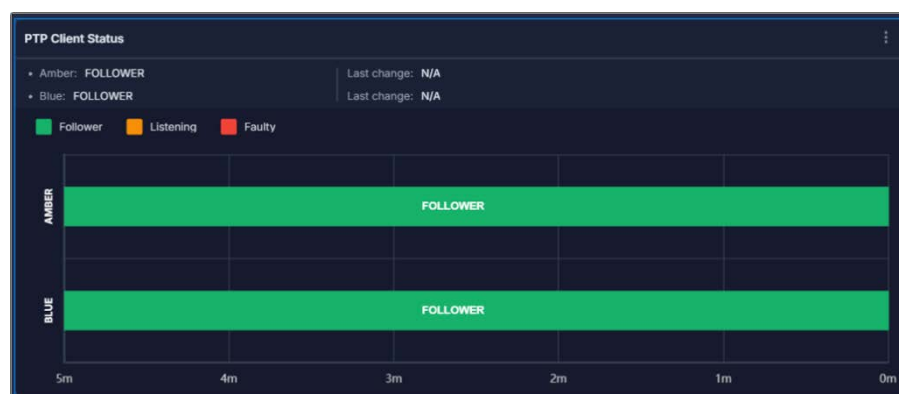
To configure an ANC Session tile:

1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select the input source from the **Source** list on the **Input** tab.
3. Turn on the toggles for the ANC columns that you want to view:
 - Services
 - Stream #
 - DID
 - SDID
 - Channel
 - ANC Stream
 - Status
 - Detail
4. On the **Display** tab, you can configure the following setting:
 - **Tile Transparency:** Select the transparency of the tile.

PTP Metrics and Graphs Tile

In the PTP Metrics and Graphs tile, you can display any of the following graphs:

- **PTP Client Status:** A PTP Client Status graph shows the current synchronization condition of a PTP follower, indicating states such as Locked, Holdover, or Fault. It provides a concise, at-a-glance visualization of non-numerical measured metrics. You can quickly check the current status and expand the view into a detailed timeline chart to see historical states.



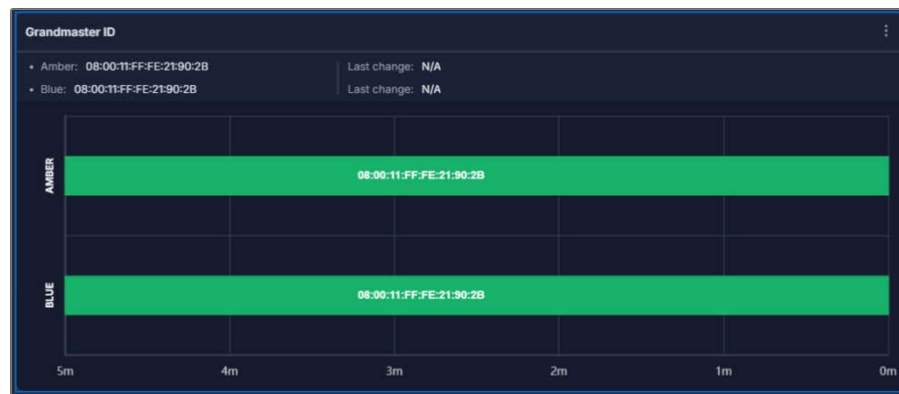
- **Offset From Leader:** The Offset from Leader graph shows the phase error of the phase-locked loop that controls the follower clock, representing the timing offset between the follower and the leader. This measurement provides a reasonable estimate of how well the PTP follower is locked to the leader clock. It does not indicate whether there is any delay asymmetry in the network.



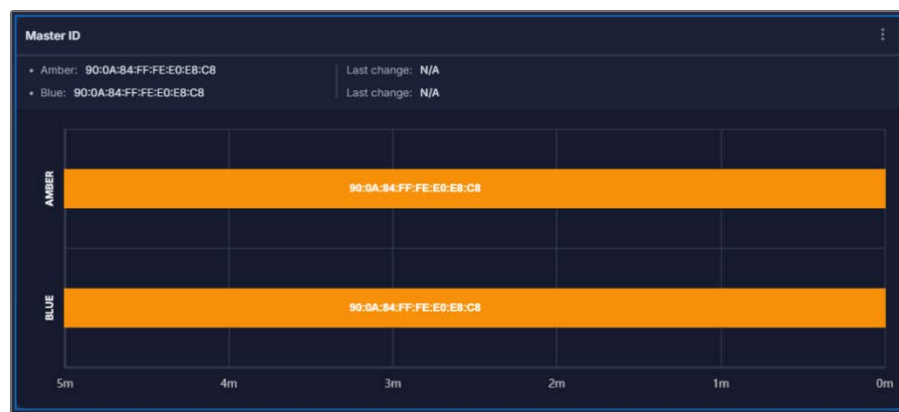
- **Path Delay:** A Path Delay graph shows the network propagation delay between the leader clock and the follower clock. PTP uses this value to calculate the clock offset and synchronize time across the network.



- **Grandmaster ID:** A Grandmaster ID graph shows which grandmaster (GM) clock the PTP follower is locked to. The displayed ID is typically the Media Access Control (MAC) address of the PTP Leader (with the bytes ff:fe inserted in the middle) or a short text label. It provides a concise, at-a-glance visualization of non-numerical data with an expandable historical timeline.



- **Master ID:** A Master ID status graph displays the current master node within a PTP domain. It is designed to show the ID or short name of the master and automatically logs an event with a date and time stamp when the master changes. It provides a concise visualization of non-numerical measured metrics.



- **Domain:** A Domain status graph displays the domain number being used by the PTP follower. It automatically logs an event with the date and time if the domain changes, and it highlights any mismatches against the expected domain configured in the alarm template. It is designed to provide a concise visualization of non-numerical data.



- **Clock Identity:** The node's PTP clock identifier, an 8-byte value usually derived from the interface MAC address.



To configure a PTP Metrics and Graphs tile:

1. Click the Edit icon (⚙️) on the tile and click **Configure**.
2. Select one of the following data metrics from the **Data Metric** list on the **Input** tab:
 - PTP Client Status
 - Offset From Leader
 - Grandmaster ID
 - Master ID
 - Domain
 - Clock Identity
3. On the **Settings** tab, you can configure the following settings:
 - **Duration:** From the **Duration** list, select the duration to display on the graph: **1 minute, 5 minutes, 20 minutes, Hourly, 6 hours, 12 hours, 1 day, or 5 days**. This setting defines the extent of the horizontal axis in the PTP graphs.
 - **Date/Time:** Click the calendar icon and select the date and time to display, or click **Today** to view today's data.
4. On the **Display** tab, you can configure the following settings:
 - **Show Graph:** Turn on the Show Graph toggle to view the graph.
 - **Port 1:** Turn on the Port 1 toggle to view information about Port 1.
 - **Port 2:** Turn on the Port 2 toggle to view information about Port 2.
 - **Tile Transparency:** Select the transparency of the tile.

View or Hide Tile Titles

To display the title of a tile, click the Edit icon (⚙️) on the tile and click **Show Title**.

To hide a title, click the Edit icon (⚙️) on the tile and click **Hide Title**.

Group Tiles

If you have multiple tiles that will use the same input, you can group the tiles together to speed up the configuration process.

To group tiles together:

1. Press **Shift** and click to select each tile.
2. From the toolbar that appears at the bottom of the screen:
 - a. **Assign a color:** When tiles are grouped, their borders are color-coded to indicate that they belong to the same group. To change a group's border color, select a color from the **Assign Group Color** list.
 - b. **Assign an input source:** To assign the same input source to all of the tiles in the group, select the source from the **Assign Source** list.
3. Click **Save**.



To remove a tile from a group:

1. Click the tile.
2. On the toolbar at the bottom of the screen, click **Ungroup**.

Move and Resize Tiles

You can customize the dashboard by moving and resizing tiles to create your ideal layout. Tiles can be resized and stacked or overlaid on top of each another.

Move a Tile

To move a tile or multiple tiles, click it and drag it to a new location. Alternatively, you can click a tile and press the arrow keys to move it. To select more than one tile to move, press **Ctrl** and click the tiles. To make the tiles move faster, press **Shift** while pressing an arrow key.

To fine-tune the tile's placement, use the arrow keys.

To bring a tile to the front, right-click the tile and press **Ctrl+]**.

To send a tile to the back, right-click the tile and press **Ctrl+[**.

Resizing Tiles

To manually resize a tile to a predefined size, click it and drag its border to adjust its size.

You can also resize a tile to one of the following predefined sizes:

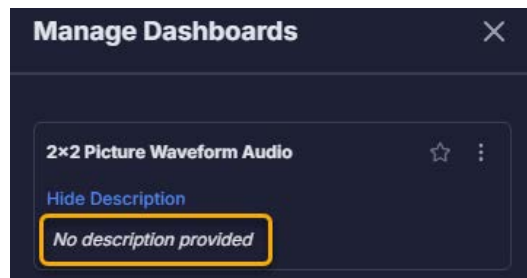
- **Full screen:** To maximize a tile so that it takes up the whole screen, do one of the following:
 - Right-click the tile and click **Full Screen**.
 - Press **F**.

- Double-click the tile.
- **Half screen:** To resize a tile to half of the screen, do one of the following:
 - Right-click the tile and click **Half Screen**.
 - Press **H**.
- **Quarter screen:** To resize a tile to one-quarter of the screen, do one of the following:
 - Right-click the tile and click **Quarter Screen**.
 - Press **Q**.
- **Default size:** To return a tile to its default size, right-click the tile and click **Restore default size**.

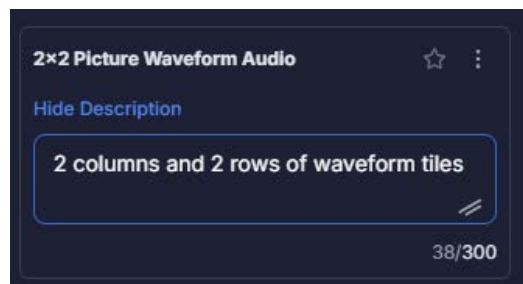
Add a Dashboard Description

To add a description to a dashboard:

1. From the **Dashboard** list, select a dashboard.
2. Click **More options**, and then click **Manage Dashboards**.
3. Click **View Description** underneath the name of the dashboard.
4. Click **No Description Provided**.



5. Enter a description, and then close the Manage Dashboards pane.



Save a Dashboard

To save a dashboard:

1. Click **More options**, and then click **Manage Dashboards**.

2. Click **Save Dashboard**:
3. In the **Dashboard Name** box, type a name for the new dashboard.
4. (Optional) In the **Description** box, type a description.
5. Click **Save**.

Copy a Dashboard

You can copy a dashboard and use it as the basis for a new dashboard that has a different layout, for example. You can copy dashboards that you have created and dashboards that someone else has created and locked.

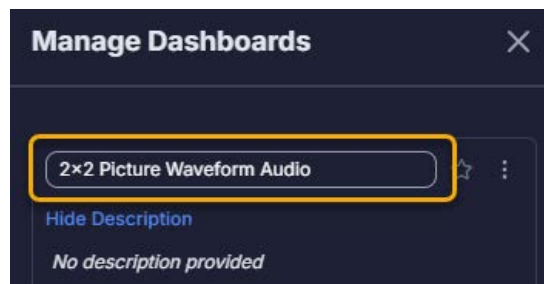
To copy a dashboard:

1. From the **Dashboard** list, select the dashboard to copy.
2. Click **More options**, and then click **Save As Dashboard**.
3. In the **Dashboard Name** box, type a name for the new dashboard.
4. (Optional) In the **Description** box, type a description.
5. Click **Save**.

Rename a Dashboard

To rename a dashboard:

1. From the **Dashboard** list, select a dashboard.
2. Click **More options**, and then click **Manage Dashboards**.
3. Click the title of the dashboard.



4. Enter a new title, and then close the Manage Dashboards pane.

Lock a Dashboard

When you are done customizing a dashboard's layout, you can lock the dashboard to prevent unintended changes to the dashboard's layout, configuration, and tile sizes.

To lock a dashboard, click the Lock icon (🔒).



To unlock a dashboard, click the Unlock icon ()

Share a Dashboard

If you build a layout that would be useful for a coworker, you can share the dashboard with other users who are registered on the same Pulse system.

To share a dashboard with another user:

1. From the **Dashboard** list, select the dashboard to share.
2. Click **More options**, and then click **Manage Dashboards**.
3. Click the Edit icon () beside the dashboard to share and click **Share**.
4. From the **User Names** list, select a user.
5. Click **Save**.

Note: If you are using a dashboard that has been shared with you, you cannot change it. If you want to modify the dashboard, save a copy of it. Then you will be the owner of that copy and can modify it.

Define a Default Dashboard

You can define a dashboard as the default dashboard that opens every time you log in.

To define a default dashboard:

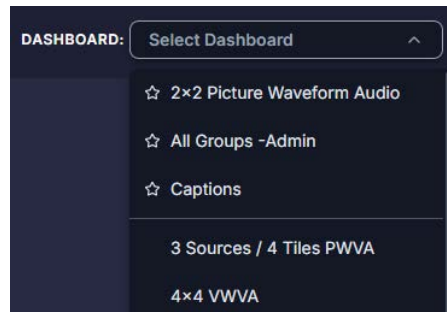
1. Click **More options**, and then click **Manage Dashboards**.
2. Click the Edit icon () beside the dashboard to copy and click **Set as default**.

Define Dashboard Favorites

Any dashboards that you mark as favorites appear at the top of the list of available dashboards to make them easy to find.

To define a favorite dashboard:

1. Click **More options**, and then click **Manage Dashboards**.
2. Click the Favorite icon () beside the dashboard to mark as a favorite.



Your favorite dashboards are mapped to keyboard shortcuts so you can quickly switch between your top 10 layouts. To load a different dashboard, press **Shift** and type the number of the dashboard. For example, to view the second dashboard in your Dashboards list, press **Shift+2**.

Delete a Dashboard

To delete a dashboard:

1. From the **Dashboard** list, select a dashboard.
2. Click **More options**, and then click **Manage Dashboards**.
3. Click the Edit icon (⚙️) beside the dashboard to delete and click **Delete**.

PTP Monitor

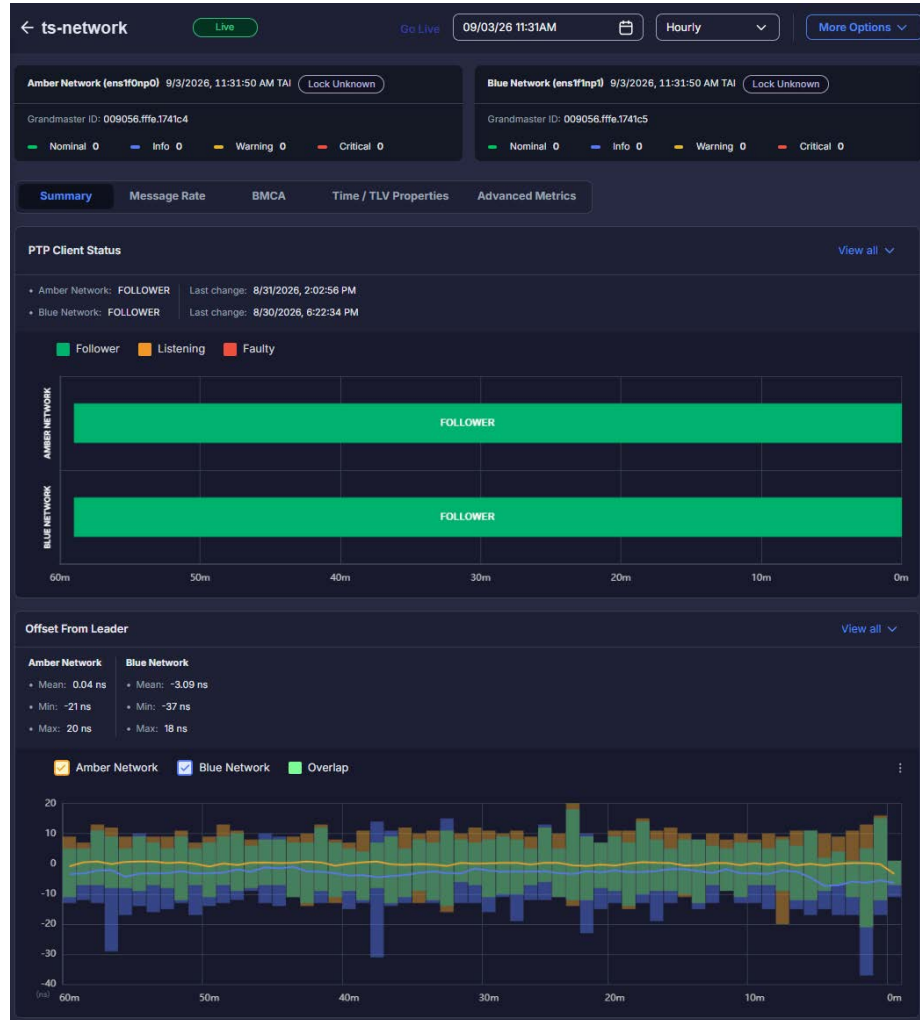
The PTP Monitor provides real-time and historical visibility into Precision Time Protocol (PTP) synchronization health across SMPTE ST 2110 networks. In ST 2110 facilities, all equipment must share a common time reference down to the nanosecond. Without it, video frames and audio samples from different sources arrive out of alignment, causing visible artifacts (frame tears, lip sync errors) and making seamless switching impossible. PTP (IEEE 1588 / SMPTE ST 2059-2) distributes this reference across the network from a Grandmaster Clock, and every device disciplines its local clock to match.

The PTP Monitor shows how well your node is synchronized to the grandmaster. In a healthy facility, Offset From Leader stays within a few hundred nanoseconds; offsets drifting into the microsecond range warrant investigation.

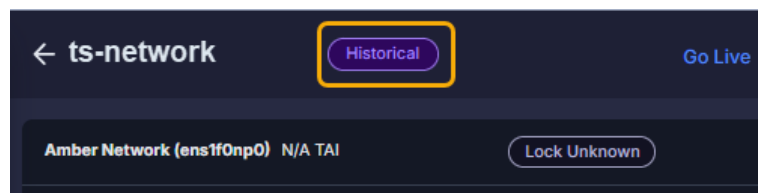
On the PTP Monitor tabs, engineers can visualize clock hierarchies, monitor message rates, and analyze timing offsets via a suite of configurable graphs and a centralized alarm summary.

Access the PTP Monitor

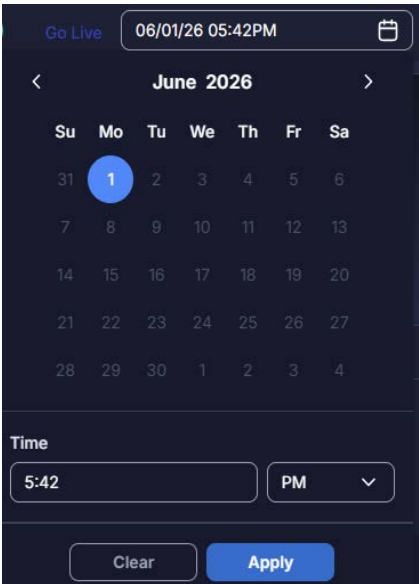
To view the PTP Monitor, click **PTP Monitor**.



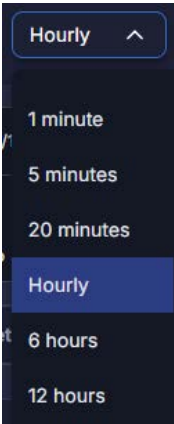
You can choose the date, time, and interval of the data that is displayed. By default, live data is displayed. To view data for a particular date and time, click the Calendar icon () , select the date and time, and click **Apply**. When you view historical data, the Historical badge is displayed and the graph time axis is displayed in absolute time instead of relative.



To return to the live view, click **Go Live**.

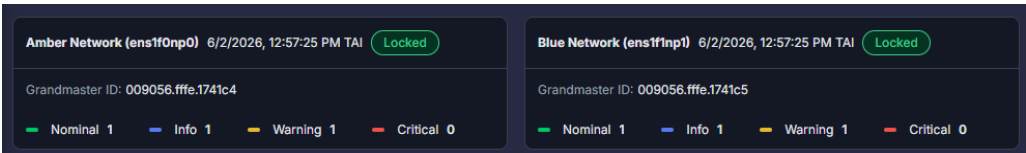


From the **Interval** list, select the interval to display: **1 minute**, **5 minutes**, **20 minutes**, **Hourly**, **6 hours**, **12 hours**, **1 day**, or **5 days**. This setting defines the extent of the horizontal axis in the PTP graphs.

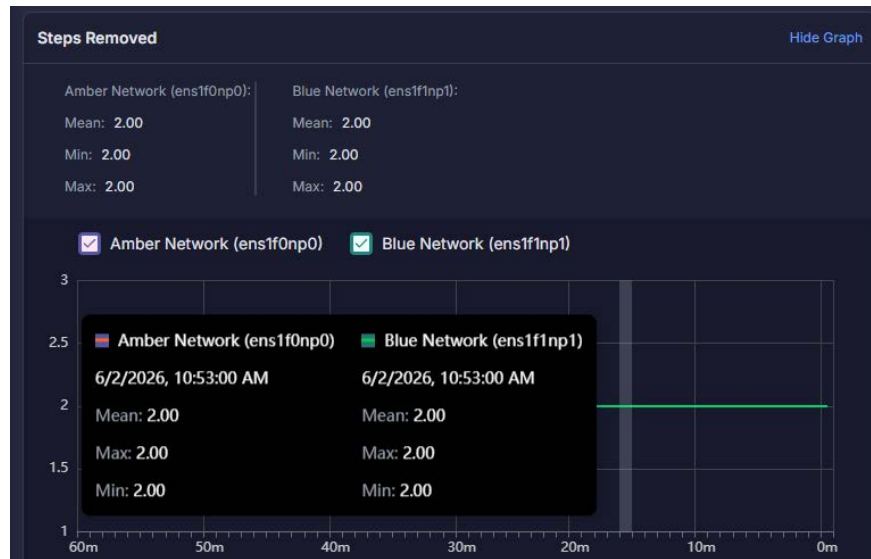


At the top of the PTP Monitor page, Pulse displays two Port Info sections, one for each redundant PTP path. Each Port Info section shows the path's name, its PHY clock time (the hardware clock, labeled TAI) and a Locked/Unlocked badge. Lock Unknown indicates that the state is still being read.

The Grandmaster ID identifies the clock that path is currently following. A row of counts (Nominal, Info, Warning, and Critical) summarizes the PTP alarms for that path.



For each graph displayed on the PTP Monitor pages, you can hover the graph to view additional details.



You can hide each graph to conserve screen space. To hide a graph, click **Hide Graph**.

Reading Graphs

Each graph shows a mean line with a shaded min/max band. Hover over the graph to read the exact values at any point. For a redundant (2022-7) input, Port 1 and Port 2 checkboxes toggle each path, and a Show Graph / Hide Graph toggle collapses a graph to its summary figures.

Auto scale is on by default for each graph, stretching the vertical axis to fit whatever data is currently visible. This is convenient, but it means small fluctuations can look like big swings as the scale keeps readjusting. To fix the axis to a steady, padded range so readings stay comparable over time, click the Edit icon (⚙️) beside the graph's legend and click **Disable Auto Scale**. To turn auto scale back on, click **Enable Auto Scale**.

Summary Tab

The Summary tab provides a high-level overview of the PTP status for a selected PTP monitor. It consolidates essential PTP follower metrics into a single view, combining visual indicators and numerical data so broadcast engineers and operators can quickly understand synchronization health, spot issues at a glance, and access historical status changes.

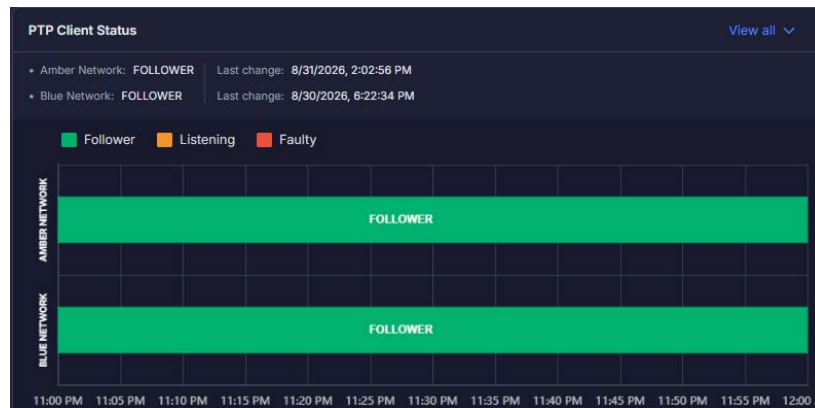
You can leverage the Summary tab for core operational workflows:

- **Real-time monitoring:** Operators can quickly verify the system's synchronization health by checking for a green (healthy) status, confirming there are no domain mismatches, and ensuring that the offset from the leader clock is within the expected range.

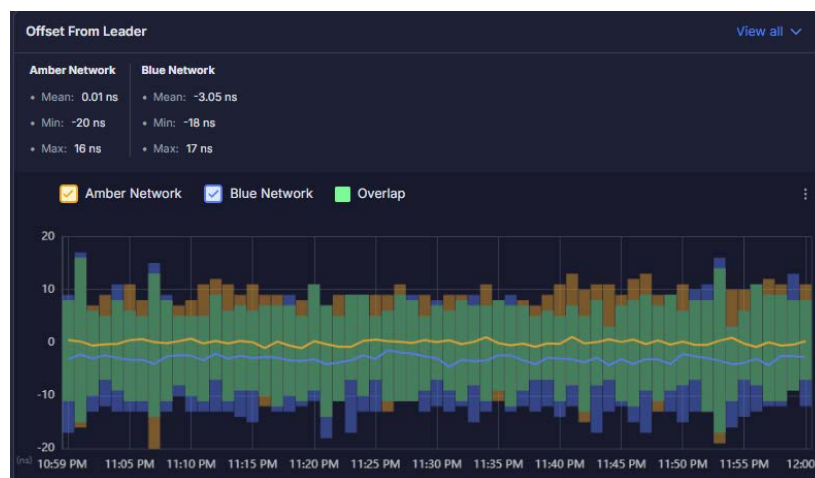
- **Troubleshooting out-of-sync alarms:** If Pulse triggers an alarm for an excessive offset from the leader, operators can open the Summary tab to locate the metric in a red alarm state. From there, they can check the timestamp of the last status change and expand the Offset from Leader line graph to compare the mean, minimum, and maximum offsets over a chosen time window to determine exactly when the deviation began.
- **Investigating frequent switchovers:** If an engineer notices that the system is repeatedly switching grandmasters, the engineer can check the summary logs for the Master ID or grandmaster ID to see how often the switches occurred and at what timestamps. This data can then be correlated with external network logs to find the root cause.

The Summary tab displays key metrics in status graphs:

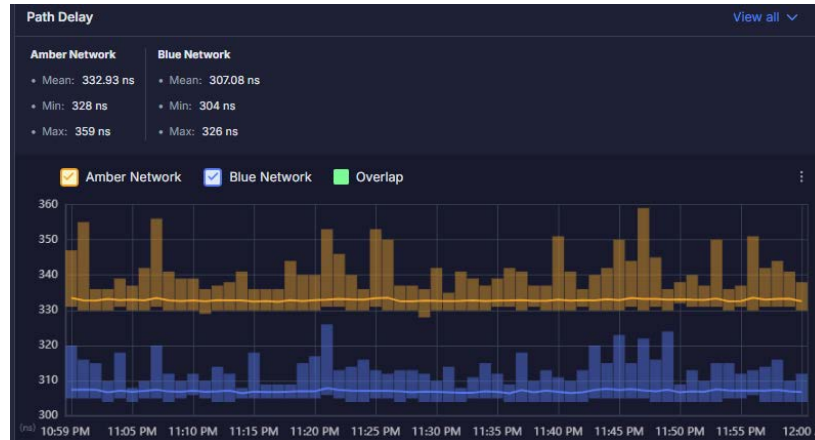
- **PTP Client Status:** The high-level state of the PTP follower, such as Locked, Holdover, or Fault. This graph updates in near real-time and logs the date and time of any status transitions.



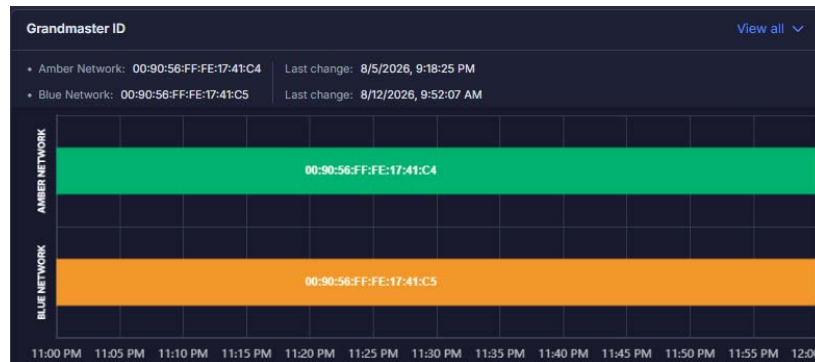
- **Offset from Leader:** The timing offset between the follower and the leader clock. The chart shows the mean, minimum, and maximum offset over a user-selected time window.



- **Path Delay:** The network propagation delay between the leader clock and the follower clock. PTP uses this value to calculate the clock offset and synchronize time across the network.



- **Grandmaster ID:** Displays the ID or short label of the grandmaster clock that the follower is locked to and logs an event with a timestamp if the grandmaster changes.



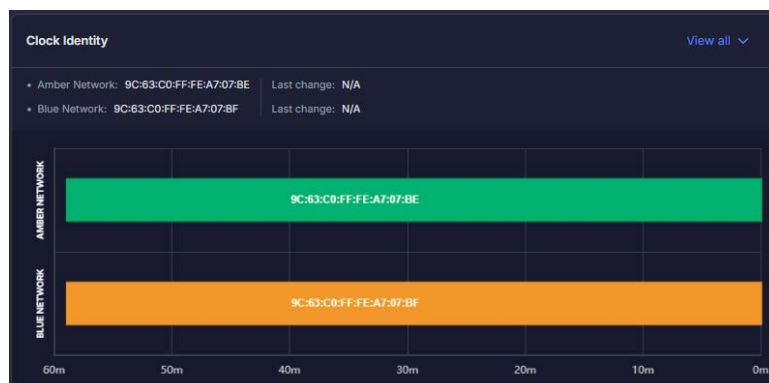
- **Master ID:** Shows the ID or short name of the current Master node within the domain and logs any changes with a timestamp.



- **Domain:** The current domain number that the follower is using. This graph highlights any mismatches against the expected domain configured in the alarm template and logs any domain changes.



- **Clock Identity:** The node's PTP clock identifier, an 8-byte value usually derived from the interface MAC address.



- **Steps Removed:** The number of network boundary or transparent clocks between the grandmaster and the follower, and it logs any changes to this value.



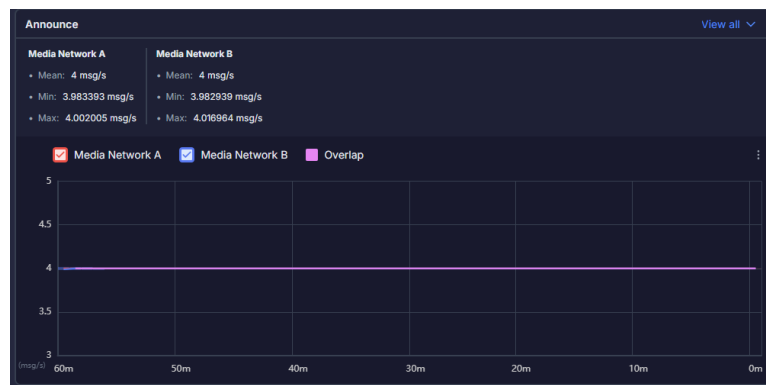
Message Rate Tab

The Message Rates tab provides detailed information about the frequency of PTP messages. The Message Rates graphs visualize the flow of messages exchanged between the PTP leader and the follower. Users can quickly identify whether synchronization instability is caused by message failures rather than phase drifts. Operators can use this tab to monitor the specific transmission and reception rates of PTP messages to ensure that they align with the expected PTP profile. Tracking these rates helps engineers troubleshoot network congestion, dropped packets, or issues with the grandmaster clock.

Message rate metrics provide an indication of the average message rates for each class of PTP message over the prior 1-minute window as measured by changes in ptp4l's PORT_STATS_NP dataset. These rate metrics provide high-level categorization of all PTP traffic present on each interface and can include traffic from multiple PTP clocks spanning multiple PTP domains.

Key metrics you can analyze include:

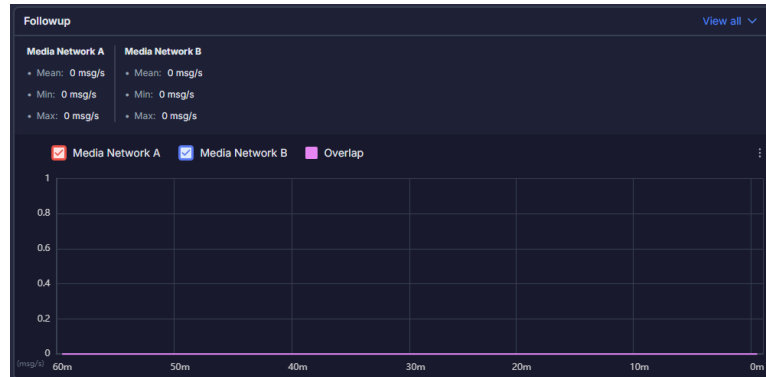
- **Announce:** Displays the rate of Announce messages received from the leader. Typical values are 1 to 4 messages per second; some profiles allow a wider range. A lower than expected value might indicate a problem in the network or the leader.



- **Sync:** Displays the rate of Sync messages received from the leader. Typical values are 1 to 16 messages per second. A lower-than-expected value suggests a potential issue with the leader or network transport.



- **Followup:** Tracks the transmission frequency of PTP follow-up messages over time. Operators can use this graph to monitor the stability and flow of secondary follow-up messages to ensure synchronization health.



- **Delay Request:** Displays the rate of Delay Request messages sent by the follower. In multicast mode, this is typically dictated by the leader and is usually set to equal the Sync message rate.



- **Delay Response:** Displays the rate of Delay Response messages received from the leader. Each Delay Request should generate a matching Delay Response. A lower than expected response rate strongly indicates an issue in the network or the leader clock.



Management: Displays the rate of PTP Management messages (measured in messages per second) being propagated across the network over a specific period of time. Operators can use this graph to monitor the stability of management traffic on the network and to troubleshoot related synchronization alarms.



BMCA Tab

The BMCA (Best Master Clock Algorithm) tab displays the details and transitions of the best master clock on the network. It provides deep visibility into the specific parameters the algorithm uses to evaluate and select the active PTP leader on a given domain. Operators can use this tab to validate the PTP network's clock hierarchy, ensure that the correct device is acting as the leader, and troubleshoot the root causes of any unexpected grandmaster transitions. To understand why a specific grandmaster was selected, operators can review the grandmaster BMCA values, which are listed in order of precedence for leader selection:

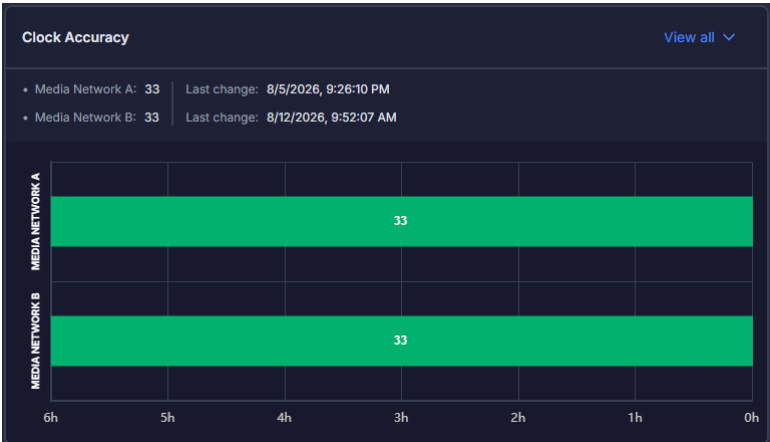
- **Priority 1:** The primary criteria evaluated by the BMCA. To be considered a leader, this value should typically be set to 128 or less. A lower Priority 1 value will force a device to be chosen as the leader even if its actual clock quality is poor.



- **Clock Class:** Characterizes the clock’s TAI (International Atomic Time) traceability. For example, a PTP grandmaster locked to GPS reports a class 6, but will drop to a class 7 if it falls into holdover mode.



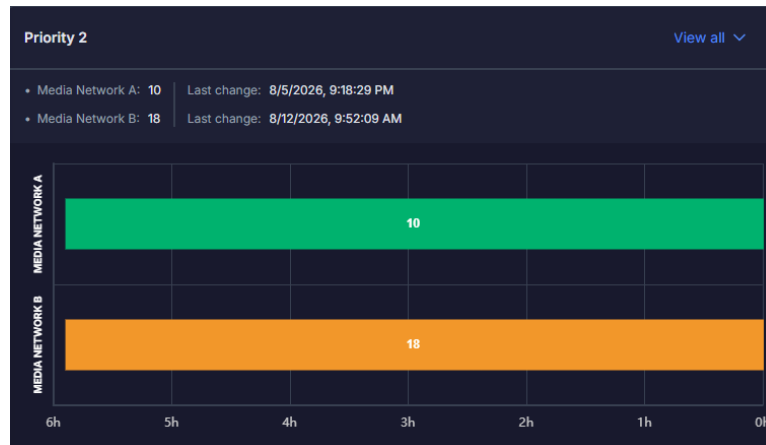
- **Clock Accuracy:** Characterizes the raw accuracy of the clock.



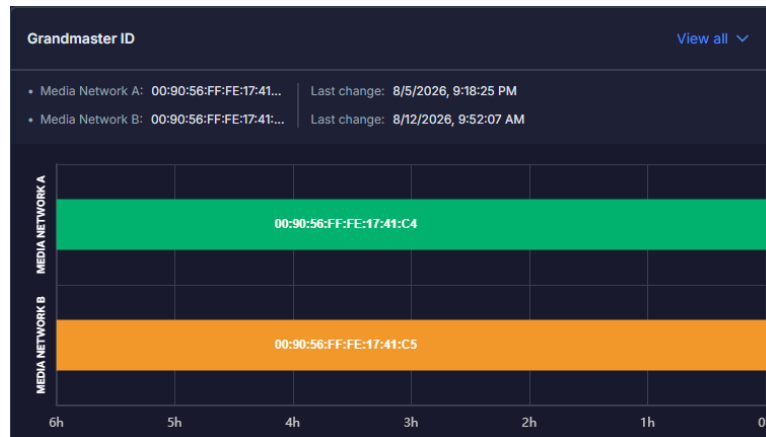
- **Clock Variance:** Indicates the variance of the clock over a 1-second interval. A lower number indicates a more stable clock, which is preferred by the algorithm.



- **Priority 2:** Used as a tiebreaker between leaders that have identical clock quality down through the previous parameters. Lower values indicate a preferred leader.



- **Grandmaster ID:** If all parameters match down through Priority 2, the BMCA uses the Clock ID (usually the MAC address of the PTP leader) as the final tiebreaker.



When using the BMCA tab to troubleshoot, operators must consider how the BMCA receives data based on the network's communication mode:

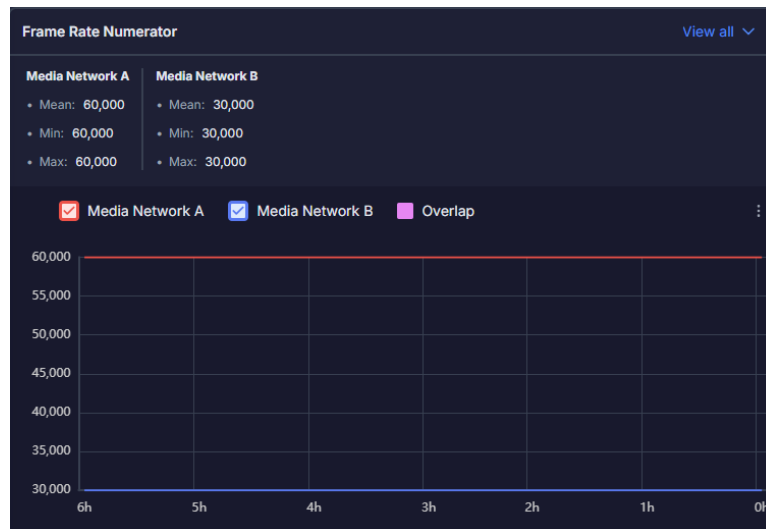
- **Multicast and Mixed Modes:** The active leader broadcasts Announce messages so all devices can evaluate the BMCA automatically. If any device determines its BMCA rating is better, it will send an announcement and take over as the active leader.
- **Unicast Mode:** Followers only receive Announce messages if they have established a grant from a leader. Therefore, it is up to the followers to independently evaluate the BMCA based on the leaders listed in their Acceptable Master Table (AMT).

Time/TLV Properties Tab

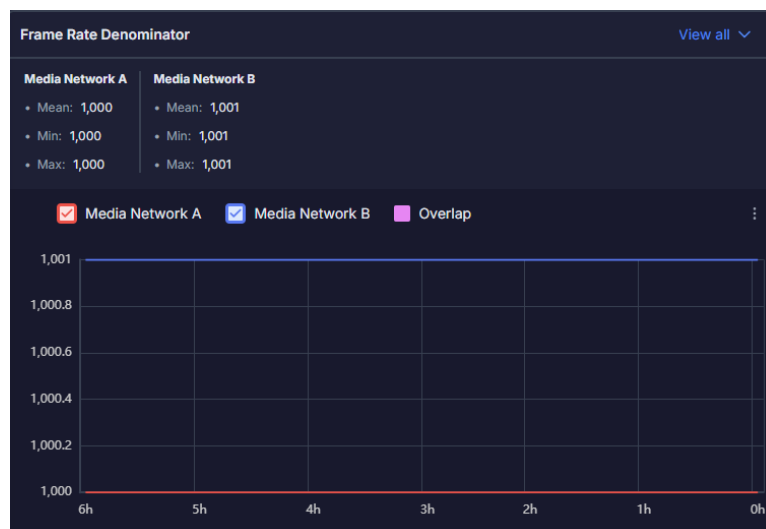
Operators can use the Time/TLV Properties tab to review Type Length Value (TLV) management messages and check precise offset data when performing advanced troubleshooting or validating ST 2059 profile configurations.

Key metrics you can analyze include:

- **Frame Rate Numerator:** The numerator of the media frame rate the grandmaster is aligned to. With the denominator, it defines the frame rate; for example: 30000/1001 for 29.97 fps.



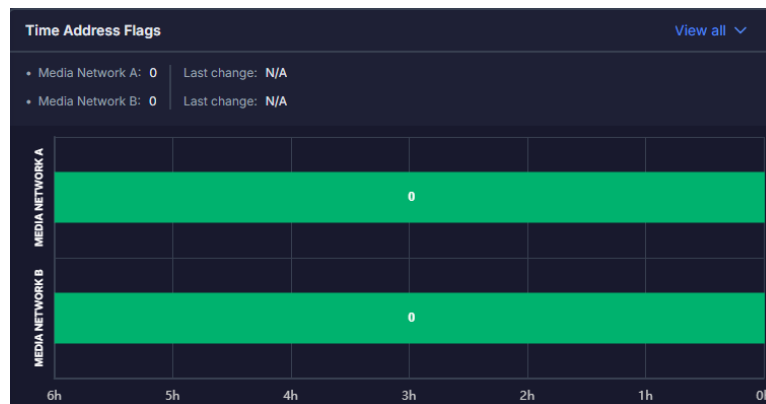
- **Frame Rate Denominator:** The denominator of the media frame rate. With the numerator, it gives the exact frame rate the alignment point is based on.



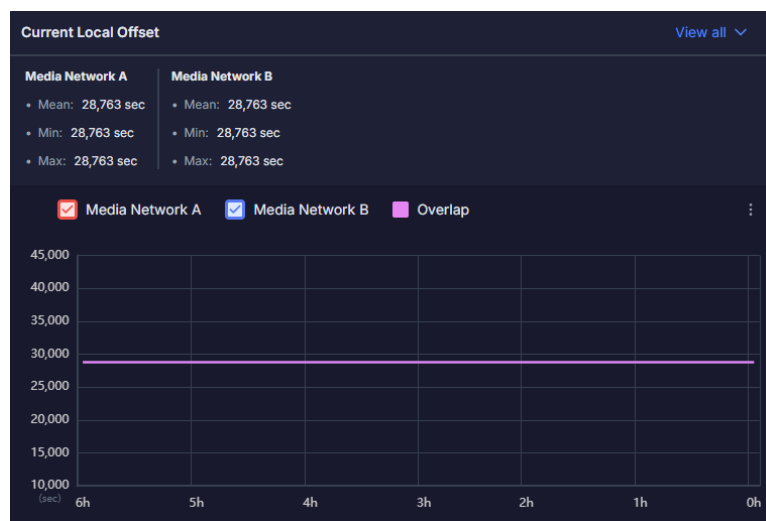
- **Master Locking Status:** Indicates whether the grandmaster is locked to its time source; for example, free-run, locked, or in holdover.



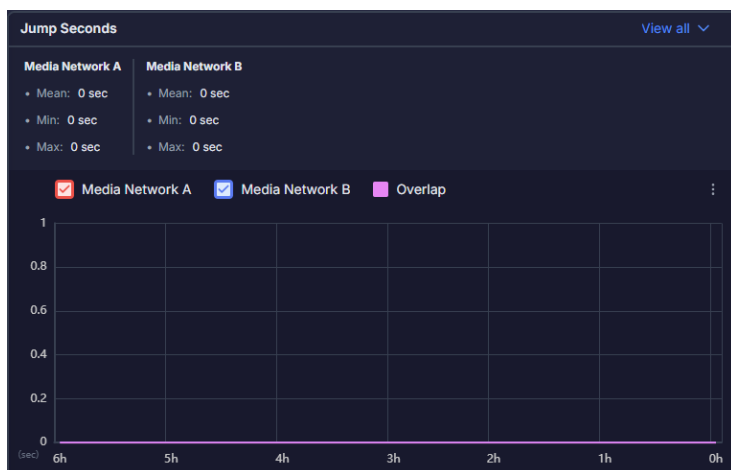
- **Time Address Flags:** These flags describe the time scale and source, such as whether the time is traceable and whether a leap second is pending.



- **Current Local Offset:** The current offset, in seconds, between TAI and local time, which is the UTC offset plus any daylight-saving adjustment.



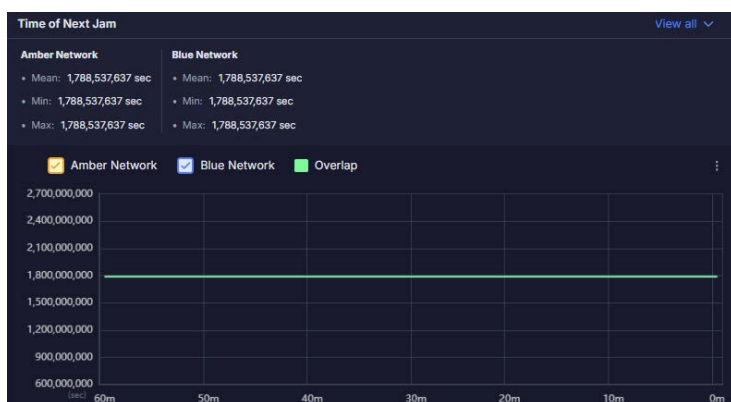
- **Jump Seconds:** The size, in seconds, of the next scheduled discontinuity in the local offset, which is typically a leap second or daylight-saving change.



- **Time of Next Jump:** The time at which the next local-offset jump, such as a leap second, is scheduled to occur.



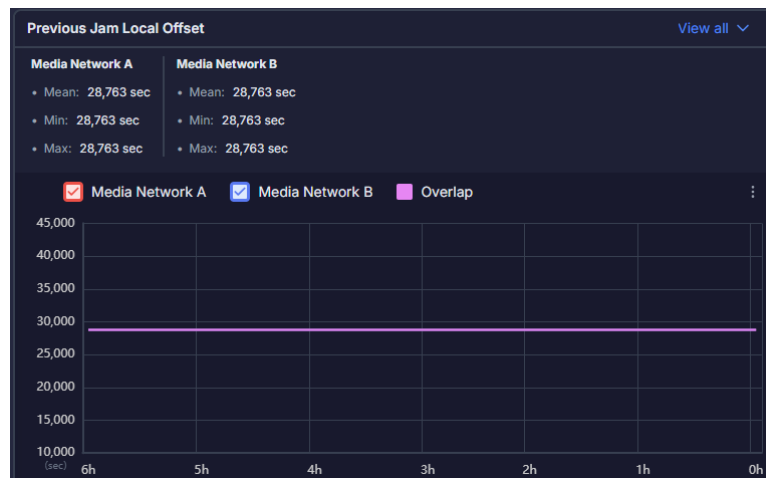
- **Time of Next Jam:** The next time the grandmaster will realign (jam) its daylight-saving and leap-second schedule from its source.



- **Time of Previous Jam:** The most recent time the grandmaster realigned its daylight-saving and leap-second schedule.



- **Previous Jam Local Offset:** The local offset that was in effect at the previous jam, for comparison against the current offset.



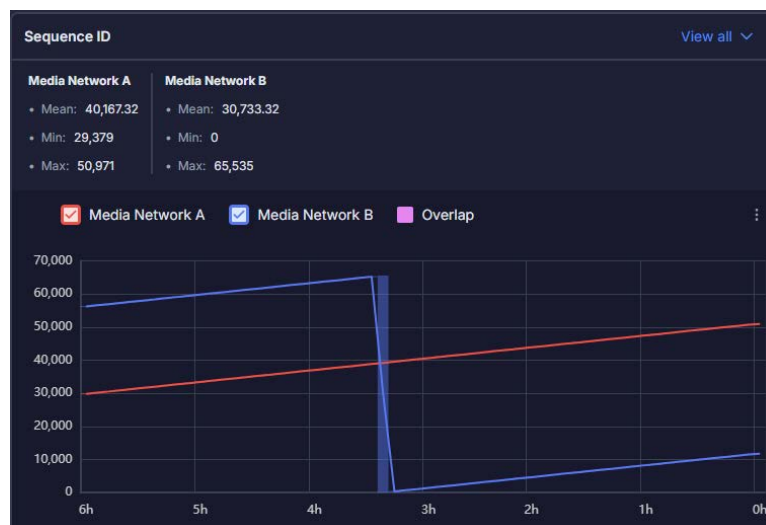
- **Daylight Saving:** Indicates whether daylight saving is currently being applied to the local time the grandmaster advertises.



- **Leap Second Jump:** Indicates a pending leap-second adjustment, which is whether the next jump adds (a 61-second minute) or removes (a 59-second minute) a second.



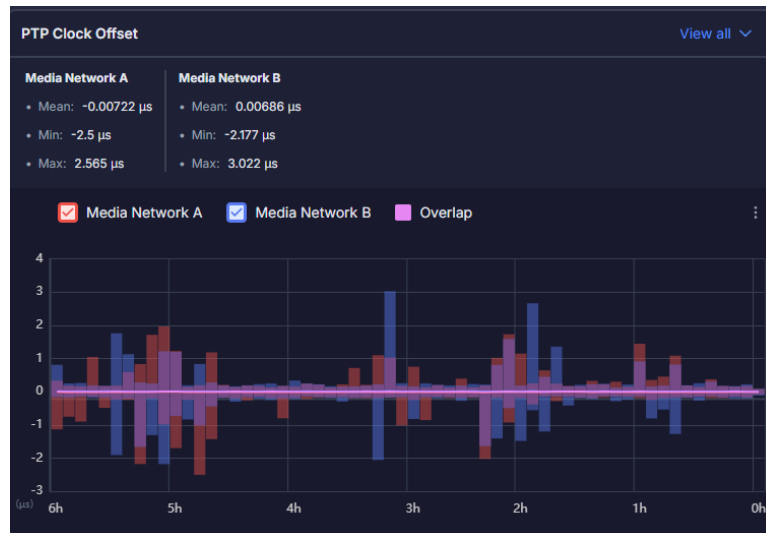
- **Sequence ID:** The sequence number of the SMPTE 2059-2 management message, incrementing with each update. It confirms that fresh metadata is arriving.



Advanced Metrics Tab

On the Advanced Metrics tab, you can view the following metrics:

- **PTP Clock Offset (ns):** The measured offset, in nanoseconds, between this path's PTP clock and the other monitored path's clock. The offset shows how closely the two redundant paths agree; a large divergence means one path is drifting.



- **PTP Clock Offset from System (ns):** The offset, in nanoseconds, between the PTP hardware clock and the host operating-system clock. In a facility where the system clock is disciplined by NTP and the network interfaces are receiving PTP, you would typically see a non-zero offset here, reflecting the difference between the two time sources. This is expected and normal. A very large or rapidly growing offset can indicate that the OS clock is not being updated correctly or that there is a configuration mismatch between timing references. This metric is most useful when diagnosing timing problems that only appear in software-dependent paths, where the OS clock rather than the PTP hardware clock is the reference.



Configure PTP Settings

To configure how Pulse monitors and synchronizes with the PTP network:

1. From the **More options** list, click **Edit**.

2. On the Setup tab, you can configure the following settings:

- To enable PTP, turn on the **Enable PTP** toggle.
- From the **Header Version** list, select the PTP header version: **2.0** or **2.1**.
- From the **PTP Profile** list, select the profile your PTP will run in: **SMPTE ST 2059-2**, **AES67**, or **General** (IEEE 1588).
- From the **Communication Mode** list, select the appropriate communication mode for your profile: **Multicast** or **Mixed SMPTE**.
- In the **PTP Domain** box, enter a domain number (from 0-127) to match the PTP service you will monitor.
- In the **Delay Asymmetry** box, enter a value to compensate for propagation delay differences in your facility. The default value is 0.
- Click **Save PTP**.

Edit PTP

Setup Alarms (3)

☒ Enable PTP

Header Version
2.1

Profile
SMPTE ST 2059-2

Communication Model
Multicast

PTP Domain
110

Delay Asymmetry
0

Cancel Save PTP

Note: On some supported NICs, the hardware clocks used by the two media interfaces are internally coupled even though PULSE monitors them as separate PTP clients. Configure both interfaces to use the same PTP clock domain and, preferably, the same Grandmaster. If the interfaces use different Grandmasters with significantly different times, correcting one clock can affect both interfaces and may cause simultaneous loss of lock, clock-jump alarms, or abnormal offset readings. When both interfaces report a PTP problem at the same time, verify the upstream PTP topology and Grandmaster configuration before treating the events as independent network failures.

Configure PTP Alarms

To view the PTP alarm profiles:

1. From the **More options** list, click **Edit**.
2. Click the **Alarms** tab.
3. To search for an alarm, click the Search icon () and type some or all of the alarm name.
4. Click an alarm name. Pulse displays the available alarm parameters. For descriptions of the available alarms and parameters, see [Alarms Overview](#).
5. To enable a PTP alarm, turn on the alarm's toggle.
6. Configure the desired parameters for the alarm.
7. Click **Save Alarms**.

Alarm Summary Pane

In the Alarm Summary pane, you can view active, unresolved, and unacknowledged alarms. See [Alarm Summary Pane](#).

Interface Monitor

The Interface Monitor is the primary interface for monitoring network interfaces on a specific Pulse node.

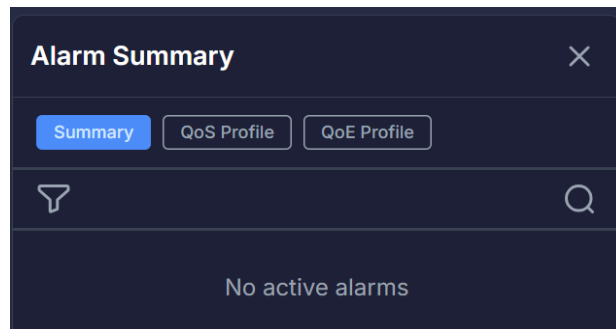
To view the Interface Monitor, click **Interface Monitor** on the Pulse menu.



By default, live data is displayed. To view data for a particular date and time, click the Calendar icon () , select the date and time, and click **Apply**. To return to the live view, click **Go Live**.

To customize the view, click **More options** and select one of the following:

- **Show Interface Names:** To view the interface names beside the aliases.
- **Show Alarm Summary:** To view the Alarm Summary pane.
 - You can click the **Summary** tab to view a summary of all alarms, the **QoS Profile** to view QoS profile alarms, or **QoE Profile** to view QoE profile alarms.
 - To filter the alarm list, click the Filter icon (🔍) and select the alarm severities to display: **Critical**, **Warning**, and/or **Information**.
 - To search for an alarm, click the Search icon (🔍) and type some or all of the alarm name.



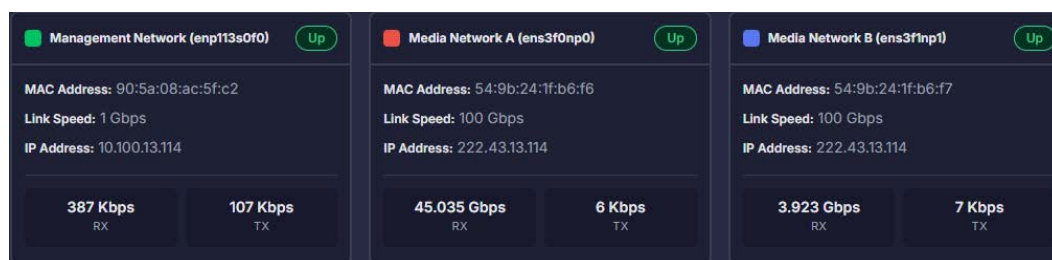
- **Reset Interface Monitor Settings:** To clear the current data collection. This action resets the sequence error counters and changes any yellow warning statuses back to a healthy green.

Interface Status Cards

The Interface Status Cards are the central access point for viewing and navigating monitored Pulse nodes and their interfaces across a facility. Operators can discover multiple nodes, quickly assess interface health across different locations—such as specific racks, rooms, or remote trucks—and identify overarching issues.

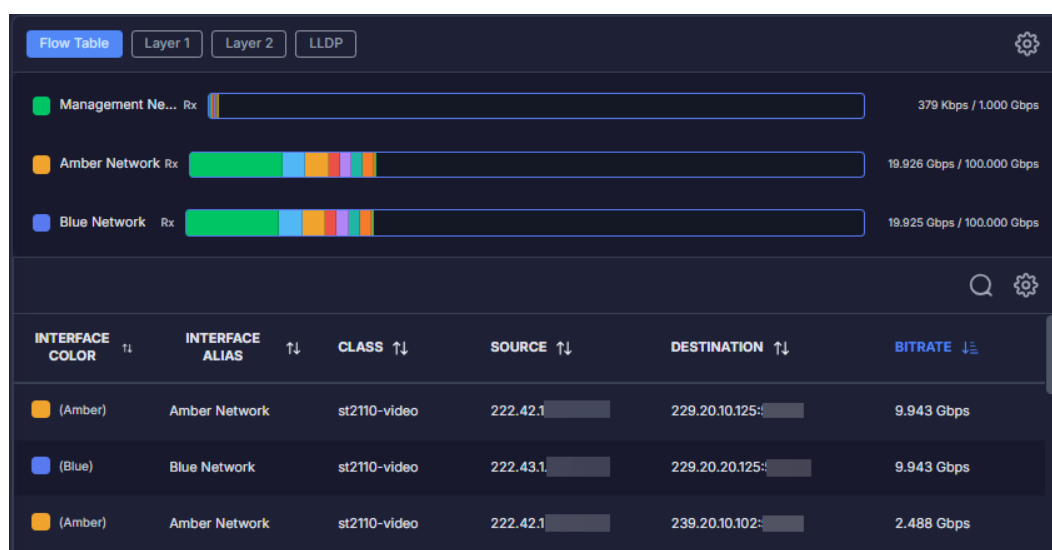
Each node interface card represents a distinct monitored Pulse node within your facility. The following information is displayed on each card:

- **Interface name:** Each card lists the interfaces associated with that node.
- **Status of the network interface:** Up or Down.
- **MAC Address** – The Media Access Control (MAC) address of the network interface.
- **IP Address:** The IP address of the interface.
- **Link Speed:** The link speed of the interface.
- **Rx and Tx metrics** – A count of the Rx (Receive) and Tx (Transmit) bytes for the current session.



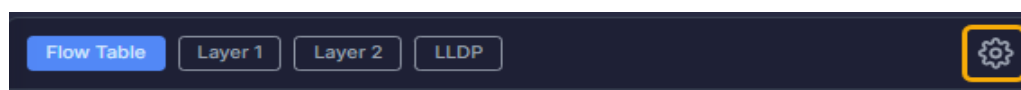
Flow Table Tab

The Flow Table displays all network traffic that is traversing the system's Network Interface Cards (NICs). The tab provides addressing information and bitrates for each active flow. The tab is designed for live monitoring; flows dynamically appear and disappear as traffic starts and stops, and no historical data is retained.



By default, data is displayed periodically every 5 seconds. To view data for a particular date and time, click the Calendar icon (📅), select the date and time, and click **Apply**. To return to the live view, click **Go Live**.

To customize the data that is displayed, click the **Settings icon** in the graph pane.



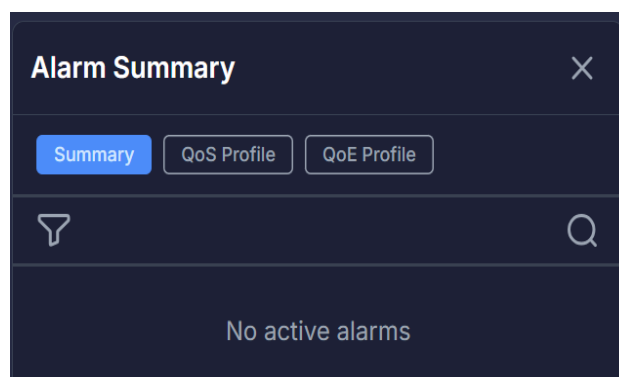
You can select the following:

- **Refresh rate:** How often the data is updated. The default is every 5 seconds. Select **Refresh: Off**, **Refresh: 1s**, **Refresh: 5s**, **Refresh: 15s**, or **Refresh: 60s**.
- **Flow TTL:** The flow Time to Live (TTL), in seconds. Select **Flow TTL: 15s**, **Flow TTL: 30s**, **Flow TTL: 60s**, or **Flow TTL: 180s**.

- **Resolve DNS Names:** When enabled, the resolved DNS names are displayed.
- **Bar Scale:** Select one of the following:
 - **Bar Scale Link Speed:** When enabled, the link speed is displayed on the bar scale.
 - **Bar Scale: Observed Bandwidth:** When enabled, the observed bandwidth is displayed on the bar scale.
- **Show Legend:** When enabled, the graph legends are displayed.
- **Show Tx:** When enabled, the Transmit (Tx) bytes are displayed.
- **Show Rx:** When enabled, the Receive (Rx) bytes are displayed.
- **Show Bandwidth Bars:** When enabled, a graph with bandwidth bars is displayed.
- **Flow Table Filters Apply to BW Bars:** When enabled, any filters that you configure for the table underneath the graph pane will apply to the graphs, too. For example, if you opt to filter the table by source name, the graphs will display only information for the specified source.

To further customize the view, click **More options** and select one of the following:

- **Hide Interface Status Cards:** To hide the Interface Status Cards.
- **Show Interface Names:** To view the interface names beside the aliases.
- **Show Alarm Summary:** To view the Alarm Summary pane.
 - You can click the **Summary** tab to view a summary of all alarms, the **QoS Profile** to view QoS profile alarms, or **QoE Profile** to view QoE profile alarms.
 - To filter the alarm list, click the Filter icon (🔍) and select the alarm severities to display: **Critical**, **Warning**, and/or **Information**.
 - To search for an alarm, click the Search icon (🔍) and type some or all of the alarm name.

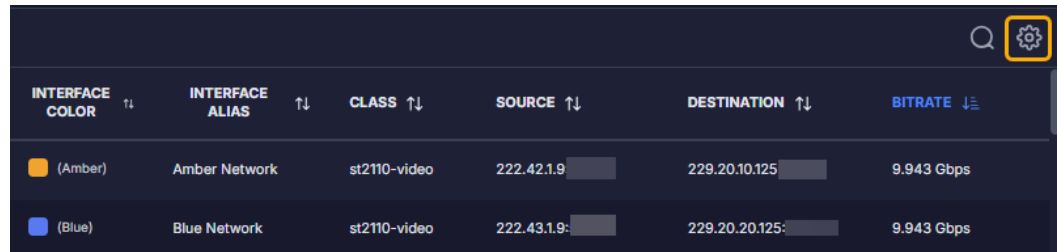


- **Reset Interface Monitor Settings:** To restore the configured settings to their initial state.

In the bottom pane, the flow table displays all active network flows, allowing you to monitor both management and media data. The table classifies and identifies the protocols the traffic is using, such as ST 2110. For each flow, current bitrate metrics and

addressing information is displayed. The data presented is real-time. Network flows will dynamically appear and disappear from the table as traffic starts and stops. No historical data is retained.

To customize the data that is displayed, click the **Settings icon** in the table pane.



The screenshot shows a table with the following columns: INTERFACE COLOR, INTERFACE ALIAS, CLASS, SOURCE, DESTINATION, and BITRATE. There are two rows of data. The first row is for 'Amber' and the second for 'Blue'. A settings icon (gear) is highlighted in the top right corner of the table pane.

INTERFACE COLOR	INTERFACE ALIAS	CLASS	SOURCE	DESTINATION	BITRATE
(Amber)	Amber Network	st2110-video	222.42.1.9	229.20.10.125	9.943 Gbps
(Blue)	Blue Network	st2110-video	222.43.1.9	229.20.20.125	9.943 Gbps

You can select the following:

- **Timestamp:** System timestamp indicating when the became active. The timestamp is based on Coordinated Universal Time (UTC).
- **SensorId:** A unique numerical identifier for each sensor.
- **InputId:** A unique numerical identifier for each input.
- **Input Name:** The name of each input.
- **Labels:** The input ID and input name labels.
- **Interface:** The name of each interface.
- **Interface Alias:** The alias of each interface.
- **Class:** The protocol class used by each flow.
- **Source:** The source of each flow.
- **Source DNS:** The Domain Name System (DNS) server address for each flow.
- **Source MAC:** The Media Access Control (MAC) address for each flow.
- **Destination:** The destination IP address and port for each flow.
- **Destination DNS:** The destination DNS server address for each flow.
- **Destination MAC:** The destination MAC address for each flow.
- **Bitrate:** The current bitrate of each flow.
- **Packets:** The number of packets in each flow.
- **PTP Domain:** The PTP domain (if any) for each flow.
- **Last Seen:** The date and time the flow was last seen.

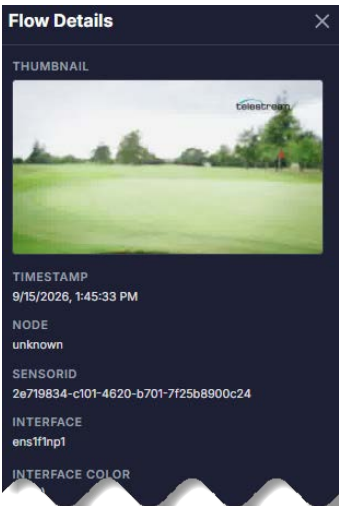
You can click column headings to sort the flow data by those columns. For example, click the **Source** column to sort the table by source IP address.



This close-up shows the column headers: INTERFACE ALIAS, CLASS, SOURCE, DESTINATION, and BITRATE. The SOURCE column header is highlighted with a yellow box.

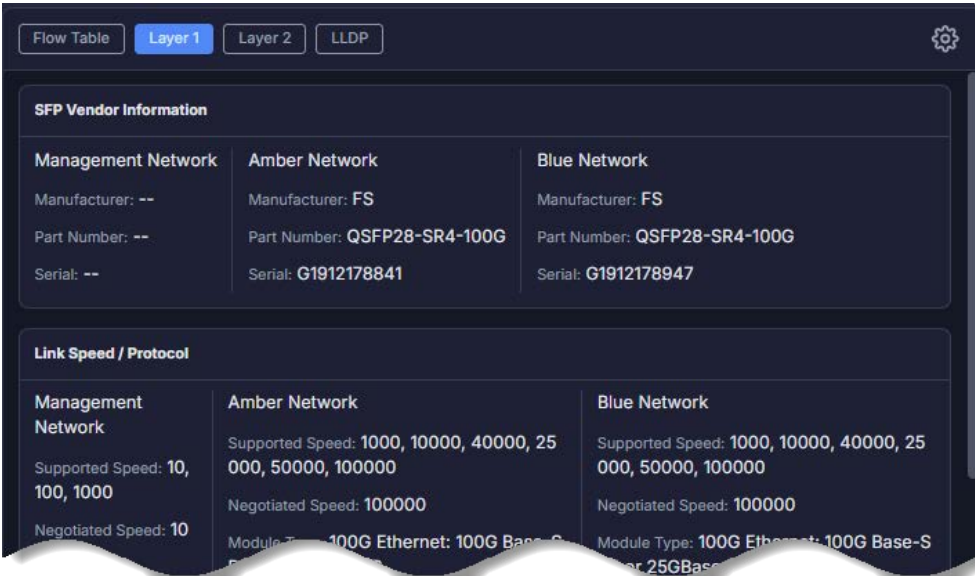
INTERFACE ALIAS	CLASS	SOURCE	DESTINATION	BITRATE
-----------------	-------	--------	-------------	---------

Click a flow to view details about the flow.



Layer 1 Tab

The Layer 1 tab provides physical link and transceiver health diagnostics. For example, you can check optical power, module temperature, and link status. You can hover over each timeline graph to view tooltips listing the numeric values for a given point in time.



By default, live data is displayed. To view data for a particular date and time, click the Calendar icon (📅), select the date and time, and click **Apply**. To return to the live view, click **Go Live**.

By default, data for the last 12 hours is displayed. To filter the amount of data that is displayed, click the **Hours** list and select a time frame. To customize the data that is displayed, click the Settings icon (⚙️). You can select the following:

- **Refresh rate:** How often the data is updated, in seconds. Select **Refresh: Off**, **Refresh: 1s**, **Refresh: 5s**, **Refresh: 15s**, or **Refresh: 60s**.
- **Column width:** Select one of the following:
 - **Interface Columns: Fixed Width** – To space the columns at a fixed width with condensed spacing in between columns.
 - **Interface Columns: Evenly Spaced** – To space the columns evenly across the width of the page.

The following information is displayed on the Layer 1 tab:

- **SFP Vendor Information:** The SFP manufacturer, model/part number, and serial number.

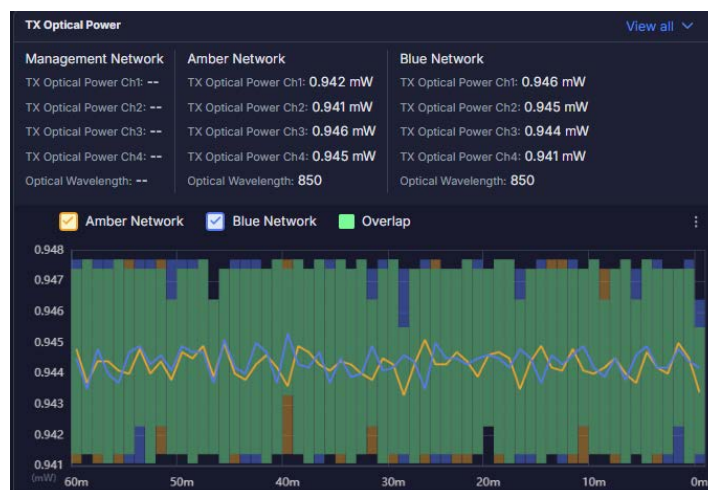
SFP Vendor Information		
Management Network (enp113s0f0)	Media Network A (ens3f0np0)	Media Network B (ens3f1np1)
Manufacturer: --	Manufacturer: FS	Manufacturer: FS
Part Number: --	Part Number: QSFP-SR4-100G	Part Number: QSFP-SR4-100G
Serial: --	Serial: G2530411118	Serial: G2530411123

- **Link Speed/Protocol:** The supported speed, actual negotiated speed, and interface type.

Link Speed / Protocol		
Management Network (enp113s0f0)	Media Network A (ens3f0np0)	Media Network B (ens3f1np1)
Supported Speed: 10, 100, 1000	Supported Speed: 1000, 10000, 40000, 25000, 50000, 100000	Supported Speed: 1000, 10000, 40000, 25000, 50000, 100000
Negotiated Speed: 1000	Negotiated Speed: 100000	Negotiated Speed: 100000
Module Type: --	Module Type: 100G Ethernet: 100G Base-SR4 or 25GBase-SR	Module Type: 100G Ethernet: 100G Base-SR4 or 25GBase-SR

- **Optical Power:** Current Tx (transmit) and Rx (receive) power in dBm, paired with a rolling timeline graph tracking levels against low/high alarm thresholds.

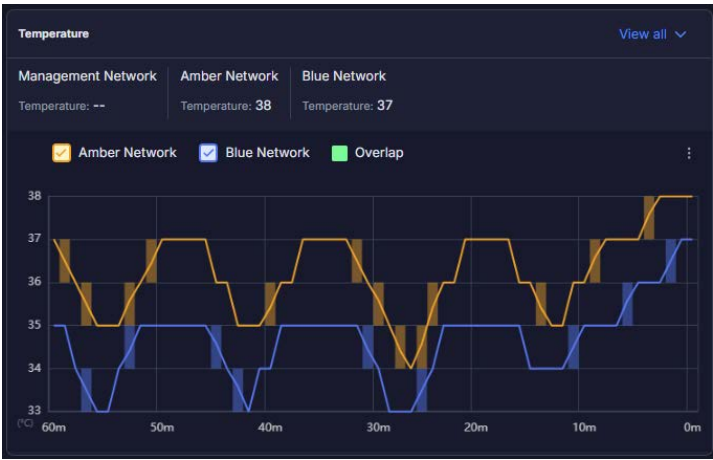
TX Optical Power



RX Optical Power

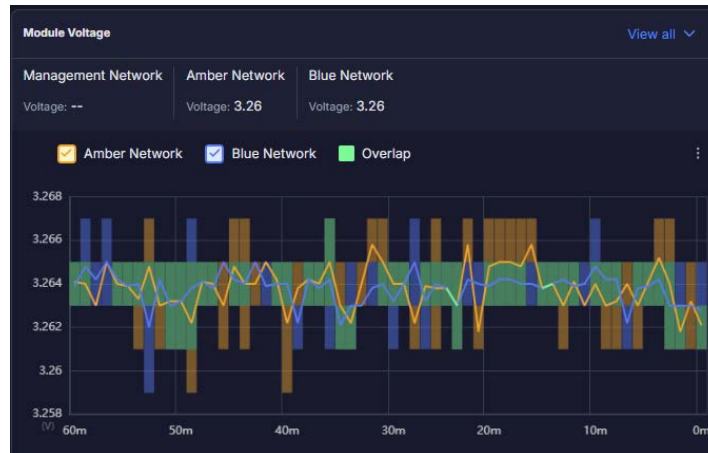


- **Temperature:** The physical module temperature, including warning/critical thresholds and a rolling timeline graph.



- **Module Voltage and Current:** Real-time metrics for supply voltage and laser bias current.

Module Voltage



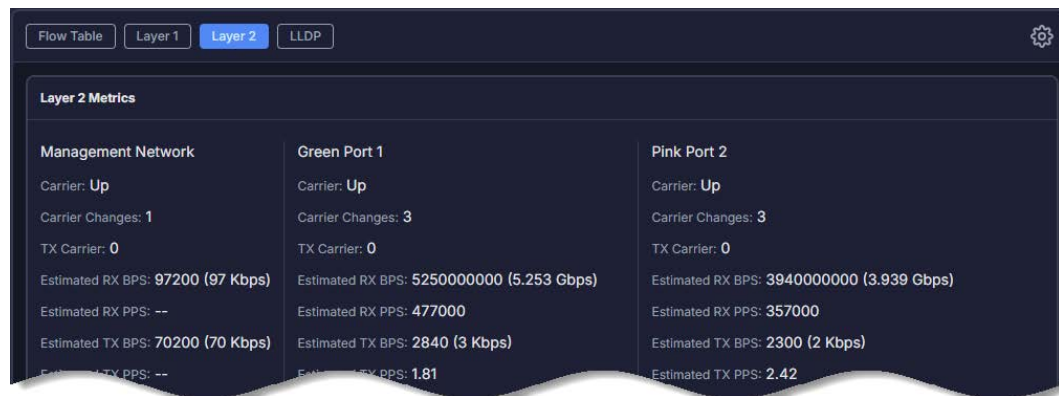
Module Current



Any out-of-range metrics in these categories will be highlighted in red (for critical alarms) or yellow/orange (for warnings).

Layer 2 Tab

On the Layer 2 tab, you can monitor Ethernet framing, packet integrity, and error detection on the network segment. For details about the information displayed, see [Layer 2](#).



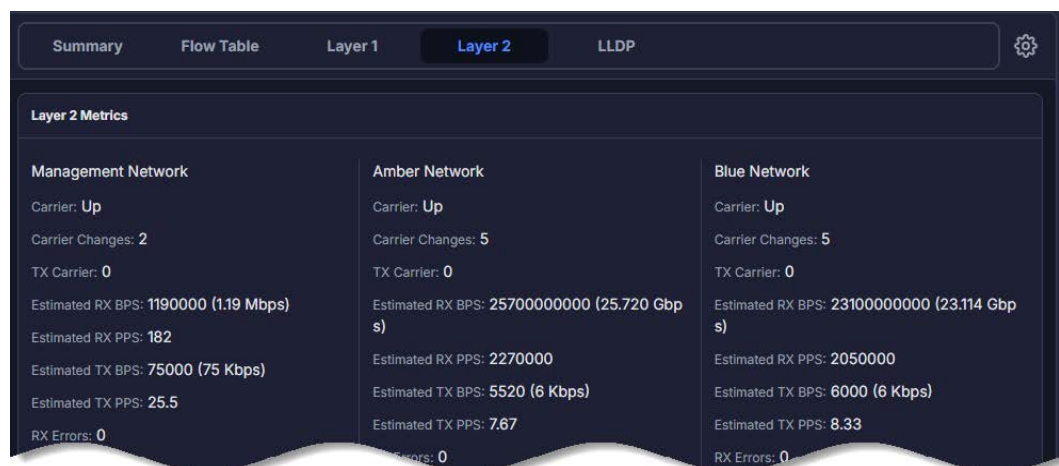
Management Network	Green Port 1	Pink Port 2
Carrier: Up	Carrier: Up	Carrier: Up
Carrier Changes: 1	Carrier Changes: 3	Carrier Changes: 3
TX Carrier: 0	TX Carrier: 0	TX Carrier: 0
Estimated RX BPS: 97200 (97 Kbps)	Estimated RX BPS: 5250000000 (5.253 Gbps)	Estimated RX BPS: 3940000000 (3.939 Gbps)
Estimated RX PPS: --	Estimated RX PPS: 477000	Estimated RX PPS: 357000
Estimated TX BPS: 70200 (70 Kbps)	Estimated TX BPS: 2840 (3 Kbps)	Estimated TX BPS: 2300 (2 Kbps)
Estimated TX PPS: --	Estimated TX PPS: 1.81	Estimated TX PPS: 2.42

To customize the data that is displayed, click the Settings icon (⚙️). You can select the following:

- **Refresh rate:** How often the data is updated, in seconds. Select **Refresh: Off**, **Refresh: 1s**, **Refresh: 5s**, **Refresh: 15s**, or **Refresh: 60s**.
- **Column width:** Select one of the following:
 - **Interface Columns: Fixed Width** – To space the columns at a fixed width with condensed spacing in between columns.
 - **Interface Columns: Evenly Spaced** – To space the columns evenly across the width of the page.

The following information is displayed on the Layer 2 tab:

- **Layer 2 status information** – High-level lock status and the number of error seconds since the last reset.
- **Layer 2 bitrate metrics** – Detailed counts for the current session, including:
 - Rx (Receive) and Tx (Transmit) bytes
 - Rx and Tx frames without errors
 - Rx and Tx frames with detected errors



Management Network	Amber Network	Blue Network
Carrier: Up	Carrier: Up	Carrier: Up
Carrier Changes: 2	Carrier Changes: 5	Carrier Changes: 5
TX Carrier: 0	TX Carrier: 0	TX Carrier: 0
Estimated RX BPS: 1190000 (1.19 Mbps)	Estimated RX BPS: 25700000000 (25.720 Gbps)	Estimated RX BPS: 23100000000 (23.114 Gbps)
Estimated RX PPS: 182	Estimated RX PPS: 2270000	Estimated RX PPS: 2050000
Estimated TX BPS: 75000 (75 Kbps)	Estimated TX BPS: 5520 (6 Kbps)	Estimated TX BPS: 6000 (6 Kbps)
Estimated TX PPS: 25.5	Estimated TX PPS: 7.67	Estimated TX PPS: 8.33
RX Errors: 0	RX Errors: 0	RX Errors: 0

LLDP Tab

Pulse supports the Link Layer Description Protocol (LLDP IEEE 802.1AB), and this provides visibility into switch-port connectivity, allowing you to see which switch port the Pulse unit is connected to, along with the performance and connectivity status of that switch.

The following information is displayed on the LLDP tab:

- **LLDP Neighbors:** Information about the management and media networks: the remote chassis, chassis ID, remote port ID, port description, management IP addresses, VLAN, autonegotiation status, and remote description.

Management Network	Amber Network	Blue Network
Remote Chassis: BEA-R13-U44	Remote Chassis: B3-Media-5	Remote Chassis: B3-Media-6
RID: 3	RID: 1	RID: 2
Chassis ID: mac 88:6f:d...	Chassis ID: mac 3c:2c:3...	Chassis ID: mac 1c:72:...
Remote Port ID: GigabitEthernet 1/45	Remote Port ID: ethernet1/1/26	Remote Port ID: ethernet1/1/26
Port Description: 0	Port Description: Inspect-RU26	Port Description: ethernet1/1/26
Mgmt IPs: 0	Mgmt IPs: 10.100.13.42, fe80::e78:a680	Mgmt IPs: 10.100.13.40, fe80::...
VLAN: --	VLAN: 42	VLAN: 43
Autoneg: S:No E:No	Autoneg: S:Yes E:No	Autoneg: S:Yes E:No
Remote Description: Dell EMC Real Time Operating System Software. Dell EMC Operating System Version: 2.0. Dell EMC Application Software Version: 9.14 (2.4) Copyright (c) 1999-2019 Dell Inc. All Rights Reserved. Build Time: Fri Nov 8 09:07:42 2019	Remote Description: Dell EMC Networking OS10 Enterprise. Copyright (c) 1999-2020 by Dell Inc. All Rights Reserved. System Description: OS10 Enterprise. OS Version: 10.5.1.2. System Type: S52 32F-ON	Remote Description: Dell EMC Networking OS10 Enterprise. Copyright (c) 1999-2020 by Dell Inc. All Rights Reserved. System Description: OS10 Enterprise. OS Version: 10.5.1.2. System Type: S52 32F-ON

- **Local Chassis:** Details about the local chassis: The name, ID, ID type, management IP addresses, capabilities, and description.

Local Chassis

Chassis Name: inspect2110-default

Chassis ID: 3c:ec:ef:e...

Chassis ID Type: mac

Management IPs: 10.100.1...

Capabilities: Bridge:on,Router:on,Station:off,Wlan:off

Description: Ubuntu 24.04.2 LTS Linux 6.8.0-111-generic #111-Ubuntu SMP PREEMPT_DYNAMIC Sat Apr 11 23:16:02 UTC 2026 x86_64

- **Local Interface Details:** Details about the local interfaces: status, local port ID, port description, TTL, and capabilities.

Local Interface Details		
Management Network	Amber Network	Blue Network
Status: RX and TX	Status: RX and TX	Status: RX and TX
Local Port ID: 3c:ec:ef:e3:7d:c4	Local Port ID: 9c:63:c0:a7:07:be	Local Port ID: 9c:63:c0:a7:07:bf
Port Description: eno1	Port Description: ens1f0np0	Port Description: ens1f1np1
TTL: 120	TTL: 120	TTL: 120
Capabilities: Bridge:on,Router:on,Station:off,Wlan:off	Capabilities: Bridge:on,Router:on,Station:off,Wlan:off	Capabilities: Bridge:on,Router:on,Station:off,Wlan:off

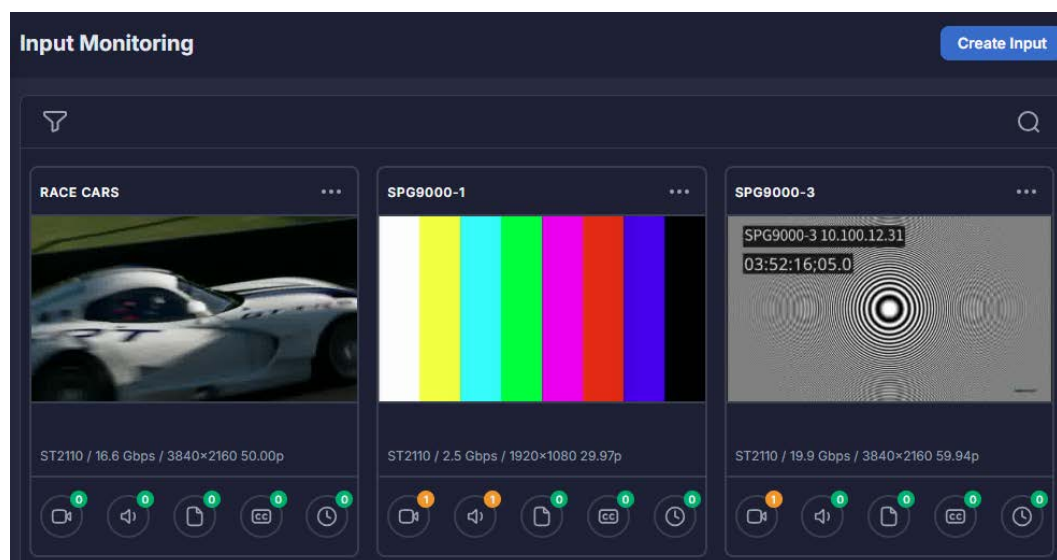
To select how often data is updated (in seconds), click the Settings icon (⚙️) and select **Refresh: Off**, **Refresh: 1s**, **Refresh: 5s**, **Refresh: 15s**, or **Refresh: 60s**.

Input Monitoring

On the Input Monitoring page, you can view and manage all configured SMPTE 2110 and other IP-based media signals in real time. It displays each signal in an easily sortable mosaic dashboard of input cards, combining real-time thumbnails and alarm indicators in a single view.

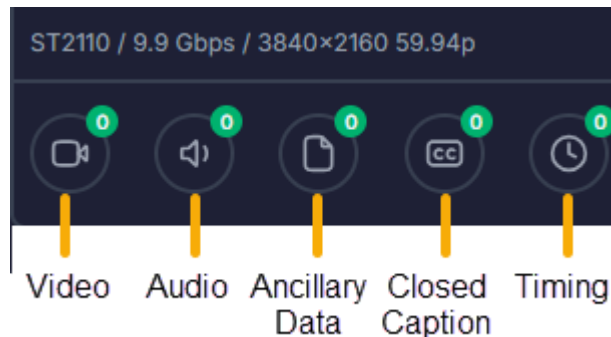
Access Input Monitoring

To view the Input Monitor, click **Input Monitoring** on the Pulse menu.



Pulse displays a thumbnail capture of each input's stream. The thumbnail is generated every second. Underneath each thumbnail is an information bar listing the protocol (such as ST 2110), the total bandwidth used by the input, the resolution, and frame rate, and the total bandwidth used by the input. The total bandwidth includes the bandwidth used by all the streams present in the input.

The information bar indicates the media types that are in the input and the alarm status for each media type. The Video, Audio, Ancillary Data, Closed Caption, and Timing icons are color-coded to indicate the status of each essence type. Red indicates that there is a critical error.



Hover over a media type icon to view summary information for the alarms that are currently triggered in the input just for that essence type.

You can filter and sort the inputs that are displayed. Click the Filter icon () and select one of the following:

- **Sort by Severity:** To sort the inputs by severity.
- **Sort A-Z:** To sort the inputs alphabetically from A to Z.
- **Sort Z-A:** To sort the inputs alphabetically from Z to A.
- **Show only active:** To display only active inputs.
- **Show only disabled:** To display only disabled inputs.
- **Show only active alarms:** To display only inputs that have active alarms.

To search for an input, click the Search icon () and type some or all of the input name or format info. For example, type 3840 to show UHD inputs.

Input Monitoring Actions

For each input card, you can click the Action icon () and select an action:

- To modify the input, click **Edit**.
- To view details about the input, click **View Details** or click the monitor card. See [View Input Details](#).
- To copy the input, click **Duplicate**.
- To disable the input, click **Disable Input and** click **Disable** to confirm.

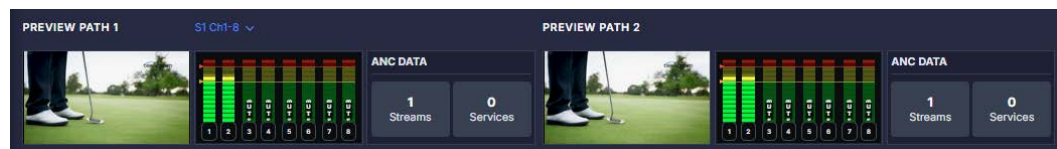
- To delete the input, click **Disable** and click **Delete** to confirm.

Add an Input

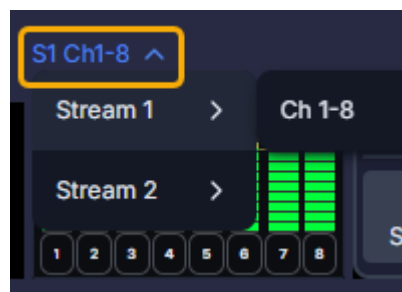
When you add an input, you select how the input will be discovered:

- **NMOS:** You configure the number of audio streams and data streams you want for the input. NMOS configures the other stream settings automatically.
- **IGMP:** You configure the stream details, including the SFP port to pull data from, the destination IP address, the destination port, and whether to enable seamless switching.

While you are adding an input, you can view a preview in the Preview Path section at the top of the Create Input page. Pulse displays decoded video, audio bars, and ancillary data for the inputs that you configured. The ancillary data section indicates the number of streams the input is receiving and the number of services it's decoding, such as Closed Caption services.



If you have more than one audio stream, you can click the audio stream list to select the audio streams to preview. Up to 16 channels can be displayed per stream.



Add an Input via NMOS

For details about configuring NMOS discovery and registration, see [Configure NMOS](#).

To add a new input via NMOS:

1. Click **Create Input**.

2. In the **Input Name** box, type a name for the input.
3. Select the **NMOS** checkbox.
4. From the **Quality of Experience Alarm Profile** list, select an alarm profile for the input, or select **None**. See [Configure Alarm Profiles](#).
5. From the **Quality of Service Alarm Profile** list, select an alarm profile for the input, or select **None**.
6. (Optional) To add an audio stream:
 - a. Click the **Audio** tab.
 - b. Click **Add Stream**.
 - c. From the **Audio Channel Configuration** list, select a configuration. See [Audio Channel Configuration](#).
 - d. (Optional) Click **Add Stream** to add another stream.

To delete an audio stream, click the Delete icon (🗑️) beside the stream. **Note:** You can delete and add streams until you click **Save**.

7. (Optional) To add a data stream:
 - a. Click the **Data (2110-40)** tab.
 - b. Click **Add Stream**.
 - c. Turn on the **Stream <x>** toggle, where <x> is the stream number.
 - d. (Optional) Click **Add Stream** to add another stream.

To delete a data stream, click the Delete icon (🗑️) beside the stream. **Note:** You can delete and add streams until you click **Save**.

8. Click **Create**.

Add an Input via IGMP

You can import an input by loading the input's Session Description Protocol (SDP) from a remote server, or you can manually configure the input.

To add a new input via IGMP:

1. Click **Create Input**.
2. In the **Input Name** box, type a name for the input.
3. Clear the **NMOS** checkbox.
4. From the **Quality of Experience Alarm Profile** list, select an alarm profile for the input, or select **None**.
5. From the **Quality of Service Alarm Profile** list, select an alarm profile for the input, or select **None**.
6. To enable seamless switching, turn on the **Seamless Switching** toggle.
7. To import an input by loading the input's Session Description Protocol (SDP) from a remote server.
 - a. Select the **Import SDP** checkbox.
 - b. Do one of the following:
 - Select **Raw Text** and enter the SDP text in the **Raw Text** box.
 - Select **URL** and enter the URL in the **URL Link** box.
 - Select **Upload File**. Click to upload an .sdp file or drag and drop the file.
 - c. Click **Import**.
8. Alternatively, to manually configure the input, in the Path 1 section, specify the **SFP Port**, **Source Address**, **Destination Address**, and **Destination Port**.
9. (Optional) If seamless switching is enabled, in the Path 2 section, specify the **SFP Port**, **Source Address**, **Destination Address**, and **Destination Port**.
10. In the Video Settings section:
 - a. In the **RTP Payload Type** box, turn on **Auto** or type a number between 96 and 127.
 - b. From the **Packet Read Schedule (PRS)** list, select **Gapped**, **Narrow Linear**, or **Wide Linear**.
 - c. The **TR Offset** defines the timing reference offset of the sender for network delays. Select **Auto** to provide an offset based on the current video standard, or type a value.
 - d. From the **Gamma Curve** list, choose one of the following settings; the selection characterizes the video signal on each virtual input.

Note: Only SDR Narrow inputs are fully supported at this time.

- **Auto:** The system selects the setting based on ST 352 VPID. If 352 VPID is not present, SDR Narrow is selected.
- **SDR Narrow:** The reference OETF (Optical to Electrical Transfer Function) is defined in ITU-R BT.709 with gamma of 0.45 and the reference EOTF (Electrical to Optical Transfer Function) is defined in ITU-R BT.1886 with gamma of 2.4.
- The Narrow scaling places the extremes of the nonlinear color value from zero to unity at code words 40 hex (64 dec) and 3AC hex (940 dec) in a 10-bit

representation for 0% Black to 100% White. This range is typical for standard-dynamic range.

- **SDR Full:** The reference OETF is defined in ITU-R BT.709 with gamma of 0.45 and the reference EOTF is defined in ITU-R BT.1886 with gamma of 2.4.
- The full scaling places the extremes of the nonlinear color value from zero to unity at code words 0d and 1023d in 10-bit representation and 0d and 4095d in 12-bit representation for 0% black and 100% white, respectively.
- **PQ Narrow:** The reference OETF with a high luminance range capability of 0 to 10,000 cd/m² standardized in ST 2084. The EOTF is the inverse of OETF.
- The narrow Scaling places the extremes of the nonlinear color value from zero to unity at code words 40 hex (64 dec) and 3AC hex (940 dec) in a 10-bit representation for 0% Black to 100% White. This range is typical for standard-dynamic range.
- **PQ Full:** The reference OETF with a high luminance range capability of 0 to 10,000 cd/m² standardized in ST 2084. The EOTF is the inverse of OETF.
- The Full scaling places the extremes of the nonlinear color value from zero to unity at code words 0d and 1023d in 10-bit representation and 0d and 4095d in 12-bit representation for 0% black and 100% white, respectively.
- **HLG:** The reference OETF is standardized in ARIB B67 and the reference EOTF is standardized in ITU BT.2100 at the nominal display peak luminance of 1000 nits.

e. From the **Color Gamut** list, select one of the following; the selection is the color space of the video signal.

- **Auto:** The system selects the setting based on ST 352 VPID. If 352 VPID is not present, Rec. 709 is selected.
- **Rec. 709:** Standard for HD.
- **Rec. 2020:** Standard for 4K.

11. In the Format Detection section, you can turn on the **Auto** toggle to enable automatic format detection, or you can turn it off to manually configure it. To manually configure format detection, set the **Resolution** and **Frame Rate**, and **Structure** if needed.

12. To add an audio stream:

- a. Click the **Audio** tab.
- b. Click **Add Stream**. Pulse adds a new stream card (for example, Stream 1).
- c. Click the stream card.
- d. Turn on the **Stream <x>** toggle, where <x> is the stream number.
- e. Click the stream card.
- f. From the **Audio Transport** list, select the transport standard:
 - **ST 2110-30:** Uncompressed PCM audio.
 - **ST 2110-31:** AES3 transparent transport.
- g. In the Path 1 section, configure the network parameters:

- **SFP Port:** If seamless switching is disabled, select Port 1 or Port 2 (including any configured interface alias, such as 1 Amber). If seamless switching is enabled, Path 1 is automatically set to Port 1.
 - **Source Address (Optional):** Enter the IPv4 address of the sending device for source-specific multicast (SSM). Leave blank if not required by your network.
 - **Destination Address:** Enter the multicast group IPv4 address in dotted decimal notation.
 - **Destination Port:** Enter the destination UDP port number (0-65535).
- h. If Seamless Switching (SMPTE ST 2022-7) is enabled, configure the redundant Path 2 parameters:
- **SFP Port:** Automatically assigned to Port 2 (or secondary interface alias).
 - **Source Address (Optional):** Enter the Path 2 sender IPv4 address.
 - **Destination Address:** Enter the Path 2 multicast group IPv4 address.
 - **Destination Port:** Enter the Path 2 destination UDP port.
- i. In the Audio Settings section, configure the stream properties:
- **RTP Payload Type:** Enter the RTP payload type number (0-127). The default is 97.
 - **Number of Channels:** Specify the number of audio channels contained in this stream (2 to 16). **Note:** Pulse supports a maximum sum of 16 channels across all audio streams within a single input.
 - **Packet Timing:** Select the packet transmission interval: **Auto**, **83 µs**, **125 µs**, or **1 ms**.
 - **Bit Depth:** Displays the audio sample bit depth (24-bit, read-only). From the **Audio Channel Configuration** list, select a configuration. See [Audio Channel Configuration](#).
- j. (Optional) Click **Add Stream** to add another stream.

To delete an audio stream, click the Delete icon () beside the stream. **Note:** You can delete and add streams until you click Save.

13. To add a data stream:

- a. Click the **Data (2110-40)** tab.
- b. Click **Add Stream**. Pulse adds a new stream card (for example, Stream 1).
- c. Turn on the **Stream <x>** toggle, where <x> is the stream number.
- d. In the Path 1 section, configure the network parameters:
 - **SFP Port:** If seamless switching is disabled, select Port 1 or Port 2 (including any configured interface alias, such as 1 Amber). If seamless switching is enabled, Path 1 is automatically set to Port 1.
 - **Source Address (Optional):** Enter the IPv4 address of the sending device for source-specific multicast (SSM). Leave blank if not required by your network.
 - **Destination Address:** Enter the multicast group IPv4 address in dotted decimal notation.

- **Destination Port:** Enter the destination UDP port number (0-65535).
- e. f. If Seamless Switching (SMPTE ST 2022-7) is enabled, configure the redundant Path 2 parameters:
 - **SFP Port:** Automatically assigned to Port 2 (or secondary interface alias).
 - **Source Address (Optional):** Enter the Path 2 sender IPv4 address.
 - **Destination Address:** Enter the Path 2 multicast group IPv4 address.
 - **Destination Port:** Enter the Path 2 destination UDP port.
- f. In the Data Settings section, configure the stream properties:
 - **RTP Payload Type:** Enter the RTP payload type number (0-127). The default is 100.
- g. (Optional) Click **Add Stream** to add another stream.

To delete a data stream, click the Delete icon () beside the stream. **Note:** You can delete and add streams until you click Save.

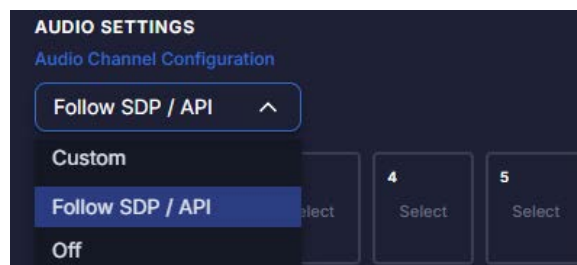
14. Click **Create**.

Audio Channel Configuration

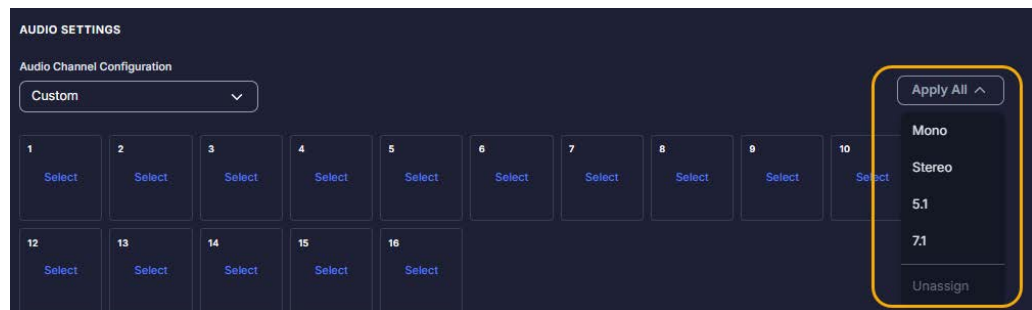
The Channel configuration applies to all the audio for the input and determines how the audio is mapped into the audio application.

Select one of the following from the **Audio Channel Configuration** list:

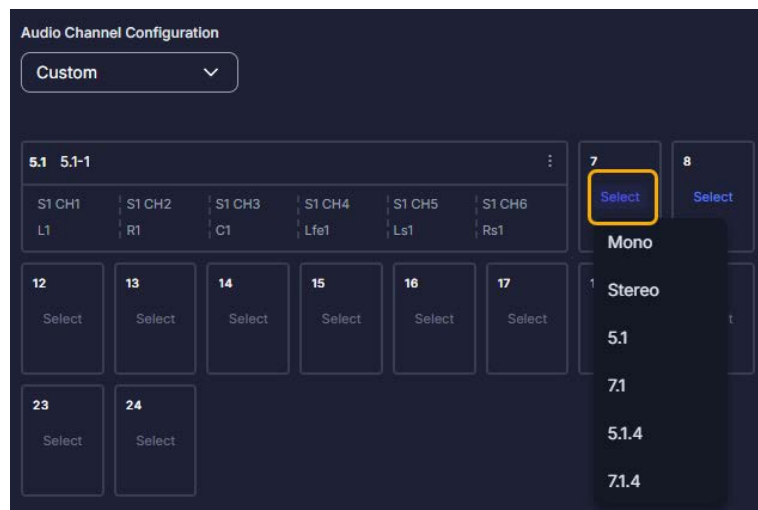
- **Follow SDP/API:** Pulse will automatically configure and display the audio channels based on the metadata provided by the incoming streams SDP or an API command.
- **Off:** To remove all audio channel configurations.
- **Custom:** To create a custom configuration. Click the starting channel and select the required audio program configuration (such as Stereo, 5.1) for each audio program defined for the input.
 - **M** is mono and requires one channel.
 - **ST** is stereo and requires two channels.
 - **5.1** is surround sound and requires six channels.
 - **7.1** is surround sound and requires eight channels.



To map all the channels to be all the same, click the **Apply All** list and select the type of program (such as mono or stereo).



Alternatively, you can click **Select** on a channel and select the type of program to assign to it.

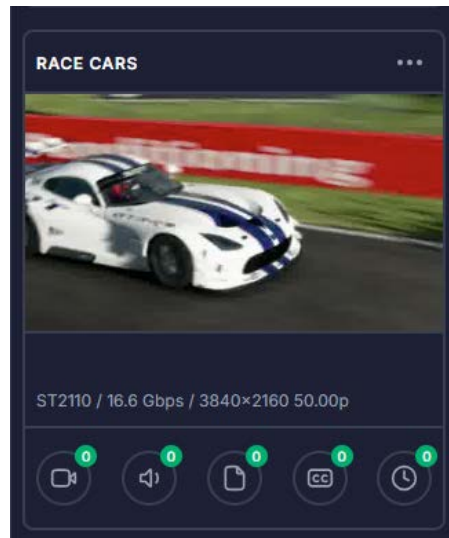


Perform an NMOS Join

After you create an input, Pulse waits for an external instruction to connect to a specific stream. The new input appears on the Input Monitoring page as a card labeled "Waiting for NMOS."

Use your facility's system management software (which should now see Pulse as a registered device with available receivers) to perform an NMOS activation. When the activation occurs, Pulse automatically configures the IP paths, sets the input type to ST 2110, and begins decoding the media.

When the join is successful, real-time video thumbnails are displayed on the input card.



Modify an Input

To modify an input:

1. Click the Edit icon (⋮) on an input card click **Edit**.
2. Modify the input as necessary and click **Save**.

View Input Details

The Input Details screen provides a consolidated, in-depth view of critical metrics, live data, and alarms related to a specific input. It is the primary tool for deep signal inspection, advanced diagnostics, and targeted troubleshooting without the distraction of unrelated network traffic. You can quickly verify signal integrity, adjust configuration parameters, or isolate root causes of errors.

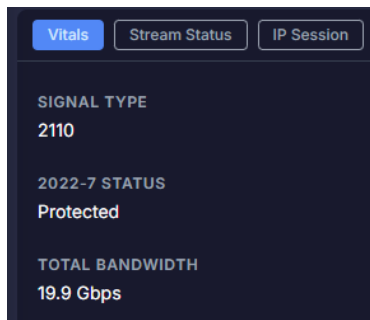
To view input details, click the input card. Real-time displays feature a live video preview, audio visual representations (with preview capabilities), and an overview of monitored ancillary metadata.

- To modify the input's configuration, click **More Options** and click **Edit Configuration**.
- To disable the input for maintenance, click **More Options** and click **Disable Input**. To enable a disabled input, click **Enable Input**.
- To view the Alarm Summary pane, click **More Options** and click **View Alarm Summary**. To hide the Alarm Summary pane, click **More Options** and click **Hide Alarm Summary**. See [Alarm Summary Pane](#).

Vitals Tab

The Vitals tab displays high-level and detailed data grouped into four sections:

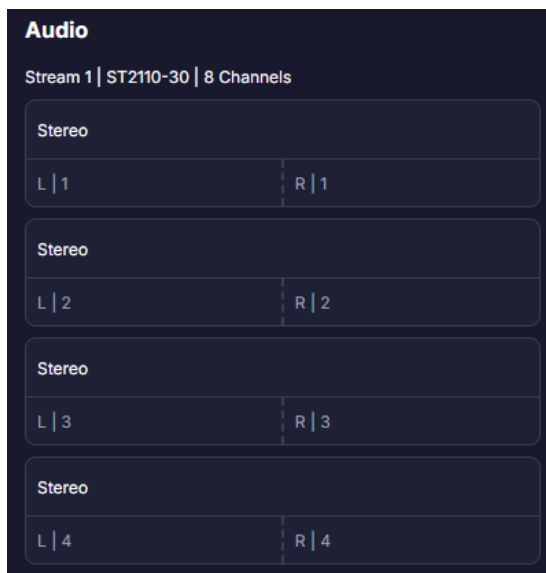
- **High-Level Input / IP Metrics:** Displays the overall signal type, the 2022-7 status, and total bandwidth utilization.



- **Video Metrics:** Shows specific video data, including resolution and frame rate, bit depth and sampling structure, gamma curve, and the colorimetry standard.



- **Audio Metrics:** Details the audio channel count and grouping (such as stereo pairs) and audio level representation (VU/PPM metering).



- **ANC Metrics:** Displays the types of ANC data currently being monitored on the input, such as Closed Captions, SCTE-104/35 ad markers, timecode (SMPTE 12M), and any custom metadata fields.

ANC							
SERVICES	STREAM #	DID	SDID	CHANNEL	ANC STREAM	STATUS	DETAIL
S334-2 CDP(708)	1	97	1	luma	unspecified	ANC Present	frequently
S352M VPID	1	65	1	luma	unspecified	ANC Present	field 1

Stream Status Tab

The Stream Status tab provides detailed IP stream information for the selected input, allowing you to troubleshoot without being overwhelmed by unrelated network traffic.

The following key elements and metrics are available on the Stream Status tab:

- **High-level visualizations and controls:**
 - **Port 1 and port 2 status:** Indicates the health of the network ports.
 - **Total bitrate:** Displays the sum of all stream bitrates for the input.
 - **IP stream bandwidth bar:** A visual representation of bandwidth usage. A blue outline bar shows the combined expected total bandwidth, and internal colored bars represent individual stream bandwidths relative to that total. Numerical ID overlays correlate directly to the stream entries in the table.
- **Real-time status indicators:** Each stream features a color-coded health indicator:
 - **Green:** The stream is healthy.
 - **Yellow:** A previous critical issue was observed, but it is no longer active.
 - **Red:** There is a critical or active error state, such as excessive packet loss.
- **Stream details table:** This table, which can be sorted and filtered, breaks down the streams associated with the input group. The following columns are displayed:
 - **ID:** A unique numerical identifier for each stream.
 - **Port:** The network port (Port 1 or Port 2).
 - **Strm:** The stream number of each protocol, per port.
 - **Protocol:** The specific protocol being used
 - **Bitrate:** The current bitrate of the stream.
 - **Payload:** The RTP Payload Type.
 - **Destination IP:** The destination IP address and port.
 - **Source IP:** The source IP address and port.
 - **Dest MAC:** The destination Media Access Control (MAC) address.

- **Source MAC:** The source MAC address.
- **RTP Clock:** The RTP Clock value.

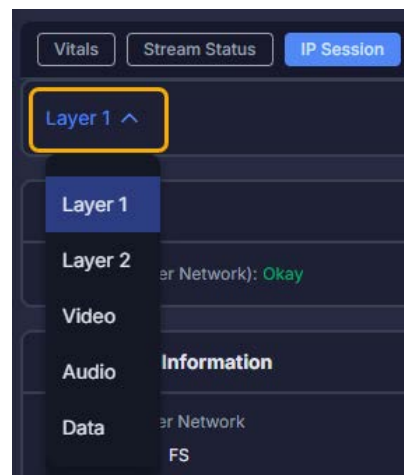


ID	PORT	ALIAS NAME	STRM	PROTOCOL	BITRATE	PAYLOAD	DESTINATION	SOURCE	DEST MAC	SOURCE MAC	RTP CLOCK
1		Media Network A	1	2110-20	9.94 GB/S	96	229.20.10	--	01:00:5e:14	00:90:f9:34	--
2		Media Network A	1	2110-30	9.22 MB/S	97	229.30	--	01:00:5e:1	00:90:f9:34	--

IP Session Tab

The IP Session tab provides visibility into the network-level parameters of an active input stream. It breaks down the data into distinct Open Systems Interconnection (OSI) model layers to help users verify packet integrity, diagnose IP routing, and analyze physical or stream-level behavior.

Data is grouped into views, which you can select from the **Views** list:



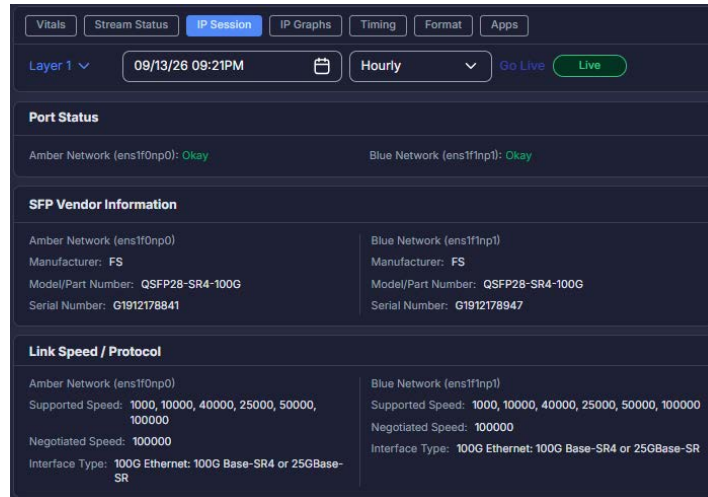
The available views are:

- **Layer 1:** At-a-glance health and deeper diagnostic views for the physical connections (cables, fiber, and electrical signals).
- **Layer 2:** Information about framing and error detection on the network segment.
- **Video:** Granular data for video streams.
- **Audio:** Granular data for audio streams.
- **Data:** Granular data for ancillary data streams.

Layer 1

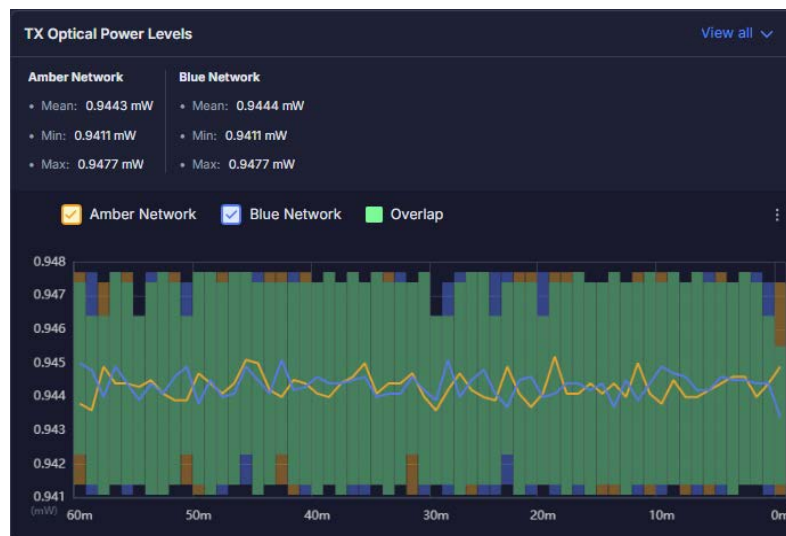
In the Layer 1 view, you can see the following:

- **Port status and SFP information:** High-level link states, negotiated link speeds, and SFP vendor details (manufacturer, model, and serial number).



- **Hardware telemetry cards:** Detailed hardware metrics for optical power levels (transmitted and received power in dBm), temperature, and voltage/bias current. These cards feature historical timeline graphs and color-coded threshold alerts (yellow for warning, red for critical) to flag out-of-range conditions such as low optical power or high temperatures.
- On the Temperature and Voltage/Bias Current graphs, click the checkboxes to select the media data to display, and click **Overlap** if you want to overlap the data for Media A and Media B. To hide a graph, click **Hide Graph**.

TX Optical Power Levels



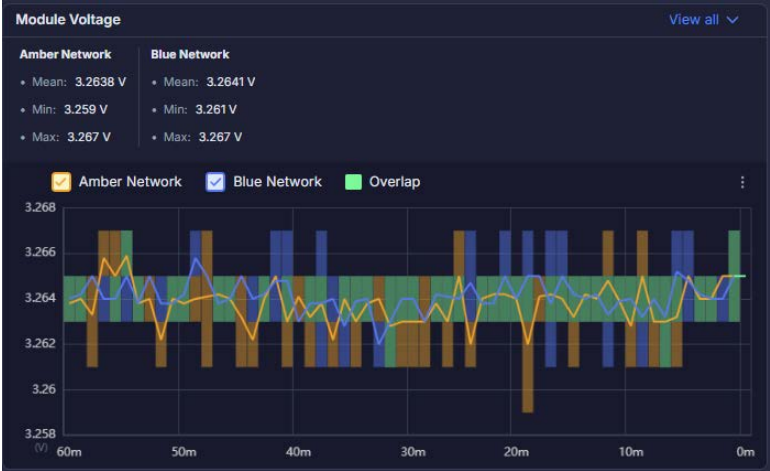
Rx Optical Power



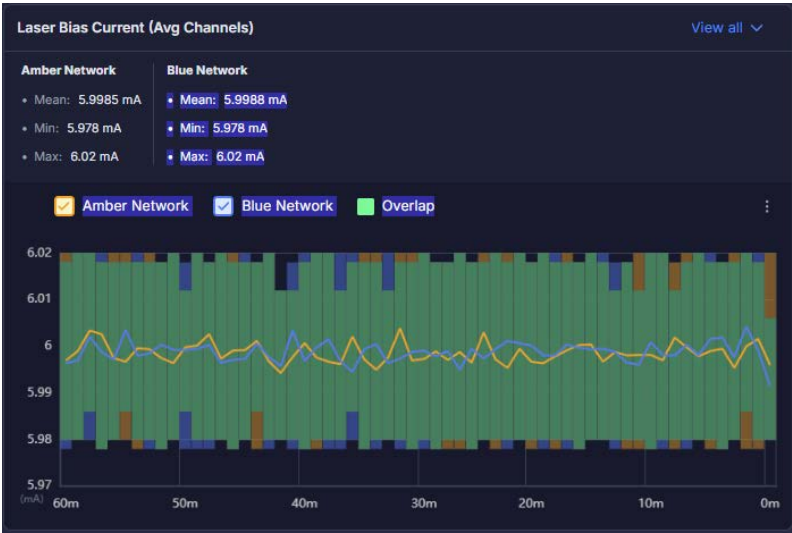
Module Temperature



Module Voltage



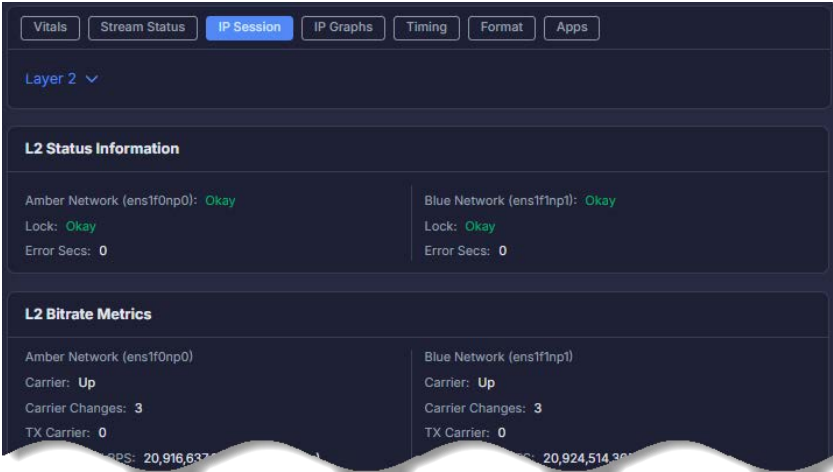
Laser Bias Current (Avg Channels)



Layer 2

The Layer 2 view displays the following:

- **L2 status:** Indicators for link lock status.
- **L2 bitrate metrics:** Real-time counters for transmitted (Tx) and received (Rx) data. This includes counts for total bytes, frames received without error, frames with errors, undersized packets, oversized packets, high bit-error rates, and error seconds related to Cyclic Redundancy Check (CRC) overflow errors.

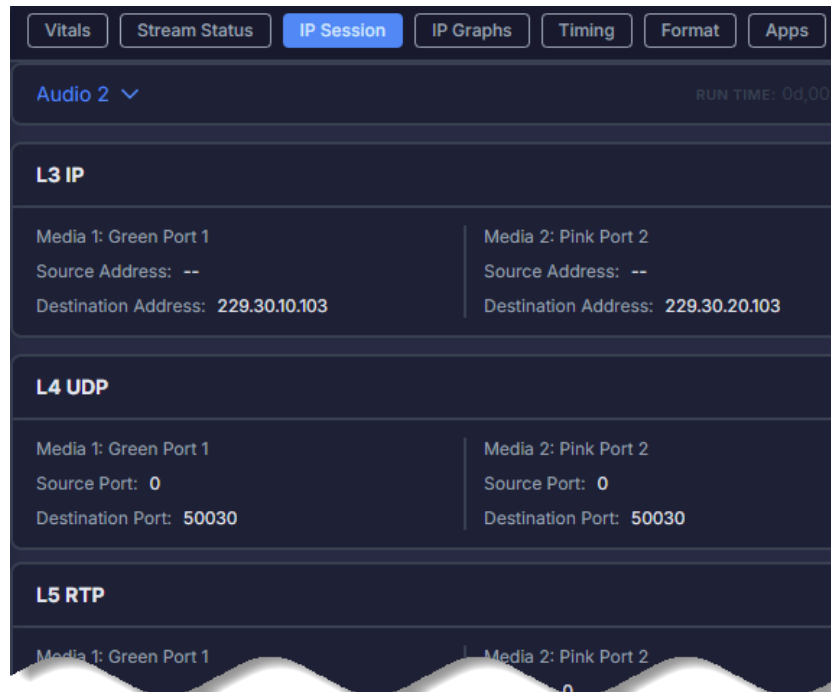


Video, Audio, and Data Layers

The Video, Audio, and Data Layer views provide granular data for specific media streams (video, audio, and ancillary data). You can select a stream to analyze and view the data in collapsible metric cards. If the input uses ST 2022-7 seamless switching, data for Path 1 and Path 2 is displayed side-by-side for easy comparison. You can see:

Stream Type: Protocol identification.

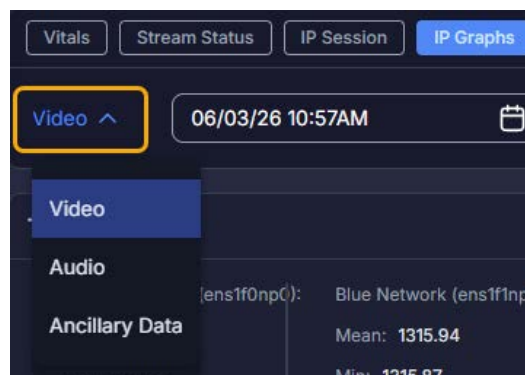
- **Layer 3 (IP):** Source and destination IP addresses, as well as Time to Live (TTL).
- **Layer 4 (UDP):** Source and destination port numbers.
- **Layer 5 (RTP):** Detailed real-time protocol metrics, including payload type, sequence numbers, timestamps, Synchronization Source ID (SSRC), marker bit frequency, and version.



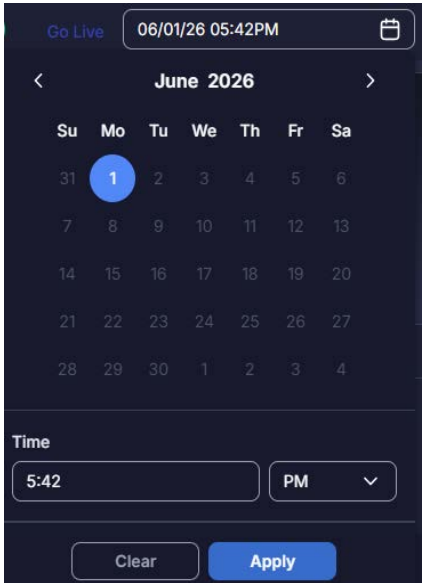
IP Graphs Tab

The Input IP Graphs tab provides visual and statistical insights into ST 2110 input stream performance for video, audio, and ANC data. You can analyze network behavior over time, validate ST 2022-7 redundancy, and quickly spot impairments or out-of-bound conditions using colored visual thresholds. To hide a graph, click **Hide Graph**.

From the **Streams** list, select the streams to view: **Video**, **Audio** (streams 1-8), or **Ancillary Data** (streams 1-4).



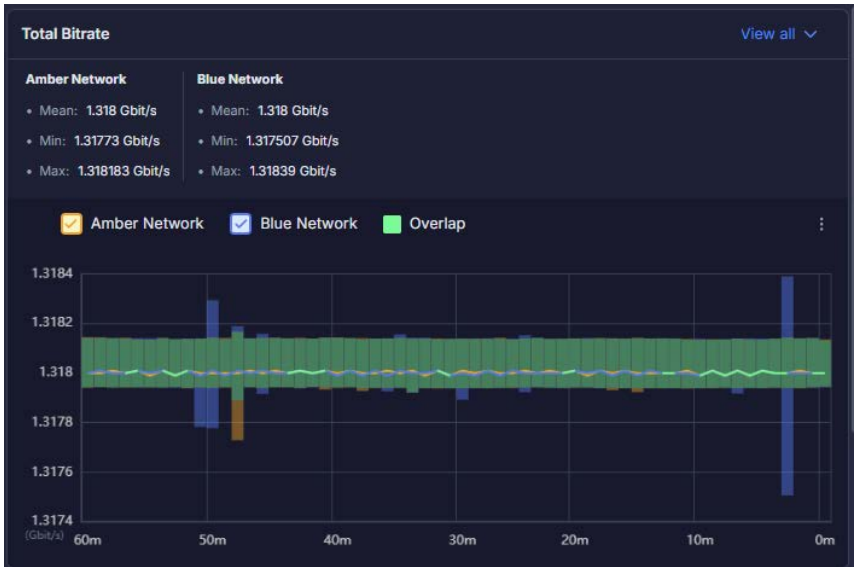
You can choose the date, time, and interval of the data that is displayed. By default, live data is displayed. To view data for a particular date and time, click the Calendar icon (📅), select the date and time, and click **Apply**. To return to the live view, click **Go Live**.



From the **Interval** list, select the interval to display: **1 minute**, **5 minutes**, **20 minutes**, **Hourly**, **6 hours**, **12 hours**, **1 day**, or **5 days**.

The following data is displayed:

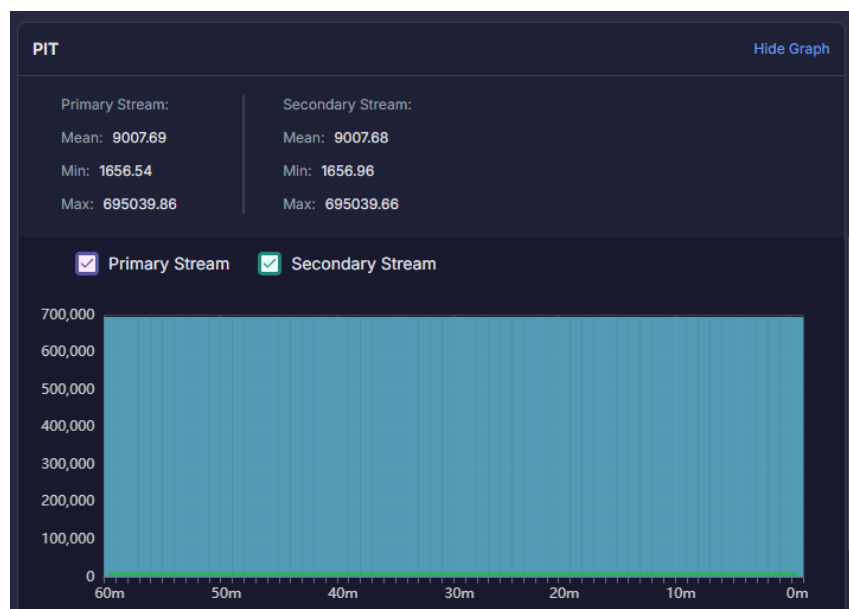
- **Total Bitrate:** The overall network throughput on the interface. This card indicates the maximum, mean, and minimum bandwidth used. Click the checkboxes to select the network data to view.



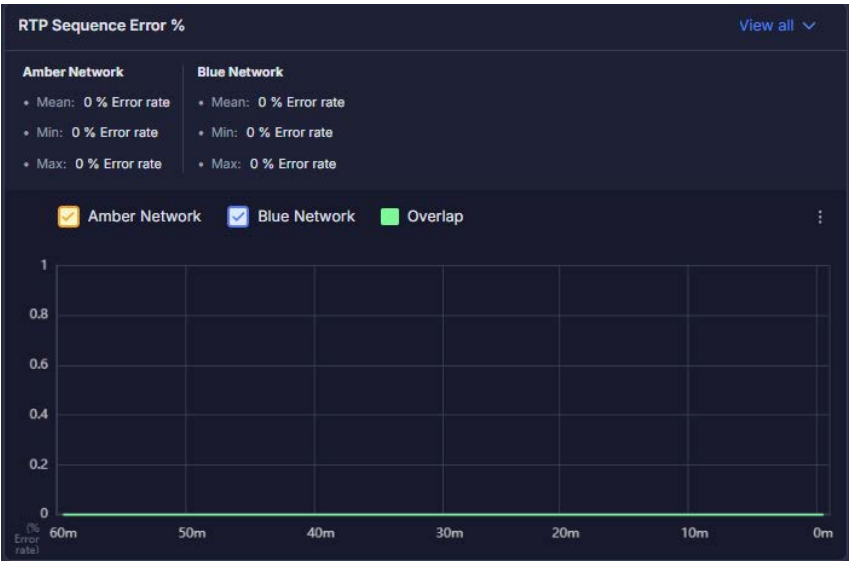
- **Session Bitrate:** The data rate of the selected stream (maximum, mean, and minimum). Click the checkboxes to select the streams to view.



- **PIT (Packet Interval Timing):** Tracks the difference in arrival time between sequential packets to indicate packet jitter and dropped packet rates. Colored bars represent the Max, Mean, and Min range for packets within a given time interval.



- **RTP Sequence Error %:** Displays the count and peak rate of packet loss or out-of-order packet events. Click the checkboxes to select the streams to view.



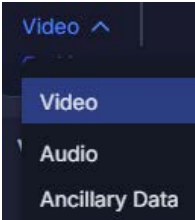
- **Path 1-Path 2 Differential:** Available for ST 2022-7 streams, this graph plots the timing delta between the redundant paths (calculated as Path 1 minus Path 2). A positive value indicates that Path 2 is lagging behind Path 1.



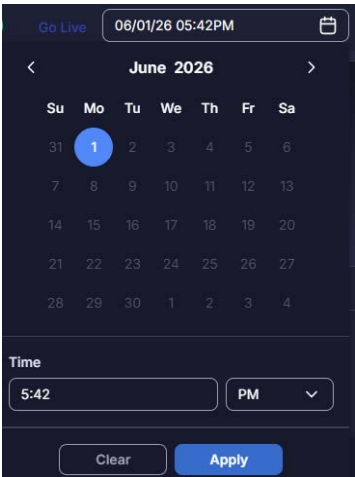
Timing Tab

The Timing tab shows the timing of the video, audio, and data as it was received relative to the embedded RTP time stamps. It also shows the relative delay between Audio/Video and the Data/Video, which is the amount of delay needed to realign the two media types. To hide a graph, click **Hide Graph**.

From the **Streams** list, select the streams to view: **Video**, **Audio**, or **Ancillary Data**.



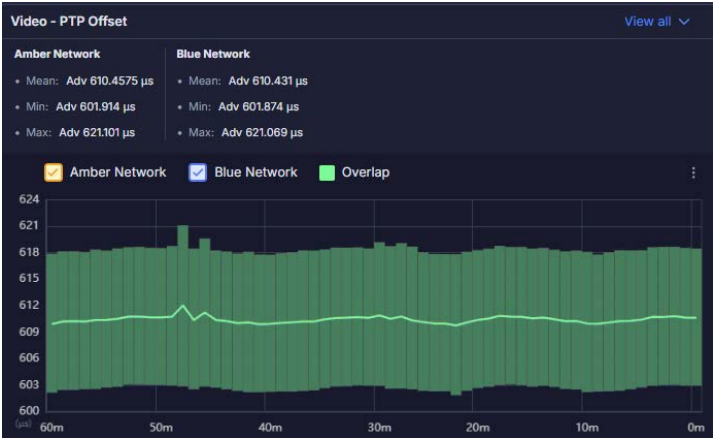
You can choose the date, time, and interval of the data that is displayed. By default, live data is displayed. To view data for a particular date and time, click the Calendar icon (📅), select the date and time, and click **Apply**. To return to the live view, click **Go Live**.



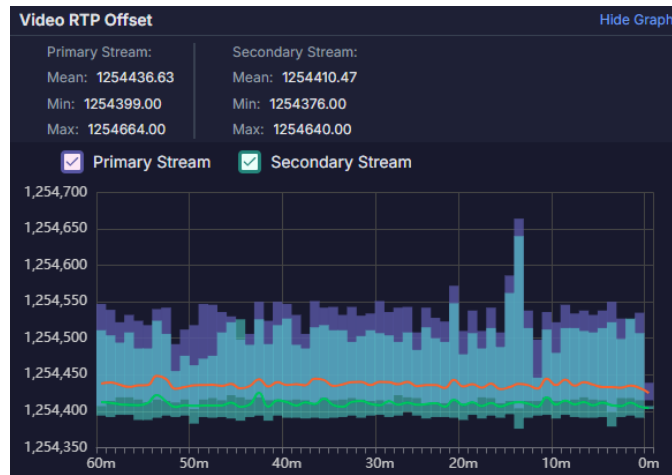
From the **Interval** list, select the interval to display: **1 minute**, **5 minutes**, **20 minutes**, **Hourly**, **6 hours**, **12 hours**, **1 day**, or **5 days**.

The following data is available on the Timing tab:

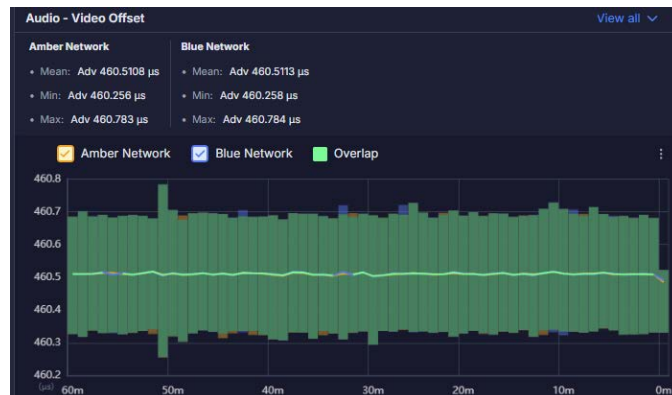
- **Video PTP Offset:** The Video PTP Offset graph shows the relative delay between the video stream and PTP. This value indicates the amount of delay that must be applied to realign the video and PTP according to the time stamps.



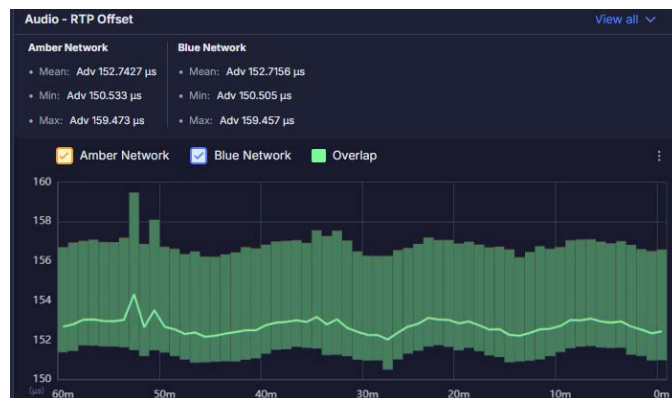
- **Video RTP Offset:** The Video RTP Offset graph shows timing of the video stream as it was received relative to the embedded RTP time stamps.



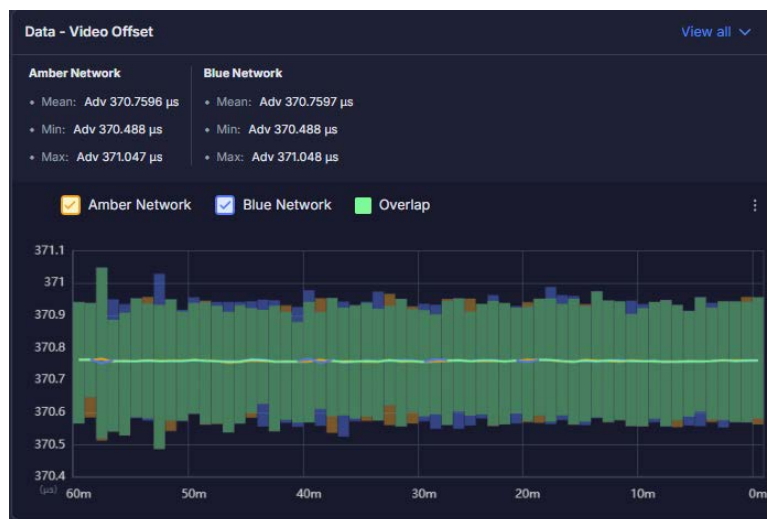
- **Audio - Video Offset:** The Audio - Video Offset graph shows the relative delay between audio and video streams. This value indicates the amount of delay that must be applied to realign the signals according to the time stamps.



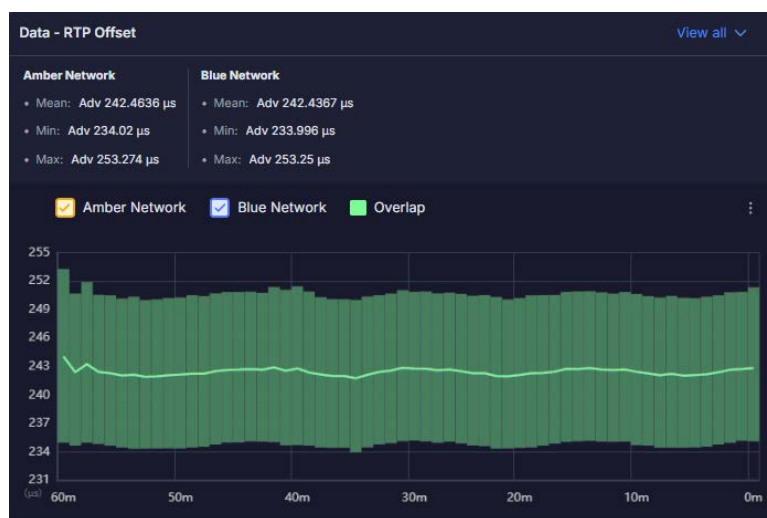
- **Audio RTP Offset:** The Audio RTP Offset graph shows timing of the audio stream as it was received relative to the embedded RTP time stamps.



- **Data - Video Offset:** The Data - Video Offset graph shows the relative delay between data and video streams. This value indicates the amount of delay that must be applied to realign the signals according to the time stamps.



- **Data - RTP Offset:** The Data - RTP Offset graph shows timing of the data stream as it was received relative to the embedded RTP time stamps.

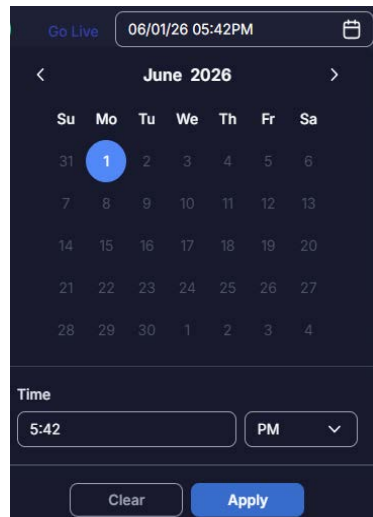


Format Tab

On the Format tab, you can view the detected signal characteristics and validate format compliance for a selected stream.

From the **Streams** list, select the streams to view: **Video**, **Audio**, or **Data**.

You can choose the date, time, and interval of the data that is displayed. By default, live data is displayed. To view data for a particular date and time, click the Calendar icon (📅), select the date and time, and click **Apply**. To return to the live view, click **Go Live**.



The signal attributes that you can view are:

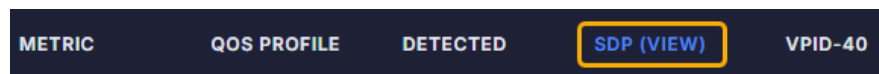
- Resolution (width and height)
- Rate (frame rate, PAR, interlace, and segmented frame)
- Color (sampling, color depth, colorimetry, transfer characteristic system, and range)
- Transport (packing mode, SMPTE standard number, and transport profile)

The Format table compares the following sources:

- **Sensor:** The detected signal.
- **QOS Profile:** The expected signal format as configured by the user.
- **SDP (View):** The advertised stream configuration from the Session Description Protocol file.
- **VPID:** Additional metadata points incorporated into the comparison table.

You can compare the active signal against the expected QoS profile, SDP, and VPID to identify format mismatches, incorrect SDP files, misconfigured senders, and unexpected signal changes.

To view the SDP file, click **SDP (View)**.



Apps Tab

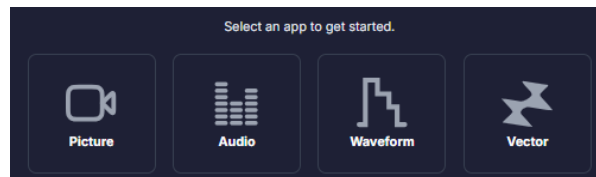
The Apps tab provides a convenient troubleshooting environment. You can quickly launch the following applications:

- Picture
- Audio
- Waveform

- Vector

The applications correspond with the Live Video, Audio Bar, and Waveform tiles that you can use on a dashboard. If you want to quickly check a specific signal's waveform, for example, you can navigate directly to the Apps tab to view the waveform without building a new dashboard or updating an existing one.

To launch an app, click on the application's icon.



Alarm Summary Pane

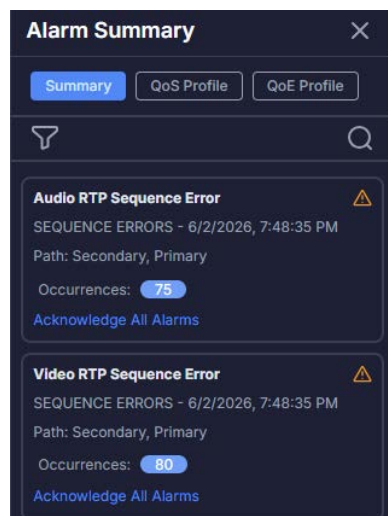
In the Alarm Summary pane, you can view active, unresolved, and unacknowledged alarms. The Alarm Summary focuses on immediate visibility to help operators quickly triage, prioritize, and respond to urgent operational events without being distracted by resolved issues.

To view the Alarm Summary pane, click **More options**, and then click **Show Alarm Summary**. To hide the Alarm Summary pane, click **More options**, and then click **Hide Alarm Summary**.

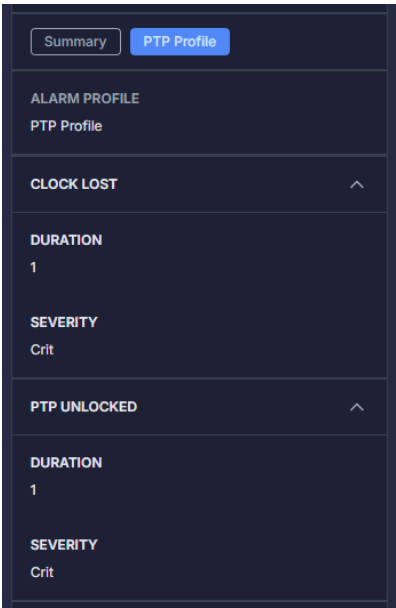
To filter the alarm list, click the Filter icon (🔍) and select the alarm severities to display: **Critical**, **Warning**, and/or **Information**.

To search for an alarm, click the Search icon (🔍) and type some or all of the alarm name.

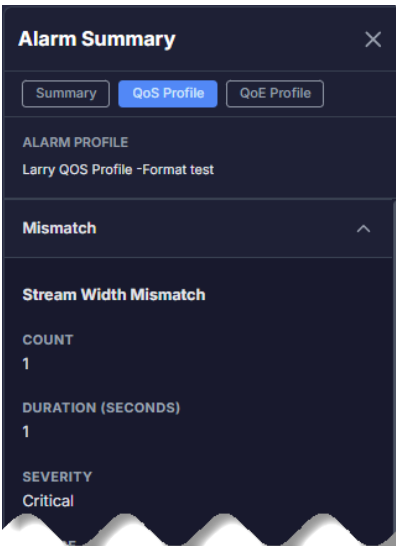
The Summary tab indicates when an alarm was detected, the alarm type, the source device, and how long the alarm has been active. Color-coded icons represent the alarm's severity: Critical, Warning, or Informational.



On the PTP Monitoring page, the PTP Profile tab lists the current parameters for the active PTP alarms.



On the Input Details and Interface Monitor pages, the QoS Profile tab lists the current parameters for the active QOS alarms. The QoE Profile tab lists the current parameters for the active QOE alarms.

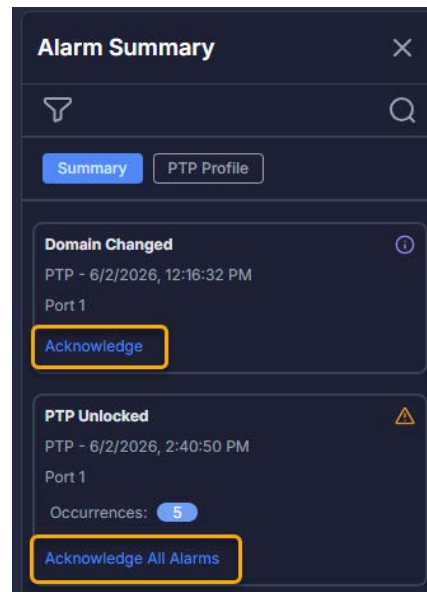


Acknowledge an Alarm

When you acknowledge an alarm, Pulse removes it from the Alarm Summary.

To acknowledge a single alarm, click **Acknowledge** on the alarm card.

If Pulse detects a burst of repeated alarms of the same type, it groups them under a single card and indicates the number of occurrences. Click **Acknowledge** on a grouped card to dismiss all occurrences in that group at once.



Informational alarms can be acknowledged at any time, regardless of whether the condition is still active.

When a Critical alarm is resolved, it remains in the Alarm Summary pane but drops to a Warning state, indicated by an orange icon. You can then acknowledge the alarm to clear it from the Summary. You cannot acknowledge a Critical alarm while it is actively occurring. To dismiss it, you must either resolve the underlying issue or disable the alarm. To disable an alarm, you must have Admin or Manager permissions.

When you acknowledge an alarm, its historical data and acknowledgment status are retained and can be reviewed in the Event Log. See [Event Log](#).

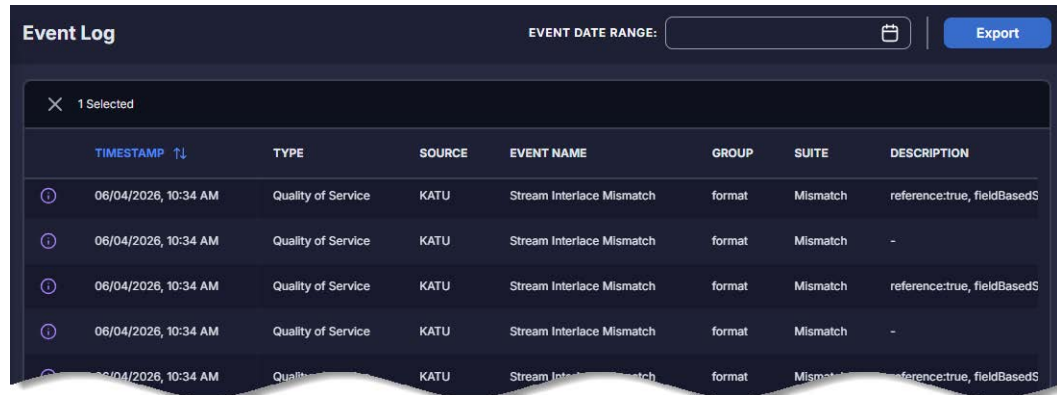
Event Log

The Event Log is a chronological record of system events across Pulse: alarms firing and clearing, state changes, acknowledgments, and system notifications all in one place. When you are troubleshooting an event, you can filter the log to the relevant time window and source, and then look at what else happened at the same moment. A video alarm that fires alongside a PTP alarm and a State event often tells a cleaner story than a single metric in isolation.

Each row in the Event Log indicates a timestamp, type, source, event name, group, suite, and severity (Critical, Warning, or Informational). Alarm events also show a colored severity icon: red for critical, amber for warning, and purple for informational. The Type column identifies what kind of event it is: QoS Alarm, QoE Alarm, PTP Alarm, System Alarm, Alarm Acknowledgment, or State.

The Event Log polls for new events automatically.

To view the Event Log, click **Event Log** on the Pulse menu.



Event Log						
EVENT DATE RANGE:						Export
X 1 Selected						
TIMESTAMP ↑↓	TYPE	SOURCE	EVENT NAME	GROUP	SUITE	DESCRIPTION
06/04/2026, 10:34 AM	Quality of Service	KATU	Stream Interface Mismatch	format	Mismatch	reference:true, fieldBasedS
06/04/2026, 10:34 AM	Quality of Service	KATU	Stream Interface Mismatch	format	Mismatch	-
06/04/2026, 10:34 AM	Quality of Service	KATU	Stream Interface Mismatch	format	Mismatch	reference:true, fieldBasedS
06/04/2026, 10:34 AM	Quality of Service	KATU	Stream Interface Mismatch	format	Mismatch	-
06/04/2026, 10:34 AM	Quality of Service	KATU	Stream Interface Mismatch	format	Mismatch	reference:true, fieldBasedS

For information about configuring alarms, see [Alarms Overview](#).

Information Categories

To select the categories of information to display, click the Settings icon (⚙️) and select the category:

- **Severity:** Critical or Informational.
- **Timestamp:** System timestamp indicating when the event occurred. The timestamp is based on Coordinated Universal Time (UTC).
- **Event Type:** The type of event: QoS Alarm, QoE Alarm, PTP Alarm, System Alarm, Alarm Acknowledgment, or State.
- **Source:** The entity that the alarm triggered on, such as an input, stream, physical interface, or audio channel.
- **Event Name:** The name of the event.
- **Group:** The event group.
- **Suite:** The event suite.
- **Event Description:** A short summary of the event.

Filter the Event Log

To filter the Event Log by date range, do one of the following from the **Event Date Range** list:

- Select the range to display: **All Available**, **Last 15 minutes**, **Last 8 hours**, **Last 12 Hours**, **Last 24 hours**, **Last day**, or **Last week**.

The screenshot shows a dark-themed interface with a label "EVENT DATE RANGE:" followed by a dropdown menu. The dropdown menu is open, displaying a list of options: "All Available", "Last 15 mins", "Last 8 hours", "Last 12 hours", "Last 24 hours", "Last day", "Last week", and "Custom". The "Custom" option is highlighted at the bottom of the list.

- Click **Custom** and select or enter the date, **Start Time**, and **End Time**, and then click **Apply**.

The screenshot shows a date and time selection interface. It features two calendar views side-by-side for June 2026 and July 2026. Below the calendars, there are two sections for "Start Time" and "End Time". Each section has a text input field showing "00:00" and a dropdown menu with "AM" selected. At the bottom right, there are two buttons: "Clear" and "Apply".

Search the Event Log

To search for an event, click the Search icon (). You can search for the following categories:

- Timestamp
- Type
- Source
- Event Name
- Group
- Suite
- Description

Q

Search event log

FILTER PARAMETERS

Timestamp:

Type:

Source:

Event Name:

Group:

Suite:

Description:

RECENT

Search

Your search can include multiple categories. For each category that you want to include in the search parameters, select the category and specify the search parameters, then click **Apply**. To select more than one parameter, press **Shift** and click on the parameters to include in the search.

Q

Timestamp:

TIMESTAMP:

06/04/2026, 3:23 am

06/04/2026, 3:24 am

Clear

Apply

RECENT

Search

To clear the search parameters for a category, click **Clear**.

The Event Log maintains a history of previous searches so you can repeat a search easily. Previous searches are listed in the Recent section. To repeat a search, select the search and click **Search**.

FILTER PARAMETERS

Timestamp:

Type:

Source:

Event Name:

Group:

Suite:

Description:

RECENT

Event Name: redundant stream frame rate mismatch

×

Search

Sort the Event Log

By default, the Event Log lists events in reverse-chronological order. To view the events in chronological order, click the **Timestamp** column heading.

Event Log			
	TIMESTAMP ↑↓	TYPE	SOURCE
ⓘ	06/04/2026, 3:24 AM	Quality of Experience	SPG
ⓘ	06/04/2026, 3:24 AM	Quality of Experience	SPG

Export the Event Log

To export the Event Log to a .csv file:

1. Click **Export**.
2. In the dialog box that appears, choose whether to open the exported data or save it locally.

Alarm Summary

The Alarm Summary displays only current, active, unresolved, or unacknowledged alarms. You can use the Alarm Summary to assess, prioritize, triage, and respond to urgent network and signal events. The Alarm Log filters out historical data and previously acknowledged alarms so you can focus on immediate issues.

The information displayed in the Alarm Summary includes the alarm's severity (Critical, Warning, or Informational), when the alarm was first detected, alarm type (QOS or QOE), the source (input name or PTP domain), event name, alarm group, alarm suite, event description, duration, and number of occurrences.

To view the Alarm Summary, click **Alarm Summary** on the Pulse menu.

Alarm Summary

ALARM DATE RANGE: All Available

Export

All 6Critical 2Warning 4Informational 0

Q

⚙

MOST RECENT ↑↓	GROUP	SUITE	DESCRIPTION	FIRST DETECTED ↑↓	DURATION	OCCURRENCES
⚠ 09/13/2026, 10:40:27 PM	video	Black	-	09/12/2026, 2:30:14 PM	1s	62
⚠ 09/13/2026, 10:35:46 PM	video	Black	-	09/12/2026, 2:30:14 PM	0s	64
⚠ 09/13/2026, 8:42:31 PM	video	Frozen	-	09/12/2026, 2:30:15 PM	0s	21

Information Categories

To select the categories of information to display, click the Settings icon () and select the category:

- **Most Recent:** The most recent alarms.
- **Type:** The type of alarm: QoS or QoE.
- **Source:** The entity that the alarm triggered on, such as an input, stream, physical interface, or audio channel.
- **Event Name:** The name of the event.
- **Group:** The event group.
- **Suite:** The alarm suite.
- **Description:** A short summary of the alarm.
- **First Detected:** When an alarm was first detected.
- **Duration:** The duration of the alarm.
- **Occurrences:** The number of times the alarm has occurred.

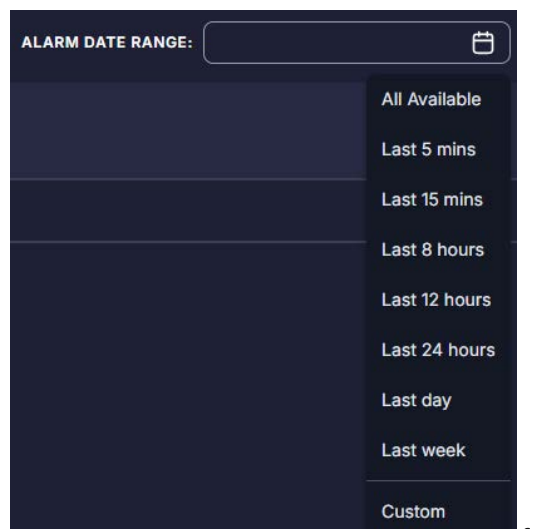
Filter the Alarm Summary

You can filter the Alarm Summary by date and alarm severity.

Filter by Date

To filter the Alarm Summary by date range, do one of the following from the **Alarm Date Range** list:

- Select the range to display: **All Available**, **Last 5 minutes**, **Last 15 minutes**, **Last 8 hours**, **Last 12 Hours**, **Last 24 hours**, **Last day**, or **Last week**.



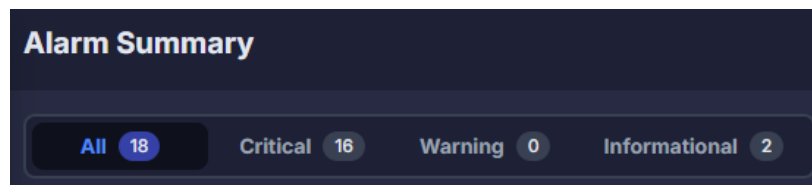
- Click **Custom** and select or enter the date, **Start Time**, and **End Time**, and then click **Apply**.

The screenshot shows a date selection interface with two calendar panels for June and July 2026. Below the calendars are two time selection fields labeled 'Start Time' and 'End Time', each containing a time input (00:00) and an AM/PM dropdown menu. At the bottom right are 'Clear' and 'Apply' buttons.

Filter by Severity

The Alarm Severity toolbar displays the number of current, active, unresolved, and unacknowledged alarms for each alarm severity: Critical, Warning, and Informational.

To filter the Alarm Summary by severity, click the severity, or click **All** to view all alarms.



Search the Alarm Log

To search for an alarm, click the Search icon (). You can search for the following categories:

- Severity
- Type
- Source
- Event Name
- Group
- Suite
- Status

The screenshot shows the 'Search alarm summary' interface. At the top is a search bar with a magnifying glass icon and the text 'Search alarm summary'. Below this is a section titled 'FILTER PARAMETERS' containing several filter buttons: 'Severity:', 'Type:', 'Source:', 'Event Name:', 'Group:', 'Suite:', and 'Status:'. Below the filters is a section titled 'RECENT' which is currently empty. At the bottom right is a blue 'Search' button.

Your search can include multiple categories. For each category that you want to include in the search parameters, select the category and specify the search parameters, then click **Apply**. To select more than one parameter, press **Shift** and click on the parameters to include in the search.

This screenshot shows the search interface with filters applied. The search bar at the top now contains 'Severity: critical' and 'Status: not acknowledged', each with a clear (X) button. The 'FILTER PARAMETERS' section remains the same. In the 'RECENT' section, a single entry 'Severity:' is visible with a clear (X) button. The blue 'Search' button is at the bottom right.

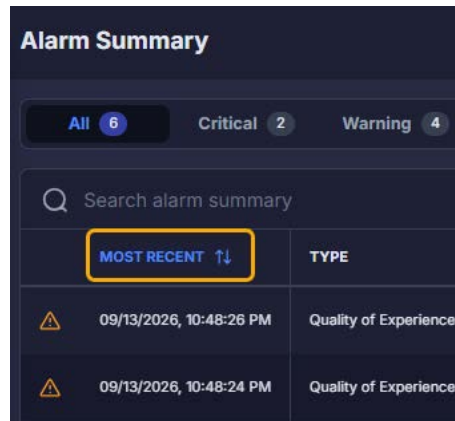
To clear the search parameters for a category, click **Clear**.

The Event Log maintains a history of previous searches so you can repeat a search easily. Previous searches are listed in the Recent section. To repeat a search, select the search and click **Search**.

This screenshot shows the search interface with the search history populated. The search bar and filter parameters are the same as in the previous screenshot. The 'RECENT' section now contains two entries: 'Severity: critical' and 'Status: not acknowledged', each with a clear (X) button. Below these is a 'Severity:' entry, also with a clear (X) button. The blue 'Search' button is at the bottom right.

Sort the Alarm Summary

By default, the Alarm Summary lists events in reverse-chronological order. To view the alarms in chronological order, click the **First Detected** column heading.



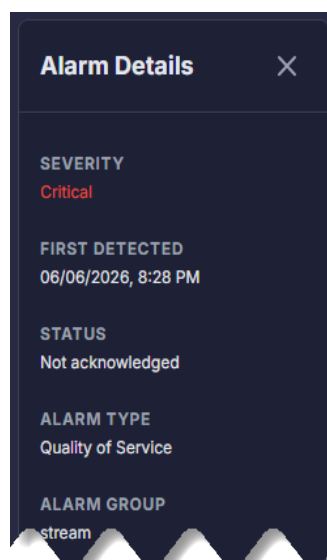
Export the Alarm Summary

To export the Alarm Summary to a .csv file:

1. Click **Export**.
2. In the dialog box that appears, choose whether to open the exported data or save it locally.

View Alarm Details

To view details about an alarm, including whether it has been acknowledged, click the **Action icon (...)** to the right of the alarm and click **View Alarm Details**.



Acknowledge an Alarm

After you have examined an alarm, you can acknowledge it. To acknowledge an alarm, click the **Action icon (...)** to the right of the alarm and click **Acknowledge**. The message “Alarm acknowledged” appears, and the alarm is removed from the Alarm Summary.

View Multiple Occurrences of an Alarm

To view multiple occurrences of an alarm, click the **Action icon (...)** to the right of an alarm and click **View Occurrences**. In the following example, there have been three occurrences of the Video Frozen Frame alarm.

←

Video Frozen Frame

ALARM DATE RANGE: All Available

Export

Q

Search alarm summary

✕

MOST RECENT ↑↓	TYPE	SOURCE	EVENT NAME	GROUP	SUITE	DESCRIPTION
1 09/13/2026, 10:48:22 PM	Quality of Experience	HD KOIN CH 6 media=video&redundancy=secondary	Video Frozen Frame	video	Frozen	-
1 09/13/2026, 10:45:02 PM	Quality of Experience	HD KOIN CH 6 media=video&redundancy=secondary	Video Frozen Frame	video	Frozen	-
1 09/13/2026, 8:42:30 PM	Quality of Experience	HD KOIN CH 6 media=video&redundancy=secondary	Video Frozen Frame	video	Frozen	-

Monitor System Status

The System Status feature provides real-time visibility into Pulse platform health, server resource consumption, license entitlements, and live stream delivery. On the Pulse platform, adding inputs, rendering scopes, and streaming multiviewer feeds consume shared server resources. System Status allows you to assess platform capacity at a glance and diagnose operational bottlenecks without interrupting active workflows.

System Status provides the following information about platform health:

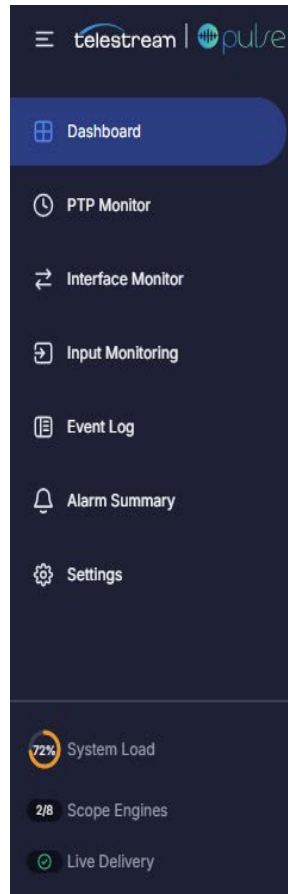
- **Hardware load:** Physical host resource pressure across CPU, memory, graphics processing unit (GPU), and network interfaces.
- **Licensed entitlements:** Consumption of licensed scope engines and licensed media bandwidth.
- **Live delivery:** WebRTC streaming health between the Pulse server and your client browser.

System Status Indicators

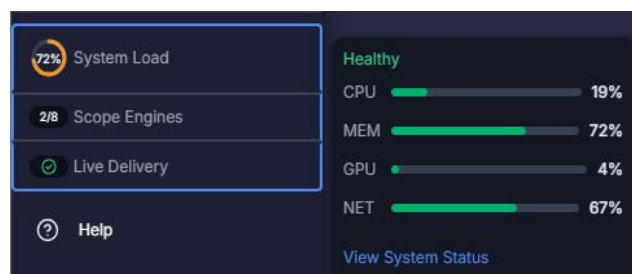
The following indicators are available in the navigation pane on the left:

- **System Load:** A composite load gauge displays overall server utilization as a percentage. The ring reflects the single resource (CPU, Memory, GPU, or Network) closest to its capacity limit.
- **Scope Engines:** Displays active versus total available scope engine licenses (for example, 5/8).

- **Live Delivery:** A three-state LED indicating WebRTC streaming status:
 - Green: Streaming is healthy.
 - Yellow: Streaming is impaired (for example, there could be packet loss, frame drops, or reduced bitrate).
 - Red: Streaming connection interrupted or offline.



To view a breakdown of the system load, click **System Load**. The summary card that appears displays current CPU, memory, GPU, and network percentages.



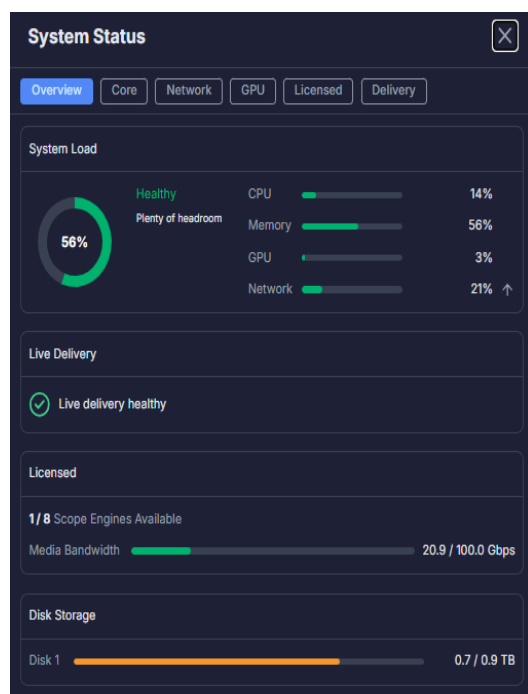
System Status View

To view additional information, click **View System Status**. The System Status view is resizable, and you can drag it next to active dashboards, tiles, or monitor sessions.

Overview Tab

The Overview tab provides an executive health snapshot of critical subsystems:

- Composite load gauge: Overall system utilization percentage and the primary limiting resource (such as “Memory usage elevated”).
- Core, network, and GPU gauges: Individual utilization bars.
- Live delivery status: Client-to-server connection health and primary delivery state.
- Licensed summary: Total scope engine usage and consumed media bandwidth.
- Disk storage: Local storage capacity and database utilization.

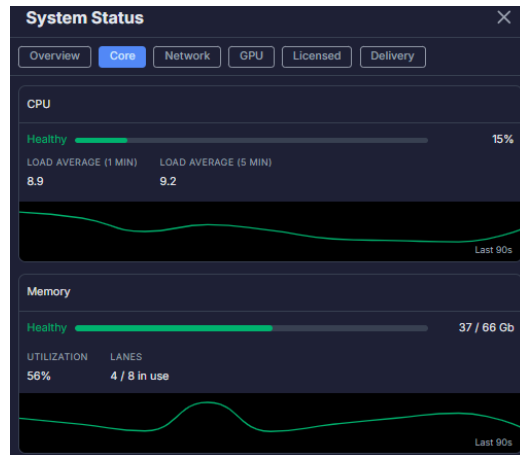


Core Tab

The Core tab displays detailed computational metrics:

- CPU metrics:
 - Total normalized CPU load percentage across all physical and logical cores.
 - 1-minute and 5-minute load averages.
 - 90-second rolling utilization trend graph.
 - Binding metric indicators identifying whether pressure is driven by active thread utilization or run-queue scheduling contention.

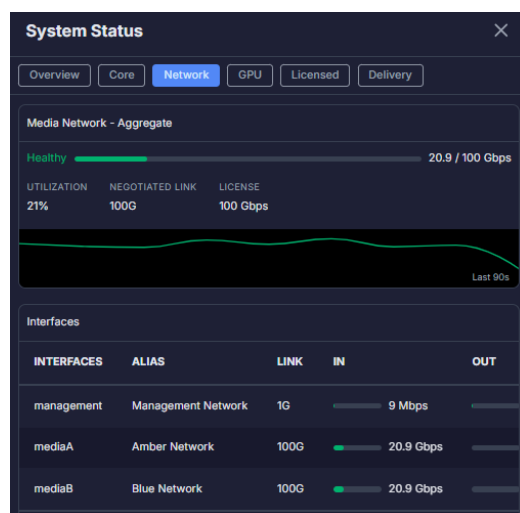
- Memory metrics:
 - Memory capacity utilized and overall utilization percentage.
 - Active memory channel/lane allocation and bandwidth saturation notes.
 - 90-second rolling memory trend graph.



Network Tab

The Network tab monitors physical network adapter capacity and traffic distribution:

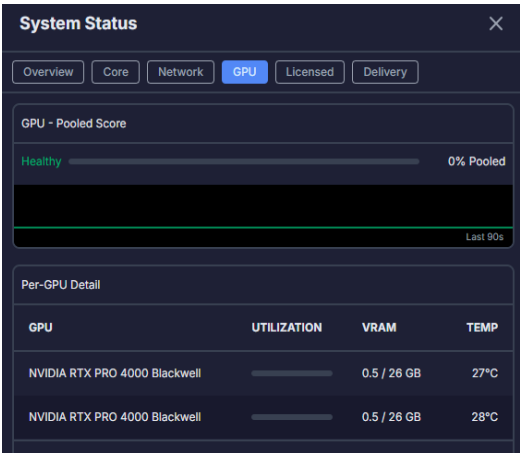
- Media Network - Aggregate: Total combined traffic across media interfaces relative to negotiated physical link rate.
If traffic is unbalanced across redundant links, the network health status automatically escalates to reflect the saturated interface.
- Interfaces: This table indicates the interfaces, alias/role, link speed, duplex status, and Received (Rx) and Transmitted (Tx) throughput.



GPU Tab

The GPU tab displays graphics accelerator processing metrics:

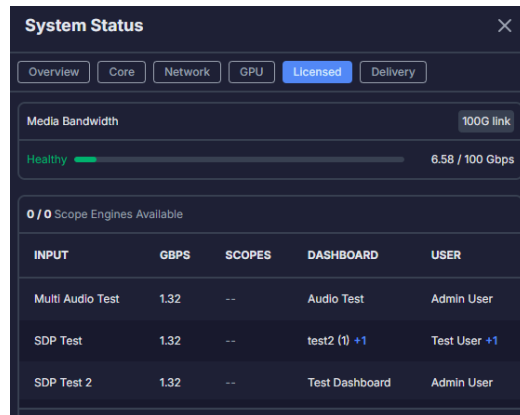
- GPU - Pooled Score: The combined utilization score across all installed GPUs.
If an individual GPU experiences abnormal load, VRAM exhaustion, or thermal throttling, the pooled health indicator escalates to flag the affected unit.
- Per-GPU Detail:
 - GPU engine utilization percentage
 - VRAM memory allocation
 - Operating temperature



Licensed Tab

On the Licensed tab, purchased software entitlements are separated from physical hardware limits to facilitate capacity planning:

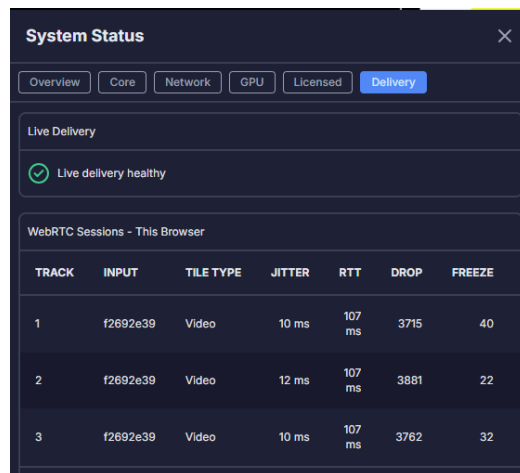
- Media Bandwidth: This section indicates the aggregated media ingest throughput evaluated against your licensed capacity limit (for example, 38.1/40 Gbps Licensed). The per-input bandwidth table indicates real-time throughput consumed by each active input feed. If the physical link is slower than the licensed limit, Pulse displays a notification that hardware constraints precede license limits.
- Scope Engines Available: This table provides the following information:
 - Occupancy counter: Total scope engines in use versus license capacity (for example, 5/8). Scope engines are consumed on a per-input basis. A single scope engine supports multiple simultaneous scope types (such as Waveform or Vector) on that input.
 - In-use breakdown table: Identifies which inputs are under active analysis, the specific scopes being rendered, associated dashboards, and the active user accounts utilizing them.
 - Availability alerts: If all engines are occupied, the counter reflects full capacity (for example, 8/8). If a user tries to launch a scope when all engines are busy, a transient notification appears.



Delivery Tab

The Deliver tab diagnoses video and audio playback streaming directly within your active browser session:

- Live delivery health diagnostic: Differentiates whether video degradation is caused by client-side network congestion or server-side encoding issues.
- WebRTC Sessions - This Browser: This table provides per-track streaming statistics:
 - Active track ID, associated input name, and tile display type.
 - Jitter, Round-Trip Time (RTT), and available bitrate.
 - Frames per second (FPS), packet loss percentage, lifetime dropped frame counters, and freeze counts.



System Status Troubleshooting

The following table describes some common troubleshooting workflows:

Symptom	Where To Check	Root Cause and Resolution
New scope will not open or displays a license warning	Licensed Tab	All scope engine licenses are in use (for example, 8/8). Review the In-Use Breakdown Table to identify which dashboards or users are analyzing inputs, and close unused scope tiles to free an engine. See Licensed Tab .
Video feed in dashboard freezes or drops frames	Delivery Tab	Check the Per-Track Table. If RTT/packet loss is high on all tracks, the client network connection to the Pulse server is constrained. If packet loss is zero but dropped frames increase server-side, check the Core and GPU tabs for hardware load saturation. See Delivery Tab .
System Status Load turns yellow or red (>75–90%)	Overview and Core Tabs	Review the composite indicator note (for example, “CPU running low — busy across all cores”). Check if excessive simultaneous inputs or unneeded background processing tasks are running on the server. See Overview Tab .
Bandwidth warning appears while total physical link is green	Licensed Tab	Ingest throughput is approaching your purchased software license cap rather than physical NIC saturation. Review the Per-Input Bandwidth Table to manage high-bitrate feeds. See Licensed Tab .

Alarms Overview

Each Pulse alarm must be configured with appropriate settings to trigger alarm notification based on error events. In general, the alarm logic tracks whether an event is considered an error based on the defined thresholds. When the number of errors exceed the threshold and/or duration, an alarm condition is raised and the alarm is visible in the Alarm Summary. After the alarm is open, all new error events are attributed to the open condition. Once the error events fall below the threshold, the alarm is cleared and the state in the Alarm Summary reflects the alarm status. If a Critical alarm is cleared, it goes to the Warning state, which can be acknowledged, the alarm is cleared from the Alarm Summary, and an acknowledgment is registered in the Event Log.

You can define conditions about which you want to be notified. Raising alarms for every error would result in an alarm storm that would be unmanageable for fault analysis. For this reason, some alarms require that you first define what is considered an error event, and then a specific threshold and duration limit that must be exceeded for the alarm.

Topics

- [2110 Quality of Service Alarms](#)
- [2110 Quality of Experience Alarms](#)
- [PTP Alarms](#)

2110 Quality of Service Alarms

Stream Alarms

AES

Alarm Name	Description	Default Severity
AES3 2110.31 Protocol	An unexpected preamble sequence was encountered in a ST 2110-31 packet.	Critical
AES3 Block Size	An AES Block with other than 192 frames was detected.	Critical
AES3 CS CRC Error	An AES professional-encoded channel status block with a CRC error was encountered.	Critical

Alarm Name	Description	Default Severity
AES3 Frame	An AES Frame was detected with the subframes in the wrong order.	Critical
AES3 Packet Size	An ST 2110-31 packet was encountered with an unexpected number of AES subframes.	Critical
AES3 Parity Error	An AES subframe with incorrect parity was detected.	Critical
AES3 V-Bit Error	One or more AES subframes with V-Bit asserted were detected.	Critical

ANC Data

Alarm Name	Description	Default Severity
ANC Checksum Error	An ancillary data packet with an invalid checksum was detected.	Critical
ANC Parity Error	An ancillary data packet with a parity error was detected.	Critical

Packet

Alarm Name	Description	Default Severity
ANC Data RTP Header Error	A Real-time Transport Protocol (RTP) packet with an invalid header was detected in the selected ANC data flow.	Critical
ANC Data RTP Length Error	An RTP packet with an incorrect length was detected in the selected ANC data flow.	Critical
ANC Data RTP Payload Type Error	The RTP payload type for the selected ANC data flow does not match the configured value.	Critical
ANC Data RTP Timestamp Error	The RTP timestamp for the selected ANC data flow is not correct.	Critical
Audio RTP Header Error	An RTP packet with an invalid header was detected in the selected audio flow.	Critical
Audio RTP Marker Bit Error	An RTP packet with the marker bit set was detected in the selected audio flow.	Critical

Alarm Name	Description	Default Severity
Audio RTP Payload Type Error	The RTP payload type for the selected audio flow does not match the configured value.	Critical
Audio RTP Timestamp Error	The RTP timestamp for the selected audio flow is not correct.	Critical
Video RTP Field Flag Error	An ST 2110-20 packet with a progressive-scan video format was detected with the field flag set.	Critical
Video RTP Header Error	An RTP packet with an invalid header was detected in the selected video flow.	Critical
Video RTP Payload Type Error	The RTP payload type for the selected video flow does not match the configured value.	Critical
Video RTP SRD Length Error	An ST 2110-20 packet with an invalid Length parameter was detected in the selected video flow.	Critical
Video RTP Sample Row Data (SRD) Row Error	An ST 2110-20 packet with an excessive row number was detected in the selected video flow.	Critical
Video RTP Timestamp Error	The RTP timestamp for the selected video flow is not correct.	Critical

RTP Sequence Error Rate %

Alarm Name	Description	Default Severity
ANC Data RTP Sequence Error	A continuity error was observed in an RTP ANC data stream.	Critical
Audio RTP Sequence Error	A continuity error was observed in an RTP audio stream.	Critical
Video RTP Sequence Error	A continuity error was observed in an RTP video stream.	Critical

Stream Not Detected

Alarm Name	Description	Default Severity
ANC Data Stream Missing	A request or configured ANC Data (ST 2110-40) stream cannot be found.	Critical
Audio Stream Missing	A request or configured audio stream cannot be found.	Critical
Video Stream Missing	A request or configured video stream cannot be found.	Critical

VPID

Alarm Name	Description	Default Severity
VPID Packets Missing	The input does not have any Video Payload Identifier (S352) packets as defined in ST 352.	Critical

Audio

Alarm Name	Description	Default Severity
Audio Nyquist Error	An audio stream with non-band-limited data and no valid SMPTE337M signaling was detected.	Critical
Audio S337 Protocol Error	An audio stream with defective or corrupted SMPTE 337 signaling was detected.	Critical

Redundant

Alarm Name	Description	Default Severity
Redundant ANC Data Content Mismatch	Content mismatch detected between redundant ancillary data streams.	Critical
Redundant Audio Content Mismatch	Content mismatch detected between redundant audio streams.	Critical
Redundant Audio Ptime Mismatch	The measured audio packet time (ptime) disagrees between two redundant streams.	Critical
Redundant Stream Sender Timing Mismatch	The measured video sender timing disagrees between two redundant streams.	Critical
Redundant Video Content Mismatch	Content mismatch detected between redundant video streams.	Critical
RTP Redundant ANC Data Sequence Error	Two redundant ancillary data RTP streams have mismatched sequence counters.	Critical
RTP Redundant Audio Sequence Error	Two redundant audio RTP streams have mismatched sequence counters.	Critical
RTP Redundant Video Sequence Error	Two redundant video RTP streams have mismatched sequence counters.	Critical

Format Alarms

Mismatch

Alarm Name	Description	Parameters
Audio AES3 Mode Mismatch	The measured audio AES3 encapsulation status disagrees with SDP metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP.
Audio Bit Depth Mismatch	The measured audio bit depth disagrees with SDP metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP.
Audio Channel Count Mismatch	The measured number of audio channels disagrees with SDP metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP.

Alarm Name	Description	Parameters
Audio Clock Rate Mismatch	The measured audio clock rate (sample frequency) disagrees with SDP metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP. Expected audio clock rate in Hz; for example, 48000).
Audio Packet Time Mismatch	The measured audio packet time (ptime) disagrees with SDP metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP. Expected packet time in milliseconds (for example, 1.0).
Color Depth Mismatch	The measured video essence color depth disagrees with metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID. Expected color depth in bits; turn the toggle on and specify a value.
Stream Frame Rate Mismatch	The measured video frame rate disagrees with metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID. Expected frame rate in frames per second; turn the toggle on and specify a value.
Stream Height Mismatch	The measured video essence height disagrees with metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID. Expected height; turn the toggle on and specify a value.
Stream Interlace Mismatch	The measured video field/frame scan mode disagrees with metadata	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID.

Alarm Name	Description	Parameters
Stream Sampling Mismatch	The measured video sampling structure disagrees with metadata	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID.
Stream Segmented Frame Mismatch	The measured video segmented frame status disagrees with metadata	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID.
Stream Width Mismatch	The measured video essence width disagrees with metadata.	Default Severity: Critical Parameters To Ignore if not Compliant: Select SDP or VPID. Expected width; Turn the toggle on and specify a value.

Redundant

Alarm Name	Description	Default Severity
Redundant Audio Bit Depth Mismatch	Two redundant RTP streams have mismatched sequence counters.	Critical
Redundant Audio Channel Count Mismatch	The measured audio channel count disagrees between two redundant streams.	Critical
Redundant Audio Clock Rate Mismatch	The measured audio clock rate disagrees between two redundant streams.	Critical
Redundant Stream Color Depth Mismatch	The measured video color depth disagrees between two redundant streams.	Critical
Redundant Stream Frame Rate Mismatch	The measured video frame rate disagrees between two redundant streams.	Critical
Redundant Stream Height Mismatch	The measured video height disagrees between two redundant streams.	Critical
Redundant Stream Scan Mode Mismatch	The measured video scanning mode (interlaced/progressive) disagrees between two redundant streams.	Critical
Redundant Stream Width Mismatch	The measured video width disagrees between two redundant streams.	Critical

Alarm Name	Description	Default Severity
Redundant ANC Data SDP	Indicates whether redundant ANC data streams have matching SDP metadata.	Critical
Redundant Audio SDP	Indicates whether redundant audio streams have matching SDP metadata.	Critical
Redundant Video SDP	Indicates whether redundant video streams have matching SDP metadata.	Critical

System Alarms

System Configuration

Alarm Name	Description	Default Severity
DHCP Status Changed	The DHCP configuration status of a network interface has changed.	Info
Gateway Changed	The default gateway for a network interface has changed.	Info
IP Address Changed	The IP address assigned to a network interface has changed.	Info
IP Address Missing	A network interface is up but has no IPv4 address configured.	Critical
Netmask Changed	The subnet mask assigned to a network interface has changed.	Info
Network Interface Down	A monitored network interface has lost its link or been disabled.	Critical

System Status

Alarm Name	Description	Default Severity
Low System Memory	This alarm is asserted when system memory gets below a configured threshold.	Critical
Service Restarted	Indicates that a service was restarted.	Info
Service Status	Determines whether service status is nominal.	Critical
Service Status Changed	Indicates that the reported status of a service changed.	Info
Service Watchdog Timeout	Indicates that heartbeats from a service have been lost.	Info

2110 Quality of Experience Alarms

Audio Alarms

Levels

Alarm Name	Description	Default Severity
Audio Clip	A PCM audio stream with a specified number of consecutive max-value samples or wraparounds was detected.	Critical
Audio Mute	A PCM audio stream with a specified number of consecutive zero-value samples was detected.	Critical

Caption Alarms

Alarm Name	Description	Default Severity
B.37 HD Missing	There is no stream providing captions via ARIB B.37 (HD).	Critical
B.37 Mobile Missing	There is no stream providing captions via ARIB B.37 (Mobile).	Critical
B.37 SD Missing	There is no stream providing captions via ARIB B.37 (SD).	Critical
OP47 (Multi) Missing	There is no stream providing subtitles via Free TV Australia OP47 Multi packets.	Critical
OP47 Missing	There is no stream providing subtitles via Free TV Australia OP47.	Critical
S2031 Missing	There is no stream providing subtitles via SMPTE 2031.	Critical
S334.1/CEA608 Missing	There is no stream providing CEA608 captions via SMPTE 334.1.	Critical
S334.2/CEA608 Missing	There is no stream providing CEA608 captions via SMPTE 334.2 (CDP).	Critical
S334.2/CEA708 Missing	There is no stream providing CEA708 captions via SMPTE 334.2 (CDP).	Critical

Video Alarms

Black Frame

Alarm Name	Description	Default Severity
Video Black Frame	A black frame was detected in the video.	Critical

Frozen Frame

Alarm Name	Description	Default Severity
Video Frozen Frame	A frozen frame was detected in the video.	Critical

PTP Alarms

Alarm Name	Description	Parameters
Announce	Indicates whether the rate of PTP Announce messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Critical
Clock Class Changed	The clock class changed.	Duration (seconds): 1 Alarm Type: Info
Clock Lost	Indicates whether there is a suitable grandmaster present.	Duration (seconds): 1 Alarm Type: Critical
Delay Request Rate	Indicates whether the rate of PTP Delay Request messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Critical
Delay Response Rate	Indicates whether the rate of PTP Delay Response messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Critical
Domain Changed	The PTP domain changed.	Default Duration (seconds): 1 Alarm Type: Info
Grandmaster Changed	The PTP grandmaster changed.	Duration (seconds): 1 Alarm Type: Info
Lock Status	Indicates whether or not PTP client is locked to a grandmaster.	Duration (seconds): 1 Alarm Type: Critical

Alarm Name	Description	Parameters
Management Rate	Indicates whether the rate of PTP Management messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Critical
Offset From Leader	Indicates whether the PTP offset from leader has exceeded the specified limit.	Over Threshold (ns); Specify a value. Duration (seconds): 1 Alarm Type: Critical
SMPTE Metadata Rate	Indicates whether the rate of SMPTE Metadata messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Info
Sync Rate	Indicates whether the rate of PTP Sync messages is over or under the specified limit.	Over Threshold (msg/s); Specify a value. Under Threshold (msg/s); Specify a value. Duration (seconds): 1 Alarm Type: Critical

Verbose Labeling

The Verbose Labeling setting controls how Pulse generates the labels (names) for Pulse objects that are registered in the selected NMOS registry.

When the Verbose Labeling field is set to No, the labels are created according to the schema in the following table.

Table 1. Verbose Labeling Disabled

Pulse Entity	Naming Example for the Pulse Entity	Corresponding NMOS Entity	Label Generated for the NMOS Entity
Appliance Name	Pulse - Unit 1	Node	Pulse - Unit 1
NMOS-enabled Monitoring Group Name	QIZ	Device	QIZ
Video Essence (Non-Redundant)	QIZ_vidp_0 ^a	Receiver (single legged) ^b	Video 0 ^c
Video Essences (Redundant)	QIZ_vidp_0 ¹ , QIZ_vids_0 ¹	Receiver (dual legged) ^d	Video 0 ³
Audio Essences (Non-Redundant)	QIZ_audp_0 ^e	Receivers (single legged) ²	Audio 0 ^f
	QIZ_audp_1 ⁵		Audio 1 ⁶
	...		...
Audio Essence (Redundant)	QIZ_audp_0 ⁵ , QIZ_auds_0 ⁵	Receivers (dual legged) ⁴	Audio 0 ⁶
	QIZ_audp_1 ⁵ , QIZ_auds_1 ⁵		Audio 1 ⁶
	...		...
Ancillary Essences (Non-Redundant)	QIZ_ancp_0 ⁹	Receivers (single legged) ²	Data 0 ^h
	QIZ_ancp_1 ⁷		Data 1 ⁸
	...		...
Ancillary Essence (Redundant)	QIZ_ancp_0 ⁷ , QIZ_ancs_0 ⁷	Receivers (dual legged) ⁴	Data 0 ⁸
	QIZ_ancp_1 ⁷ , QIZ_ancs_1 ⁷		Data 1 ⁸
	...		...

- a. Pulse generates these names automatically by concatenating:
the monitoring group name (for example, QIZ);
_vid;
one of the following:
 p_ for the primary essence; or
 s_ for the secondary essence; and
the index number of the video essence (pairs) in the monitoring group. As in Pulse, there can only be one video essence (pair) per program; the index will always be 0.
- b. Single legged is an NMOS receiver that will be connected to a sender that has (transmits) only one essence.
- c. Video essences in Pulse are mapped to one receiver (Video 0).
- d. Dual legged is an NMOS receiver that will be connected to a sender that has (transmits) two essences: a primary essence and a secondary/backup essence.
- e. Pulse generates the names automatically by concatenating:
the program name (for example, QIZ);
_aud;
one of the following:
 p_ for the primary essence; or
 s_ for the secondary essence; and
the index number of the audio essence (pairs) in the program. As in Pulse, there can be multiple audio pairs per program (for example, a pair for English subtitles, a pair for Spanish subtitles, etc.), the index for each pair will be 0, 1, etc.
- f. Each audio essence (pair) in Pulse is mapped to one receiver (for example, Audio 0 for the first audio essence pair and Audio 1 for the second audio essence pair).
- g. Pulse generates names automatically by concatenating:
the program name (for example, QIZ);
_anc;
one of the following:
 p_ for the primary essence; or
 s_ for the secondary essence; and
The index number of the ancillary essence (pairs) in the program. As in Pulse, there can be multiple ancillary pairs per program (for example, one pair for English audio, one pair for Spanish audio, etc.). The index for each pair will be 0, 1, etc.
- h. Each ancillary essence (pair) in Pulse program is mapped to one receiver (for example, Data 0 for the first ancillary essence pair and Data 1 for the second ancillary essence pair).

When the Verbose Labeling field is set to Yes, the labels are created according to the schema in the following table. In this table, it is assumed that the Verbose Labeling Delimiter (the character used to separate the components in the NMOS entities) is a slash (/). For details about configuring the delimiter character, see [Configure NMOS Functionality](#).

Table 2. Verbose Labeling Enabled

Pulse Entity	Naming Example for the Pulse Entity	Corresponding NMOS Entity	Label Generated for the NMOS Entity
Appliance Name	Pulse - Unit 1	Node Name	Pulse - Unit 1
NMOS-enabled Program Name	QIZ	Node Name/ Device Name	Pulse - Unit 1/QIZ
Video Essence (Non-Redundant)	QIZ_vidp_0	Node Name/ Device Name/Receiver Name	Pulse - Unit 1/QIZ/Video 0
Video Essence (Redundant)	QIZ_vidp_0, QIZ_vids_0		
Audio Essences (Non-Redundant)	QIZ_audp_0	Node Name/ Device Name/Receiver Name	Pulse - Unit 1/QIZ/Audio 0
	QIZ_audp_1		Pulse - Unit 1/QIZ/Audio 1
	...		
Audio Essence (Redundant)	QIZ_audp_0, QIZ_auds_0	Node Name/ Device Name/Receiver Name	Pulse - Unit 1/QIZ/Audio 0
	QIZ_audp_1, QIZ_auds_1		Pulse - Unit 1/QIZ/Audio 1
	...		...
Ancillary Essences (Non-Redundant)	QIZ_ancp_0	Node Name/ Device Name/Receiver Name	Pulse - Unit 1/QIZ/Data 0
	QIZ_ancp_1		Pulse - Unit 1/QIZ/Data 1
	...		
Ancillary Essence (Redundant)	QIZ_ancp_0, QIZ_ancs_0	Node Name/ Device Name/Receiver Name	Pulse - Unit 1/QIZ/Data 0
	QIZ_ancp_1, QIZ_ancs_1		Pulse - Unit 1/QIZ/Data 1
	...		...