VADDIO

A brand of legrand

Complete Manual for the

IntelliSHOT-M

Auto-Tracking Camera

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Contents

Overview 1
What's in this Guide 1
Features 1
A Quick Look at the Camera 2
Front of the Camera 2
Connector Panel 3
Installation 4
Don’t Void Your Warranty! 4
Before You Install the Camera 4
Cabling Notes 5
Basic Connections 5
Pre-Installation Functional Check 5
Installing the Wall Mount 6
Installing the Camera and Connecting Power 6
About Inverted Installation 6
Status Lights 7
Initial Device Set-Up 8
Browser Support 8
Initial Device Set-Up Using the Vaddio Device Controller 8
Initial Device Set-Up Using the Vaddio Deployment Tool 8
Manual Access and Initial Device Set-Up 10
Getting the Camera's IP Address 10
If the Camera Is At 169.254.1.1 10
Initial Access to the Web Interface 11
Completing the Initial Device Set-up 11
System Administration and Communication 12
Configuring Access and Other Security Settings 12
Configuring the Device with a Static IP Address 13
Changing the Camera's Hostname 14
Specifying Time Zone and NTP Server 14
Adding Room Information to the Camera's Web Interface 14
Configuring Camera Behavior 15
Changing Latency Mode 15
Configuring USB Streaming Settings 16
Configuring Status Light Behavior 17
Configuring Video Behavior 18
Configuring Camera Performance 19
How It Works: Digital Zoom 19
How it works: Digital Pan and Tilt 19
Setting the Home Position and Other Preset Shots 20

Renaming Presets 20
Speed Adjustments 21
Setting the Direction for Camera Movements 21
Adjusting Color, Lighting, and Image Quality Settings 22
Lighting and Image Quality Quick Reference 23
Color Adjustment Quick Reference 24
Saving Color and Lighting Settings 24
Adjusting the Focus 25
Fine-Tuning Auto-framing Behavior 26
How It Works: Auto-Framing 26
Basic Auto-framing Adjustments 27
Masking Unwanted Motion 28
Advanced Auto-framing Adjustments 29
Auto-framing Adjustment Quick Reference 30
System Maintenance 31
Saving (Exporting) or Restoring (Importing) a Configuration 31
Installing a Firmware Update 32
Rebooting the Camera 32
Contacting Vaddio Technical Support and Viewing Diagnostic Logs 33
Operating the Camera 34
About the Remote 34
About The Web Interface 35
Muting Video 36
Managing the Camera Ready State 36
Moving the Camera 36
Zooming In or Out 36
Moving the Camera to a Preset Position 36
Command Reference for Third-Party Control 37
Requirements 37
Usage Notes 37
Querying for More Information 37
Typographical Conventions 37
Auto-Framing Commands 38
autoframer enabled 38
autoframer paused 39
autoframer default-wide 39
camera optical-zoom 40
autoframer shot-margin 40
autoframer max-electronic-zoom 41
autoframer buffer-zone 41
autoframer sensitivity 42

autoframer responsiveness 42
autoframer initial-persistence 43
autoframer persistence 43
autoframer max-speed 44
autoframer noise-threshold 44
autoframer tri-sync-motion 45
autoframer history 45
autoframer forced-wait-time 46
Camera and Video Management Commands 47
camera home 47
camera pan 48
camera tilt 49
camera zoom 50
camera ptz-position 51
camera preset 52
camera focus 53
camera ccu scene 53
camera ccu get 54
camera ccu set 55
camera led 55
video mute 56
camera standby 56
Maintenance and Troubleshooting Commands 57
network settings get 57
version 57
network ping 58
system reboot 58
system factory-reset 59
Information and Session Management Commands 60
history 60
help 60
exit 60
Troubleshooting and Care 61
Power and Control 61
Video and Streaming 62
Status Lights 62
Restoring Default Camera Settings 63
Operation, Storage, and Care 63
Glossary 64
Photo Credits 67
Index 68

Overview

This guide covers:

IntelliSHOT-M® auto-tracking camera:

- North America – 999-21182-000 (black); 999-21182-000W (white)
- Europe and UK – 999-21182-001 (black); 999-21182-001W (white)
- Australia and New Zealand – 999-21182-009 (black); 999-21182-009W (white)

What's in this Guide

This guide covers

- Physical features
- Installation
- Initial set-up and system administration
- Behavior and performance 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 IntelliSHOT-M Auto-Tracking Camera**.

Features

- Ideal for small to medium conference rooms
- Certified for Microsoft Teams
- Auto-framing available
- 30x zoom, horizontal field of view of 70.2°
- Up to 1080p/60 video (up to 1080p/30 in High Quality mode)
- Universal Video Class (UVC) drivers, compatible with most UC conferencing applications
- Full administrative control via web interface
- Integration-friendly control via Command Line Interface Shell (CLISH)
- Presenter-friendly RF remote control

A Quick Look at the Camera

This section covers the physical features of the camera.

Front of the Camera

The camera is available in black or white.

Camera and zoom lens – Up to 30x zoom.

Status lights – The illuminated trim detail on the camera's face indicates the camera's current state. The status lights can be turned off in the administrative web interface.

Pivoting head – Manually tilt the head as needed.

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 for power, network access, and camera control. Connect to a PoE+ network switch or to the Power and Data Out port of the mid-span PoE+ power injector.

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

IP button – Press to display the camera's IP address in the video output.

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 you install 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.

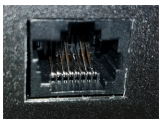
Cabling Notes

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



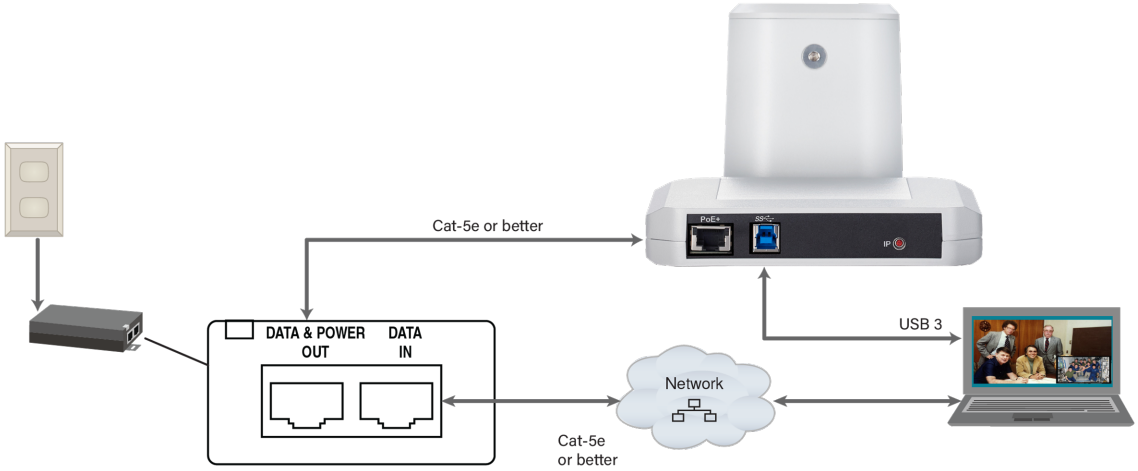
Damaged – Bent contact fingers will NOT make reliable contact with cable connector

Pro Tip

Label all cables at both ends.

Basic Connections

The camera receives power and network connectivity from its PoE connection. Connect a computer to the camera's USB port for conferencing.



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.

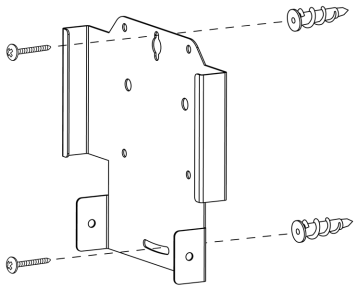
1. Connect the camera.
2. Connect power. The camera's status light turns white.
3. Connect the camera's USB port to your computer.
4. Verify that you can select the camera as the USB video capture device for conferencing.

If the camera turns on and is available as a USB device, continue with the installation.

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.



The mount can also be installed on a tripod. Use a 1/4-20 hex nut to secure the mount to the 1/4-20 screw on the tripod head. Then tilt the tripod head.

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. Slide the camera into the mount. It should be a tight fit.
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. See Configuring Video Behavior for more information.

Status Lights

The lights in the camera's head indicate its current state.

- Purple – Initializing
- White – Active
- 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 lights are yellow, showing a firmware update in progress. Interrupting a firmware update can make the camera unusable.

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.

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. This gives you access to the system administration tasks to define how the device behaves as an element of your network. **You will also need to set the admin password 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:

- Microsoft® Edge
- Chrome®
- Firefox®
- 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 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.

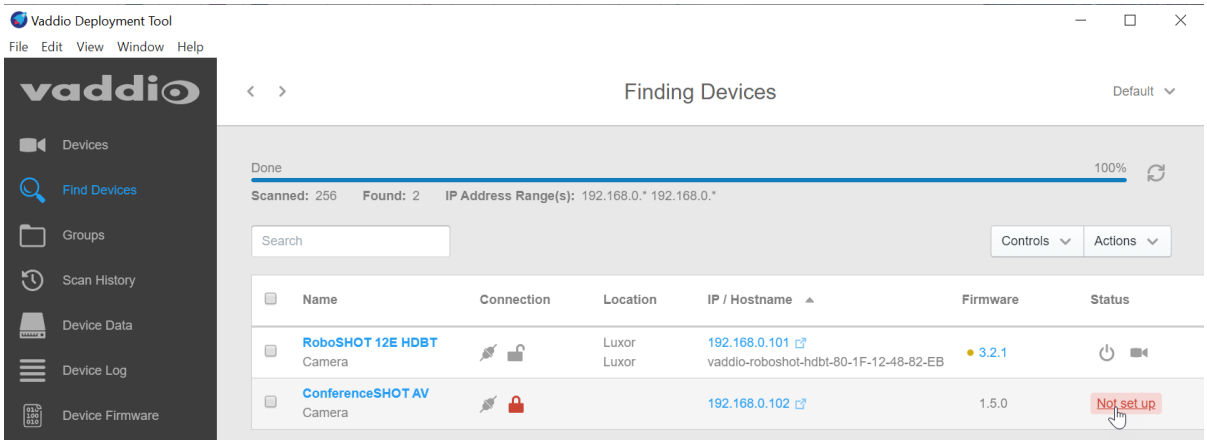
Initial Device Set-Up Using the Vaddio Deployment Tool

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.

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.

To get the IP address:

1. View the camera's USB stream.
2. Briefly press the IP button on the connector panel. This displays the camera's IP address and MAC address.
3. 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:

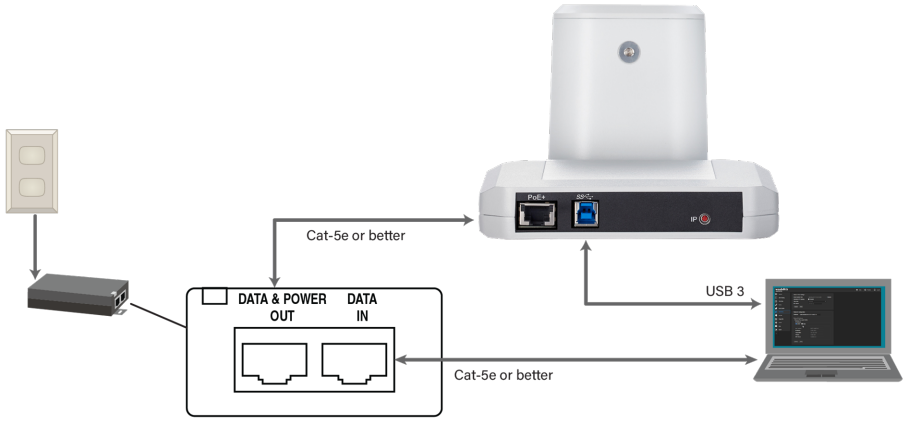
- The camera's PoE+ power injector is not connected to the network,

  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:

Connect a network cable directly from your computer's network port to the PoE+ power injector's DATA IN port.

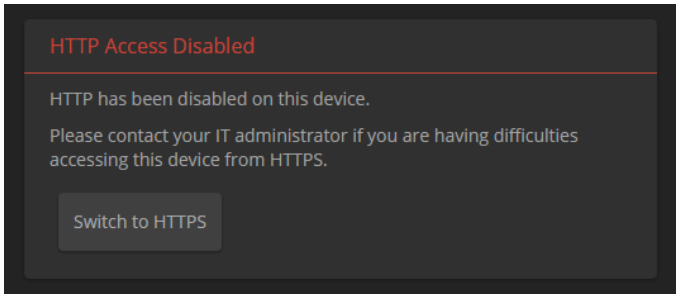


Note

After you have configured the camera for your network, reconnect the PoE+ power injector's DATA IN port to the network.

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 and Communication

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

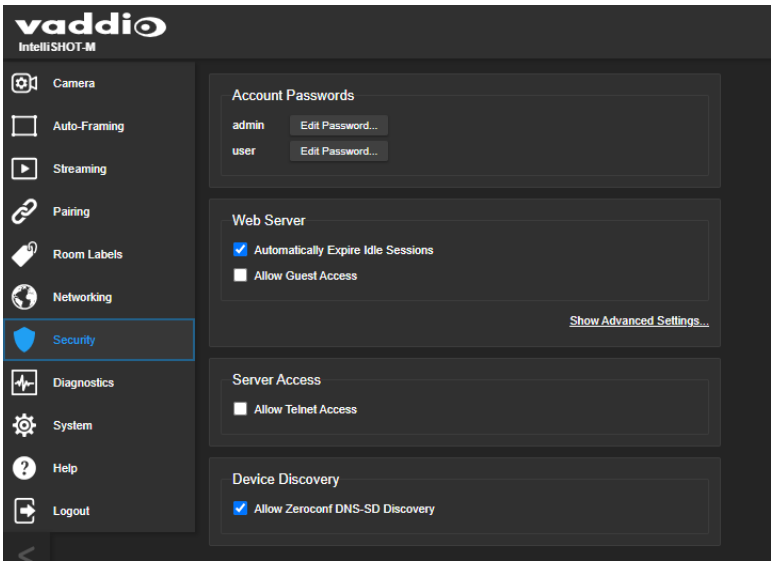
Vaddio products are designed with very similar web interfaces. Some of the screen shots in this manual may be from other cameras. Some may show settings that are not present or not enabled in your camera.

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. This setting allows other Vaddio devices to discover the camera on your network.
- 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 Device with a Static IP Address

NETWORKING PAGE

Caution

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

By default, the camera is set to DHCP, and will receive an IP address automatically if your network assigns IP addresses. If this does not happen, the camera uses its default IP address (169.254.1.1) and may be unable to communicate with your network. *If you install more than one camera or other device on a non-DHCP network, you must follow this procedure to prevent IP address conflicts.*

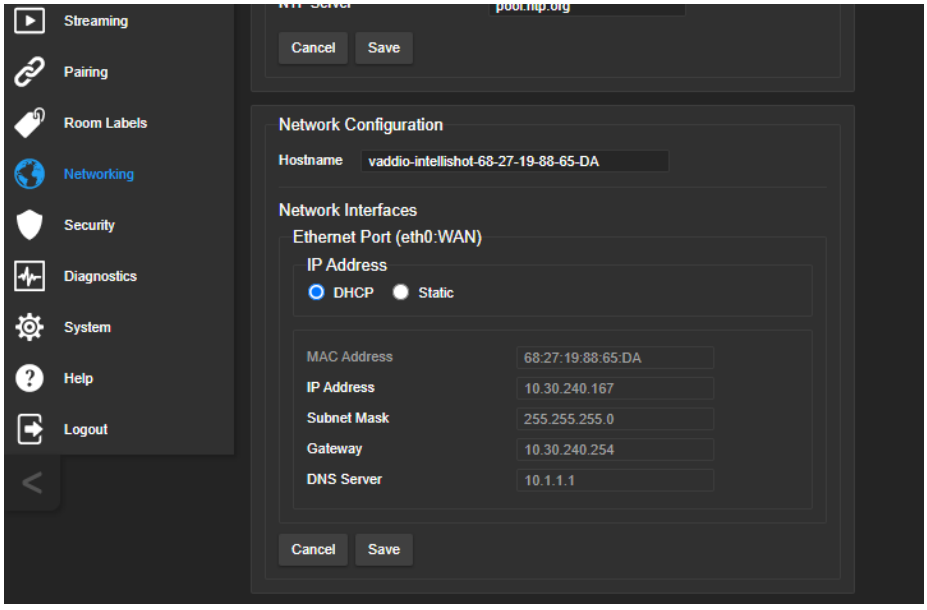
It may be desirable to configure the camera with a static address even if it does receive an IP address automatically. Work with your network specialist to ensure that the camera is configured to comply with the organization's network policies.

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.

If the camera is using its default IP address:

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 if you have not done this already. See If the Camera Is At 169.254.1.1.
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 has received an IP address:

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, follow the procedure above for a camera using its default IP address.

Changing the Camera's Hostname

NETWORKING PAGE

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

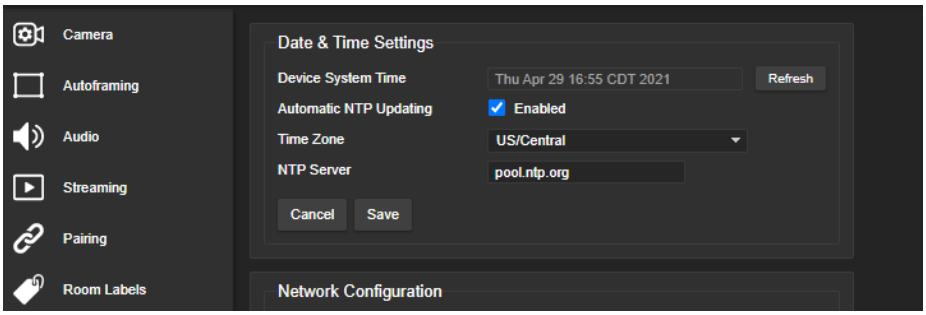
You may need to log in to the web interface again after changing the hostname.

Specifying Time Zone and NTP Server

NETWORKING PAGE

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.

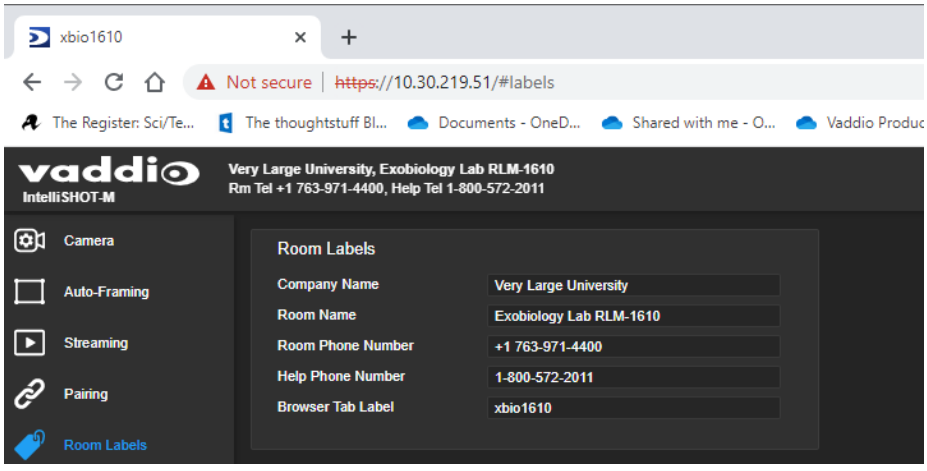


You may need to refresh the system time display.

Adding Room Information to the Camera's Web Interface

ROOM LABELS PAGE

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 section covers settings for changing the camera's behavior to suit your environment.

- Latency mode
- USB streaming settings
- Video settings
- Status light 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.

Changing Latency Mode

SYSTEM PAGE, GENERAL TAB

The IntelliSHOT-M camera has two operating modes.

- In **Low Latency mode**, the camera behaves as a fixed camera. This is the camera's default mode.
- In **High Quality mode**, the camera offers additional capabilities including electronic pan/tilt and Auto-framing.

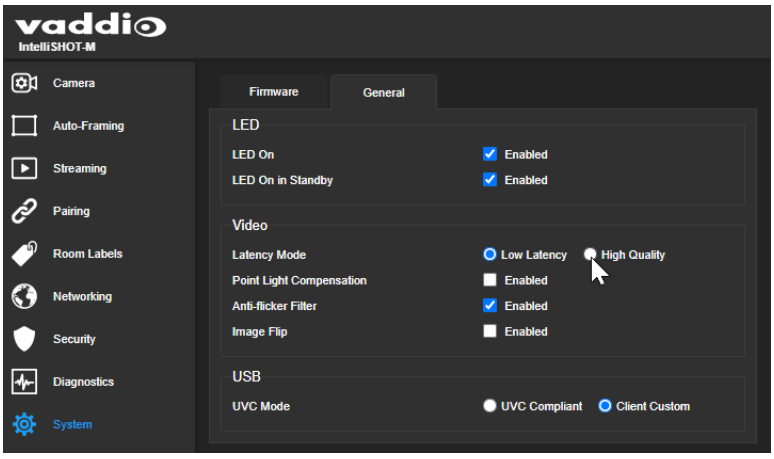
The additional processing for the Auto-framing feature in High Quality mode may result in up to one frame of video delay during calls.

When you change the latency mode, many of the behavior and performance settings revert to their factory default values. These include:

- Camera position and zoom
- Presets
- Color and lighting adjustments
- Custom scenes
- Speed settings
- Auto-framing settings
- Video settings on the System > General tab

To change latency mode:

On the System page, go to the General tab and change the Latency Mode selection.



A confirmation dialog box notifies you that the camera will reboot, and that some settings will be lost.

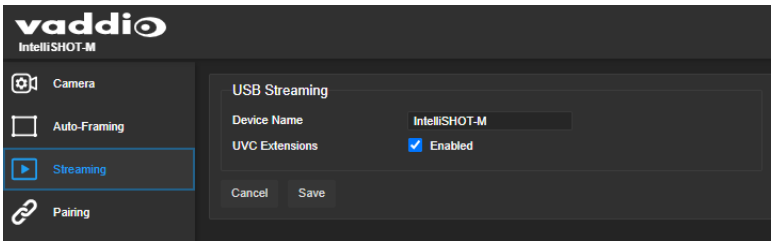
Configuring USB Streaming Settings

STREAMING PAGE

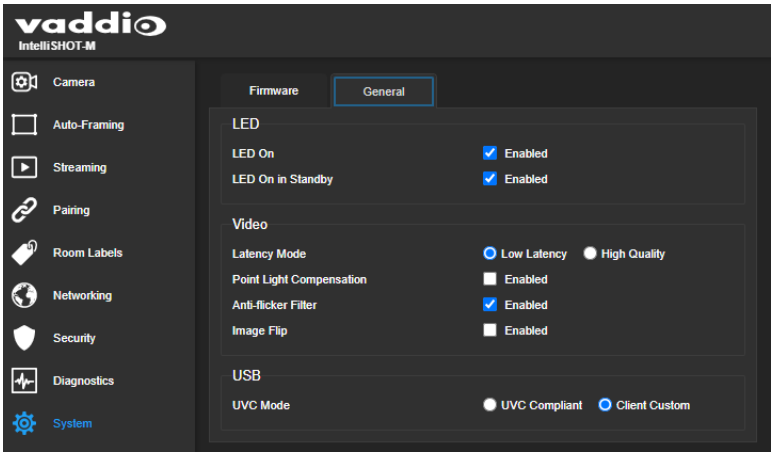
These settings affect how the camera works with soft conferencing applications. They are available in both Low Latency mode and High Quality mode. They do not change when you change modes.

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

UVC Extensions – Enable UVC extensions 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 on the System page's General tab.



Configuring Status Light Behavior

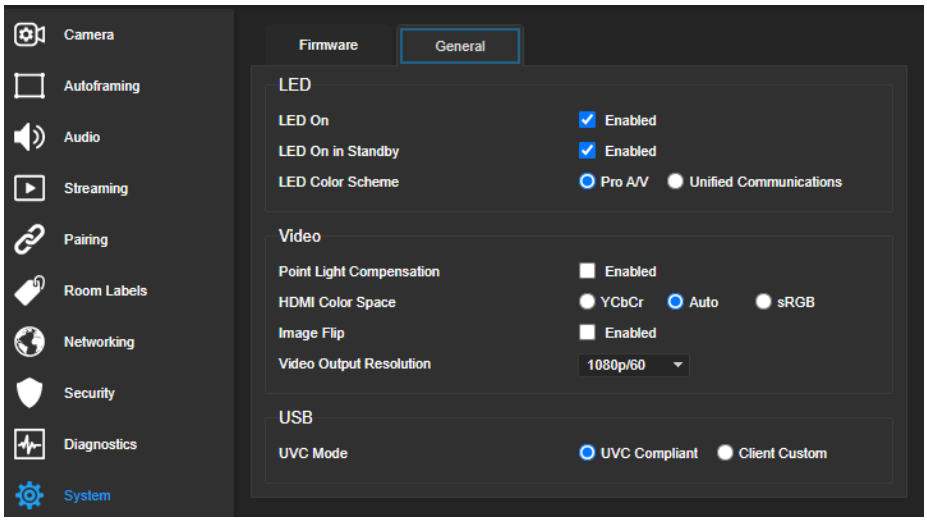
SYSTEM PAGE, GENERAL TAB

You can set the camera's status light behavior and color scheme to fit your environment.

By default, the status lights are on if the camera is on.

For this behavior...	...Use these settings
Status lights are on when the camera is on	**LED On** – selected **LED On in Standby** – selected
Status lights are on when the camera is sending video	**LED On** – selected **LED On in Standby** – not selected
Status lights remain off	**LED On** – not selected (**LED On in Standby** is ignored)

These settings are available in both Low Latency mode and High Quality mode. They do not change when you change modes.



Configuring Video Behavior

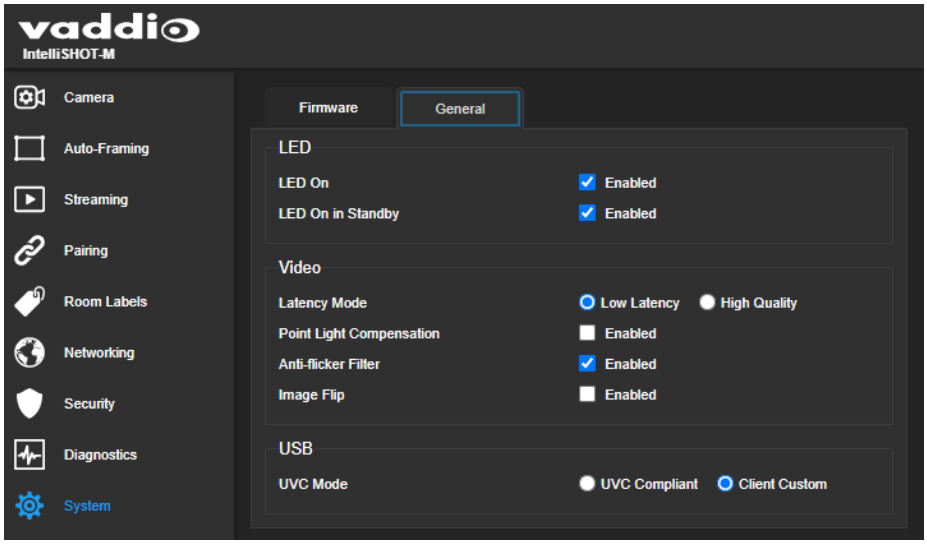
SYSTEM PAGE, GENERAL TAB

Get the best video performance by adjusting for your environment. These settings are available in both Low Latency mode and High Quality mode. They revert to their factory default values when you change modes, so you will need to configure them again afterward.

Point Light Compensation – Reduces the intensity of small, extremely bright areas (point light sources) that would otherwise swamp the camera with light and make it difficult to see details in areas with less intense lighting.

Anti-Flicker Filter – Improves video quality if using 50 Hz mains power; no significant effect for systems using 60 Hz power. This setting is on by default.

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.



Configuring Camera Performance

Set up the video experience you want:

- Camera presets (different behavior for Low Latency mode and High Quality mode)
- Speed adjustments (additional settings in High Quality mode)
- Color and lighting adjustments (same settings in Low Latency mode and High Quality mode)
- Auto-framing adjustments (High Quality mode only)

These settings and adjustments return to factory default settings when you change the camera's latency mode.

In the camera's default Low Latency mode, it behaves as a fixed camera: It can zoom, but not pan or tilt. Pan and tilt are available only in High Quality mode. Because of this,

- Camera presets are zoom-only in Low Latency mode, but include pan and tilt information in High Quality mode.
- Zoom speed setting is available in both Low Latency mode and High Quality mode.
- Pan and tilt speed settings are available only in High Quality mode.
- Tri-Sync is only available in High Quality mode.
- Auto-framing is only available in High Quality mode.

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.

How It Works: Digital Zoom

Zooming is available in both Low Latency mode and High Quality mode.

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.

How it works: Digital Pan and Tilt

Digital pan and tilt are only available in High Quality mode.

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.

Setting the Home Position and Other Preset Shots

CAMERA PAGE

If a camera shot will be used repeatedly, you can save the shot and color settings together as a preset. Home and presets 1 through 8 are available from the remote; all stored presets are available from the web interface.

The camera returns to the Home preset when it comes out of standby mode, or when you reboot it.

Low Latency mode and High Quality mode offer different controls and settings available for creating presets. When you change modes, the presets are lost.

To store a preset:

1. Set up the shot. In Low Latency mode, all you need to do is adjust the zoom to the desired level. In High Quality mode, you can also pan and tilt to frame exactly the shot you want.
2. Adjust the color settings as needed.
3. Select Store to open the Store Preset box. Presets that have already been defined are highlighted.
4. 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.

5. When you select the preset to store, the checkbox for storing the current color settings appears, as if by magic. Select it if you expect to always use the current color settings with this preset.

   If the camera is in High Quality mode, you also have the Save with Tri-Sync option.
   - The camera will cut to the preset if you do not select Save with Tri-Sync.
   - To pan/tilt smoothly to the preset, select Save with Tri-Sync. Use the Tri-Sync Speed slider to control the speed.
6. Save the preset.

Renaming Presets

CAMERA PAGE

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

CAMERA PAGE

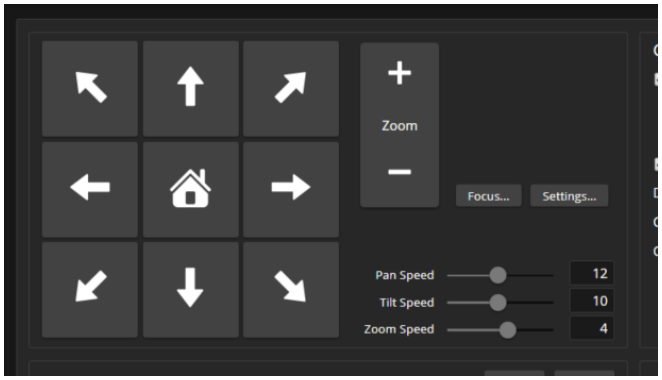
Low Latency mode and High Quality mode offer different speed adjustments. When you change modes, the speed adjustments are lost.

In Low Latency mode, you can set the camera's zoom speed.

In High Quality mode, 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. Tri-Sync 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.



Setting the Direction for Camera Movements

CAMERA PAGE

This setting is only available in High Quality mode. It returns to its default value (Normal) if you change modes.

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

CAMERA PAGE

These settings are available in both Low Latency mode and High Quality mode. They revert to their factory default values when you change modes.

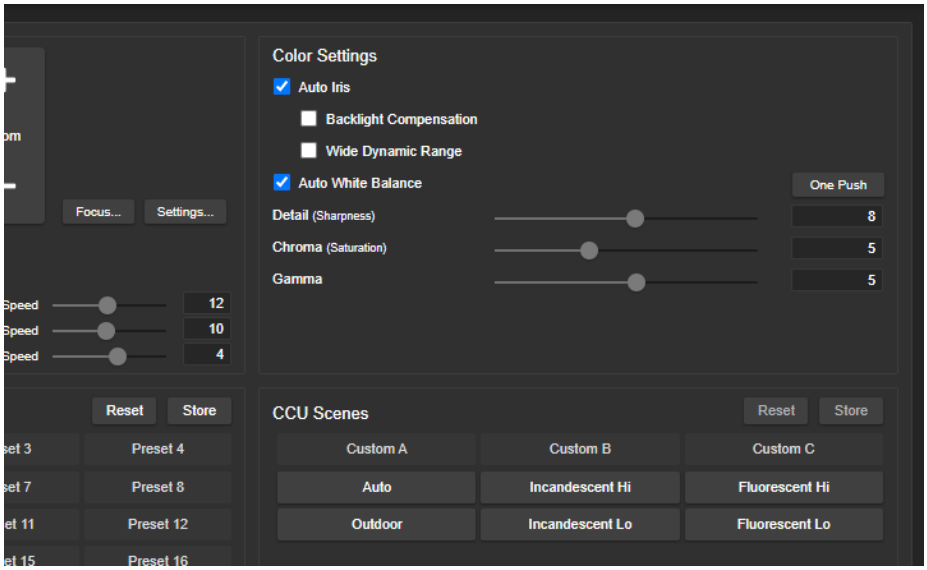
No two rooms are exactly alike – but a lot of rooms are a lot alike. The technical folks at Vaddio (Scott, to be specific) have already set up adjustments for common lighting scenarios (CCU scenes) – Incandescent Hi, Incandescent Lo, Fluorescent Hi, Fluorescent Lo, and Outdoor. The Auto setting allows 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.
- **Backlight Compensation** (available when Auto Iris is selected) reduces contrast to adjust for bright light behind the main subject of the shot. This setting can't be used with Wide Dynamic Range.
- **Wide Dynamic Range** (available when Auto Iris is selected) increases the contrast between the brightest and darkest areas. This setting can't be used with Backlight Compensation.
- **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
The subject is silhouetted against a bright background	Enable Backlight Compensation
Highlights and shadows look right, but mid-tones are too dark.	Increase Gamma
Shadows are too dark	Enable Wide Dynamic Range (WDR)
	Decrease Gamma
The image looks grainy	Decrease Detail
	Decrease Iris Gain
"Soft focus" effect; the image looks unrealistically smooth	Increase Detail

These adjustments revert to their factory default values when you change modes.

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
	One Push 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

If you are adjusting for lighting conditions that are likely to recur, you can save your settings as a custom CCU scene.

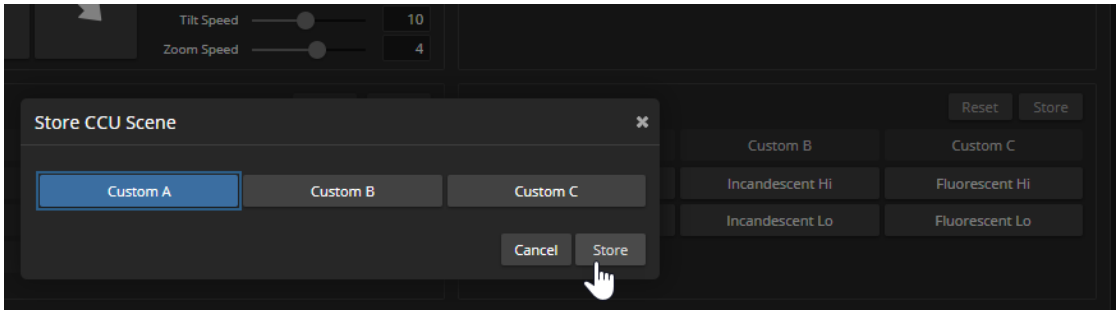
These adjustments revert to their factory default values when you change modes.

Saving Color and Lighting Settings

CAMERA PAGE

If you are adjusting for lighting conditions that are likely to recur, you can save your adjustments as a custom scene or store them as an element of the presets you set up.

1. Select Store CCU Scene.
2. In the Store CCU Scene dialog box, select the custom scene to store (Custom A, B, or C) and select Store. The button for this scene becomes available in the web interface.



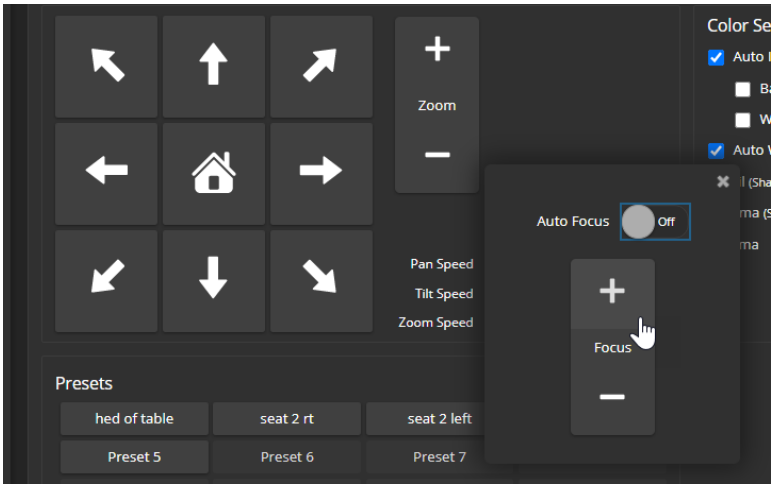
3. Optional: Right-click the button for your custom CCU scene, and enter a short name for it in the text box that opens. Save the name.

CCU scenes are lost when you change modes.

Adjusting the Focus

CAMERA PAGE

Open the Focus control to select Auto-focus, or set manual focus with the + (near) and – (far) buttons. The + and – buttons only work when Auto Focus is not selected.



Focus control is available to non-administrative users via the RF remote.

Fine-Tuning Auto-framing Behavior

Auto-framing is only available in High Quality mode. If you switch between High Quality mode and Low Latency mode, Auto-framing settings revert to their factory default values.

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: Auto-Framing

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

- In High Quality mode, 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

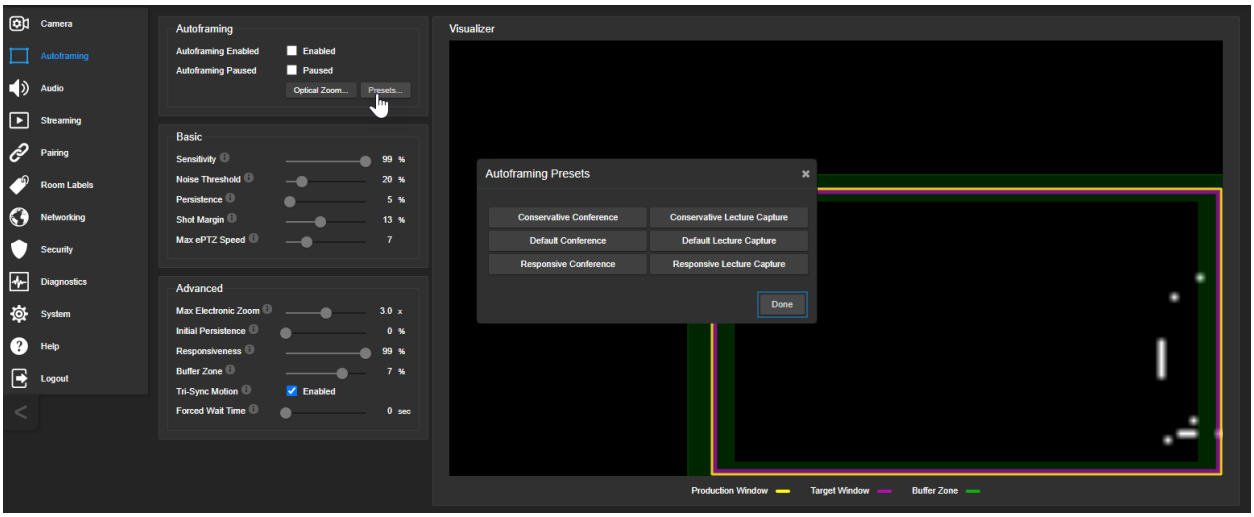
When making adjustments, compare the Visualizer's image to the video output.

Optical Zoom – Sets the area in which motion can be tracked. Adjust this first.

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.

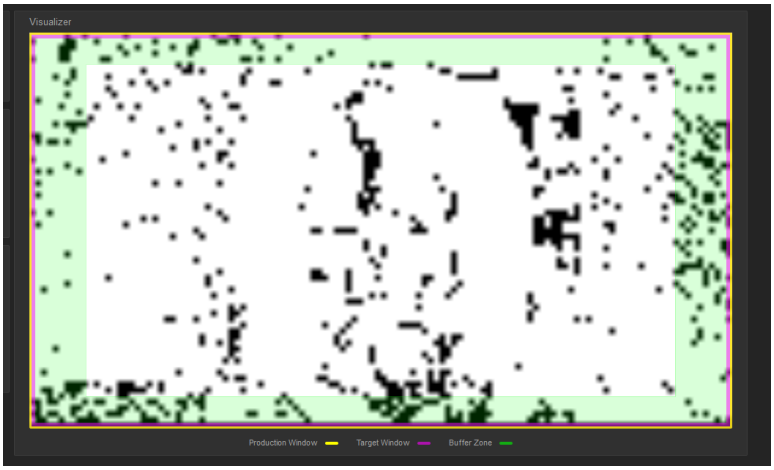
Note

In many cases, the camera delivers good Auto-framing performance with no adjustments beyond setting the optical zoom and selecting the appropriate Auto-framing preset.



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.

Max ePTZ Speed – The maximum speed for pan, tilt, and zoom while framing. Low speed may lose fast-moving motion sources. High speed may seem jumpy. Typically 5 to 6 for conferencing, 12 to 18 for lecture capture.

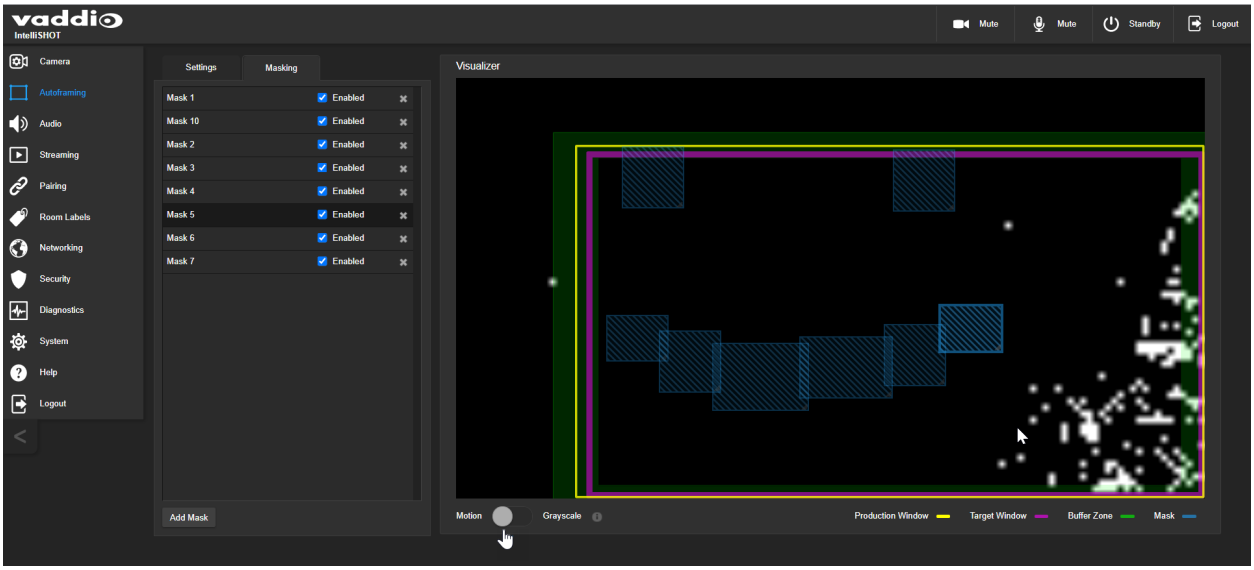
Masking Unwanted Motion

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.

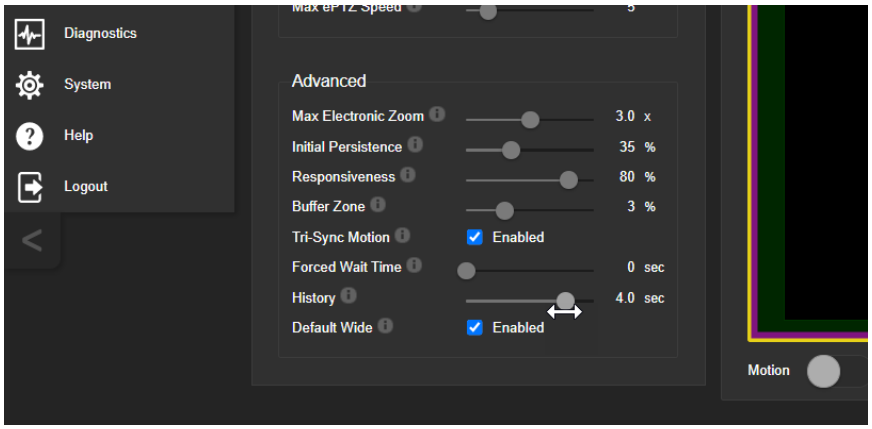
Buffer Zone – The area around the edge of the frame where new motion causes the image to re-center. Typically 3% for conferencing, 7% for lecture capture. Adjust this value higher to make the camera move less.

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.

History – History data is used for motion detection. High settings are best for conferencing and other low-motion situations, because they allow the camera to detect small motions such as changes in expression; but they increase latency. Low History settings provide more reactive framing, with the possible drawback that the camera moves away from a motion source that pauses, and may not respond to small motions. Low History settings are best for lecture capture and other high-motion uses.

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 Max ePTZ Speed and 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
	Decrease Optical Zoom	Enlarge the area where Auto-framing can occur

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	Decrease Max ePTZ Speed	Slower camera movements
	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

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 latency mode, home and other presets, NTP and time zone information, and room labels.

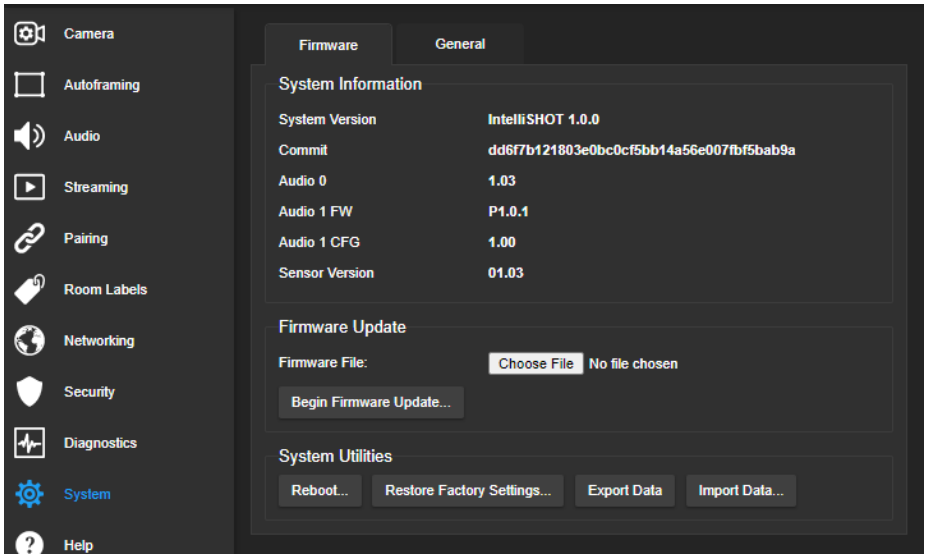
It does not include any information that is unique to the device, such as passwords, hostname, camera settings, or remote pairing.

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.



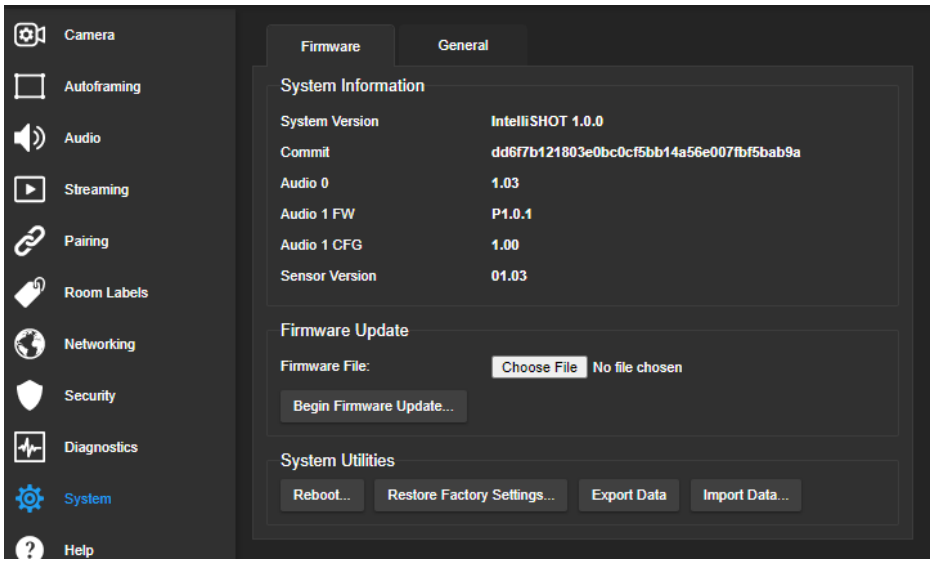
Installing a Firmware Update

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.

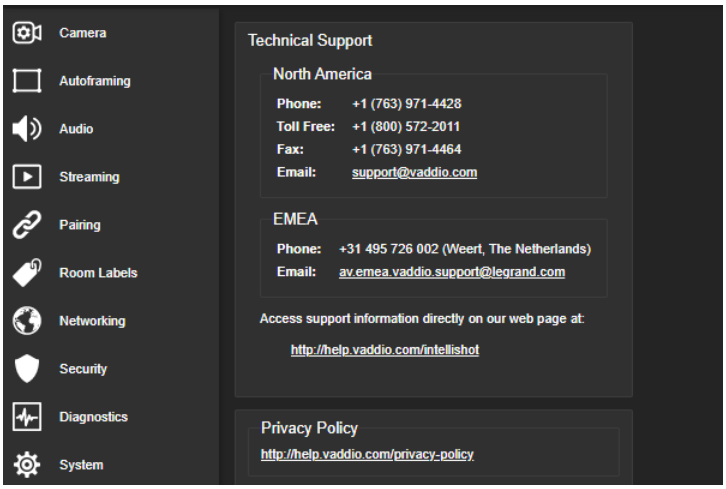
In the System Utilities section, select Reboot.

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.

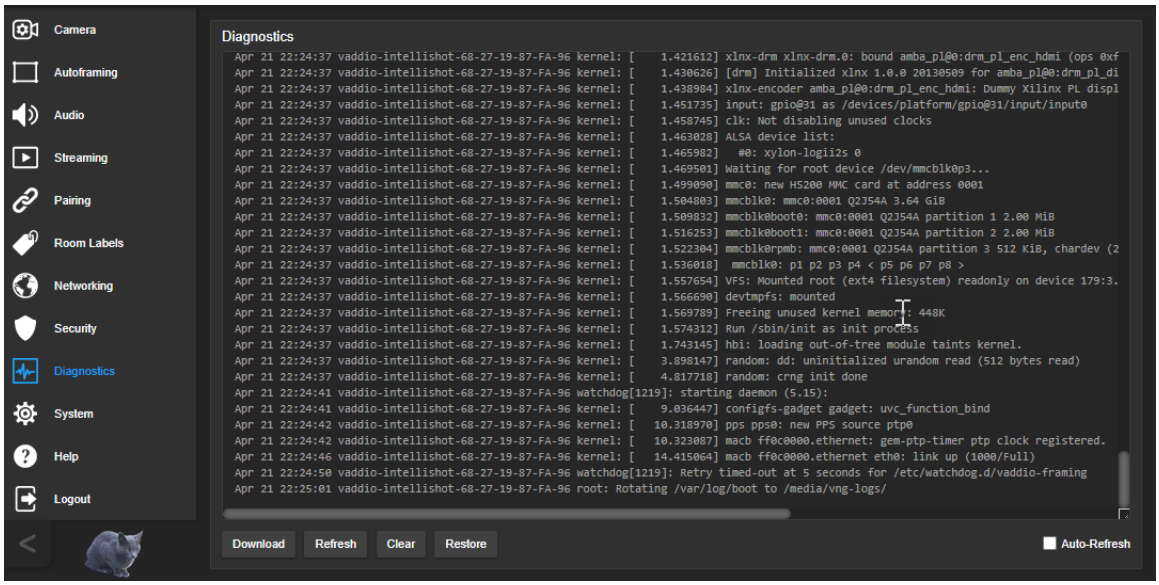
You'll find information for contacting Vaddio Technical Support on the Help screen.



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

The IntelliSHOT-M camera has two operating modes.

- In **Low Latency mode**, the camera behaves as a fixed camera. This is the camera's default mode.
- In **High Quality mode**, the camera offers additional capabilities including electronic pan/tilt and Auto-framing.

Camera

In the default Low Latency mode:

In Low Latency mode, the IntelliSHOT-M is a fixed camera that provides zoom control, color and lighting adjustments, and focus control. You can store zoom presets and save color and lighting settings as custom scenes.

In High Quality mode:

In High Quality mode, pan and tilt are also available. You can store PTZ presets instead of zoom presets. The color and lighting adjustments and custom scenes work the same way they do in Low Latency mode.

Auto-framing is available in High Quality mode. This feature automatically keeps the shot centered on the person who is moving the most – usually the person presenting or speaking.

If you use Auto-framing, you don't usually need to use the camera controls. However, you may want to store presets for some shots, such as a dry-erase board or a zoomed-out view of the room.

When you use the directional controls or stored presets, 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.

About the Remote

The camera is shipped with a remote. The user guide for the remote is available from the same web page as this manual.

About The Web Interface

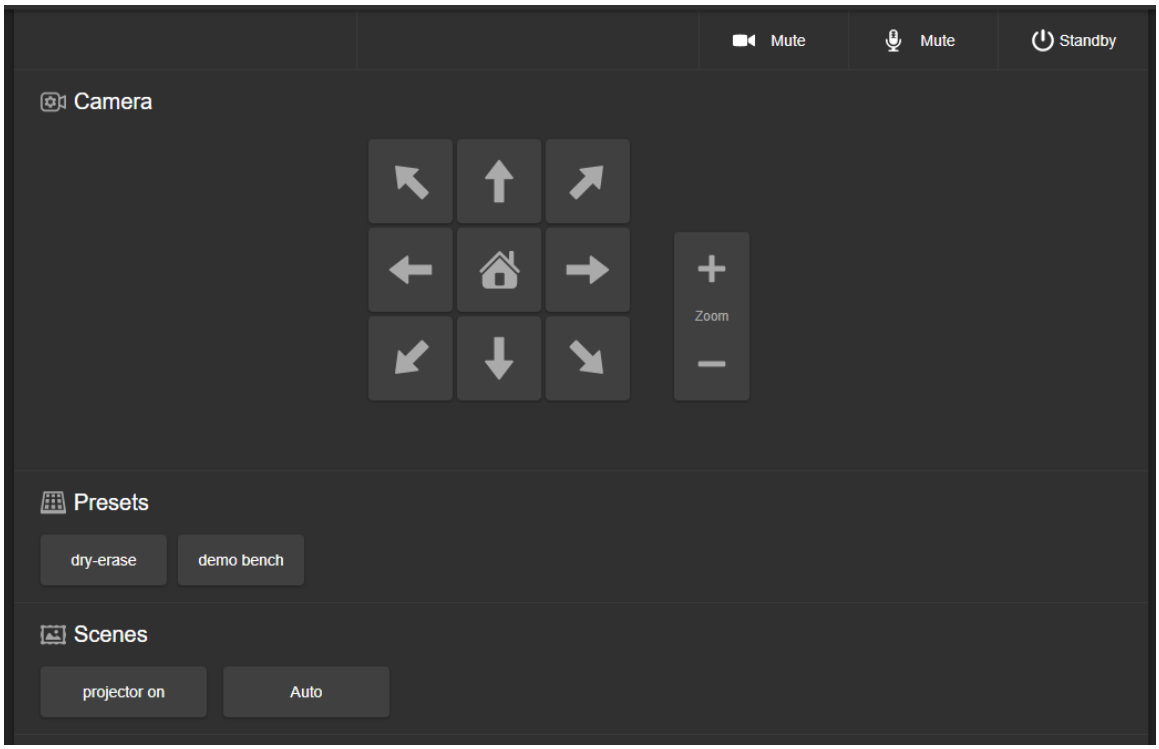
By default, the operator's page of the web interface is not available. The administrator must set a password for the `user` account or enable guest access; this provides access to the operator's page only. The web interface is available on the Vaddio Device Controller touch panel (if your installation uses one) or from a web browser.

The operator's Camera page provides most of the same controls as the remote:

- Video mute
- Camera standby
- Pan, tilt, and zoom
- Camera presets, if any have been stored
- Custom color/lighting settings, 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.

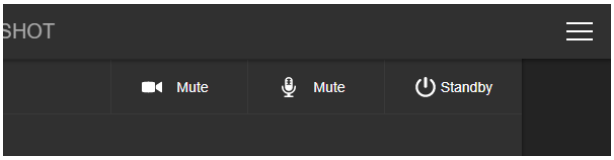


Muting Video

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

Managing the Camera Ready State

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



Moving the Camera

In High Quality mode, the camera's web interface provides pan and tilt controls. Use the arrow buttons to pan and tilt. The center button moves the camera to the home position.

The arrow buttons are absent when the camera is in Low Latency mode.

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.

Command Reference for Third-Party Control

The Vaddio Command Line Interface SHell (CLISH) allows an external device such as an AMX or Crestron presentation system to control the camera. These commands are sometimes called Telnet commands. The Vaddio CLISH is also used for writing macros.

Requirements

- Your computer must be able to connect to the device over the network.
- Telnet must be enabled on the Security page of the device's web interface.
- You may need to install a Telnet client on your computer.
- Port 23 is used for Telnet communication.
- To start a CLISH session, you must log in using the admin account.

Usage Notes

- The > character is the command prompt.
- In addition to the camera control commands, 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.

Auto-Framing Commands

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

Status commands:
- autoframer enabled
- autoframer paused

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

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 history
- 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.	

camera optical-zoom

Adjusts the area in which Auto-framing can occur.

Synopsis	camera optical-zoom { in [<speed>] | out [<speed>] | stop | get] }	
Options	`in`	Zooms the camera in.
	`out`	Zooms the camera out.
	`speed` [1 - 7]	Optional: Zoom speed (integer).
	`stop`	Stops the camera's zoom movement.
	`get`	Returns the camera's zoom setting.

Examples	`>`**`camera zoom in`**
	`OK`
	`>`
	
	Zooms the camera in at the default speed.
	
	`>`**`camera zoom out 7`**
	`OK`
	`>`
	
	Zooms the camera out at its highest speed.
	
	`>`**`camera zoom stop`**
	`OK`
	`>`
	
	Stops the camera's zoom motion.	

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 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 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 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-speed

Get or set the value for the Auto-framing maximum ePTZ speed. This limits pan, tilt, and zoom movements during Auto-framing.

Synopsis	autoframer max-speed { get | set <value> }	
Options	`get`	Returns the current value for the maximum speed.
	`set` <value>	Sets the maximum speed.
Examples	>**autoframer max-speed set 7** OK > Sets the maximum speed to 7. >**autoframer max-speed get** autoframer max-speed: 7 OK > Returns the current maximum speed.	

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 history

Get or set the value for the Auto-framing History setting. This is the number of seconds of data that the camera evaluates for motion. Increase the value if the camera does not reliably detect motion in a low-motion environment.

Synopsis	autoframer history { get | set <value> }	
Options	`get`	Returns the current value for the history.
	`set` <value>	Sets the history as a floating-point value from 0 to 5 seconds.
Examples	>**autoframer history set 2** OK Sets History to 4 seconds. >**autoframer history get** autoframer history: 2 OK Returns the current History value.	

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 focus
- 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. (See How It Works: Digital Pan/Tilt/Zoom.)

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 focus

Changes the camera focus.

Synopsis	camera focus { near [<speed>] | far [<speed> | stop | mode {get | auto | manual} }	
Options	`near`	Brings the focus nearer to the camera; manual mode only.
	`far`	Moves the focus farther from the camera; manual mode only.
	speed <1 - 8>	Optional: focus speed (integer).
	`mode get`	Returns the current focus mode.
	`mode auto`	Puts the camera in auto-focus mode.
	`mode manual`	Puts the camera in manual focus mode .
	`stop`	Stops the focus movement.
Examples	**`camera focus far 7`** OK > Moves the focus farther from the camera at a speed of 7. **`camera focus mode get`** `auto_focus:  on` OK > Returns the current focus mode.	

camera ccu scene

Stores the current CCU scene or recalls the specified ccu scene.

Synopsis	camera ccu scene {recall {factory <1 - 6> | custom <1 - 3>} | store custom <1 - 3>}	
Options	`recall factory` <1 - 6> `recall custom` <1 - 3>	Recalls the camera to the specified scene (factory 1 - 6 or custom 1 - 3).
	`store custom` <1 - 3>	Saves the current scene as a custom scene.
Examples	>**`camera ccu scene recall factory 2`** OK > Sets the camera to use factory CCU scene 2. >**`camera ccu scene store custom 1`** OK > Saves the current CCU scene as custom CCU scene 1.	

camera ccu get

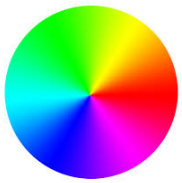
Returns CCU (lighting and color) information. Entering the command without specifying a parameter returns all current CCU settings.

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).
	`backlight_compensation`	Current backlight compensation setting (on or off).
	`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).
	`wide_dynamic_range`	Current wide dynamic range setting (on or off).
	`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).
	backlight_compensation	Sets backlight compensation on or off.
	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).
	wide_dynamic_range	Sets Wide Dynamic Range (on or off).
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.

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.	

Maintenance and Troubleshooting Commands

The following commands are available for maintenance and troubleshooting:

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

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`
	`>`

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.	

Information and Session Management Commands

The following commands are available for CLISH help and session management:

- history
- help
- exit

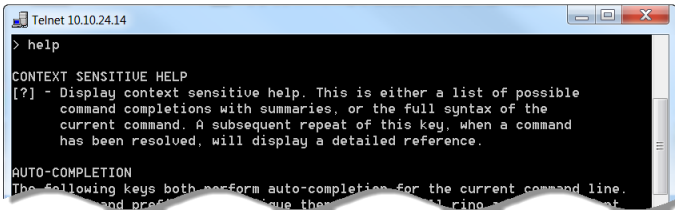
history

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 is not paired to the camera.	Pair the remote to the camera. Refer to the Vaddio RF Remote Commander User Guide.
	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 USB stream.	The USB cable is not connected.	Connect the USB cable.
No video.	Video is muted.	Unmute the video.

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

Status Lights

The lights in the camera's head indicate its current state.

- Purple – Initializing
- White – Active
- 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 lights are yellow, showing a firmware update in progress. Interrupting a firmware update can make the camera unusable.

Note

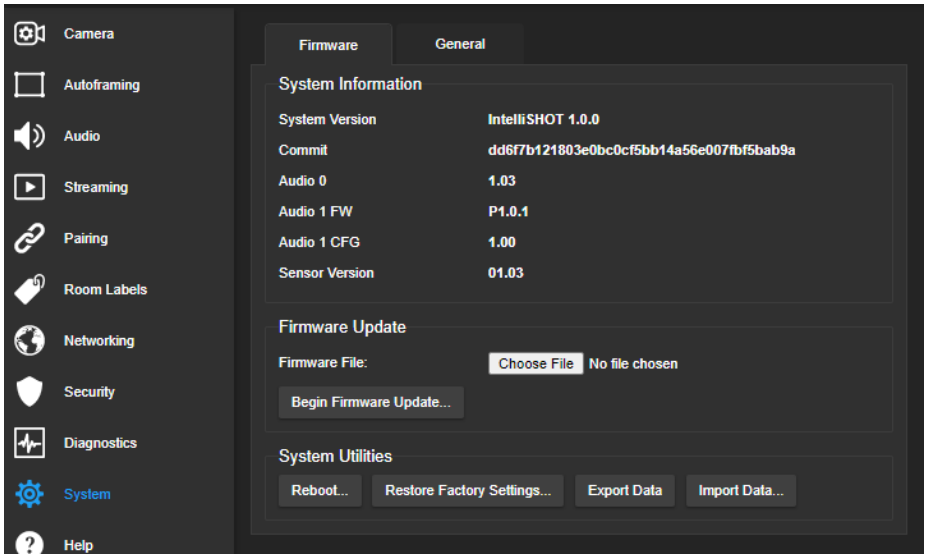
By default, the status lights on Vaddio cameras are active during normal operation; however, they can be configured to remain off even when the camera is sending video.

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
- Dry environments with an excess of static discharge

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

Glossary

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

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

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

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.

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.

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.

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.

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.

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

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 or a PoE/PoE+ network switch. PoE+ and PoE++ deliver more power than PoE.

preset
A stored camera shot. Depending on the camera, the preset may include pan, tilt, and zoom position, color settings, and 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.

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.

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.

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.

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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Carl Sagan, Bruce Murray, Louis Friedman (founders) and Harry Ashmore (advisor), on the occasion of signing the papers formally incorporating The Planetary Society
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Main Control Room / Mission Control Room of ESA at the European Space Operations Centre (ESOC) in Darmstadt, Germany
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Expedition 42 on orbit crew portrait, International Space Station, Mar. 7, 2015 – Barry Wilmore (Commander) Top, Upside down, to the right cosmonaut Elena Serova, & ESA European Space Agency Samantha Cristoforetti. Bottom center US astronaut Terry Virts, top left cosmonauts Alexander Samokutyaev and Anton Shkaplerov.
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Author's own cats, photos by author, you're welcome.

Index

A

admin password 11-12
  changing 12
  initial 11
AEC 5
anatomy of the camera 2
Auto-framing 26, 30, 34, 38-46
  adjustments 40-41, 43, 45-46
  behavior 39
  electronic zoom 41
  enabled state 38
  noise threshold 44
  pause state 39
  persistence 43
  quick reference 30
  responsiveness 42
  sensitivity 42
  shot margin 40
  speed 44
  stopping and resuming 34
  Tri-Sync Motion 45
Auto-framing page (web) 28-29
Auto-framing presets 27
auto focus 25, 53
auto iris 22, 54-55
auto white balance 22, 24, 54-55
Autoframing page (web) 27

B

backing up a configuration 31
backlight compensation 22-23, 54-55
blue gain 22, 24, 54-55
browsers 8, 11
  compatibility 8
  HTTP and HTTPS access 11
  security warnings 11
Buffer Zone (Auto-framing setting) 29, 41

C

cable connectors 3, 5
camera mount 4, 6
camera placement 4
camera standby position 36
capabilities 1
CCU scenes 20, 24, 53
  custom 20, 24, 53
  recalling 53
CCU settings 20, 22-24, 52, 54-55
  adjusting 23-24
  in the web interface 22
  storing with a preset 20, 52
ceiling-mounted cameras 6
cheat sheet 23-24, 30
  Auto-framing 30
  color adjustment 24
  lighting and image quality 23
chroma setting 22-24, 54-55
cleaning 63
CLISH 38-60
color codes for status light 7, 62
color settings 20, 22, 24, 53-55
  renaming 20
  storing and recalling 53
command history 60
compatibility, browsers 8
conferencing 16
configuration, saving or restoring 31
connection diagram 5
connectors 3
Controls page (web) 35
custom CCU scenes 24
custom home position 20

D

damage, preventing 4-5
default IP address 13
default settings, restoring 59, 63
Default Wide (Auto-framing setting) 29, 39
detail setting 22-23, 54-55
DHCP vs. non-DHCP networks 10, 13
diagnosing issues 58, 61
diagnostic logs 33
Diagnostics page (web) 33
diagram, connection 5
directional controls 36

E

echo cancellation 5
Ethernet port 3

F

factory defaults, restoring 59, 63
fault isolation 58, 61

firmware update 32
firmware version 57
focus 25, 53
Forced Wait Time (Auto-framing setting) 29, 46
functional check 5

G
gain 22-24
  blue 22, 24
  iris 23
  red 22, 24
gamma setting 22-23
getting help 33
guest access 12

H
HDMI Color Space setting 18
Help page (web) 33
History (Auto-framing setting) 29, 45
home position 20, 36, 47
hostname 14
HTTP, enabling 12
HTTPS 11-12
  browser warnings 11
  SSL certificate 12

I
ignoring unwanted motion sources 28
Image Flip setting 6, 18
importing a configuration 31
inactive sessions (web interface) 12
indicator light 7, 17, 55, 62
  behavior 17, 55
  meaning of colors 7, 62
information, conference room 14
initial device set-up 8-9, 11
  using the Vaddio Device Controller 8, 11
  using the web interface 11
  using Vaddio Deployment Tool 9
Initial Persistence (Auto-framing setting) 29, 43
installation 5-6
  basic connections 5
  camera 6
  camera mount 6
inverted installation 6
IP address 10, 13
  default 10, 13-14
  static, configuring 13
iris settings 23, 54-55

L
labels, room 14
LED control 55
light, status indicator 7, 17, 55, 62
  behavior 17, 55
  meaning of colors 7, 62
lighting settings 20, 22, 54-55
  naming 20
location of the camera 4, 14
locations of connectors 3
log files 33
low-power (standby) state 36, 55-56

M
manual focus 25, 53
masks 28
Max Electronic Zoom (Auto-framing setting) 29, 41
Max ePTZ Speed (Auto-framing setting) 27, 44
microphones 5
mount 4, 6
mounting the camera 4, 6
muting 36, 56
  video 36, 56

N
network configuration 14, 57
network port 3
Networking page (web) 14
Noise Threshold (Auto-framing setting) 27, 44
NTP server 14

O
One Push White Balance 24
operating environment 4, 63
Optical Zoom (Auto-framing setting) 27, 40

P
page 12, 14, 16, 27-29, 33, 35
  Auto-framing 27-29
  Controls 35
  Diagnostics 33
  Help 33
  Networking 14
  Room Labels 14

Security 12
Streaming 16
pan 21, 36, 48, 51
direction 21
speed 48
pan/tilt 52
storing as a preset 52
passwords 11-12
admin 11-12
user 12
Persistence (Auto-framing setting) 27, 43
ping command 58
Point Light Compensation setting 18, 23
power on/power off 36, 56
pre-installation functional check 5
precautions 4
for operating the system 4
presets 20, 27, 36, 52
Auto-framing 27
moving to 36, 52
renaming 20
setting 20, 52
with Tri-Sync 20
product capabilities 1

Q

quick reference 23-24, 30
Auto-framing 30
color adjustment 24
lighting and image quality 23

R

ready state 36, 56
rebooting 32, 58
red gain 22, 24, 54-55
remote control 34
requirements 4
installation 4
mounting 4
reset See also rebooting; restoring default settings
Responsiveness (Auto-framing setting) 29, 42
restoring a configuration 31
restoring default settings 59, 63
resuming Auto-framing 34
RJ-45 connectors 5
room information 14
Room Labels page (web) 14

S

saving a configuration 31
saving color (CCU) settings 24
scenes, CCU 20
naming 20
storing 24
Security page (web) 12
self-signed certificate 11
Sensitivity (Auto-framing setting) 27, 42
settings 6
Image Flip 6
settings, default, restoring 59, 63
shelf, camera mount 6
Shot Margin (Auto-framing setting) 27, 40
site requirements 4
software update 32
solving problems 61
speakers 5
speed 20-21, 44, 48-50, 53
focus 53
pan 48
tilt 49
zoom 50
SSL certificate 12
standby (low-power) state 36, 55-56
static IP address 13
status light 7, 17, 55, 62
behavior 17, 55
meanings of colors 7, 62
storage environment 63
storing a CCU scene 24
storing a configuration 31
streaming 16
Streaming page (web) 16
supported web browsers 8
syntax help, Telnet commands 37, 60

T

tablet 8
technical support 33
Telnet 12, 37-60
commands 38-60
disabled by default 37
enabling access via 12
session history 60
session, ending 60
syntax help 37, 60

typographical conventions in command reference 37
temperature, operating and storage 63
third-party control 37
tilt 36, 49, 51
speed 49
time zone 14
tracking adjustments 27, 29
tracking area 40
Tri-Sync Motion (Auto-framing setting) 29, 45
Tri-Synchronous Motion (Tri-Sync) 20
troubleshooting 58, 61

U

update 32
USB port 3
USB streaming 16
user password 12

V

Vaddio Deployment Tool 8-9
check for the latest version 8
initial device set-up 9
Vaddio Device Controller 8
version, firmware 57
video mute 36, 56
Video Output Resolution setting 18
visual parts identification 2-3

W

wall mount 6
warranty 4
web browsers supported 8
web interface 8, 12, 14, 16, 27-29, 33, 35
accessing 8
Auto-framing page 27-29
Controls page 35
Diagnostics page 33
Help page 33
Networking page 14
Room Labels page 14
Security page 12
Streaming page 16
Wide Dynamic Range setting 23

Z

zone, buffer 41
zoom 36, 40-41, 50-52
electronic (Auto-framing setting) 41
in stored presets 52
optical (Auto-framing setting) 40
speed 50

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