VADDIO

A brand of **legrand**

Complete Manual for the

ConferenceSHOT ePTZ

Auto-Framing Camera

Document 411-0054-30 Rev A
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Contents

Overview

This guide covers:

ConferenceSHOT® ePTZ auto-framing camera:
- North America – 999-21050-000
- Europe and UK – 999-21050-001
- Australia and New Zealand – 999-21050-009

What's in this Guide

This guide covers
- Physical features
- Installation
- Initial set-up and system administration
- Performance/behavior configuration
- System maintenance
- Operation
- Telnet API reference
- Troubleshooting

For your convenience, the information you need to install this product is also available in the smaller, stand-alone **Installation Guide for the ConferenceSHOT ePTZ Auto-Framing Camera**.

Features

- Integrated camera and audio system, ideal for small to medium conference rooms
- IntelliFrame™ algorithm keeps participants in view reliably, without facial recognition
- Simultaneous HDMI, uncompressed USB 3.0 and H.264 IP streaming (RTSP or RTMP)
- Up to 1080p/30 video
- Integrated phased microphone array
- Audio line in and line out
- Universal Video Class (UVC) and Universal Audio Class (UAC) drivers supported in Windows®, macOS®, and Linux operating systems, compatible with most UC conferencing applications
- Integration-ready Telnet control
- Full administrative control via web interface; manage the camera remotely while monitoring the stream separately
- Presenter-friendly IR remote control

A Quick Look at the Camera

This section covers the physical features of the camera.

Front of the Camera

Camera and zoom lens – Up to 5x zoom.

Integrated microphone – No external microphone needed in typical installations. Echo-canceling microphone picks up the voices of participants up to 10 ft. (3 m) away.

Status light – The light on the camera's face indicates the camera's current state. It can be turned off in the administrative web interface.

Adjustable position – Manually tilt the camera as needed. When mounted in its wall bracket, the camera pivots at the attachment points.

Note
By default, the status lights on Vaddio cameras are active during normal operation; however, they can be configured to remain off even when the camera is sending video.

Connector Panel

The connectors are on the underside of the camera.

PoE+ – RJ-45 connector. Connect to the network and to power via the Power and Data Out port of the mid-span PoE+ power injector. Provides power and network access for IP streaming and camera control via web interface or Telnet.

HDMI output – HDMI video and audio output connector.

USB 3.0 – USB Type B connector. Connect to a computer for use with soft conferencing applications. Provides uncompressed USB 3.0 stream.

IP button – Press to display the camera's IP address on video outputs.

Audio input – Line level balanced audio for an external microphone or other audio source.

Audio output – Line level balanced audio output to amplified speaker or other audio infrastructure.

Installation

This section covers:
- Selecting the location for the camera
- Verifying that the camera is ready to install
- Installing the mount
- Connection diagrams
- Mounting the camera

And a required safety note here:

Note
PoE type networks connected to this equipment are for intra-building use only and should not be connected to lines that run outside of the building in which this product is located.

Don't Void Your Warranty!

Caution
This product is for indoor use. Do not install it outdoors or in a humid environment without the appropriate protective enclosure. Do not allow it to come into contact with any liquid.

Do not install or operate this product if it has been dropped, damaged, or exposed to liquids. If any of these things happen, return it to Vaddio for safety and functional testing.

Before You Install the Camera

Prepare for a successful installation:
- Consider camera viewing angles, lighting conditions, line-of-sight obstructions, and in-wall obstructions where the camera is to be mounted.
- Ensure that the camera points away from the ceiling and lights. The camera will not perform well if it is pointed toward a light source such as a light fixture or window.
- Mounting the camera at eye level is best. If this is not feasible, mounting the camera above eye level typically produces a better experience than mounting it below eye level.
- If you make cables for this installation, check them for continuity.
- Be sure you can identify all cables correctly.
- Talk to the network administrator. If installing the camera in a non-DHCP network (one that does not automatically assign IP addresses), you will need to configure the camera with a static IP address as directed by the network administrator.

Cabling Notes

Use Cat-5e or better cable. Use shielded cabling if the cables will be coiled, run tightly with other cables, or routed near sources of electromagnetic interference such as power lines or fluorescent light fixtures. We recommend using high-quality connectors and a high-quality crimping tool.

Caution
Do not use pass-through RJ-45 connectors when making cables for this product. Poorly crimped connectors of this type can cause intermittent connections and degraded signal quality. They can also damage the connectors on the product, which will void your warranty.
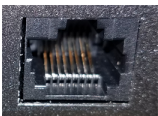
Intact – will make reliable contact with cable connector
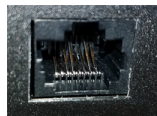
Damaged – Bent contact fingers will NOT make reliable contact with cable connector

Pre-Installation Functional Check

If you're installing the camera where it's hard to reach, you may want to verify functionality before you install it.

1. Connect the camera in its minimum functional configuration.
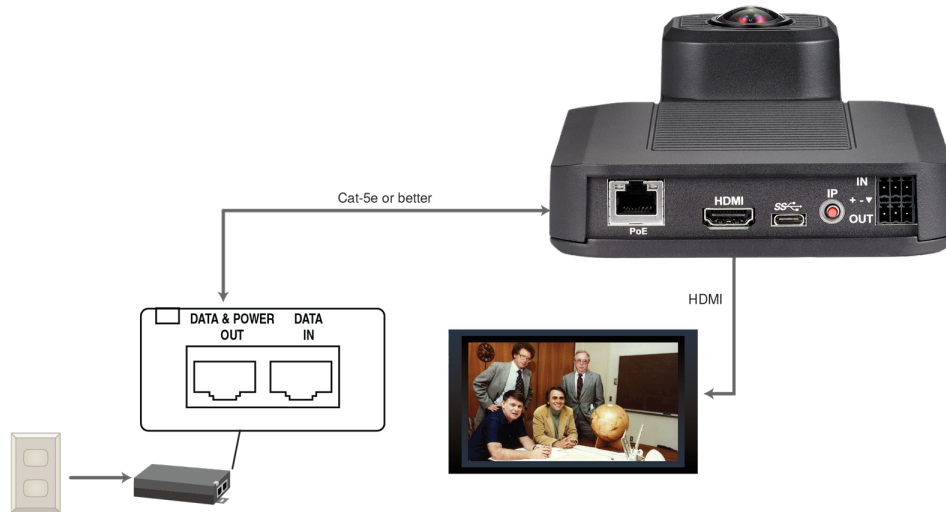
2. Connect power. The camera's status light turns white. If an HDMI display is connected, video is available.
3. *If not using an HDMI display:* Connect the camera's USB port to your computer, then verify that you can select the camera as the USB video capture device using a media player.

If the camera turns on and sends video, continue with the installation.

Getting the Camera's IP Address

You will need the camera's IP address if you do not use the Vaddio Device Controller or Vaddio Deployment Tool to access its web interface.

Briefly press the IP button on the connector panel. This displays the camera's IP address and MAC address on the video outputs. Press the button again to dismiss the information.

If the Camera Is At 169.254.1.1

This is the camera's default IP address. This means one of these things:

- The camera's PoE+ power injector is not connected to the network,
  OR
- The network does not automatically assign IP addresses.

If the camera does not receive an IP address when connected to the network, you will need to configure the camera for the network after you have done the initial device set-up.

To communicate directly with the camera for initial device set-up and network configuration, you will need to connect a cable from your computer's network port to the DATA IN port on the PoE+ power injector.

Status Light

The light in the camera's head indicates its current state.
- Purple – Initializing
- White – Active
- Red – Audio is muted
- Blinking red – Video is muted
- Yellow – Firmware update is in progress
- Blinking cyan – Remote pairing mode
- Blinking blue – Pairing error

Caution
Do not remove power or reset the camera while the status light is yellow, showing a firmware update in progress. Interrupting a firmware update can make the camera unusable.

Note
By default, the camera's status light is active during normal operation; however, it can be configured to remain off when the camera is powered up. The camera may be sending video even if the light is off.

Installing the Wall Mount

The camera is shipped with a wall mount, which can be inverted.

You can install the camera wall mount to a display mount or directly to drywall. If you mount it to drywall, use wall anchors.

Basic Connections

Here is an example of how the camera might be set up in a medium-size conference room. In this setup, a PC uses a unified communications conferencing application to manage the camera and connected microphones and speaker.
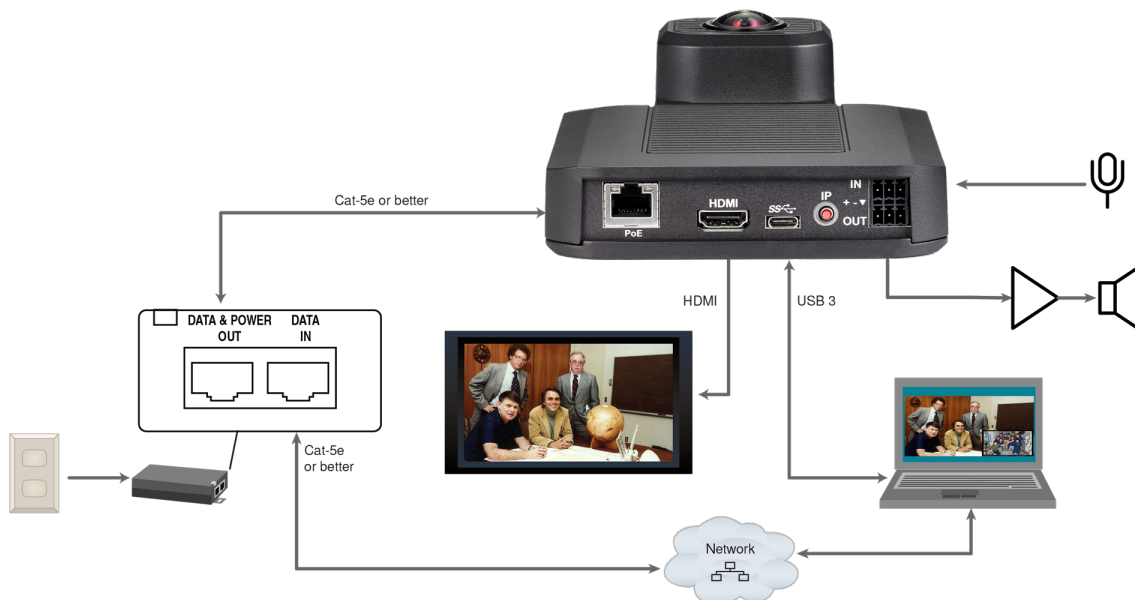
Pro Tip
Label all cables at both ends.

Installing the Camera and Connecting Power

Caution
Check your cables. Connecting a cable to the wrong port or using the wrong pin-out can result in equipment damage and will void the warranty.

1. Secure the camera in the mount using the two screws provided.
2. Connect all required cables to the camera.
3. Secure the cable cover to the mount.
4. Connect the mid-span power injector to mains power.

About Inverted Installation

If you install the camera with the connector panel pointing up, you will need to select the camera's Image Flip setting when configuring behavior and performance. Image Flip orients the video image correctly and sets the camera to respond appropriately to tilt commands. See Additional Camera Settings for more information.

Initial Device Set-Up

Vaddio cameras have a web interface for initial device set-up, administrative control, and operation.

When any Vaddio product is shipped from the factory, the admin password is not set and the administrative controls are not available. You will need to access the web interface and set the admin password. Then you will be able to access to the system administration tasks to define how the device behaves as an element of your network. **This is also true after restoring factory defaults.**

Because this process is the same for all Vaddio cameras, screen shots in this section may show different products.

Browser Support

We have tested this product with these web browsers:
- Chrome®
- Firefox®
- Microsoft® Edge and Internet Explorer®
- Safari®

We test using the browser version available from the vendor at that time. Other browsers (including older versions of the ones on this list) are likely to work also.

Initial Device Set-up Process Overview

The details of initial device set-up and system administration differ somewhat, depending on which method you use.
- **Access the web interface from a Vaddio Device Controller** – The touch-panel automatically scans the subnet to locate Vaddio devices. Select the desired device and exit to the device's web interface to complete the initial device set-up.
- **Locate and set up the camera using the Vaddio Deployment Tool** – Available as a free download at https://info.legrandav.com/VaddioDeploymentTool. The tool scans the network for Vaddio devices, identifies all devices that are not set up, provides the controls to complete the initial device set-up, and provides links to each device's web interface.
- **Access the web interface directly** – The classic method. Discover the camera's IP address and browse to its web interface.

Initial Device Set-Up Using the Vaddio Device Controller

The Vaddio Device Controller is a stand-alone tablet for working with Vaddio products.

To complete the initial device set-up with the Vaddio Device Controller:

1. Connect the touch-panel to the network on the same subnet as the products you need to work with – for example, connect both to the same PoE+ switch.
2. Go to the touch-panel's Configuration page (gear icon) and select Scan.
3. Locate the device you need to work with, and select Use.

   If the Vaddio Device Controller does not find the camera, verify that the Vaddio Device Controller and camera are connected to the same subnet.
4. Select Exit to leave the Configuration page and open the device's web interface.
   Note
   The first time you access a device at a specific IP address, the Vaddio Device Controller's screen may remain blank for 20 seconds or more.

5. Set the admin password.

Initial Device Set-Up Using the Vaddio Deployment Tool

The Vaddio Deployment Tool provides an option to do the initial device set-up for unprovisioned devices, and provides a shortcut to each device's web interface for system administration. This tool is available as a free download at https://info.legrandav.com/VaddioDeploymentTool.

Note
Be sure you have the current version of the Vaddio Deployment Tool. If it notifies you that an update is available, install the update. This ensures that you have access to the full capabilities of the tool. Old versions may not recognize the newest products.

To complete the initial device set-up with the Vaddio Deployment Tool:

1. Power up the camera and other devices if you have not done so already.
2. On the Find Devices page, select Scan. If the scan does not locate the devices you need to set up, your computer may be on a different subnet. Return to the Find Devices page and set up an advanced scan to search the appropriate portion of the network.
3. In the list of equipment that the scan discovers, locate the devices marked Not Set Up.
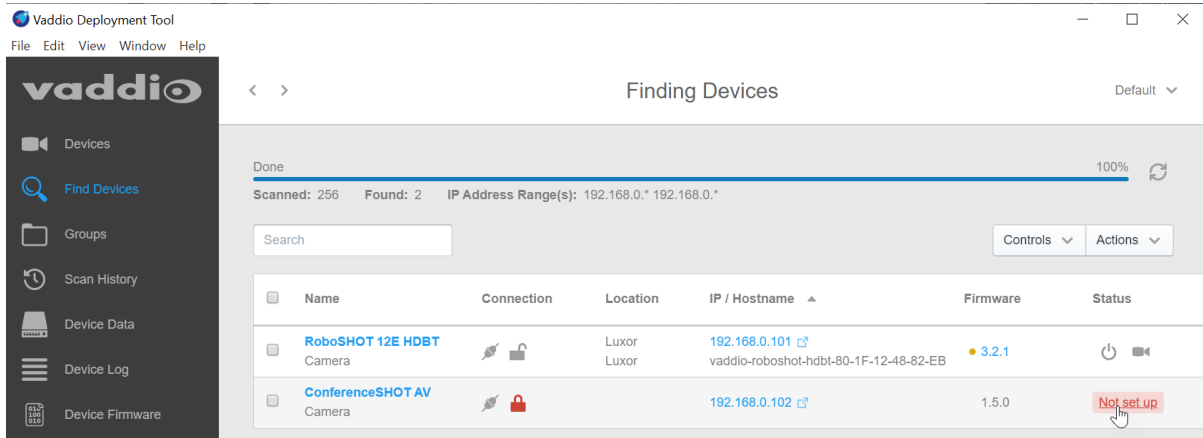
4. For each device that you need to work with, select Not Set Up and set the admin password.

You can now access the administrative web interface for system administration and other configuration tasks.

Manual Access and Initial Device Set-Up

If you do not use a Vaddio Device Controller or the Vaddio Deployment Tool, you will need to complete the initial device set-up manually, by browsing to the device's web interface using its IP address. See Getting the Camera's IP Address.

Initial Access to the Web Interface

HTTP access is disabled initially. Enter the camera's IP address in your browser's address bar using `https://` as a prefix. (Example: `https://10.30.200.125`) When you access the web interface without using the `https://` prefix, the browser may treat it as a search query, or you may encounter this message:
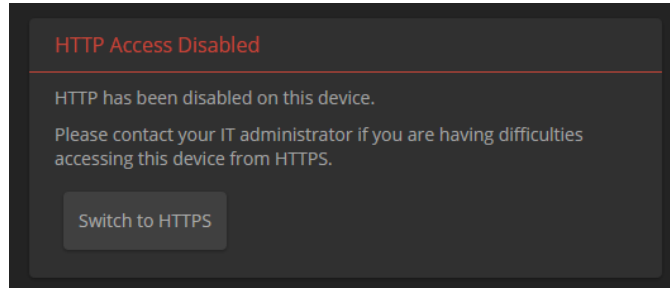
Switch to HTTPS if you see this message.

Expect a security warning from your browser the first time you access the device's web interface.

Different browsers will respond with different messages and options. Your browser will probably present a message indicating one of these things:
- The connection is not private
- The site is not secure
- The site is not trusted
- The site poses a security threat

This is because the certificate (the product's website security credential) is self-signed, not issued by an external certificate authority. *Your HTTPS connection is secure and traffic is encrypted.*

You will need to make the selections that your browser's security message discourages. Depending on the browser, the warning presents an option to learn more, view details, or go to the "Advanced" page. When you select this, your browser provides an explanation and a button or link to continue to the IP address you entered, with a reminder that it may be unsafe. Select the option to continue. *Your HTTPS connection is safe.*

After you have accessed the product's web interface once, your browser may remember its IP address and not present the security message again.

Completing the Initial Device Set-up

Set the admin password and complete any other required tasks, such as accepting agreements. The full administrative interface opens when you finish.

Note
This page includes a link to the company's standard privacy policy. This product does not record or save audio or video files, and it does not store any identifying information other than what you may choose to enter on the Room Labels page of the web interface. However, the device's IP address is considered "personally identifiable information" for the purposes of the privacy policy.

System Administration

This chapter covers settings for managing the camera as an element of your network.
- Security – Passwords, guest access, other IT security-related settings
- Network configuration
- Time settings

See Configuring Camera Behavior for information on image adjustments, streaming configuration, and other items related to camera behavior.

Note
Vaddio products are designed with very similar web interfaces. Some of the screen shots in this manual may be from other cameras. Some may show settings that are not present or not enabled in your camera.

Configuring Access and Other Security Settings

SECURITY PAGE

The Account Passwords and Web Server areas of the Security page provide basic security for the web interface:
- **Admin password** – Required. The web interface is unavailable if no admin password is set.
- **User password** – Password-protected access to the operator's page of the web interface.
- **Allow Guest Access** – Allow access the operator's page without a password. Disabled by default.
- **Automatically Expire Idle Sessions** – Automatically logs you out after 30 minutes of inactivity.
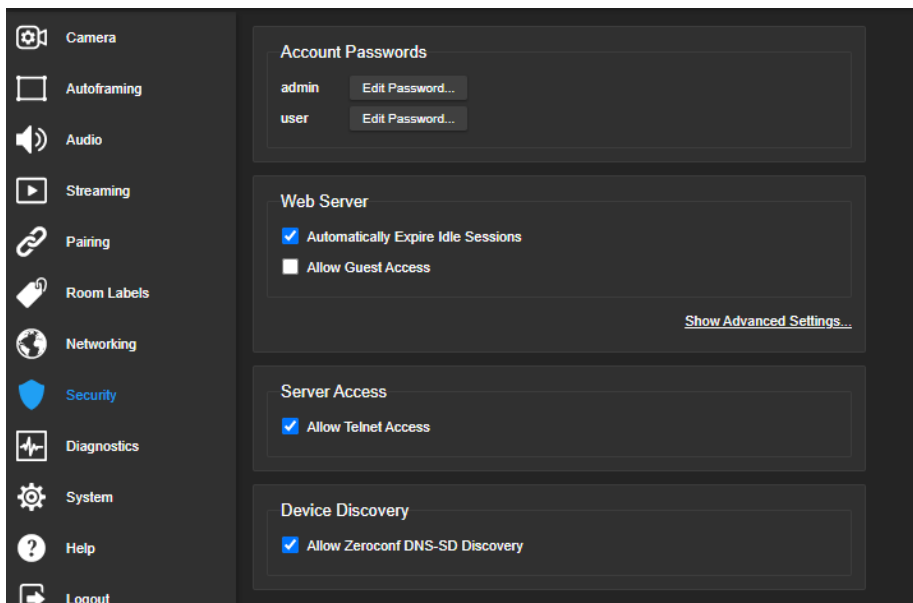
Other security settings include:
- **Allow Telnet Access** – disabled by default.
- **Allow Zeroconf DNS-SD discovery** – allowed by default.
- Advanced Settings – **Enable HTTP access** (disabled by default) and **Manage SSL Certificate**.

Note
Consult your network security specialist before changing any of these settings. Seek explicit guidance concerning the SSL certificate.

Configuring the Camera for Your Network

By default, the camera is set to DHCP, and will receive an IP address automatically if your network assigns IP addresses. Work with your network specialist to ensure that the camera is configured to comply with the organization's network policies.

Caution
Consult your IT department before changing network settings. Errors in network configuration can make the camera inaccessible from the network.

Note
When you change the camera's hostname, IP address, or other network information, you will need to log in to the web interface again. This does not happen if the only change you make is from DHCP to static addressing or vice-versa.

Configuring the Device with a Static IP Address

NETWORKING PAGE

If no DHCP server is available to automatically assign an IP address, the camera uses its default IP address (169.254.1.1). If you install more than one camera or other device on this network, you must follow this procedure to prevent IP address conflicts.

If the camera is currently at 169.254.1.1:

1. Work with your IT department's network specialist to determine the correct network settings.
2. Connect your computer's network port to the camera's network port.
3. Set IP Address to Static. Then enter the IP address, subnet mask, and gateway. DNS Server is optional; ask the network specialist.
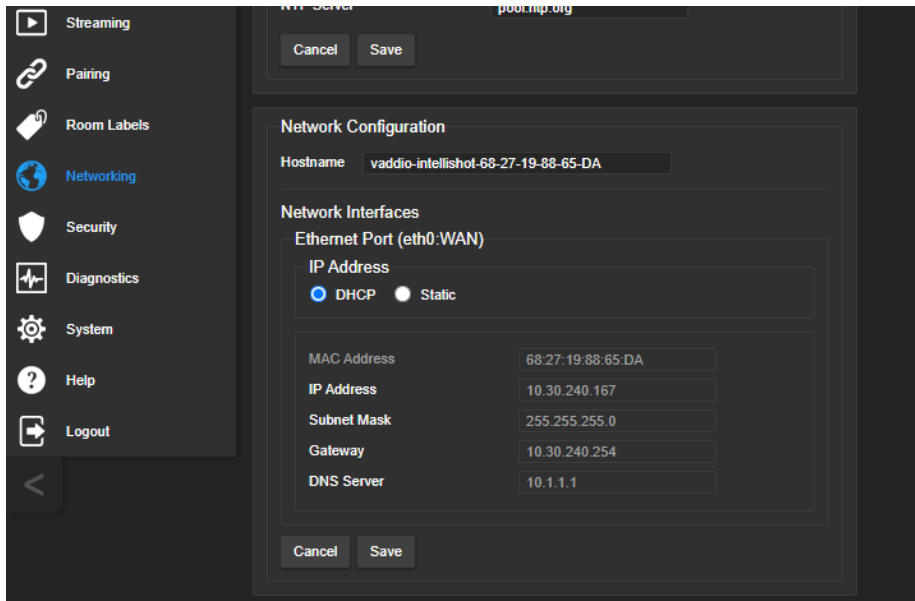
If the camera is currently at an IP address other than 169.254.1.1:

Work with your IT department to determine whether the device's current IP address is suitable.

If it is, you only need to set the IP Address to Static.

If not, set IP Address to Static and enter the IP address, subnet mask, and gateway as directed. Again, DNS Server is optional; ask the network specialist.

Changing the Camera's Hostname

If your network supports hostname resolution, you can browse to the camera using its hostname. Giving it a simple, easy-to-remember hostname means you don't need to know its IP address. Work with your IT department to ensure that the new hostname conforms to the organization's naming conventions.

Note
You may need to log in to the web interface again after changing the hostname.

Specifying Time Zone and NTP Server

Using automatic NTP updating ensures that the timestamps in the camera's diagnostic log are accurate. Specifying your time zone may make it easier to match logged events with other actions and external events.

1. To make the time zone and NTP server editable, enable Automatic NTP Updating.
2. If you are not sure what to use for NTP Server, use the default.
3. Select the desired time zone from the list.
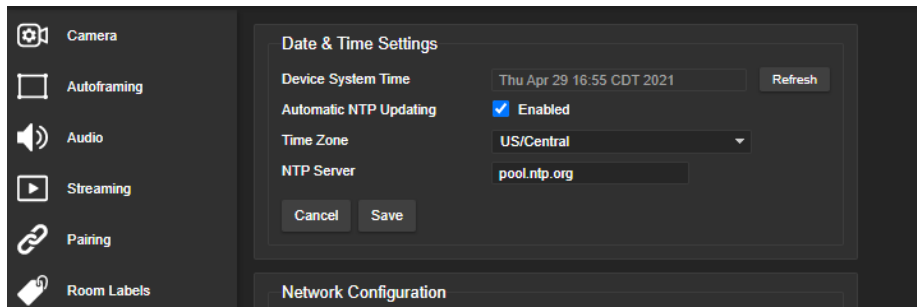
You may need to refresh the system time display.

Adding Room Information to the Camera's Web Interface

The information you enter on this page is displayed on every page of the web interface. In a multi-camera environment, you may also wish to specify what appears on the browser tab.
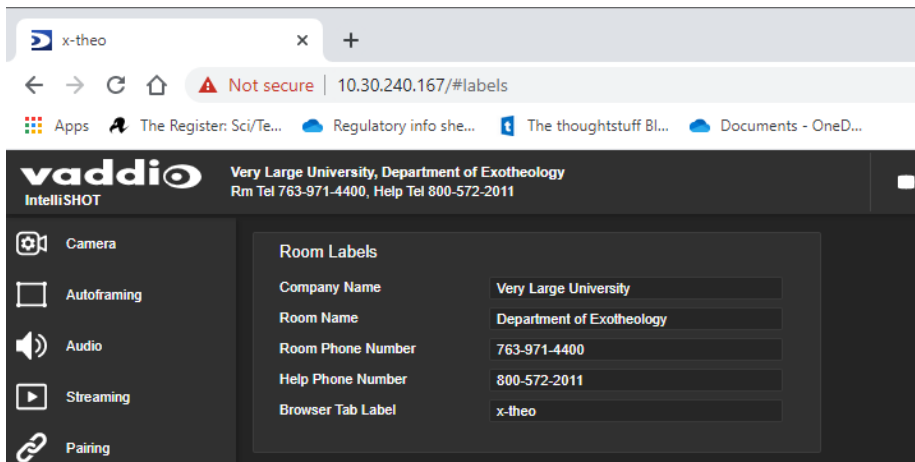
Configuring Camera Behavior

This chapter covers settings for defining how the camera performs in your environment:
- Auto-framing adjustments
- Streaming
- Manual-mode settings and adjustments – presets, color and lighting, speed, focus
- Audio adjustments
- Other camera settings

Note
Vaddio products are designed with very similar web interfaces. Some of the screen shots in this manual may be from other cameras. Some may show settings that are not present or not enabled in your camera.

Fine-Tuning Auto-framing Behavior

The Auto-framing feature can be tuned to your specific installation. This includes defining areas where the camera does not evaluate motion (masking), adjusting the area where Auto-framing occurs, and adjusting speed, sensitivity, and responsiveness.

How It Works: Digital Pan/Tilt/Zoom

The lenses in a camera control how much of the room can be in the shot – the image area. Zooming in optically makes the image area smaller by moving the lenses. Zooming in digitally makes the image area smaller by using the pixels from a smaller portion of the image sensor. Either way, the effect is the same: When the image area is smaller, everything in the shot looks bigger.

Digital pan and tilt work when the camera is zoomed in. If some image area is available outside the shot, the camera can pan and tilt by moving the image area to use pixels outside the current shot. As the camera zooms in, the image area is a smaller part of the total field, so more pan and tilt is available. But if the current shot uses all the pixels, there's no room to pan or tilt.

The unmasked portion in each frame of the diagram represents the zoomed image while the camera pans from the Mars globe to Dr. Sagan.

How It Works: Auto-framing

Auto-framing uses digital pan, tilt, and zoom to center the source of motion, so the image is almost always zoomed in at least slightly.

Vaddio's Auto-framing is based on motion detection. It won't mistake pictures for people, it still works if you turn away from the camera, and you don't have to wear a special device. But with no special device to follow, Auto-framing does not necessarily keep the shot on its original subject.

- Auto-framing is enabled by default.
- The camera tries to keep the frame centered on the source of motion.
- If the motion is small, the camera zooms in.
- When the camera does not detect any motion, by default it zooms out. This behavior is configurable.
- If the motion is near the edge of the field of view, it can't be centered in the frame.
- If the motion is mostly outside the field of view, the camera can only detect the small part of the motion within its field of view.

In this diagram, the unmasked area represents the framed area. The area of motion is large (which limits the zoom) and the two people on the left are near the edge of the total field of view, so the camera cannot pan far enough to center the people in the frame.

Basic Auto-framing Adjustments

AUTO-FRAMING PAGE

When making adjustments, compare the Visualizer's image to the video output.

Auto-framing Presets – Factory configurations. "Conservative" settings are less sensitive and track at lower speeds than "responsive" settings. Select the one closest to the room's requirements, then make other adjustments if needed.

Note
In many cases, the camera delivers good Auto-framing performance with no adjustments beyond selecting the appropriate Auto-framing preset. Note that the ConferenceSHOT ePTZ does not have lecture capture settings.
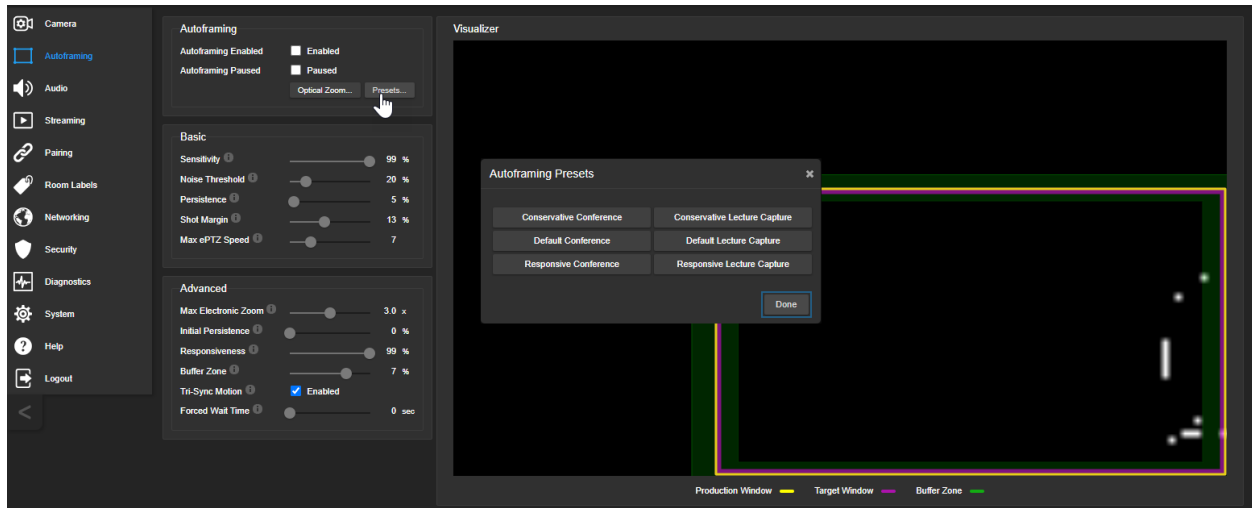
Sensitivity – How quickly the camera responds to new motion. High sensitivity may respond to brief, unwanted motion, such as people walking past an open door. Typically 70% to 90% for conferencing, 95% or higher for lecture capture.

Noise Threshold – The minimum change recognized as motion. Default value is 20%. If Noise Threshold is high, the Visualizer shows less movement data (white dots). If Noise Threshold is too low, the Visualizer shows pixel changes that are not motion, such as individual pixels' color values being reinterpreted in each frame – which is typical camera behavior. This screen shot is an example.
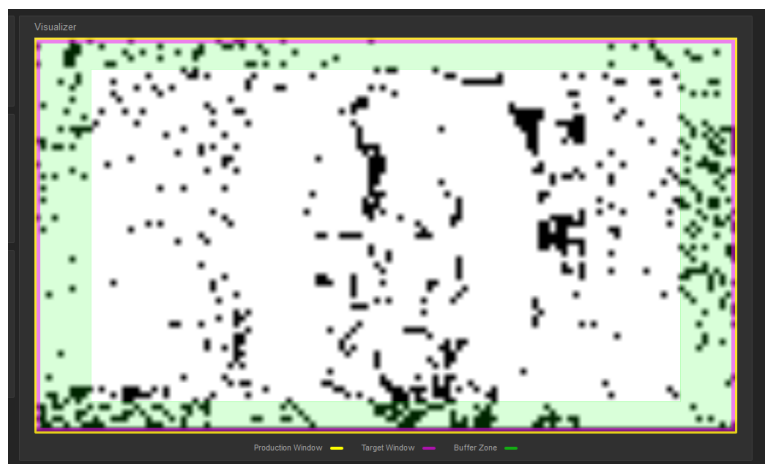
Persistence – How long the camera remembers motion and stays on its source after other trackable motion starts. Typically 25% to 100% for conferencing, below 15% for lecture capture.

Shot Margin – Controls how tight or wide the shot will be around the people in the camera's field of view. A high value will result in a wider shot and a low value results in a tighter shot around the person or group of people. Default value is 7% for conferencing and 13% for lecture capture.

Masking Unwanted Motion

AUTO-FRAMING PAGE, MASKING TAB

Masks are areas where the camera ignores motion. For example, if a door is within the camera's field of view, a mask can prevent the camera from responding to the movement of the door or people in the doorway. You can create multiple masks to fine-tune the camera's performance.

Things to know about masks:
- When you select the Masking tab, the Auto-framing Visualizer mode automatically switches to a view of the room, so you can see what part of the room each mask affects.
- After you select Add Mask, drag the new mask to the desired location. Adjust its dimensions by dragging its corners or edges.
- Right-click the mask name to rename it.
- Clear a mask's Enabled check box to disable the mask without deleting it.
- Set the Visualizer mode to Motion to test the mask.
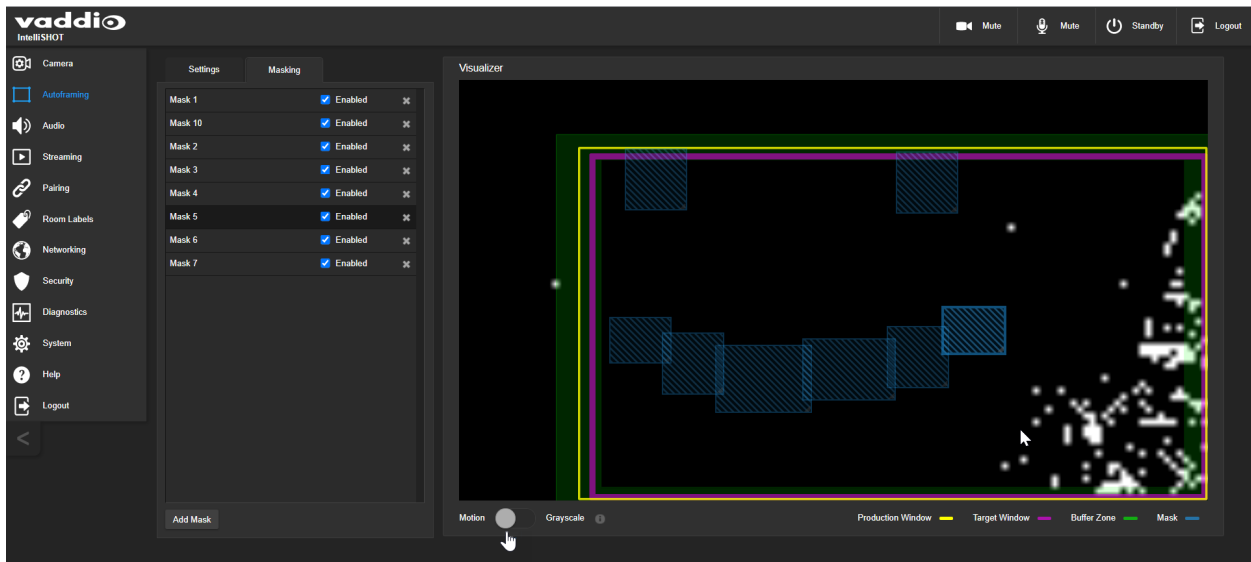
Advanced Auto-framing Adjustments

AUTO-FRAMING PAGE

Max Electronic Zoom – Sets the default size of the frame relative to the area defined by Optical Zoom. Default value is 3x for all Auto-framing presets.

Initial Persistence – How the camera remembers motion when it starts; similar to Persistence. Typically 25% to 100% for conferencing, 0 for lecture capture or presenter framing.

Responsiveness – How quickly Auto-framing reacts to new motion. Typically 70% to 90% for conferencing, 95% or higher for lecture capture.

Buffer Zone – The area around the edge of the frame where new motion causes the image to re-center. Typically 3% for conferencing, 7% for lecture capture. Adjust this value higher to make the camera move less.

Tri-Sync Motion – Smooth pan/tilt/zoom. When Tri-Sync Motion is disabled, the camera snaps to position presets. Enabled by default.

Forced Wait Time – Minimum number of seconds between camera movements. Default is 0. Increasing Persistence often provides better performance than setting a Forced Wait Time.

Default Wide – In Default Wide mode, the camera widens the shot (zooms out) when it detects no motion. This is best for conferencing or other situations with low motion. When Default Wide is not enabled, the camera remains where it last detected motion. We recommend disabling Default Wide mode for lecture capture.
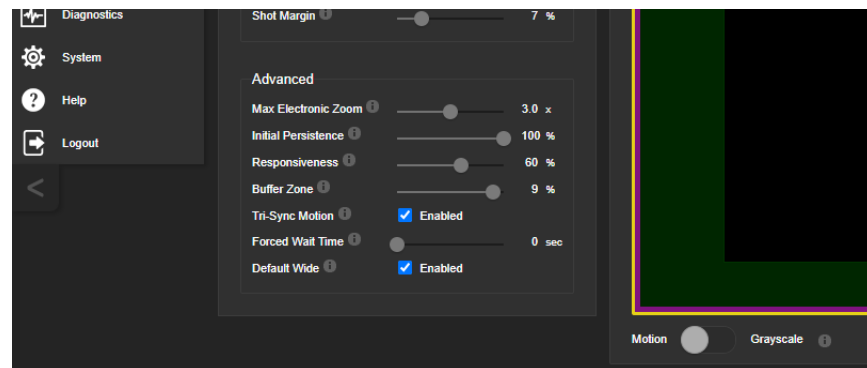
Auto-framing Adjustment Quick Reference

Set Optical Zoom and select the Auto-framing preset that is most similar to the room's requirements. Then adjust Auto-framing to meet the unique demands of your space. These tables may help.

Not Responding Enough

To correct this	Do this	For this effect
Auto-framing isn't working	Resume Auto-framing; avoid using manual controls	Manual controls override Auto-framing
Auto-framing takes too long to start	Increase Responsiveness and Sensitivity	"Notice" motion sooner
	Decrease Initial Persistence	Respond to motion sooner
The camera only frames participants who move frequently	Increase Sensitivity	Recognize smaller movements, such as participants who don't gesture or fidget
	Decrease Noise Threshold	Recognize brief motion
The presenter moves faster than the camera	Increase Shot Margin	Pan, tilt, and zoom faster
The presenter keeps moving out of the frame	Increase Responsiveness	"Notice" motion sooner
	Decrease Initial Persistence	Respond to motion sooner

Responding Too Much

To correct this	Do this	For this effect
The camera keeps moving away from the person who is speaking	Increase Persistence	Stay on the last source of motion longer
	Increase Noise Threshold	Require movements to be bigger before they are evaluated
Movement seems jumpy	Increase Buffer Zone	Fewer camera movements
The camera keeps zooming in too far	Reduce Max Electronic Zoom	Limits how far the camera can zoom in while framing
The camera recenters even when the presenter is still within the frame	Increase the Buffer Zone	Enlarges the area where new movement does not cause the camera to recenter

Managing Audio

Controls for individual inputs (audio from your site) and outputs (audio from the far end of the conference) are on separate tabs.

To mute all audio inputs together:

To stop sending audio, use the audio mute button at the top of any page of the web interface.
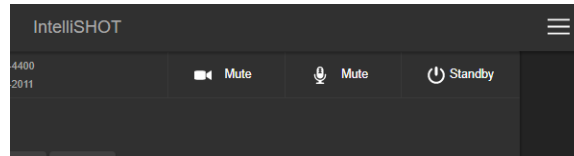
To mute or control volume for individual audio inputs or outputs:

Use the button to mute the desired audio input or output. Use the slider for the appropriate audio input or output to set the volume.
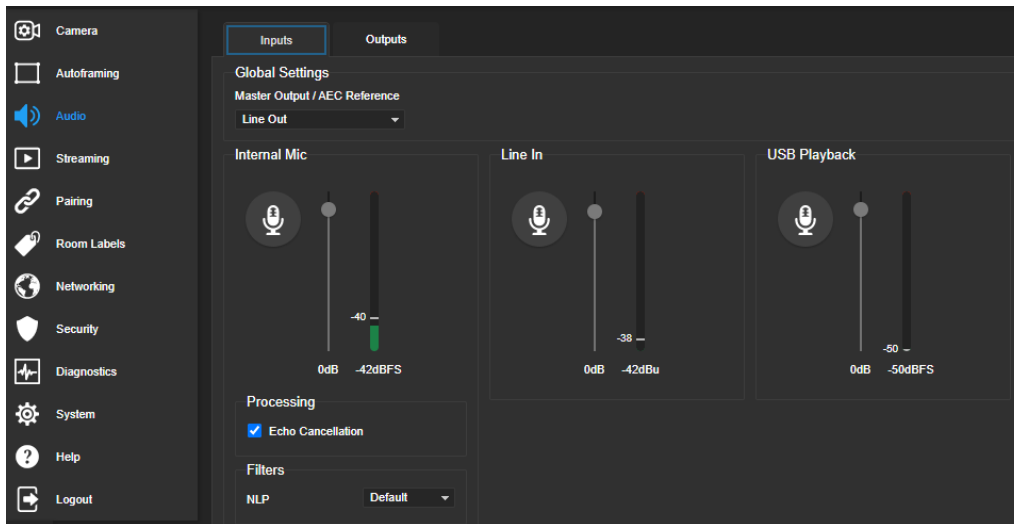
Note
For best performance with most computers, we recommend setting the USB Record volume high. This allows people at the far end of the call to adjust the audio to their environment.

Other Audio Settings and Adjustments

To adjust microphones for best far-end audio performance:

Select the desired adjustments:
- **Echo Cancellation** – Keeps microphones from feeding the speaker output back into the system. Under most circumstances, echo cancellation is desirable. Echo cancellation is on by default.
- **Master Output/AEC Reference** – The source for the far-end audio to be canceled from the signal that the built-in microphone picks up. Select Line Out to use the connected speaker as the reference, or HDMI Out to use the built-in speakers of the connected HDMI display.
- **Automatic Gain Control** – Adjusts gain to compensate for differences in the volume of people's voices.

To sync the sound with the video in the IP stream:

On the Outputs tab, check the Delay box and enter a delay value in milliseconds.
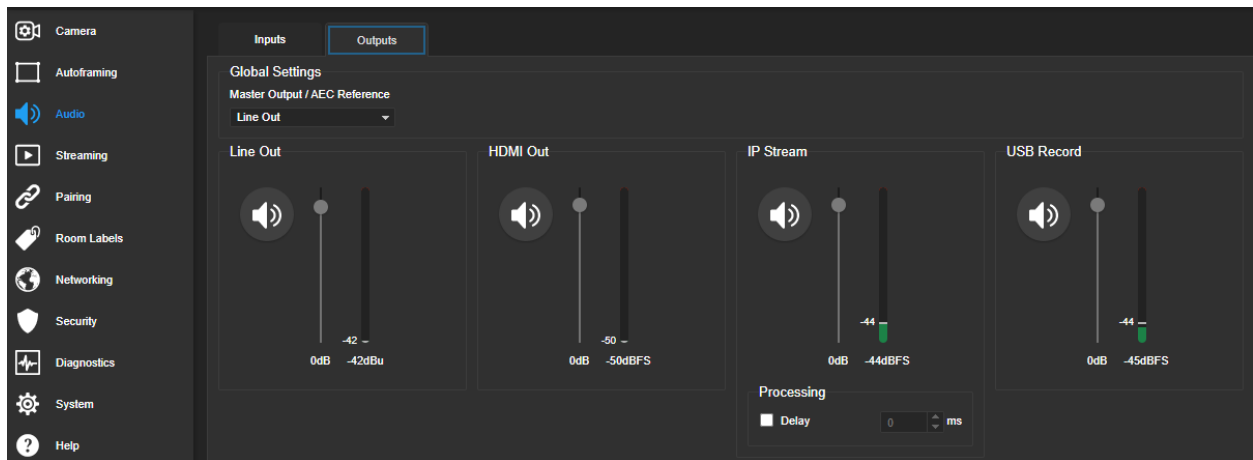
About Echo Cancellation

When a microphone picks up the audio from a speaker (far-end audio) during a conference, it sends the far-end audio back to the participants at the far end, creating an echo. Acoustic echo cancellation prevents this.

Here's how it works:

1. The speaker feeds the far-end audio into the room. This signal also goes to the audio processor as the reference that needs to be canceled.
2. The audio processor inverts the signal and sends it to the microphone.
3. The sum of the audio that the microphone picks up from the speaker and the inverted signal is 0: The echo is canceled.

— Far-end audio signal
— Inverted audio signal
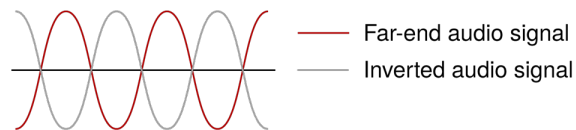
With the audio from the speaker canceled out, the audio from the microphone includes only the sounds originating at your end of the conference.

Configuring Streaming Behavior

Conferencing applications use *USB streaming*. After initial device set-up is complete, the camera's USB stream is always enabled.

IP streaming is disabled by default.

Notes
The screen shots in this section are representative, and may differ from what you see. Some may refer to other Vaddio products.

You may be prompted to reboot the camera when you save changes to the streaming settings.

Viewing the USB Stream

Do one of these things:
- Start or join a conference.
- Open a stream viewer and select the camera as the video capture device.
  The image below shows how to view a camera's USB stream using VLC Media Player. The media player will correctly identify your camera by model.
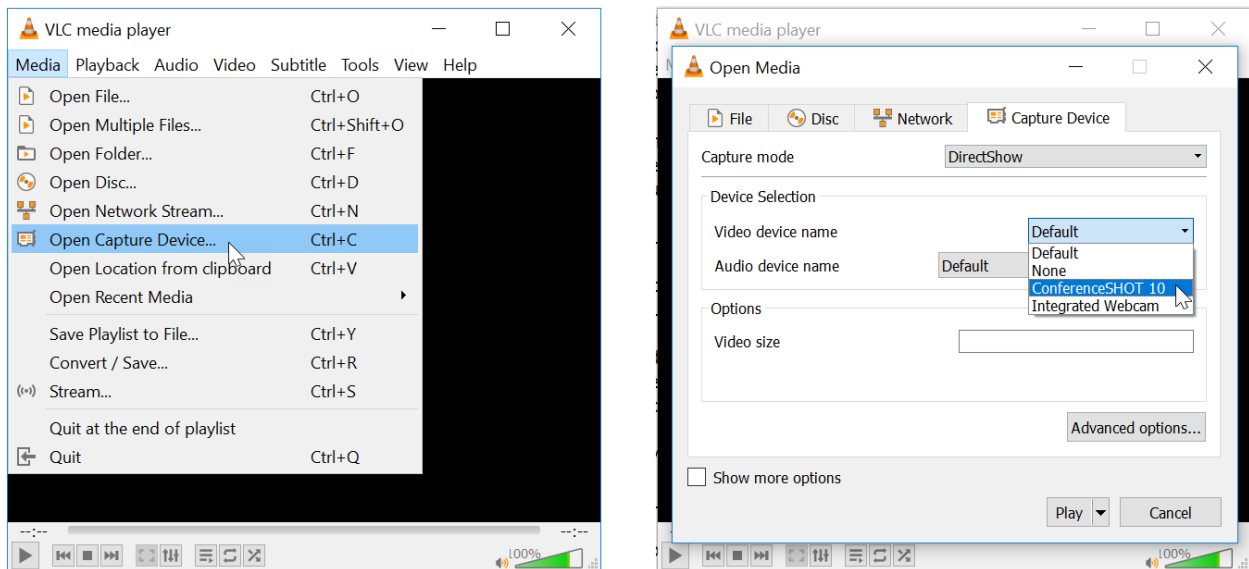
Configuring USB Streaming

STREAMING PAGE

These settings affect how the camera works with soft conferencing applications.

Device Name – Specify how the camera shows up in your soft client's device selection list.

HID Audio Controls – Enable to allow conferencing applications to control the audio.

UVC Extensions – Enable to allow conferencing applications to control the camera.

Depending on the conferencing application that you use, you may also need to change the UVC Mode (USB stream format) setting. See Additional Camera Settings.

Enabling or Disabling IP Streaming

IP streaming is disabled by default.

Two IP streaming protocols are available:
- *RTSP streaming* delivers an IP stream that people can access from your network using a media player.
- *RTMP streaming* sends a stream to a content service provider such as YouTube. To use RTMP streaming, you must have an account with a streaming service.

Viewing the IP Stream (RTSP)

1. Ensure that IP streaming is enabled.
2. Open a stream viewer such as VLC Media Player.
3. Select "Network stream" or your viewer's equivalent option.
4. Copy the streaming URL from the camera's Streaming page and paste it into the viewer as the URL for the network stream.

The image below shows how you would view a camera's IP stream using VLC Media Player. The media player will correctly identify your camera by model.
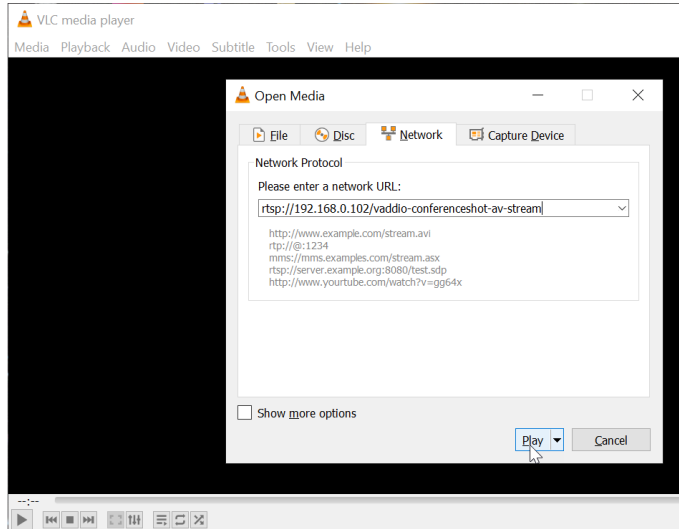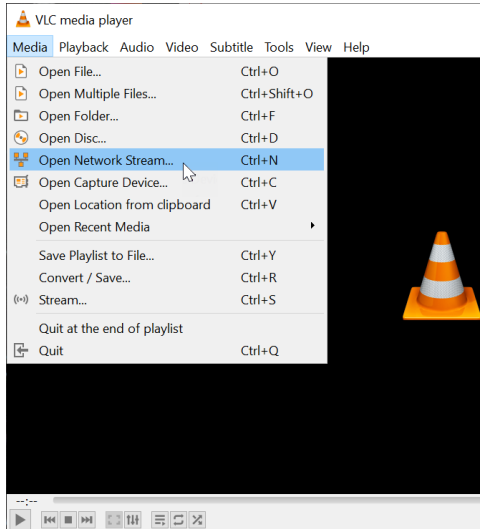
RTSP Streaming Protocol and URL

When IP streaming is enabled and RTSP is selected, the RTSP stream is automatically available. Consult your IT department before changing these settings.

RTSP port: Vaddio strongly recommends using the default RTSP port number.

Path: The portion of the streaming URL that appears after the IP address. You may wish to change this to help identify the stream source – for example, `demo-studio-3`.

URL: The location where the stream can be viewed. This will change if you edit the path.
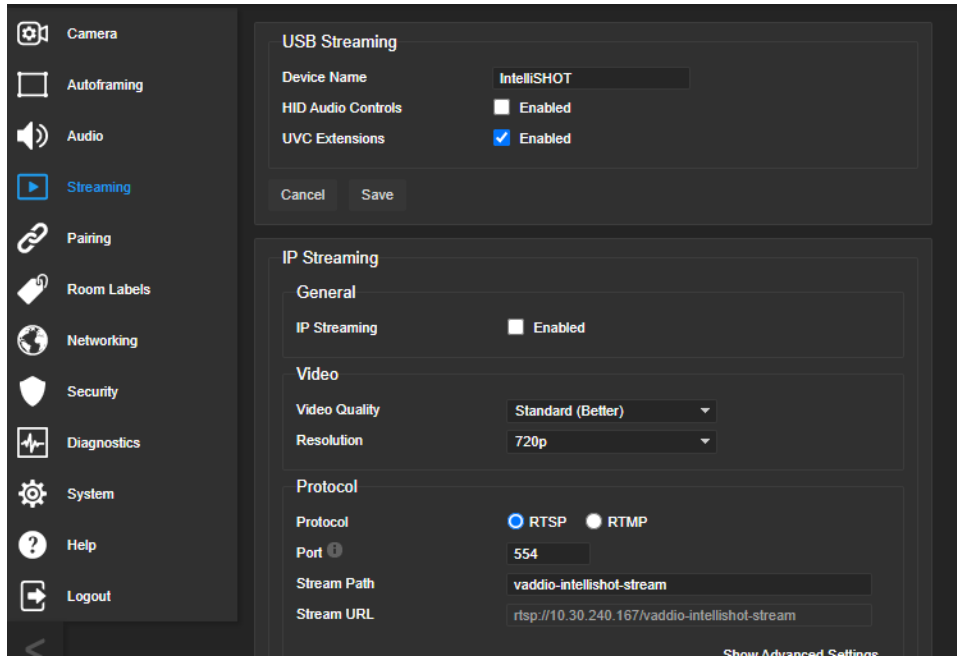
Setting up IP Streaming in Easy Mode

Note
Consult your network specialist when setting up IP streaming, to be sure that you select settings that are appropriate for the network.

If you are not sure about these settings, start with the defaults.

1. Select Video Quality – High Quality, Standard, or Low Bandwidth.
2. Select the desired IP streaming resolution. This determines the size of the stream viewer window.
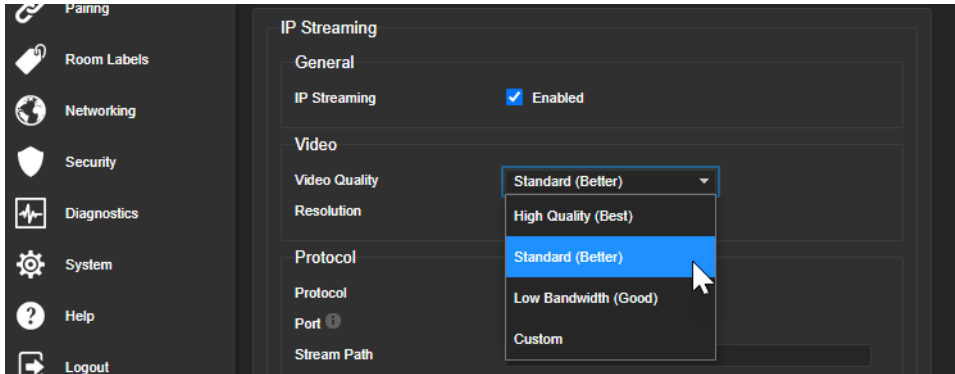
Note
The IP streaming resolution and frame rate cannot be higher than the local video rate (see Additional Camera Settings).

Customizing IP Streaming Settings

Note
Consult your network specialist when setting up IP streaming, to be sure that you select settings that are appropriate for the network.

1. Select Custom quality mode.
2. Select the desired resolution and frame rate.
3. Select Constant or Variable Bit Rate.
4. Constant Bit Rate only: Set Max Bandwidth.
5. Variable bit rate only: Set the Compression slider. Then save your changes.
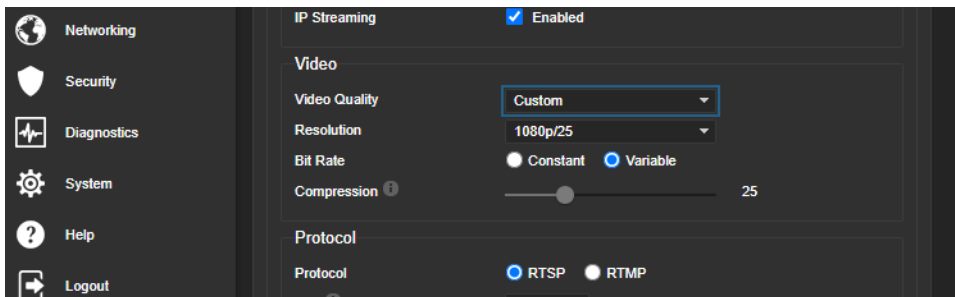
Configuring RTMP Streaming

To use RTMP streaming, you must have an account with a streaming service.

To configure an RTMP streaming service:

1. Select RTMP streaming, then select Settings.
2. Expand the information box for the service.
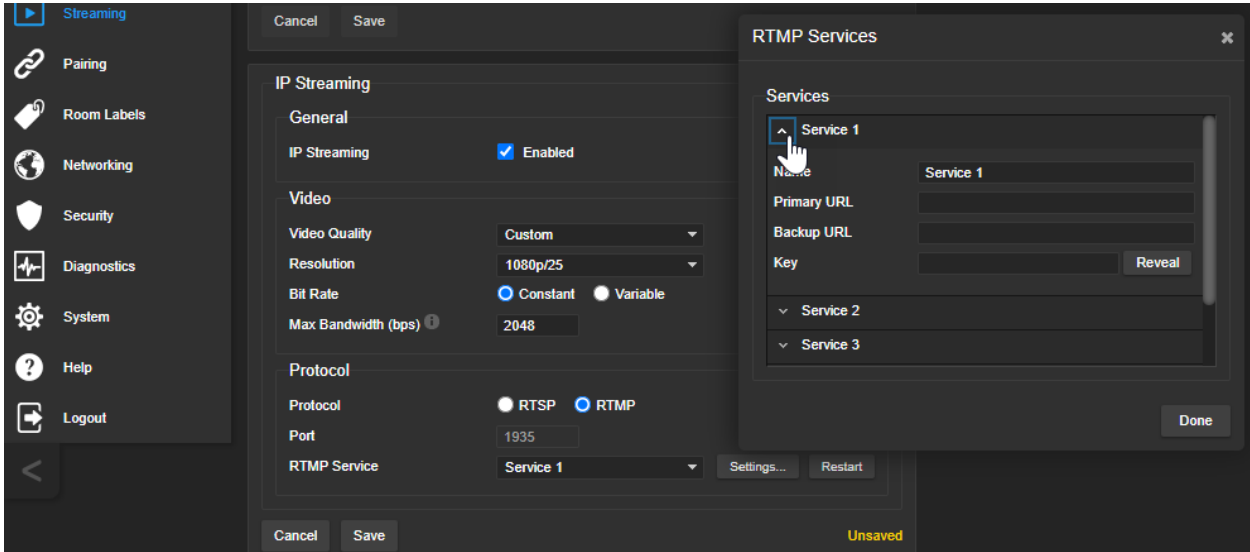
3. Enter the name of the service.
4. Paste in the key and URL(s) provided by the service.

To select the enabled RTMP streaming service:

Expand the list of available streaming services, and select the one to use.
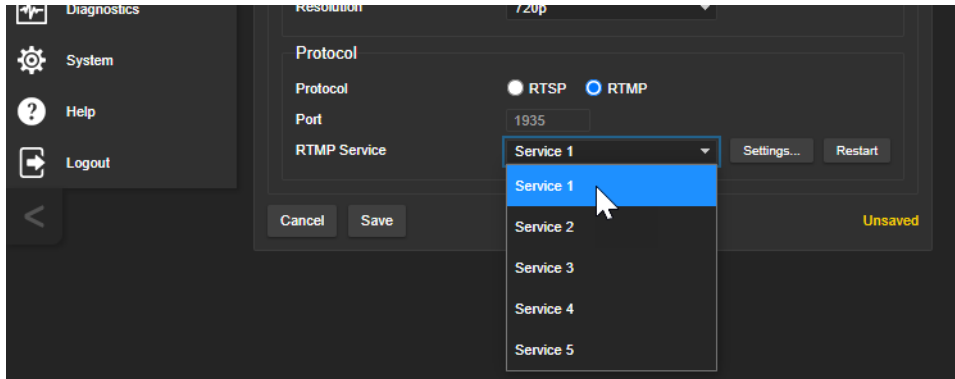
Note
When RTMP streaming is selected and a service is configured, the camera streams to that service until you stop the stream.

Changing MTU

The default packet size for streaming is 1400. Do not change this except in consultation with your network administrator.

Configuring Manual Mode Behaviors

Although Auto-framing mode is normally used with this camera, there are times when you need conventional PTZ behaviors. This section covers:

- Preset shots
- Speed controls
- Direction controls

These settings are on the Camera page of the web interface.

Setting the Home Position and Other Preset Shots

CAMERA PAGE

Although the camera's Auto-framing feature is the simplest way to keep the focus on the presenter, there are times when you need a static shot – such as a zoomed-in shot of the room's dry-erase board. You can set up static shots and store them as presets. Each preset includes pan, tilt, zoom, and (optionally) color settings. This is not the same as Auto-framing presets, which define how the camera follows motion.

When you recall a preset or use the directional controls, Auto-framing pauses but is still enabled.

If you don't plan to leave Auto-framing enabled, you can set the Home preset to specify a shot that the camera goes to after standby.

To store a preset:

1. Set up the shot.
2. In the Presets area, select Store to open the Store Preset dialog.
3. Select the preset to store. The preset button changes color.

   Note
   The Store Preset dialog box does not indicate whether presets have already been defined, but the main display dims the preset buttons if they have no preset information stored.

4. Select the behavior for the preset:
   - To save the preset with specific color settings, select Store with Current Color Settings.
   - To pan/tilt smoothly to the preset, select Save with Tri-Sync. Use the slider to control the speed.
   - The camera will cut to the preset if you leave the Save with Tri-Sync checkbox clear.
5. Store the preset.
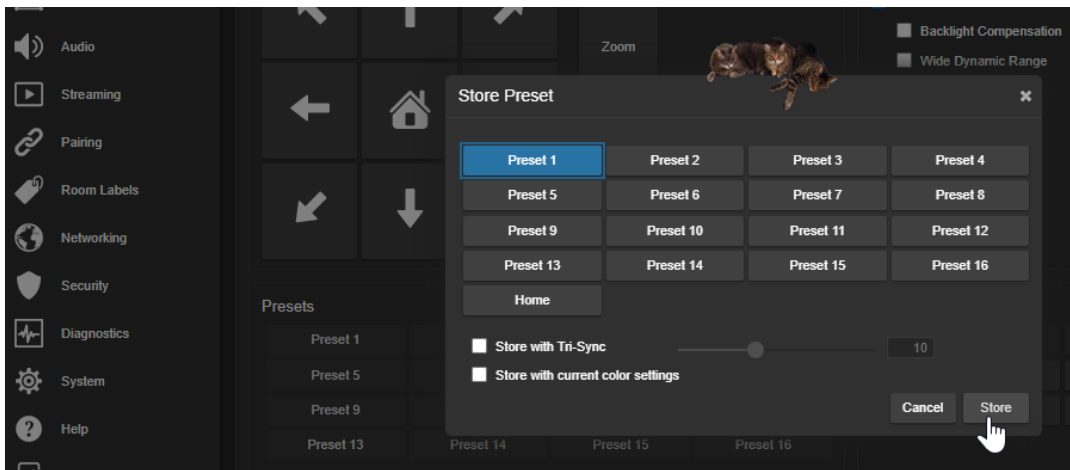
Renaming Presets

You can rename presets to identify them. This also helps you identify and avoid overwriting them when you store new ones.

Right-click the button for the preset or custom scene, and edit the label.
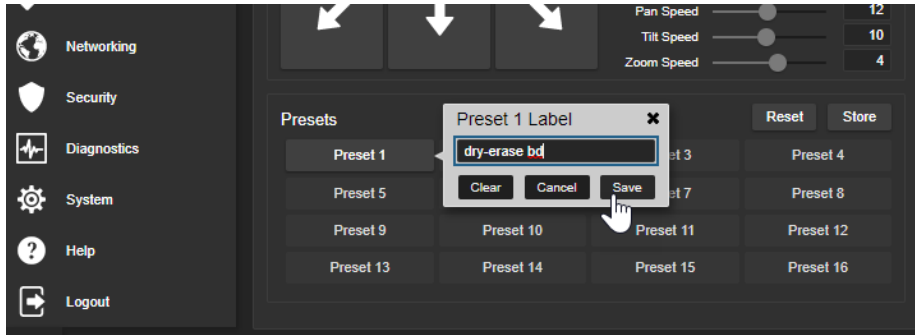
Speed Adjustments

The following speed adjustments are available:

- Manual pan, tilt, and zoom speeds – Used when you control camera movements with the RF remote or the arrow buttons in the web interface
- Tri-Sync – Only available when storing a preset. Specifies a speed for the camera to pan, tilt, and zoom to the shot, as a motorized PTZ camera would do. If you save the preset without Tri-Sync, the camera cuts to the shot instead.

Use the Pan Speed, Tilt Speed, and Zoom Speed sliders to adjust how fast the camera moves in response to the direction and zoom controls on the remote and in the web interface.
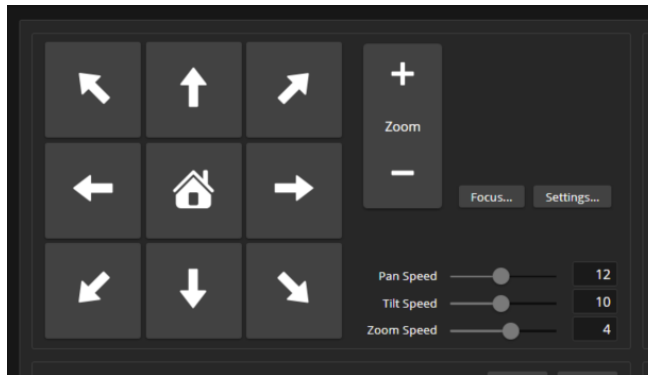
Setting the Direction for Camera Movements

By default, the arrow buttons on the remote and in the web interface show the direction the image frame moves from the camera's point of view. This may not suit your situation.

If the presenter will control the camera with the remote:

1. Select Settings to open the direction control box.
2. Set Pan Direction to Inverted to make the camera move to the presenter's left when they press the left arrow button.

Adjusting Color, Lighting, and Image Quality Settings

No two rooms are exactly alike – but a lot of rooms are a lot alike. The technical folks at Vaddio (Scott, to be specific) have already set up adjustments for common lighting scenarios (CCU scenes) – Incandescent Hi, Incandescent Lo, Fluorescent Hi, Fluorescent Lo, and Outdoor. The Auto setting allows the camera to determine the appropriate adjustments.

When adjusting for the room lighting, start with a factory-defined CCU scene and fine-tune the color and lighting as needed using the Color Settings controls. After you customize the camera's color and lighting settings, you can save the adjustments as a custom CCU scene.

- **Auto Iris** allows the camera to compensate automatically for the light level. Clear this box to adjust iris and gain manually.
- **Iris** and **Gain** (available when Auto Iris is not selected) provide manual lighting adjustment.
- **Auto White Balance** adjusts color automatically. Clear this box to adjust red gain and blue gain manually.
- **Red Gain** and **Blue Gain** (available when Auto White Balance is not selected) provide manual color adjustment.
- **Detail** adjusts the image sharpness. If the video looks grainy or "noisy," try a lower Detail setting.
- **Chroma** adjusts the color intensity.
- **Gamma** adjusts the range (gray density) between bright areas and shadows.

The Lighting and Image Quality Quick Reference and Color Adjustment Quick Reference may be helpful.

If you make a change that you don't like, start over by selecting and then deselecting Auto Iris and Auto White Balance.
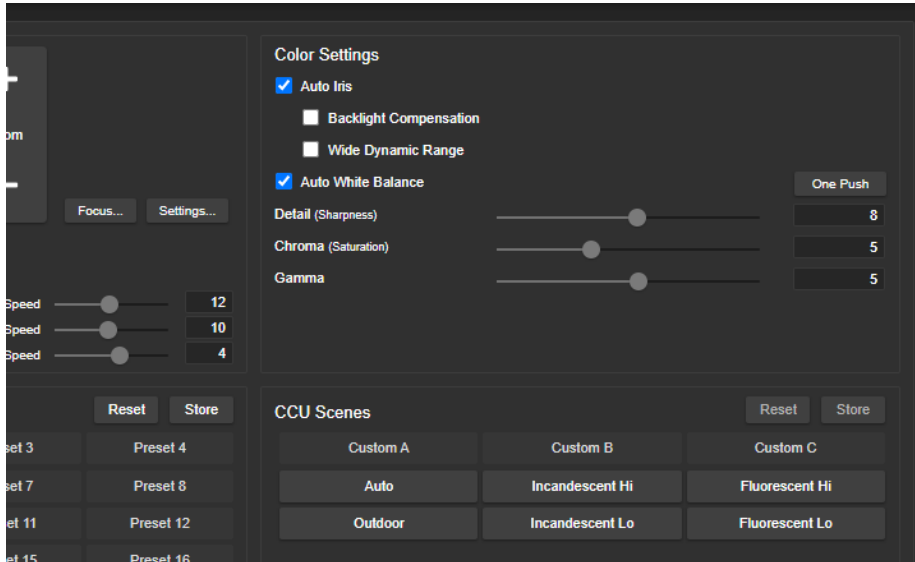
Lighting and Image Quality Quick Reference

Here are some tips for using the CCU settings for lighting and image quality.

What do you need to correct?	Make this adjustment:
The image is too dark	Increase Iris (lower F-stop value)
	Increase Iris Gain
The image looks washed out or faded	Decrease Iris (higher F-stop value)
	Decrease Iris Gain
	Increase Chroma
	Decrease Gamma
Highlights and shadows look right, but mid-tones are too dark.	Increase Gamma
Shadows are too dark	Decrease Gamma
The image looks grainy	Decrease Detail
	Decrease Iris Gain
"Soft focus" effect; the image looks unrealistically smooth	Increase Detail

Color Adjustment Quick Reference

Here are some tips for using the color-related CCU settings.

What do you need to correct?	Make this adjustment:
Colors look less vivid than they should	Increase Chroma
Colors look too vivid	Decrease Chroma
Colors look wrong; white objects do not appear white	Enable Auto White Balance
	Disable Auto White Balance and... ■ adjust Red Gain (decrease for less red, increase for less green) ■ adjust Blue Gain (decrease for less blue, increase for less yellow)

Too much red   Not enough red   Too much blue   Not enough blue   Balanced

Additional Camera Settings

Additional settings are available on the General tab on the System page.

LED On – In most cases, Vaddio recommends leaving the status lights on, to let people in the room know whether the camera is currently sending video.

LED On in Standby – Select Disabled to turn off the LED when the camera is in standby mode.

LED Color Scheme – Status light color codes for Unified Communications (conferencing) or Pro AV (broadcast). Default is UC.

Image Flip – If mounting the camera upside-down, set Image Flip ON. This orients the video image correctly and sets the camera to respond appropriately to tilt commands from the remote, web interface, and connected control devices.

Video Output Resolution – Select the desired resolution for the HDMI output. IP streaming is set separately. See Setting up IP Streaming in Easy Mode.

UVC Mode – USB stream format. Client Custom enables far-end camera control when used with the Zoom soft client. Use the default UVC Compliant setting with most other conferencing applications.

IR Remote – Select Enabled if people will use the remote to control the camera.

IR Remote Channel – If the remote will be used, specify which of the three channels to use. Press the corresponding channel button on the remote.
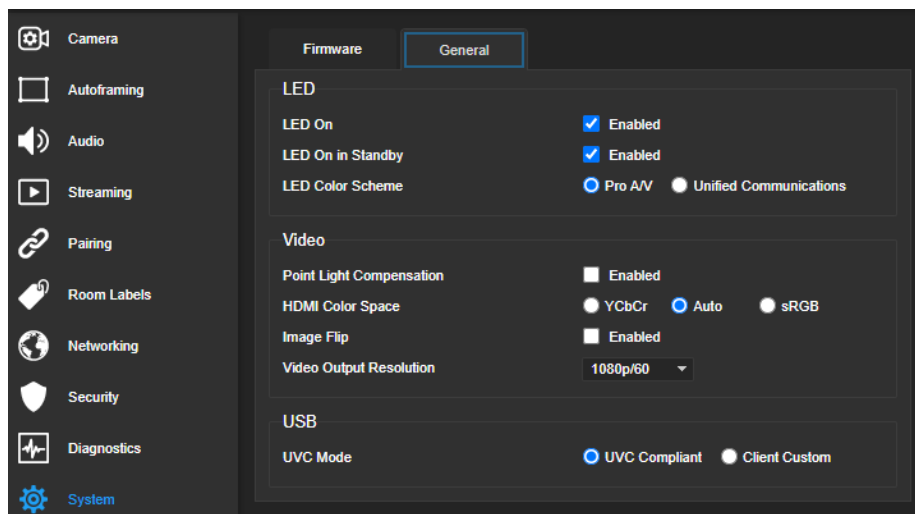
System Maintenance

This chapter covers tasks for keeping your system up-to-date and operating properly:
- Rebooting
- Backing up and restoring the camera configuration
- Installing firmware updates
- Getting help

Note

Vaddio products are designed with very similar web interfaces. Some of the screen shots in this manual may be from other cameras. Some may show settings that are not present or not enabled in your camera.

Saving (Exporting) or Restoring (Importing) a Configuration

SYSTEM PAGE, FIRMWARE TAB

If you need to restore a camera's factory default settings, you can export the configuration beforehand to restore customized information instead of re-entering it manually.

The data export includes home and other presets, NTP and time zone information, and room labels.

It does not include any information that is unique to the device, such as passwords, hostname, camera settings, or remote pairing.

To export a configuration:

Select Export Data. The export downloads to your computer as a .dat file. The filename is the camera's hostname.

To import a configuration file:

Select Import Data. The web interface prompts you to select the file to import.
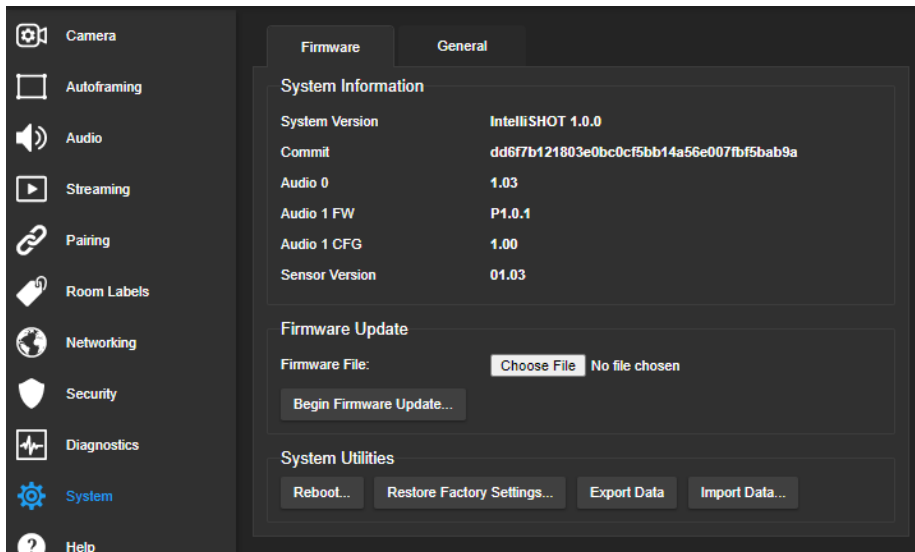
Installing a Firmware Update

SYSTEM PAGE, FIRMWARE TAB

Caution
Be sure the camera stays connected to power and to the network during the update. Interrupting the update could make it unusable.

1. Read the release notes and download the firmware update file from the product's web page at www.legrandav.com. The release notes can help you to decide whether to install the update.
2. On the camera's System page, select Choose File. Then select the firmware update file that you downloaded. The filename ends with `.p7m`.
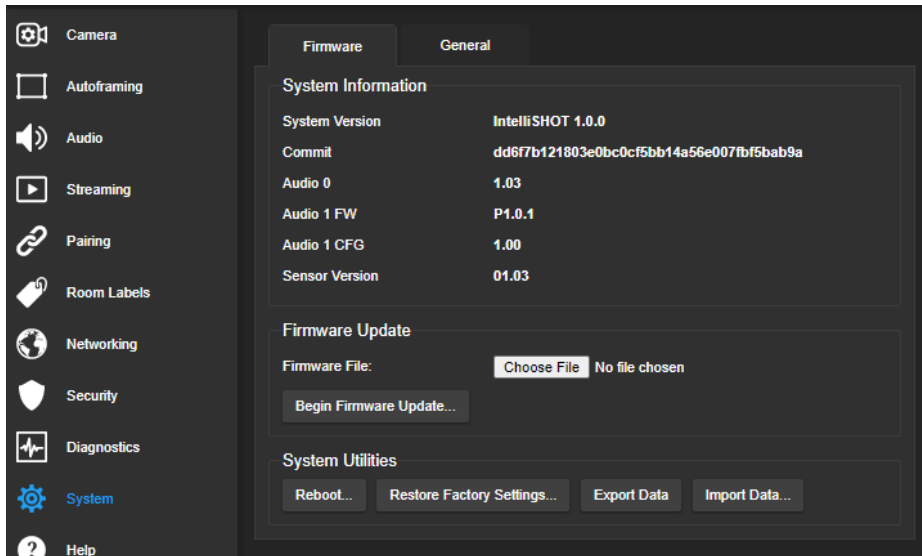
3. Select Begin Firmware Update.
4. Read and understand the information in the Confirm dialog box, then select Continue. A progress message box opens and the camera's status lights turn yellow. If the update process presents warnings or error messages, read them carefully.

The camera reboots to complete the update, and the web interface prompts you to log in again.

Rebooting the Camera

SYSTEM PAGE, FIRMWARE TAB

This can help if the camera stops responding as you expect.

In the System Utilities section, select Reboot.

Contacting Vaddio Technical Support and Viewing Diagnostic Logs

HELP PAGE, DIAGNOSTICS PAGE

If you can't resolve an issue using your troubleshooting skills (or the Troubleshooting tables in this manual), we are here to help.

You'll find information for contacting Vaddio Technical Support on the Help screen.
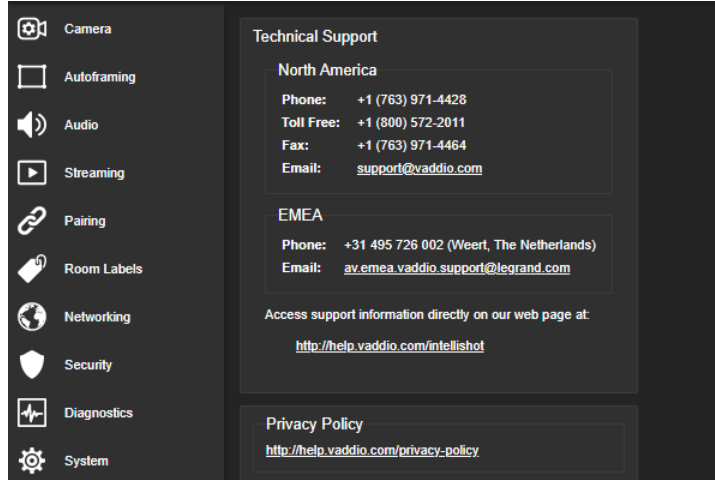
Note
The Help page links to our standard privacy notice. This product does not record or save video files, or store any identifying information except what you enter on the Room Labels page. However, the camera's IP address is considered "personally identifiable information" for the purposes of the privacy notice. This information is stored for display to the user, but not otherwise shared or transmitted.

Your technical support representative may ask you to download the event log file from the Diagnostics page. The log may include large numbers of internal events even when no errors have occurred. Rebooting generates over 100 log entries.
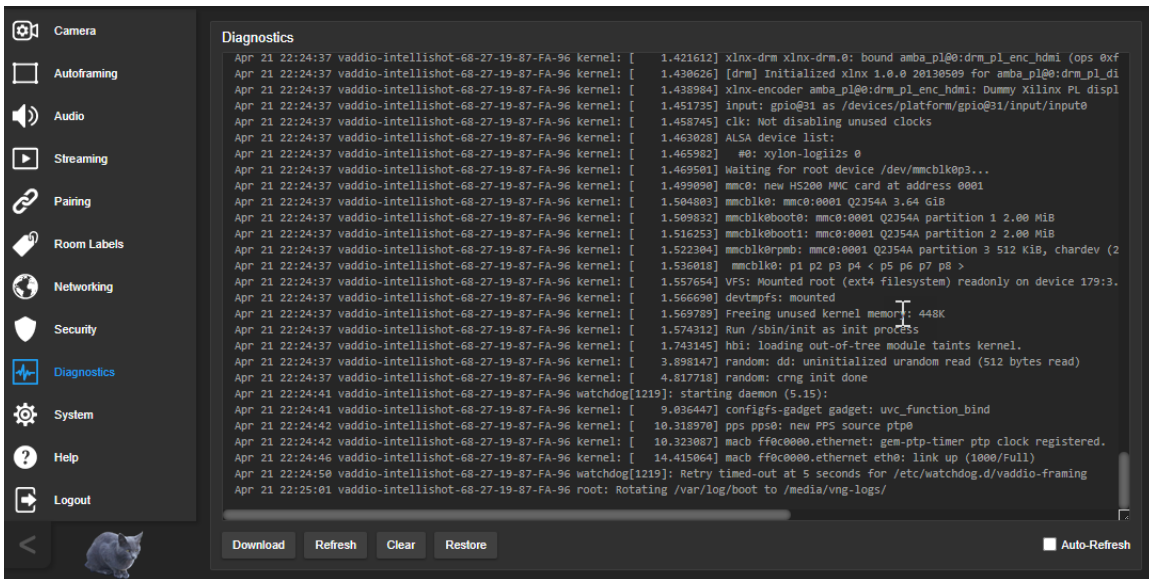
Operating the Camera

When you need to control the camera in manual mode rather than using Auto-framing, you can use
- The remote
- The web interface (accessible from your computer's browser or using a Vaddio Device Controller)
- A third-party control device

When you use the directional controls or stored presets for framing the shot, Auto-framing pauses. It's similar to cruise control in a car: Using a preset or directional control is like tapping the brake pedal. The camera remains under manual control until you resume Auto-framing.

Operating the Camera from the Web Interface

CAMERA PAGE (USER OR GUEST ACCESS)

By default, the operator's page of the web interface is not available. The administrator must set a password for the `user` account or enable guest access.

Only the operator's page is available with user or guest access.

The operator's Camera page provides most of the same controls as the remote:
- Audio and video mute
- Camera standby
- Pan, tilt, and zoom
- Camera presets, if any have been stored

Note
Vaddio products are designed with very similar web interfaces. Some of the screen shots in this manual may be from other cameras. Some may show settings that are not present or not enabled in your camera.
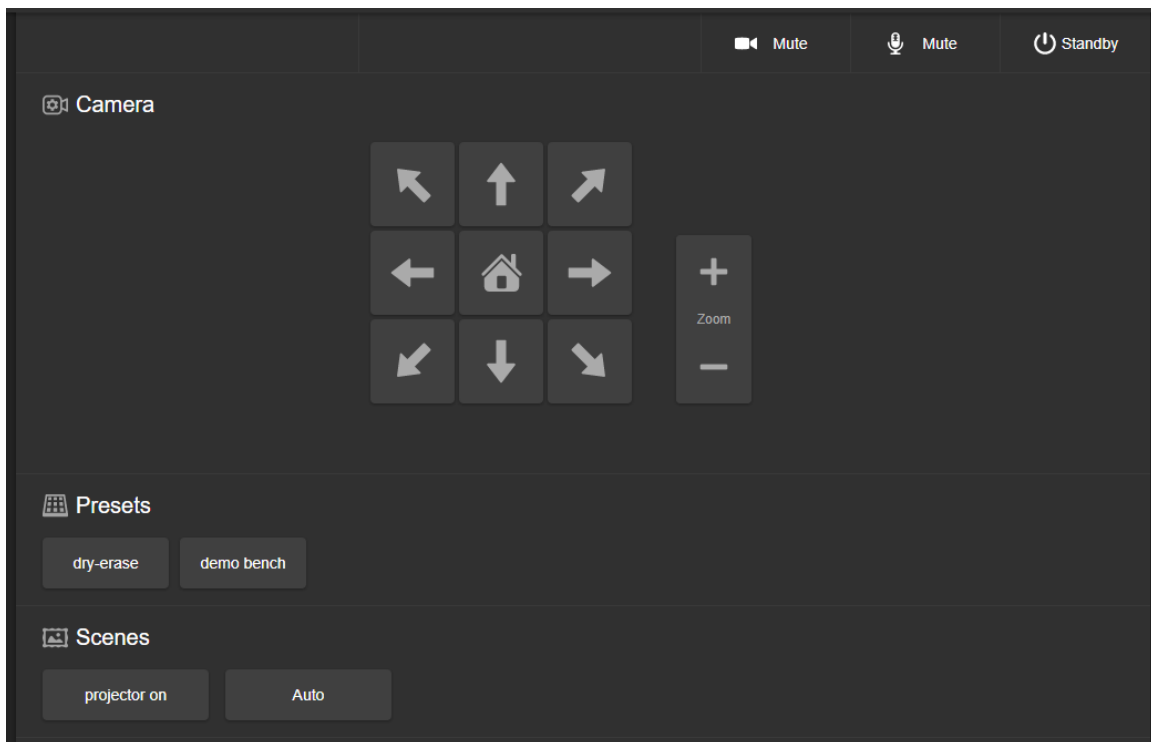
Moving the Camera

Use the arrow buttons for camera pan and tilt. The center button moves the camera to the home position.

Zooming In or Out

Use the Zoom + button to zoom in and the Zoom – button to zoom out.

Moving the Camera to a Preset Position

Use the Preset buttons (if available) to move the camera to any of its programmed positions. Presets are only available if they have been set in the administrative interface or with the remote.

Muting Audio and Video

Use the audio mute button to stop sending audio. Use the video mute button to temporarily stop sending video from the camera without placing it in standby.

Use the remote to control volume.

Managing the Camera Ready State

Use the Standby button to switch between low-power (standby) and ready states.
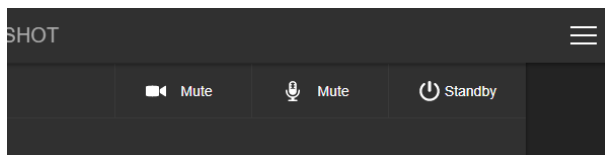
Using the Remote Control

The remote provides basic camera control. Some additional functionality is available from the web interface.

What do you need to do?	Button(s)	
Power on or standby	**Power** (green button at top right)	
Change the speaker volume	**Volume** buttons (center left)	
Mute the microphone(s)	**Mic Mute** button (center)	
Move the camera	Arrow buttons and **Home** button (dark red)	
Move the camera to a preset position	**Position Preset** buttons 1 through 6 (bottom two rows)	
Change how the camera responds to pan commands	Press **Rev. Pan** to make the right arrow button move the shot to your right. Press **Std. Pan** to make the right arrow button move the shot to the camera's right. (Below the Camera Select buttons)	
Adjust for excess light behind the camera's subject (backlight compensation)	**Back Light** button (top center)	
Change zoom	**Zoom** buttons – **T** (telephoto) to zoom in and **W** (wide-angle) to zoom out. (center right)	
Select the camera to control (if this remote controls more than one)	**Camera Select** buttons 1 through 3 (near the top) If the camera does not respond to the remote, try selecting a different camera. The camera's default is Camera 1.	
Discover the camera's IP address	**Data Screen** button (top left) – press to display the camera's IP and MAC addresses on video outputs, press again to dismiss the information display.	

Storing a Preset Using the Remote

Set up the shot using the pan, tilt, and zoom controls. Then hold down the **Preset** button and press one of the numbered preset buttons.

Clearing a Preset Using the Remote

Press and hold the **Reset** button while pressing the preset number you want to clear.

Telnet Serial Command API

The Vaddio Telnet command API allows an external device such as an AMX or Crestron presentation system to control the camera. It is also used for writing macros.

Requirements

- Telnet must be enabled on the Security page of the device's web interface.
- Your computer must have a Telnet client. Telnet port 23 is used.
- Your computer must be able to connect to the device over the network.
- When you connect via Telnet, you must log in using the admin account.

Usage Notes

- The > character is the command prompt.
- In addition to the camera control commands, Telnet session management commands are available – help, history, and exit.
- CTRL-5 clears the current serial buffer on the device.

Querying for More Information

Use a question mark as a command or command parameter to display a list of available commands, subcommands, or command parameters. For example, `?` returns all top-level commands; `network ?` returns the valid subcommands for the `network` command; and `network ping ?` returns the parameters available for the `network ping` command.

To discover the valid range of values for a command, use a value that you expect to be out of range.

```
> autoframer buffer-zone set 15000
value must be at most 10
ERROR
>
```

Firmware updates sometimes implement new commands or command parameters, or change value ranges. We do not update the manuals for every firmware update, and occasionally the author makes a mistake. Querying returns the command parameters that are currently available, along with guidance on command syntax.

Typographical Conventions

- { x | y | z } – Choose x, y, or z.
- <variable> – Substitute the desired value here.
- < x - y > – Valid range of values is x through y.
- [parameter] – Parameter is optional.

Autoframer Commands

Commands to manage and adjust Auto-framing fall roughly into three categories.

Status commands:
- autoframer enabled
- autoframer paused

Shot definition commands:
- camera optical-zoom
- autoframer shot-margin
- autoframer max-electronic-zoom
- autoframer buffer-zone

Auto-framing behavior adjustment commands:
- autoframer sensitivity
- autoframer responsiveness
- autoframer initial-persistence
- autoframer persistence
- autoframer max-speed
- autoframer noise-threshold
- autoframer tri-sync-motion
- autoframer forced-wait-time

autoframer enabled

Enable or disable Auto-framing. This is normally on. Use the `autoframer paused` command to switch to manual mode with the intent of resuming Auto-framing.

Synopsis	autoframer enabled { get | off | on | toggle }	
Options	`get`	Returns the current enable state for Auto-framing.
	`off`	Turns off Auto-framing.
	`on`	Turns on Auto-framing.
	`toggle`	Changes the Auto-framing state.

Examples	`>`**`autoframer enabled off`**
	`OK`
	`>`
	
	Stops Auto-framing, placing the camera in manual mode.
	
	`>`**`autoframer enabled get`**
	`autoframer enabled:    false`
	`OK`
	`>`
	
	Returns the current state of Auto-framing.	

autoframer paused

Pause or resume Auto-framing. Auto-framing pauses automatically when the camera receives a pan, tilt, zoom, or preset recall command from any source.

Synopsis	autoframer paused { get | off | on | toggle }	
Options	`get`	Returns the pause state for Auto-framing.
	`off`	Turns off the pause state (restarts Auto-framing).
	`on`	PausesAuto-framing.
	`toggle`	Changes the Auto-framing pause state.
Examples	>**autoframer paused on** OK > Pauses Auto-framing, placing the camera in manual mode. >**autoframer paused get** autoframer paused: true OK > Returns the current pause state of Auto-framing.	

autoframer default-wide

Specify how the camera behaves when it detects no motion. This setting is on by default.

Synopsis	autoframer default-wide { get | off | on }	
Options	`get`	Returns the state of the Default Wide setting (on or off).
	`off`	Turns off Default Wide mode. The camera remains on the shot where it last detected motion.
	`on`	Turns on Default Wide mode. The camera zooms all the way out when it detects no motion.
Examples	>**autoframer default-wide off** OK > Turns off Default Wide mode. The camera does not zoom out to "search" for motion. >**autoframer default-wide get** default wide: false OK > Returns the current state of the Default Wide setting.	

autoframer buffer-zone

Get or set the size of the Auto-framing buffer zone.

Synopsis	autoframer buffer-zone { get	set <value> }	
Options	`get`	Returns the current value for the Auto-framing buffer zone.
	`set` <value>	Sets the Auto-framing buffer zone.
Examples	>**autoframer buffer-zone set 10** OK > Sets the buffer zone to 10. >**autoframer buffer-zone get** autoframer buffer-zone: 10 OK > Returns the current size of the buffer zone.	

autoframer shot-margin

Get or set the size of the Auto-framing shot margin.

Synopsis	autoframer shot-margin { get	set <value> }	
Options	`get`	Returns the current value for the Auto-framing shot margin.
	`set` <value>	Sets the Auto-framing shot margin.
Examples	>**autoframer shot-margin set 15** OK > Sets the shot margin to 15. >**autoframer shot-margin get** autoframer shot-margin: 15 OK > Returns the current size of the shot margin.	

autoframer sensitivity

Get or set Auto-framing sensitivity.

Synopsis	autoframer sensitivity { get | set <value> }	
Options	`get`	Returns the current value for sensitivity.
	`set` <value>	Sets Auto-framing sensitivity.
Examples	>**autoframer sensitivity set 95** OK > Sets the sensitivity to 95. >**autoframer sensitivity get** autoframer sensitivity: 95 OK > Returns the current sensitivity value.	

autoframer responsiveness

Get or set Auto-framing responsiveness.

Synopsis	autoframer responsiveness { get | set <value> }	
Options	`get`	Returns the current value for responsiveness.
	`set` <value>	Sets Auto-framing responsiveness.
Examples	>**autoframer responsiveness set 95** OK > Sets responsiveness to 95. >**autoframer responsiveness get** autoframer responsiveness: 95 OK > Returns the current responsiveness value.	

autoframer initial-persistence

Get or set the initial persistence value.

Synopsis	autoframer initial-persistence { get | set <value> }	
Options	`get`	Returns the current value for initial persistence.
	`set` <value>	Sets initial persistence.

Examples	`>`**`autoframer initial-persistence set 15`**
	`OK`
	`>`
	
	Sets the initial persistence to 15.
	
	`>`**`autoframer initial-persistence get`**
	`autoframer initial-persistence:        15`
	`OK`
	`>`
	
	Returns the current initial persistence value.	

autoframer persistence

Get or set Auto-framing persistence.

Synopsis	autoframer persistence { get | set <value> }	
Options	`get`	Returns the current value for persistence.
	`set` <value>	Sets persistence.

Examples	`>`**`autoframer persistence set 15`**
	`OK`
	`>`
	
	Sets persistence to 15.
	
	`>`**`autoframer persistence get`**
	`autoframer persistence:        15`
	`OK`
	`>`
	
	Returns the current persistence value.	

autoframer max-electronic-zoom

Get or set the value for the Auto-framing maximum electronic zoom. This limits how far the camera zooms in for Auto-framing.

Synopsis	autoframer max-electronic-zoom { get	set <value> }	
Options	`get`	Returns the current value for the maximum electronic zoom.
	`set` <value>	Sets the maximum electronic zoom.
Examples	>**autoframer max-electronic-zoom set 4** OK > Sets the maximum electronic zoom to 4. >**autoframer max-electronic-zoom get** autoframer max-electronic-zoom: 4 OK > Returns the current maximum electronic zoom.	

autoframer noise-threshold

Get or set the value for the Auto-framing noise threshold. This helps the camera to identify motion.

Synopsis	autoframer noise-threshold { get	set <value> }	
Options	`get`	Returns the current value for the noise threshold.
	`set` <value>	Sets the noise threshold.
Examples	>**autoframer noise-threshold set 4** OK > Sets the noise threshold to 10. >**autoframer noise-threshold get** autoframer noise-threshold: 10 OK > Returns the current noise threshold.	

autoframer tri-sync-motion

Enable or disable Tri-Sync Motion. This allows the camera to pan, tilt, and zoom smoothly. When Tri-Sync Motion is off, the camera snaps to the new position.

Synopsis	autoframer tri-sync-motion { get | off | on | toggle }	
Options	`get`	Returns the current state for Tri-Sync Motion.
	`off`	Turns off Tri-Sync Motion.
	`on`	Turns on Tri-Sync Motion.
	`toggle`	Changes the state of Tri-Sync Motion.

Examples	`>autoframer tri-sync-motion on`
	`OK`
	`>`
	
	Turns on Tri-Sync Motion, so the video pans, tilts, and zooms like a motorized camera.
	
	`>autoframer tri-sync-motion get`
	`autoframer tri-sync-motion:    on`
	`OK`
	`>`
	
	Returns the current state of Tri-Sync Motion.	

autoframer forced-wait-time

Get or set the value for the Auto-framing forced wait time. This sets a minimum time to hold the shot before responding to new motion. Increasing persistence and reducing responsiveness may produce more satisfactory results.

Synopsis	autoframer forced-wait-time { get | set <value> }	
Options	`get`	Returns the current value for forced wait time.
	`set <value>`	Sets the forced wait time.

Examples	`>autoframer forced-wait-time set 0`
	`OK`
	`>`
	
	Sets the forced wait time to 0 (the default value).
	
	`>autoframer forced-wait-time get`
	`autoframer forced-wait-time:    0`
	`OK`
	`>`
	
	Returns the current forced wait time.	

Camera and Video Management Commands

The following camera and video management commands are available:
- camera home
- camera pan
- camera tilt
- camera zoom
- camera ptz-position
- camera preset
- camera ccu get
- camera ccu set
- camera led
- video mute

camera home

Moves the camera to its home position and zoom level. Color settings may also be part of the home preset.

Auto-framing pauses when the camera receives this command.

Synopsis	camera home
Example	>**camera home** OK >

camera pan

Moves the shot horizontally. The amount of pan available depends on the zoom level. (See How It Works: Digital Pan/Tilt/Zoom.)

Auto-framing pauses when the camera receives this command.

Synopsis	camera pan { { left [<speed>] [no_wait] }	{ right [<speed>] [no_wait] }	stop	get	{ set <position> } }	
Options	left	Moves the camera left.
	right	Moves the camera right.
	<speed>	Optional: Specifies the pan speed (integer). Not used with the set option.
	no_wait	Optional – allows the command to return the command prompt and respond to new commands immediately, while the command is in progress. Not used with the set option.
	stop	Stops the camera's horizontal movement.
	get	Returns the camera's pan position.
	set	Centers the shot as close as possible to the specified column of pixels on the image sensor; snaps to the specified position if no speed is given. No error is generated if the command specifies a pixel column that exists.
	<position>	The pixel column to center the shot on. Range may vary by model.
Examples	>**camera pan left** OK > Pans the camera left at the default speed. >**camera pan right 6 no-wait** OK > Pans the camera right using a speed of 6. The command prompt is available immediately. >**camera pan stop** OK > Stops the camera's horizontal motion. >**camera pan set 400** OK > Attempts to re-center the image on pixel column 400, which is right of center.	

camera tilt

Moves the shot vertically. The amount of tilt available depends on the zoom level. (See How It Works: Digital Pan/Tilt/Zoom.)

Auto-framing pauses when the camera receives this command.

Synopsis	camera tilt { { up [<speed>] [no_wait] }	{down [<speed>] [no_wait] }	stop	get	{ set <position> } }	
Options	up	Moves the shot up at the default speed or the specified speed.
	down	Moves the shot down at the default speed or the specified speed.
	<speed >	Optional: Specifies the tilt speed (integer). Not used with the set option.
	no_wait	Optional – allows the command to return the command prompt and respond to new commands immediately, while the command is in progress. Not used with the set option.
	stop	Stops the tilt movement.
	get	Returns the camera's tilt position.
	set	Centers the shot as close as possible to the specified row of pixels on the image sensor; snaps to the specified position if no speed is given. No error is generated if the command specifies a pixel row that exists.
	<position>	The pixel row to center the shot on. Range may vary by model.
Examples	>**camera tilt up** OK > Tilts the camera up at the default speed. >**camera tilt down 4 no-wait** OK > Tilts the camera down at a speed of 4. The command prompt is available immediately. >**camera tilt set -560** OK > Attempts to re-center the shot at pixel row -560, which is below center.	

camera zoom

Moves the camera in toward the subject or out away from the subject.

Auto-framing pauses when the camera receives this command.

Synopsis	camera zoom { in [<speed>] | out [<speed>] | stop | get | set <position> [<speed>] [no_wait] }	
Options	`in`	Zooms the camera in.
	`out`	Zooms the camera out.
	`speed`[1 - 7]	Optional: Specifies the zoom speed as an integer.
	`stop`	Stops the camera's zoom movement.
	`get`	Returns the camera's zoom setting.
	`set <zoom>`	Sets the camera's zoom level; snaps to the requested zoom unless speed is specified.
	`no_wait`	Optional; when camera zoom set specifies a speed, allows the command to return the command prompt immediately, while the command is still in progress.

Examples	`>`**`camera zoom in`**
	`OK`
	`>`
	
	Zooms the camera in at the default speed.
	
	`>`**`camera zoom out 7 no_wait`**
	`OK`
	`>`
	
	Zooms the camera out using a speed of 7. The command prompt is available immediately.
	
	`>`**`camera zoom stop`**
	`OK`
	`>`
	
	Stops the camera's zoom motion.
	
	`>`**`camera zoom set 3`**
	`OK`
	`>`
	
	Sets the camera's zoom to 3x. The camera snaps to this zoom level because no speed is given, so the no_wait parameter is not needed.	

camera ptz-position

Specifies a shot by zoom and pan/tilt coordinates. The amount of pan and tilt available depend on the zoom level. (See How It Works: Digital Pan/Tilt/Zoom.) Pan, tilt, and zoom may be specified in any order. Auto-framing pauses when the camera receives this command.

Synopsis	camera ptz-position pan <position> tilt <position> zoom <position> [<speed>] [no_wait]	
Options	`pan` <position>	The pixel column to center the shot on. Range may vary by model.
	`tilt` <position>	The pixel row to center the shot on. Range may vary by model.
	`zoom` <position>	<position> is a floating-point value; range varies by model.
	<speed>	Optional; speed of movements (integer) if the camera should not snap to the specified position.
	`no_wait`	Optional; when speed is specified, allows the command to return the command prompt immediately, while the command is in progress.

Examples	`>camera ptz-position pan -150 tilt 200 zoom 3`
	`OK`
	`>`
	
	Centers the shot at pixel column -150, row 200, at a zoom level of 3. The camera snaps to the shot, because no speed is specified. At this zoom level, the shot can be centered exactly as requested.
	
	`>camera ptz-position pan -1470 tilt 200 zoom 2 speed 5 no_wait`
	`OK`
	`>`
	
	Attempts to center the shot at pixel column -1470, row 200, at a zoom level of 2. The camera moves at speed 5 and returns the command prompt before the motion is finished. The shot cannot be centered exactly as requested, because it is relatively wide and the requested center is close to the leftmost column of pixels.	

camera preset

Moves the camera to the specified preset, or stores the current camera position and type of motion to use, optionally including color and lighting information.

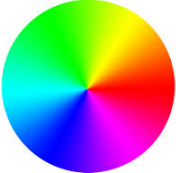| Synopsis	camera preset { recall <1 - 16> | store <1 - 16> [tri-sync <1 - 24>] [save-ccu] }	
Options	`recall` <1 - 16>]	Moves the camera to the specified preset.
	`store` <1 - 16>	Stores the current camera position as the specified preset.
	`tri-sync` <1 - 24>	Optional: Tri-Sync Motion pans, tilts, and zooms smoothly to the shot, at the specified speed; if not used, the camera snaps to the preset.
	`save-ccu`	Optional: Saves the current color and lighting settings as part of the preset.
Examples	`>camera preset store 2 tri-sync 10 save-ccu` OK > Stores the current shot as preset 2. The camera will apply the current CCU settings and use Tri-Sync Motion at speed 15 to move to this preset. >`camera preset recall 2` OK > Goes to preset 2. Because the preset was stored with a Tri-Sync speed, the shot will move smoothly rather than snapping to the preset.	

camera ccu get

Returns CCU (lighting and color) information. Entering the command without specifying a parameter returns all current CCU settings.

Synopsis	camera ccu get <param>	
Options	`auto_white_balance`	Current auto white balance setting (on or off).
	`red_gain`	Red gain value (integer).
	`blue_gain`	Blue gain value (integer).
	`auto_iris`	Current auto-iris state (on or off).
	`iris`	Iris value (integer).
	`gain`	Iris gain value (integer).
	`detail`	Detail value (integer).
	`chroma`	Chroma value (integer).
	`gamma`	Gamma value (integer).
	`all`	All current CCU settings.
Examples	>`camera ccu get iris` iris 6 OK > Returns the current iris value.	

camera ccu set

Sets the specified CCU (lighting) information.

Synopsis	camera ccu set <param> <value>	
Options	`auto_white_balance`	Sets auto white balance on or off.
	`red_gain`	Sets the red gain value (integer).
	`blue_gain`	Sets the blue gain value (integer).
	`auto_iris`	Sets auto-iris state on or off.
	`iris`	Sets the iris value (integer).
	`gain`	Sets the iris gain value (integer).
	`detail`	Sets the detail value (integer).
	`chroma`	Sets the chroma value (integer).
	`gamma`	Sets gamma (integer).

Examples	`>`**`camera ccu set auto_iris off`**
	`OK`
	`>`
	
	Turns off auto-iris mode, returning the camera to manual iris control.
	
	`>`**`camera ccu set red_gain 10`**
	`OK`
	`>`
	
	Sets the red gain value to 10.	

camera led

Set or change the behavior of the status lights.

Synopsis	camera led { get | off | on }	
Options	`get`	Returns the status lights' current state (on or off).
	`off`	Turns off the status lights.
	`on`	Turns on the status lights.

Examples	`>`**`camera led off`**
	`OK`
	`>`
	
	Turns off the status lights. When LED is off, you cannot tell by looking at the camera whether it is sending video.
	
	`>`**`camera led get`**
	`led:    on`
	`OK`
	`>`
	
	Returns the current state of the status lights.	

video mute

Gets or sets the camera's video mute status. When video is muted, the camera sends blue or black video with an on-screen message stating that video mute is on. This can be desirable when preparing the room, or when privacy is needed.

Note
In systems with audio, this command does not affect the audio.

Synopsis	video mute { get | off | on | toggle}	
Options	`get`	Returns the current video mute status.
	`off`	Unmutes the video.
	`on`	Mutes the video.
	`toggle`	Changes the video mute status.

Examples	`>video mute get`
	`mute:  off`
	`OK`
	`>`
	
	Returns video mute status.
	
	`>video mute on`
	`OK`
	`>`
	
	Transmits blue or black video.	

camera standby

Set or change camera standby status.

Synopsis	camera standby { get | off | on | toggle }	
Options	`get`	Returns the camera's current standby state.
	`off`	Brings the camera out of standby (low-power) mode.
	`on`	Stops video and puts the camera in standby mode.
	`toggle`	Changes the standby state.

Examples	`>`**`camera standby off`**
	`OK`
	`>`
	
	Brings the camera out of standby mode.
	
	`>`**`camera standby get`**
	`standby:      on`
	`OK`
	`>`
	
	Returns the current standby state.	

Audio Commands

The following audio commands are available:
- audio volume
- audio mute
- audio echo-cancel

audio volume

Gets or sets the volume of the specified audio channel.

Synopsis	audio < channel > volume { get | up | down }	
Channels	`internal_mic`	The built-in microphone.
	`line_in`	The Line In port (often a microphone).
	`usb_playback`	Audio portion of the incoming (far-end) USB stream.
	`line_out`	Line Out port (speaker output).
	`hdmi_out`	Audio portion of the HDMI output (far-end audio to the display's speakers).
	`ip_out`	Audio portion of the IP stream output.
	`usb_record`	Outbound (near-end) audio portion of the USB stream.
Options	`get`	Returns the current volume.
	`up`	Increases the volume.
	`down`	Reduces the volume.

Examples	`audio line_in volume up`
	`OK`
	`>`
	
	Increases the volume for the device connected to the Line In port.
	
	`audio line_out volume get`
	`volume -10.0 dB`
	`OK`
	`>`
	
	Returns the current volume for the speaker connected to the line out port.	

audio mute

Gets or sets the mute status of the specified audio channel.

Synopsis	audio < channel > mute { get | on | off | toggle }	
Channels	`master`	Applies the command to all audio channels.
	`internal_mic`	The built-in microphone.
	`line_in`	The Line In port (often a microphone).
	`usb_playback`	Audio portion of the incoming (far-end) USB stream.
	`line_out`	Line Out port (speaker output).
	`hdmi_out`	Audio portion of the HDMI output (far-end audio to the display's speakers).
	`ip_out`	Audio portion of the IP stream output.
	`usb_record`	Outbound (near-end) audio portion of the USB stream.
Options	`get`	Returns the channel's current mute status.
	`on`	Mutes the channel.
	`off`	Unmutes the channel.
	`toggle`	Changes the mute state.

Examples	`> `**`audio line_out mute get`**
	`mute:  off`
	`OK`
	`>`
	
	Returns the current mute state of the connected audio line out device. Mute is off, so the speaker audio is on.
	
	`>`**`audio master mute on`**
	`OK`
	`>`
	
	Mutes all audio.	

audio echo-cancel

Gets or sets the echo cancellation status of the specified audio channel. On this camera, echo cancellation is available for the internal microphone only.

Synopsis	audio < channel > echo-cancel { get | on | off | toggle }	
Channels	`internal_mic`	The built-in microphone.
Options	`get`	Returns the channel's current echo cancellation status.
	`on`	Turns on echo cancellation.
	`off`	Turns off echo cancellation.
	`toggle`	Changes the state of echo cancellation.

Examples	`> audio internal_mic echo-cancel get`
	`echo-cancel:    on`
	`OK`
	`>`
	
	Returns the current echo cancellation state of the channel.	

Network and Communication Commands

The following communication-related commands are available:
- network settings get
- streaming ip enable
- streaming settings get

network settings get

Returns the camera's current network settings and MAC address. The default hostname includes the model name of the camera; in the example here, the hostname has been changed.

Synopsis	network settings get
Example	```network settings get
Name   eth0:WAN
MAC Address   00:1E:C0:F6:CA:7B
IP Address   10.30.240.67
Netmask   255.255.255.0
VLAN   Disabled
Gateway   10.30.240.1
Hostname   eptz-manchaca
OK
>```

streaming ip enable

Set or change the state of IP streaming.

Synopsis	streaming ip enable { get | on | off | toggle}	
Parameters	get	Returns the current state of IP streaming.
	on	Enables IP streaming.
	off	Disables IP streaming.
	toggle	Changes the state of IP streaming.
Example	>**streaming ip enable on** > OK Enables IP streaming. >**streaming ip enable get** enabled: true > OK Returns the current state of IP streaming.	

streaming settings get

Returns current IP and USB streaming settings. The default RTSP URL includes the model name of the camera; the example is from an IntelliSHOT camera.

Synopsis	streaming settings get	
Parameters	`USB Active`	True if a USB stream is present.
	`USB Device`	USB Device Name.
	`USB Resolution`	Resolution and frame rate of the USB stream.
	`USB Enumeration Speed`	0 if no USB connection.
	`HID Audio Controls Enabled`	Allow or disable far-end control of audio.
	`UVC Extensions Enabled`	Allow or disable far-end control of the camera.
	`IP Streaming Enabled`	True if IP streaming is enabled.
	`IP Video Quality`	Video quality mode.
	`IP Preset Resolution`	Resolution (Easy mode).
	`IP Custom Resolution`	Resolution and frame rate (Custom mode).
	`IP Bit Rate Mode`	Constant or Variable.
	`IP Max Bandwidth`	Maximum bandwidth for Constant Bit Rate.
	`IP Compression`	Compression used with Variable Bit Rate.
	`IP Protocol`	IP streaming protocol in use.
	`IP RTSP Port`	Port for RTSP streaming.
	`IP RTMP Port`	Port for RTMP streaming.
	`IP RTSP URL`	URL where the RTSP stream is available.
	`IP RTSP MTU`	Current MTU setting for RTSP streaming.
	`IP RTMP Service`	Service selected for RTMP streaming.
Example	``` >streaming settings get USB Active false USB Device IntelliSHOT USB Resolution 0x0/0 USB Enumeration Speed 0 HID Audio Controls Enabled true UVC Extensions Enabled true IP Streaming Enabled true IP Video Quality Standard (Better) IP Preset_Resolution 720p IP Custom_Resolution 1080p/25 IP Bit Rate Mode Variable IP Max Bandwidth 2048 bps IP Compression 25 IP Protocol RTSP IP RTSP Port 554 IT RTMP Port 1935 IP RTSP URL vaddio-intellishot-stream IP RTSP MTU 1400 IP RTMP Service Service 1 OK > ```	

Maintenance and Troubleshooting Commands

The following commands are available for maintenance and troubleshooting:

- version
- network ping
- system reboot
- system factory-reset

version

Returns the current firmware version. "System version" may show a product family name or more than one product name, as multiple products sometimes use the same firmware. The example is from an IntelliSHOT camera.

Synopsis	version
Example	``` >version Audio 0 1.03 Audio 1 CFG 1.00 Audio 1 FW P1.0.1 Commit 966a78e827a2e6f871011eb820706dcaa64ec0e2 Sensor Version 01.03 System Version IntelliSHOT 1.0.0 OK > ```

network ping

Sends an ICMP ECHO_REQUEST to the specified hostname or IP address.

Synopsis	network ping [count <count>] [size <size>] <string>	
Options	<count>	The number of ECHO_REQUEST packets to send. Default is five packets.
	<size>	The size of each ECHO_REQUEST packet. Default is 56 bytes.
	<string>	The hostname or IP address where the ECHO_REQUEST packets will be sent.
Examples	``` >network ping 192.168.1.66 PING 192.168.1.66 (192.168.1.66): 56 data bytes 64 bytes from 192.168.1.66: seq=0 ttl=64 time=0.476 ms 64 bytes from 192.168.1.66: seq=1 ttl=64 time=0.416 ms 64 bytes from 192.168.1.66: seq=2 ttl=64 time=0.410 ms 64 bytes from 192.168.1.66: seq=3 ttl=64 time=0.410 ms 64 bytes from 192.168.1.66: seq=4 ttl=64 time=3.112 ms --- 192.168.1.66 ping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss round-trip min/avg/max = 0.410/0.964/3.112 ms > ``` Sends five ECHO_REQUEST packets of 56 bytes each to the host at 192.168.1.66.	
	`>network ping count 10 size 100 192.168.1.1` Sends 10 ECHO_REQUEST packets of 100 bytes each to the host at 192.168.1.1. The command returns data in the same form as above.	

system reboot

Reboots the system either immediately or after the specified delay. Note that a reboot is required when resetting the system to factory defaults (system factory-reset). The reboot message includes the model name of the camera; the example is from an IntelliSHOT camera.

Synopsis	system reboot [<seconds>]	
Options	<seconds>	The number of seconds to delay the reboot.

Examples	`>`**`system reboot`**
	`OK`
	`>`
	`The system is going down for reboot NOW!intellishot-D8-80-39-62-A7-C5`
	
	Reboots the system immediately.
	
	`>`**`system reboot 30`**
	
	Reboots the system in 30 seconds. The response is in the same form; the system message appears at the end of the delay.	

system factory-reset

Gets or sets the factory reset status. When the factory reset status is on, the system will resets to factory defaults on the next reboot.

Synopsis	system factory-reset { get | on | off}	
Options	`get`	Returns the camera's current factory reset status.
	`on`	Enables factory reset on reboot and returns he camera's current factory reset status.
	`off`	Disables factory reset on reboot and returns he camera's current factory reset status.

Examples	`>`**`system factory-reset get`**
	`factory-reset (software):      off`
	`OK`
	`>`
	
	Returns the factory reset status.
	
	This evaluates the most recent `system factory-reset` on or off command, if one has been received.
	
	`>`**`system factory-reset on`**
	`factory-reset (software):      on`
	`OK`
	`>`
	
	Enables factory reset upon reboot.
	
	Note
	This command does not initiate a factory reset. The factory reset takes place on the next reboot.	

Telnet Information and Session Management Commands

The following commands are available for Telnet help and session management:
- history
- help
- exit

history

Returns the most recently issued commands from the current Telnet session. Since many of the programs read user input a line at a time, the command history is used to keep track of these lines and recall historic information.

Synopsis	history <limit>	
Options	<limit>	Integer value specifying the maximum number of commands to return.
Examples	**history** Displays the current command buffer. **history 5** Sets the history command buffer to remember the last 5 unique entries.	
Additional information	You can navigate the command history using the up and down arrow keys. This command supports the expansion functionality from which previous commands can be recalled from within a single session. History expansion is performed immediately after a complete line is read. Examples of history expansion: * **!!** Substitute the last command line. * **!4** Substitute the 4th command line (absolute as per 'history' command) * **!-3** Substitute the command line entered 3 lines before (relative)	

help

Displays an overview of the CLI syntax.

Synopsis	help
Example	**help**

exit

Ends the command session and closes the socket.

Synopsis	exit
Example	**exit**

Troubleshooting and Care

When the camera doesn't behave as you expect, check the status lights on the front before you do anything else. See Status Lights.

Note
If the symptoms suggest even the smallest possibility of a bad cable, please try a known good cable. Factory-made cables can be defective. Cables can appear to be good but only work part of the time. A cable may pass a standard continuity check but be unable to pass enough power to the connected device. Crimping tools can crimp unevenly, contacts can break internally, and individual conductors in the cable can break inside the jacketing material. Any of these can result in a cable that passes a continuity check but does not work reliably.
(The author would like to confess having made a certain number of almost-good cables. It happens.)

Use this table to determine whether it's time to call Vaddio Technical Support.

Power and Control

What is it doing?	Possible causes	Check and correct
Nothing. Status light(s) off and no video available.	At least one of the cables is bad.	Check using known good cables.
	The wall outlet is not active. (Check by finding out if it powers something else, such as a laptop or phone charger.)	Use a different outlet.
	The camera or its PoE power injector is bad.	Contact your reseller or Vaddio Technical Support.
No status light(s) but the web interface and video are available.	Status light(s) disabled.	Enable the status light(s). (System page, General tab, LED On setting)
The camera is not responding to the remote and the light(s) are yellow.	A firmware update is in progress.	Wait a few minutes, and try again when the light(s) turn white.
The camera does not respond to the remote, but the web interface is available.	The remote and the camera are not using the same IR channel.	Press Camera Select button 1. If that does not fix the problem, try the other two buttons.
	The batteries in the remote are dead.	Put new batteries in the remote.
	The batteries were installed incorrectly in the remote.	Install the batteries as shown in the diagram inside the remote.
The camera responds to the remote but the web interface is not available.	The camera is not using the IP address you browsed to.	Press the Data Screen button on the remote to see camera information.

Video and Streaming

What is it doing?	Possible causes	Check and correct
No IP stream.	IP streaming is not enabled.	Enable IP streaming: Streaming page in the web interface.
No USB stream.	The USB cable is not connected.	Connect the USB cable.
No video.	Video is muted.	Unmute the video.
Poor video in the IP stream.	Limited bandwidth.	On the Streaming page, select a less resource-intensive video quality or resolution.

Audio

What is it doing?	Possible causes	Check and correct
No audio from the speaker (far-end audio)	Far-end microphone is muted (the conferencing window may show a mute icon for that site's microphone)	Ask the participants at that site to unmute their microphone.
	Speaker is not connected.	Check all connections carefully.
	Speaker volume is turned all the way down.	You checked that first, right?
Far end reports that they can't hear you. (No near-end audio)	Your microphone is muted.	Unmute your microphone.
Echo cancellation is not working.	The soft conferencing client is not using the camera's microphone and connected speaker.	In the soft conferencing client, the camera's microphone and connected speaker as the conference audio devices.
	Echo cancellation is not enabled.	Enable echo cancellation (Audio page, Inputs tab) and select the appropriate master output/AEC reference.

Need help? Call Vaddio Technical Support at (+1) 763-971-4400 or 800-572-2011.

Status Light

The light in the camera's head indicates its current state.
- Purple – Initializing
- White – Active
- Red – Audio is muted
- Blinking red – Video is muted
- Yellow – Firmware update is in progress
- Blinking cyan – Remote pairing mode
- Blinking blue – Pairing error

Caution
Do not remove power or reset the camera while the status light is yellow, showing a firmware update in progress. Interrupting a firmware update can make the camera unusable.

Note
By default, the camera's status light is active during normal operation; however, it can be configured to remain off when the camera is powered up. The camera may be sending video even if the light is off.

Restoring Default Camera Settings

This returns the camera to its original state. If you export the camera's configuration before restoring factory defaults, you will be able to restore the room label, time zone information, and home information by importing the configuration afterward.

Using the IP button on the connector panel: Disconnect the network cable. Then press and hold the IP button while reconnecting the cable. Continue to hold the button for about 10 seconds.

From the web interface: Log on using the admin account, go to the System page's Firmware tab, and select Restore Factory Settings.

Operation, Storage, and Care

For smears or smudges on the product, wipe with a clean, soft cloth. Use a lens cleaner on the lens. Do not use any abrasive chemicals.

Keep this device away from food and liquids.

Do not operate or store the device under any of the following conditions:
- Temperatures above 104° F (40° C) or below 32° F (0° C)
- High humidity, condensing or wet environments
- Inclement weather
- Severe vibration
- Dense asteroid fields
- Dry environments with an excess of static discharge

Do not attempt to take this product apart. There are no user-serviceable components inside.

Glossary

AEC

Acoustic echo cancellation. Audio processing that subtracts the far-end (speaker) audio from the sound that your microphone picks up.

auto white balance

A setting that allows the camera to manage color adjustments automatically.

Autoframing

Vaddio's motion-based technology for automatically keeping the camera on the action.

backlight compensation

A setting that reduces contrast to adjust for bright light behind the main subject of the shot.

bandwidth

Data transfer rate (bits per second) for the stream. In some cases, using a high bandwidth can slow down other network traffic. On networks with very low bandwidth, video issues may result. Streaming at a lower resolution or frame rate can reduce bandwidth usage.

CCU scene

A stored set of color and lighting adjustments. (CCU = Camera Control Unit)

chroma

A setting that adjusts color intensity.

Default Wide

Autoframing setting, enabled by default. Causes the camera to zoom all the way out if it detects no motion. When disabled, the camera remains on the last shot where motion was detected.

detail

A setting that adjusts image sharpness. If detail is set too low, the image may appear unrealistically smooth.

DHCP

Dynamic Host Configuration Protocol. A network management protocol that assigns an IP address to a device automatically when it is connected to the network.

DIY

Do It Yourself. As in, "You can copy information from this document to create a DIY room guide customized for your conference room." Yes! You can do that! In fact, the "Info for DIY Room Guides" document is specifically designed for you to adapt and customize.

dynamic range

The amount of difference between extremes - for example, the darkest and lightest areas in a shot, or the softest and loudest sounds that a microphone picks up.

echo cancellation

Audio processing that subtracts the far-end (speaker) audio from the sound that your microphone picks up.

ePTZ

Electronic pan/tilt/zoom. No motors needed!

far end

(conferencing) A location in the conference other than the one where you are. Far-end video is what you typically see in a conference – the people at the other end of the call.

Field of View (FOV)

How wide the video image is. Vaddio measures horizontal field of view. Some manufacturers use diagonal field of view, which yields a bigger number for the same actual image area. Tilt your head to one side and diagonal FOV will make sense.

flombodulator

A technically complex item the name of which you can't recall at the moment.

frame rate

The number of output video frames per second. Different outputs (such as the IP stream and the USB stream) may use different frame rates. For streaming, higher frame rates use more bandwidth.

framing

Keeping the camera on a subject by using an algorithm to determine where the subject is. Vaddio's ePTZ cameras do this using motion recognition, not facial identification.

full-duplex

Simultaneous two-way (or multi-way) audio; conference participants at the near end can talk and still hear the participants at the far end(s), as in a face-to-face meeting.

gamma

A setting that adjusts the range (gray density) between bright areas and shadows.

gateway

Network information automatically assigned in a DHCP network. If installing equipment on a non-DHCP network, get this information from the network administrator.

HDMI

A video output format; may also carry audio information.

HID audio controls

(Human Interface Device) Controls to enable conference participants to use the conferencing client to control the audio.

home

The button (web interface or remote) that restarts Autoframing.

HTTP

HyperText Transfer Protocol. The magic that makes websites work.

HTTPS

HyperText Transfer Protocol Secure. The magic that uses encryption to make websites work securely. See SSL certificate for more information.

IP address

Where a given device is on the IP network, logically. The IP address enables the network to route data to the right device – and that's the reason IP address conflicts are bad.

IP address conflict

Two or more devices attempting to use the same IP address on a network. Results are unpredictable but never good.

LED

Light-Emitting Diode. An indicator light.

mask (autoframing)

An area where the camera does not evaluate motion. Create masks to keep the camera from framing unwanted motion or pixel changes such as doorways, windows, and projection screens.

mic
Microphone. Pronounced "mike" because the etymology matters more than English pronunciation rules, which are inconsistent anyway.

MTU
Maximum Transmission Unit. The largest number of bytes allowed in a packet. If you don't know what that means, don't change MTU size.

near end
(conferencing) Your location in a conference. When you mute the video, your camera stops sending near-end video.

NLP
Non-Linear Processing. Removes certain particularly challenging types of undesirable audio, such as the echo in a room without acoustic treatment, or background chatter in an office.

noise
Changes that are not meaningful. Audio noise typically sounds like a background hiss; video noise is visible at relatively low resolution as individual pixels randomly changing color.

noise threshold
The amount of noise that is ignored. Autoframing does not work properly unless the noise threshold is set high enough to allow video noise (such as shifting light levels) to be ignored.

NTP
Network Time Protocol. Ensures that NTP-enabled devices on the network all show the same system time, so timestamps are accurate.

pairing
The process of "teaching" two specific devices to recognize each other. The HuddleSHOT camera and its remote must be paired for the remote to control the camera.

PoE, PoE+, PoE++
Power over Ethernet; a means of powering a device using its network connection. Requires a mid-span power injector. PoE+ and PoE++ deliver more power than PoE.

preset
A stored camera shot. Contains pan, tilt, and zoom position; may also include color and Tri-Sync Motion speed settings.

resolution
1. The image size. For Vaddio cameras, resolution is expressed in terms of digital TV standards, with 1080p being the default in most cases. Resolution and frame rate are set together on Vaddio cameras. 2. The thing that usually flies out the window by January 10th.

RTMP
Real-Time Messaging Protocol. Used for livestreaming video (and audio, if available) to a service such as YouTube Live.

RTSP
Real-Time Streaming Protocol. Used for streaming video and audio over your network.

soft conferencing client
A conferencing application (such as Zoom, Google Hangouts, or Skype for Business) that uses a computer rather than requiring a conferencing codec.

SSL certificate

A file used with HTTPS proving that a web page really originates from its purported source. If you enable or require HTTPS on a camera or other device without installing an SSL certificate, your browser will pop up security warnings when you try to browse to the device's web interface.

streaming protocol

A set of rules that define how video and audio data are sent over the network. See RTMP and RTSP.

subnet mask

Network information automatically assigned in a DHCP network. If installing equipment on a non-DHCP network, get this information from the network administrator.

tracking

Keeping the camera on a subject by following a specific target such as a tracking device that the subject carries or wears.

UAC drivers

(Universal Audio Class) Standard USB audio drivers used by Vaddio conferencing products with audio capabilities.

UCC, UC conferencing

Unified Communications Conferencing; refers to soft-client conferencing (such as Zoom or Skype for Business) using a computer with USB-connected peripherals.

USB playback

Audio from other sites (far-end audio) in a conference call.

USB record

Audio from your site (near-end audio) in a conference call.

UVC drivers

(Universal Video Class) Standard USB video drivers used by Vaddio cameras. They're the reason your computer doesn't have to stop and download a driver when you connect your new Vaddio USB camera to it.

UVC extensions

Controls in UVC drivers to allow participants at the far end of a conference to control your camera, if it processes UVC commands. The administrator may choose to disable these.

Photo Credits

This guide may include some of these photos.

European Space Agency (ESA) astronaut Samantha Cristoforetti, a Flight Engineer with Expedition 42, photographs the Earth through a window in the Cupola on the International Space Station
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Author's own cats, photos by author, you're welcome.

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