



Complete Manual for

RoboSHOT 20 UHD and RoboSHOT 40 UHD

Professional PTZ Cameras

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Overview

This guide covers the RoboSHOT® 20 UHD and RoboSHOT 40 UHD professional PTZ cameras:

- RoboSHOT 20 UHD, North America – 999-9950-000 (silver/black); 999-9950-000W (white)
- RoboSHOT 20 UHD, Europe/UK – 999-9950-001 (silver/black); 999-9950-001W (white)
- RoboSHOT 20 UHD, Australia/New Zealand – 999-9950-009 (silver/black); 999-9950-009W (white)
- RoboSHOT 40 UHD, North America – 999-9952-000 (black); 999-9952-000W (white)
- RoboSHOT 40 UHD, Europe/UK – 999-9952-001 (black); 999-9952-001W (white)
- RoboSHOT 40 UHD, Australia/New Zealand – 999-9952-009 (black); 999-9952-009W (white)



What's in this Guide

This guide covers:

- Unpacking
- Physical features
- Switch settings
- Installation
- Controlling the camera using the IR remote
- Web interface: system administration and performance/behavior configuration
- Telnet and RS-232 API references
- Specifications
- Troubleshooting
- Warranty and compliance/conformity information

For your convenience, the information you need to install this product is also available in the smaller, stand-alone **Installation Guide for RoboSHOT 20 UHD and RoboSHOT 40 UHD Professional PTZ Cameras**, which covers unpacking, physical features, switch settings, installation, and initial power-up.

Download manuals, dimensional drawings, and other information from www.vaddio.com/support.

Camera Features

- Back-illuminated, ultra high definition Exmor R™ sensor delivers native UHD (3840 x 2160) video
- Imaging and performance comparable to 3-chip cameras
- Professional performance and flexibility, with simultaneous 3G-SDI, HDMI, and H.264 IP streaming
- RoboSHOT 40 UHD is Vaddio's first camera with genlock
- View the RTSP stream from the camera using any standards-based media viewer
- RoboSHOT 20 UHD: 12x optical zoom; 20x combined optical and digital zoom; horizontal field of view 74° (wide) to 4.8° (tele) at 20x
- RoboSHOT 40 UHD: 20x optical zoom; 40x combined optical and digital zoom; horizontal field of view 70° (wide) to 4.1° (tele) at 20x
- Tri-Synchronous Motion™ simultaneous 3-axis pan/tilt/zoom movement between presets
- Smooth, silent direct-drive motors – ultra-accurate positioning, from 120° per second down to 0.35° per second
- Web interface for remote administration and operation, integration-ready Telnet or serial RS-232 control, presenter-friendly IR remote control

Unpacking the Camera

Make sure you received all the items you expected.



Caution

Always support the camera's base when picking it up. Lifting the camera by its head or mounting arm will damage it.

RoboSHOT 20 UHD, silver/black, North America – 999-9950-000

RoboSHOT 20 UHD, white, North America – 999-9950-000W

RoboSHOT 20 UHD, silver/black, Europe and UK – 999-9950-001

RoboSHOT 20 UHD, white, Europe and UK – 999-9950-001W

RoboSHOT 20 UHD, silver/black, Australia and New Zealand – 999-9950-009

RoboSHOT 20 UHD, white, Australia and New Zealand – 999-9950-009W

- RoboSHOT 20 UHD camera, 998-9950-000
- 12 VDC, 3.0 A switching power supply with AC cord set(s)
- Thin Profile Wall Mount with mounting hardware, black (535-2000-240) or white (535-2000-240W), depending on camera color
- Vaddio IR Remote Commander (998-2100-000)
- EZCamera RS-232 Control Adapter (998-1001-232)
- Quick Start Guide



OR



RoboSHOT 40 UHD, black, North America – 999-9952-000

RoboSHOT 40 UHD, white, North America – 999-9952-000W

RoboSHOT 40 UHD, black, Europe and UK – 999-9952-001

RoboSHOT 40 UHD, white, Europe and UK – 999-9952-001W

RoboSHOT 40 UHD, black, Australia and New Zealand – 999-9952-009

RoboSHOT 40 UHD, white, Australia and New Zealand – 999-9952-009W

- RoboSHOT 40 UHD camera, 998-9950-000
- 12 VDC, 3.0 A switching power supply with AC cord set(s)
- Thin Profile Wall Mount with mounting hardware, black or white depending on camera color
- Vaddio IR Remote Commander (998-2100-000)
- EZCamera RS-232 Control Adapter (998-1001-232)
- Quick Start Guide



OR



A Quick Look at the Camera

This section covers the physical features of the camera.

Front of the Camera



- **Camera and Zoom Lens, RoboSHOT 20 UHD (image on the left):** 20x zoom range; 4.8° field of view at 20x. Horizontal field of view up to 74°. Optical zoom to 12x, combined optical and digital zoom from 12x to 20x.
- **Camera and Zoom Lens, RoboSHOT 40 UHD (image on the right):** 40x zoom range; 4.1° field of view at 40x. Horizontal field of view up to 70°. Optical zoom to 20x, combined optical and digital zoom from 20x to 40x at 1080p, or 20x to 30x at 2160p.
- **Dual-arm mount** provides superior stability.
- **IR Sensors:** Sensors in the front of the camera base receive signals from the remote. Make sure there's nothing directly in front of the camera base, and point the remote at the camera.
- **Status indicator:** The multicolored LED indicates the camera's current state.

RoboSHOT 20 UHD: Back of the Camera



From left to right:

- **12 VDC, 3.0 A power connector** – For local power. Not used when connecting the camera to a OneLINK device or a PoE++ power injector. Use only the 12 VDC, 3A power supply.
- **OneLINK HDBaseT connector** – Network connectivity for streaming and control; also for power if a PoE++ injector or OneLINK device is used.
- **HDMI connector** – HDMI video output.
- **HD-SDI connector** – HD-SDI video output.
- **RS-232 port** – Allows an external device to control the camera using a modified VISCA protocol. See [RS-232 Serial Communication Settings and Port Pin-outs](#).
- **HD video select switch** – Sets the video output resolution.
- **Camera Settings DIP switches** – Sets camera behaviors such as IR remote frequency, image flip, and RS-232 baud rate. See [Camera Settings](#) for more information.

RoboSHOT 40 UHD: Back of the Camera



From left to right:

- **12 VDC, 3.0 A power connector** – For local power. Not used when connecting the camera to a OneLINK device or a PoE++ power injector. Use only the 12 VDC, 3A power supply.
- **OneLINK HDBaseT connector** – Network connectivity for streaming and control; also for power if a PoE++ injector or OneLINK device is used.
- **HDMI connector** – HDMI video output.
- **SDI connector** – 3G-SDI video output.
- **Sync connector** – For genlock signal.
- **RS-232 port** – Allows an external device to control the camera using a modified VISCA protocol. See [RS-232 Serial Communication Settings and Port Pin-outs](#).
- **Camera Settings rotary switch** – Sets the video output resolution.

Note

A label on the bottom of the camera lists the physical switch settings.

Camera Switch Settings

Both models use a rotary switch to set the video resolution. The RoboSHOT 20 UHD camera uses DIP switches to set some basic camera behaviors; the RoboSHOT 40 UHD camera uses "soft DIP switches" in the web interface to set these behaviors.

A label on the bottom of the camera provides a quick reference for setting the switch or switches on the back. After the camera is installed, you can read all switches from the camera's web interface.

Set the switch or switches on the back of the camera before mounting the camera.

Video Resolution Selector

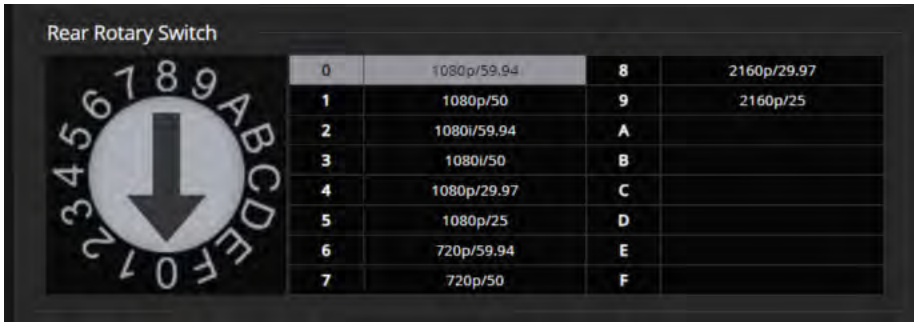
Set the desired output resolution for the camera with the rotary switch.

Notes

The maximum resolution for the HD-SDI output and the IP stream is 1080p.

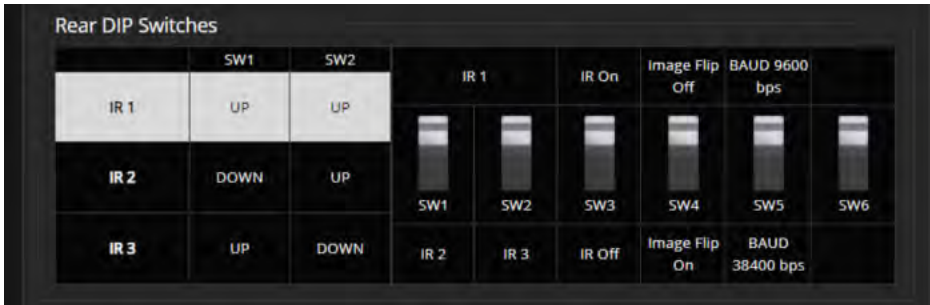
On the RoboSHOT 20 UHD, when the video output is set to 1080p/29.97 or 1080p/25 (rotary switch positions 4 and 5), the HDMI output is at double the specified frame rate, with each frame doubled. Other outputs deliver the specified frame rate. This is a limitation of the camera hardware.

On the RoboSHOT 40 UHD, zoom is limited to 30x at 2160p.



Camera Behavior Settings for RoboSHOT 20 UHD

DIP switches on the back of the RoboSHOT 20 UHD set its basic behaviors.



Note

When the camera is not inverted, DIP switches are in their default positions when they are up.

IR1, IR2, IR3 (Frequency Selection): If there are multiple cameras in the room, use **switches 1 and 2** to configure each with a different IR frequency to allow the IR Remote Commander to control them independently. Then use the Camera Select buttons at the top of the remote to select the camera you want to control.

- SW1 and SW2 up: IR frequency 1
- SW1 down, SW2 up: IR frequency 2
- SW1 up, SW2 down: IR frequency 3

IR: Leave **switch 3** UP if the IR remote will be used.

Image Flip: If mounting the camera upside-down, set **switch 4** DOWN: IMAGE FLIP ON.

Baud Rate: Set **switch 5** to the baud rate of the device connected to the RS-232 port. The default is 9600 bps. The 38400 baud setting is optional if the connected control device supports it.

Switch 6 is not currently used.

Note

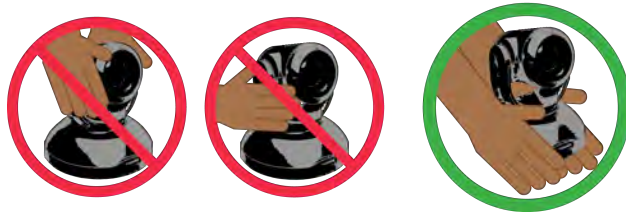
On the RoboSHOT 40 UHD, these settings are available using the corresponding soft DIP switches on the System page of the web interface. See [Software Switch Settings – RoboSHOT 40 UHD Only](#).

Installing the Camera

This section covers:

- Selecting the location for the camera
- Installing the mount
- Connection diagrams
- RS-232 cable pin-out and communication settings
- Connecting and mounting the camera

Don't Void Your Warranty!



Caution

Always support the camera's base when picking it up. Lifting the camera by its head or mounting arm will damage it.

Caution

This product is for indoor use. Use an appropriate protective enclosure if installing it outdoors or in a humid environment.

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.

Caution

If using a DC power supply with this product, use the power supply included with it or recommended for use with it. Always check the output voltage listed on the power supply label, as power supplies for different products may look nearly identical. Using the wrong power supply will void the warranty, possibly causing unsafe operating conditions and damage to the product.

Before You Start

Things to keep in mind when deciding where to install the camera:

- Consider camera viewing angles, lighting conditions, line-of-sight obstructions, and in-wall obstructions.
- If the IR Remote Commander will be used, ensure that nothing blocks the IR lens in the camera's base.
- Ensure that the camera body can move freely and point away from the ceiling and lights.

Prepare for a successful installation:

- Be sure you can identify all cables correctly.
- Check Cat-5 cables for continuity.
- Ensure that the DIP switches (if present) and the video resolution switch are set appropriately. See [Camera Switch Settings](#).

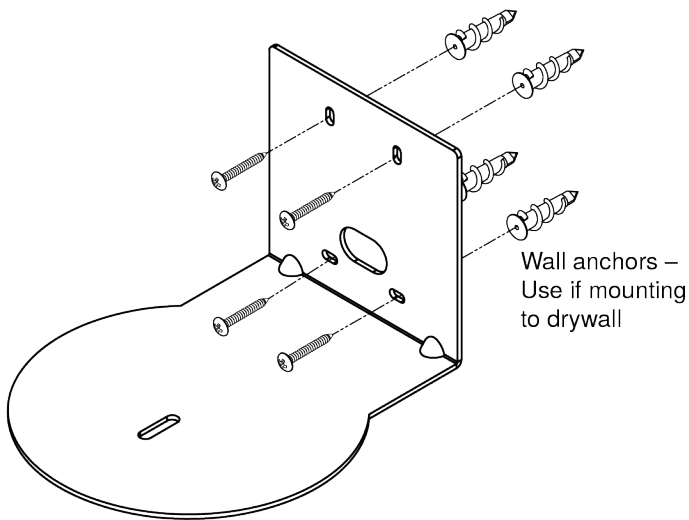
Installing the Wall Mount

The camera is shipped with a Thin Profile Wall Mount. Other mounting options are available as well. Contact us if you don't have the camera mount you need.

If you are installing a OneLINK camera extension system with the camera, attach the EZIM (the smaller unit) to the camera mount and route the camera cables through the opening before you install the mount. Refer to the Quick-Start Guide supplied with the OneLINK extension, or to the OneLINK manual available at support.vaddio.com/resources.

You can install the camera wall mount to a 2-gang wall box or directly to the drywall.

- If you mount it to drywall, use the wall anchors provided with the wall mount.
- If you mount it to a wall box, use the cover plate screws supplied with the wall box.



About Ceiling-Mounted Cameras

If you use an inverted mount, set the camera's Image Flip DIP switch ON for inverted operation. See [DIP Switches: Camera Behavior Settings](#) for more information.

Note

On the RoboSHOT 40 UHD, this setting is available using the corresponding soft DIP switch on the System page of the web interface. See [Software Switch Settings – RoboSHOT 40 UHD Only](#).

Cabling Notes

Caution

Do not use pass-through RJ-45 connectors. If they are crimped incorrectly, they can damage the connectors on the product, cause intermittent connections, and degrade signal quality. Physical damage to the connectors may void your warranty.



Intact – will make reliable contact with cable connector



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

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

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.



Pro Tip

To prevent tragic mishaps, label both ends of every cable.

Basic Connection Diagrams

Here is a simple set-up for the RoboSHOT 20 UHD camera.



Here is a simple set-up for the RoboSHOT 40 UHD camera, using genlock.



Options for Power and Other Connections

Use the provided 12 VDC power supply – As shown in the Basic Connections section, this set-up requires separate connections for power, network, control, and video output.

Use a PoE++ power injector – Connect to the network and to power through a PoE++ power injector. Video output and RS-232 control (if used) require separate connections. In most cases, you do not need to use the camera's 12 VDC power supply in this configuration.

Connect the camera to a OneLINK® device – A single Cat-5e (or better) cable to the OneLINK/HDBaseT connector provides power, control, network, and video connectivity. Network, video output, and RS-232 control are connected at the OneLINK receiver. Do not use the camera's 12 VDC power supply in this configuration.

This example shows basic connections for a RoboSHOT 20 UHD camera using a OneLINK HDMI extension. Connection details vary depending on the equipment and functionality to be used in your installation.



RS-232 Serial Communication Settings and Port Pin-outs

The RS-232 serial port (color-coded blue) near the center of the camera's back panel provides another means of controlling the camera.

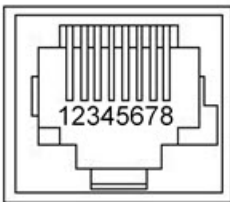
Speed and Encoding

| Specification | Value |
|----------------------|--------------------------------|
| Communication Speed | 9600 or 38400 baud, selectable |
| Number of start bits | 1 |
| Number of stop bits | 1 |
| Number of data bits | 8 |
| Parity | None |
| Flow control | None |

9600 baud is default. The 38400 baud setting is optional if the connected device supports it.

Connector Pin-Out

- Pin 1: Not used
- Pin 2: Not used
- Pin 3: Not used
- Pin 4: Not used
- Pin 5: Not used
- Pin 6: GND
- Pin 7: RXD (from TXD of control source)
- Pin 8: TXD (to RXD of control source)



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.

Installing the Camera

Be sure you have already set the camera's DIP switches (if present) and video resolution switch.

Caution

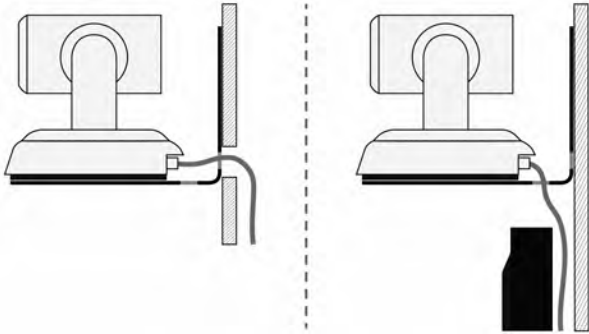
Check your cables. Connecting a cable to the wrong port or using the wrong pin-out can result in equipment damage and will void the warranty.

1. Route the cables to the camera location.
2. Route the cables through the mount, and install the mount on the wall or attach it to the wall box. Leave the screws loose enough to adjust the position of the mount.
3. Level the mount and tighten the mounting screws.
4. Connect the cables to the camera.

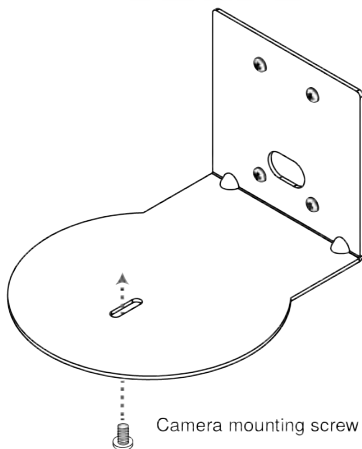
Caution:

If using local power rather than connecting to a OneLINK device or using PoE++, use the power supply shipped with the camera. Using a different power supply may create an unsafe operating condition or damage the camera, and will void the warranty.

5. Place the camera on the mount.



6. Attach the camera to the mount using the 1/4"-20 x .375 mounting screw supplied with the camera.



Images for illustration only; not to scale. Camera and mount details may differ.

Powering Up the Camera

Connect camera power.

The camera will run a self-test routine and move to its home position. This will take a few seconds.

When the camera is initialized and ready, video is available and the status light is blue. At this point, the camera is ready to accept control information.

Note

Wait until the camera finishes initializing before trying to operate or control it.

Status Light

The light in the camera's base indicates its current state.

- **Blue:** Normal operation (blinks once when the camera receives a command from the remote)
- **Red:** On-air tally (Pro A/V color scheme only)
- **Purple:** In standby mode or booting
- **Yellow:** Firmware update in progress

Caution

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

Note

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

Using the IR Remote

The IR remote provides basic camera control for end users.

IR Remote Cheat Sheet

| What do you need to do? | Button(s) |
|--|--|
| Power on or standby | Power (green button at top right) |
| Select the camera to control (if this remote controls more than one) | Camera Select buttons 1 through 3 (second row of buttons) |
| Discover the camera's IP address | Data Screen button (top left) – press and hold for 3 seconds. |
| Move the camera | Arrow buttons and Home button (dark red) |
| Move the camera to a preset position | Position Preset buttons 1 through 6 (bottom two rows) |
| Focus the camera | Auto Focus button (near arrow buttons) Manual Focus buttons Near and Far (below Zoom Speed buttons) |
| Control zoom speed | Zoom Speed buttons (light gray) - Slow T and W , Fast T and W for telephoto (zoom in) and wide-angle (zoom out) modes |
| Adjust for excess light behind the camera's subject | Back Light button (top center) |

IR Remote Details

The Vaddio remote provides the following functions:

Power – Switch the selected camera on or off.

Power indicator – Lights momentarily when you press a button.

Back Light – Use or turn off Back Light Compensation.

Data Screen – Display the camera’s IP address and MAC address. Press this button again to dismiss the display.

Camera Select – In multi-camera installations, selects the camera to be controlled. If your camera is a RoboSHOT 20 UHD, see [Camera Behavior Settings for RoboSHOT 20 UHD](#) for information on configuring the camera as camera 1, 2, or 3. If the camera is a RoboSHOT 40 UHD, see [Software Switch Settings](#).

Pan/Tilt (arrow button) controls and Home button – Control the camera’s position.

Rev. Pan and Std. Pan– Control how the camera responds to the arrow buttons. Helpful for ceiling-mounted cameras and for presenters who are controlling the camera.

Pan/Tilt Reset – Not used.

Auto Focus – Switch the camera to Auto-Focus mode.

Zoom Speed – Select Slow or Fast movements for telephoto and wide-angle shots.

- T slow and T fast – Telephoto (zoom in)
- W slow and W fast – Wide-angle (zoom out)

Manual Focus – Switch the camera to Manual Focus mode.

Near (-) adjustment – Moves the focus nearer when in manual focus mode.

Far (+) adjustment – Moves the focus farther when in manual focus mode.

Preset – Save the camera’s current position as one of the numbered presets.

Reset – Clear a saved preset.

Position Presets 1 through 6 – Move the camera to a predefined position, or specify the preset to save or clear.

The web interface offers greater control over camera movements to presets (such as setting the speed for Tri-Synchronous Motion), and provides additional presets.

Storing a Preset Using the Remote

Position the camera. Then hold down the Preset button and press one of the numbered preset buttons.

Clearing a Preset Using the Remote

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



Web Interface

The camera's web interface allows control via a network connection, using a browser. Password-protected pages provide administrative access to tasks such as setting passwords, changing the IP address, viewing diagnostics, and installing firmware updates. The user login (or guest access, if it is enabled) provides access to camera controls similar to those available from the IR remote.

You will need to know the camera's IP address to use its web interface. If the network has a DHCP server, the camera will get its IP address, gateway and routing information automatically and you will be able to browse to it. If not, you will need to configure the camera to use a static IP address.

For cameras powered by a OneLINK HDMI or OneLINK Bridge: The OneLINK device has its own web interface. Refer to the appropriate OneLINK manual for information on its web interface.

Getting the Camera's IP Address

You will need to be able to view the camera's video output.

1. Press the Data Screen button on the remote. The display presents the camera's IP address and MAC address.
2. Press the Data Screen button again to dismiss the information.

If the address is 169.254.1.1, the camera is using its default IP address. This usually means one of these things:

- The network automatically assigns IP addresses, but the camera is not connected to the network.
- The network does not automatically assign IP addresses, and you need to configure the camera for the network. See [Configuring the Camera with a Static IP Address](#).

Accessing the Web Interface

Enter the IP address or hostname in your browser's address bar. You may need to enter `http://` or `https://` as a prefix to keep the browser from treating it as a search query.

(Example: `http://10.30.200.125`)

Browser Support

We have tested this product with these web browsers:

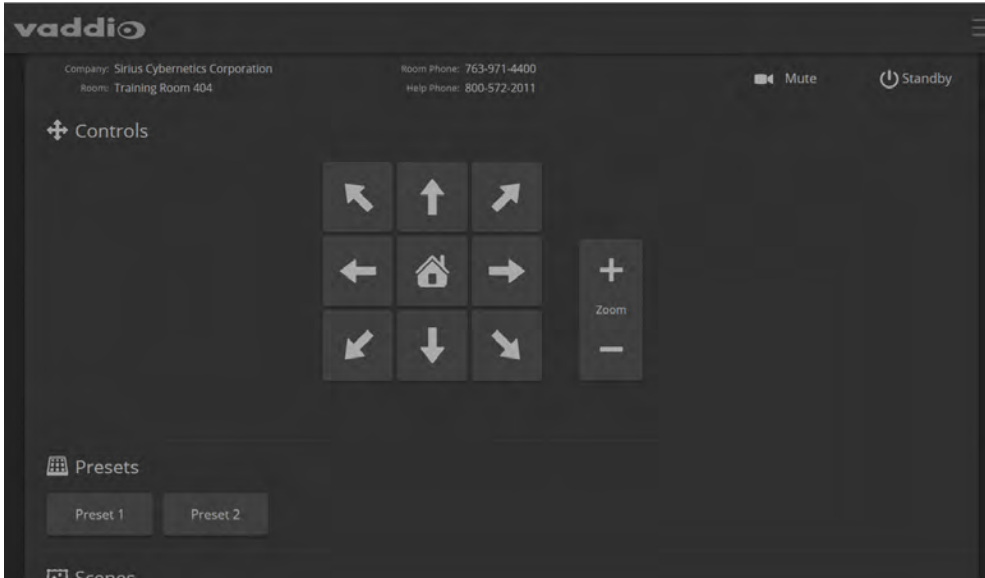
- Chrome®
- Microsoft® Internet Explorer®
- Safari®
- Firefox®

We test using the browser version available from the vendor at that time. Older versions of these browsers are likely to work, and other browsers may also work.

User Access

By default, the web interface opens to the Controls page, but the camera can be configured to require a user login. The default user password is **password**, but this can be changed. Check with the system administrator if the camera's web interface requires you to log in.

Only the Controls page is available with user-level access.

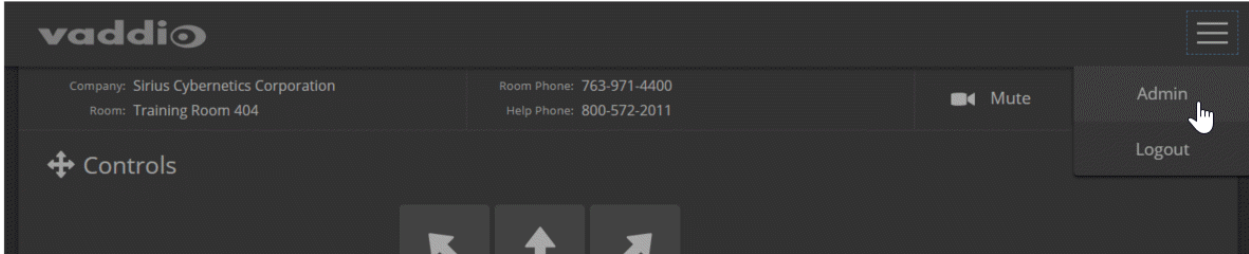


Your camera's Controls page will look somewhat different.

Administrative Access

If you are on the Controls screen, you're logged in at the user level, or guest access is enabled and you're not logged in at all.

Your camera's web interface will look somewhat different from this image.



Open the menu to log on as Admin. The default admin password is **password**, but this can be changed.

Note

For best security, Vaddio strongly recommends changing the user and admin passwords from the default. Using the default passwords leaves the product vulnerable to tampering.

The admin account has access to system administration tasks and performance/behavior configuration tasks. System administration tasks are on the following pages, listed in the lower portion of the left navigation panel:

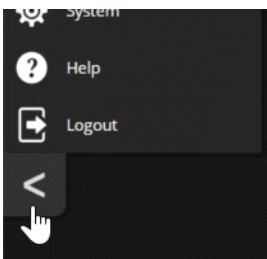
- Networking page – Configure date and time settings, hostname, and IP addressing.
- Security page – Set passwords, manage guest access, and enable/disable Telnet access.
- System page – View firmware version and switch settings, reboot, restore factory defaults, and update firmware.
- Room Labels page – Information to display on the web interface screens, including the conference room name and phone number and the in-house number for AV assistance.
- Help page – Tech support contact information and a link to the product information library on the Vaddio website.
- Diagnostics page – View or download the diagnostic log when troubleshooting issues.

Performance and behavior configuration tasks are on the following pages, listed in the upper portion of the left navigation panel:

- Camera page – Control the camera, make adjustments, create and manage presets and CCU scenes.
- Streaming page – Configure IP streaming.

Compact Menu View

By default, the navigation buttons in the camera's administrative interface display an icon and a text label. You can also select the compact view of the menu buttons along with the standard view. The button at the bottom of the menu toggles between the two views.



Web Interface Cheat Sheet

Where to find the camera controls you need right now.

| What do you need? | Go to this screen |
|--|--|
| Camera operation <ul style="list-style-type: none"> ■ Stop sending video (video mute) ■ Enter or exit standby mode | (any page) |
| Camera operation <ul style="list-style-type: none"> ■ Move or zoom the camera manually ■ Move to a camera preset (Presets section, if available) ■ Select the appropriate lighting adjustments (CCU Scenes section, if available) | Controls (user or guest access) or Camera (admin access) |
| Camera behavior and adjustments <ul style="list-style-type: none"> ■ Set or clear presets ■ Set the speed for pan, tilt, or zoom motions ■ Focus the camera ■ Work with color and lighting adjustments (CCU scenes) ■ Set motors for inverted operation (Settings button reveals the control) | Camera |
| Advanced camera settings <ul style="list-style-type: none"> ■ HDMI color space (YCbCr or sRGB; default is YCbCr) ■ 3G HD-SDI level (A or B; default is A) ■ Indicator light – select color scheme, enable/disable, set behavior in standby mode ■ Codec control mode | System (DIP switches tab) |
| Read-outs of the camera's hardware switch settings | System (DIP switches tab) |
| Access management <ul style="list-style-type: none"> ■ Guest access ■ Account passwords ■ Idle session time-out ■ Telnet access enabled/disabled ■ Advanced security settings | Security |
| IP streaming settings <ul style="list-style-type: none"> ■ Quality, resolution, and frame rate ■ RTSP streaming URL and path ■ RTMP service provider configuration | Streaming |
| Network settings <ul style="list-style-type: none"> ■ Hostname ■ DHCP or static addressing ■ Static: IP address, subnet mask, gateway | Networking |
| Time zone and NTP server (source for system time/date) | Networking |
| Information about the camera location Help desk phone number for end users | Room Labels |
| Vaddio Technical Support contact information | Help |
| Diagnostic logs | Diagnostics |

System Administration

Administrative tasks are on these pages of the web interface:

- Networking – Ethernet configuration, time zone and NTP server
- Security – Passwords, guest access, other IT security-related settings
- Room Labels – Helpful information to display in the web interface
- System – Controls to reboot, reset to factory defaults, and run firmware updates, read the rear panel switches, and access the soft DIP switches
- Help – Contact information for Vaddio Technical Support and a link to the documentation for this product
- Diagnostics – Logs to help Vaddio Technical Support troubleshoot issues

Note

Vaddio's RoboSHOT series cameras all have very similar web interfaces. Some of the screen shots in this manual may be from other models in the RoboSHOT series.

Some of the screen shots in this manual are from the RoboSHOT 20 UHD web interface; some are from the RoboSHOT 40 UHD web interface. Any differences will be noted.

For Non-DHCP Environments: Configuring the Device with a Static IP Address for Initial Installation

NETWORKING PAGE

Caution

Consult your IT department before editing network settings. Errors in network configuration can make the camera inaccessible from the network. Do not change DHCP/Static addressing, IP address, subnet mask, or gateway unless you are very familiar with the characteristics and configuration of the network where you install the camera.

By default, the camera is set to DHCP and you do not need to configure it with a static IP address. However, if no DHCP server is available to automatically assign an address, the camera will use the default IP address of 169.254.1.1. If this is the case, you may need to follow this procedure.

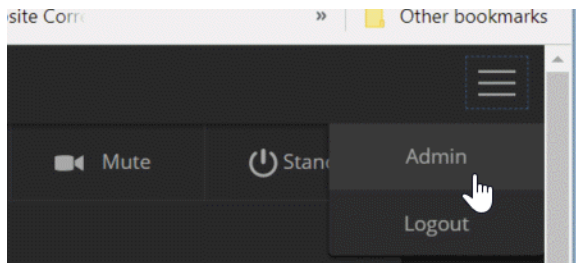
If you install more than one camera on a network that does not automatically assign IP addresses (a non-DHCP network), follow this procedure to prevent IP address conflicts.

Note

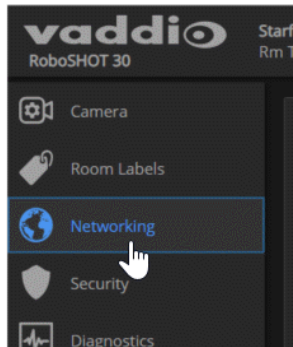
If the camera is currently at an IP address other than 169.254.1.1, skip this section unless you are instructed to configure the camera with a static IP address.

To access the camera's Networking page during installation (skip this procedure if the camera has already been in service on this network):

1. Connect the camera according to the connection diagram, but *do not connect the camera to the network*.
2. Connect the network port on the camera to the network port on a computer. Depending on the computer, you may need a crossover cable.
3. On the computer, open a browser and access the camera's web interface at `http://169.254.1.1`.
4. Log in as admin. The default password is **password**.

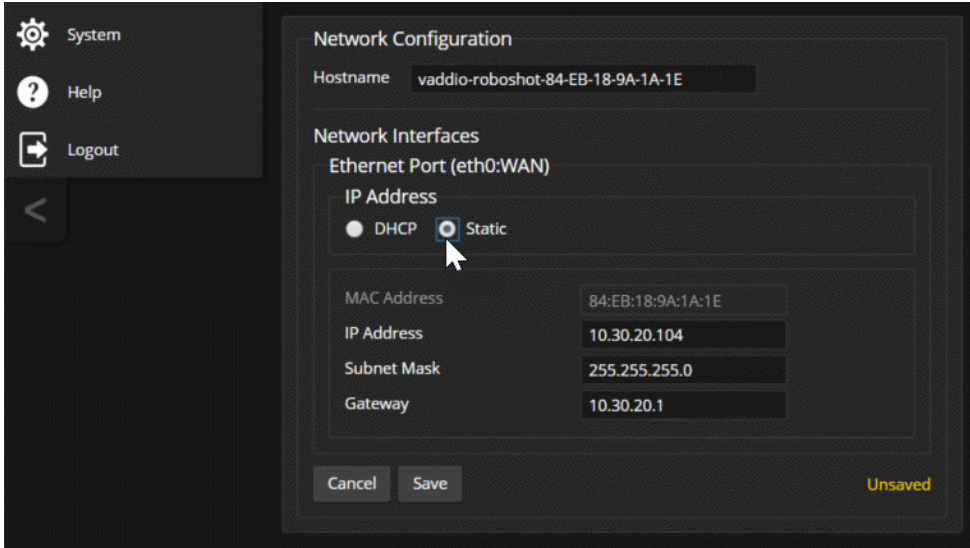


5. Navigate to the Networking page.



To configure the camera with a static IP address:

1. Work with your IT department to determine the correct IP address, subnet mask, and gateway to assign.
2. On the Networking page, set IP Address to Static.
3. Enter the IP address, subnet mask, and gateway as directed by the IT staffer; then save your work.



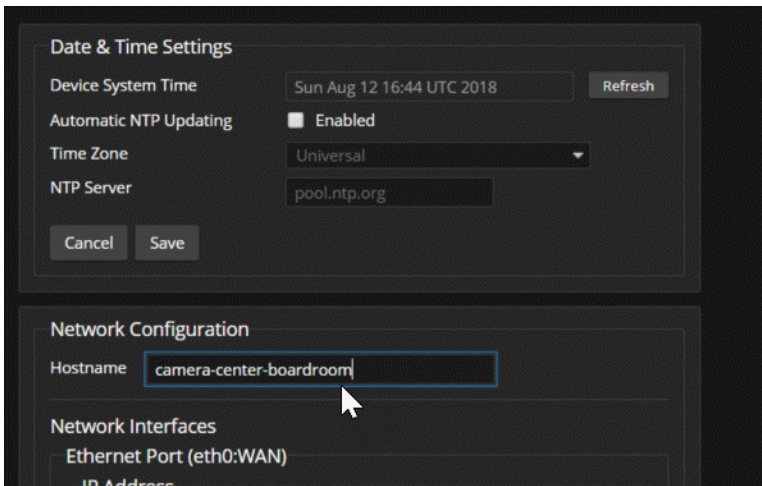
The camera is now ready to be connected to the network.

Changing the Camera's Hostname

NETWORKING PAGE

If your network supports hostname resolution, you may find it convenient to change the camera's hostname to something easy to remember, such as **camera-center-boardroom**.

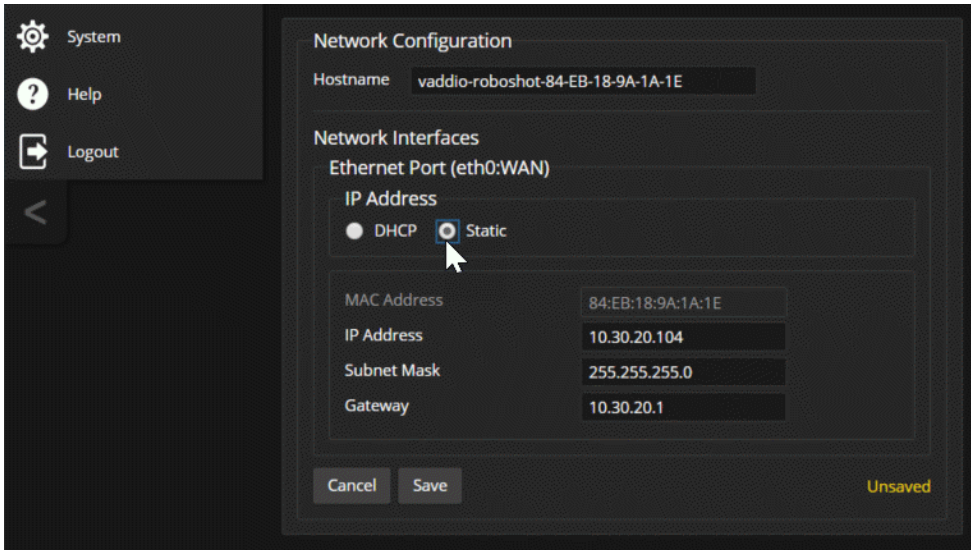
Work with your IT department to ensure that the new hostname conforms to the organization's naming conventions.



Optional For DHCP Environments: Changing from a DHCP Address to a Static IP Address

NETWORKING PAGE

In a network that assigns IP addresses automatically, the camera's IP address may change from time to time. To keep this from happening, set the IP address to Static. *Do not change the IP address, subnet mask, or gateway.*



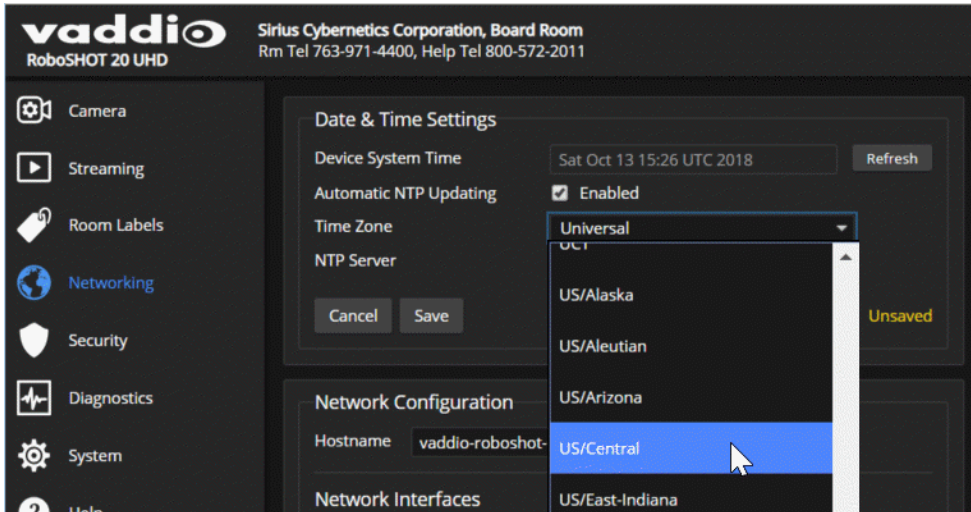
Specifying Time Zone and NTP Server

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. Select the desired time zone from the list.
3. If desired, specify the NTP server to use. Otherwise, use the default.

You may need to refresh the system time display.



Managing Access and Passwords

SECURITY PAGE

Set the camera according to your organization's security policies:

- Allow or deny access to the Camera screen without logging on (Allow Guest Access)
- Set whether inactive sessions log off automatically or not (Automatically Expire Idle Sessions)
- Change the password for the `admin` account
- Change the password for the `user` account
- Allow or disable access via Telnet (by default, access via Telnet is enabled)
- Require HTTPS for web access (by default, HTTP is also permitted)
- Allow or deny device discovery (allowed by default)

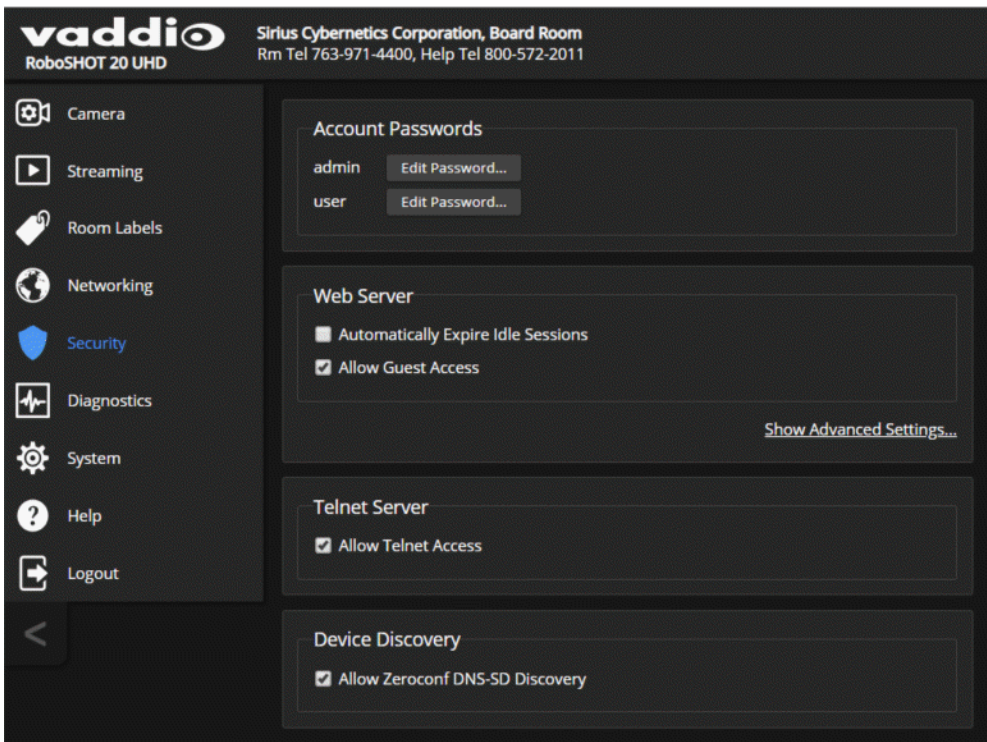
Some of these capabilities may be absent if the camera has not been updated with the latest firmware.

Note

Consult your network security specialist before changing any of these settings.

Note

For best security, Vaddio strongly recommends changing the user and admin passwords from the default. Using the default passwords leaves the product vulnerable to tampering.



Disabling Telnet Access

SECURITY PAGE

If your installation does not require camera access via Telnet, you may choose to disable the camera's internal Telnet server.

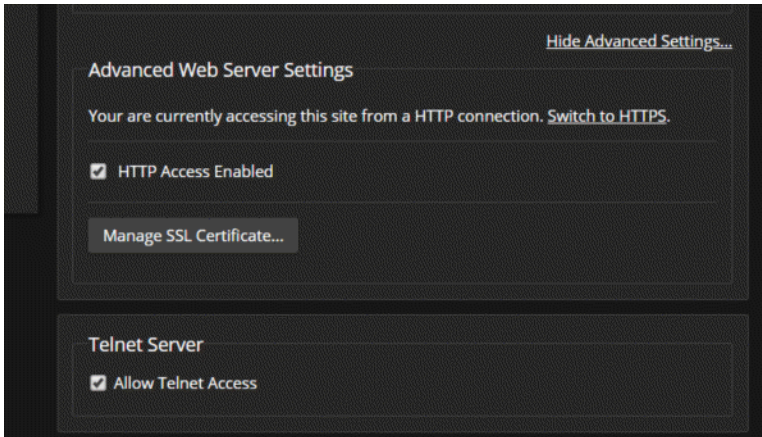
Enabling or Requiring HTTPS

SECURITY PAGE

By default, the web interface uses the HTTP protocol. You can configure the camera's web interface to require a secure HTTPS connection instead.

Caution

Consult your network security professional to manage the camera's SSL certificate. Do not make any changes in the Certificate or Private Key text boxes without guidance from your organization's network security professional.



1. Select Show Advanced Settings. The advanced options open.
2. To switch to a secure HTTPS connection, select Switch to HTTPS.

Note

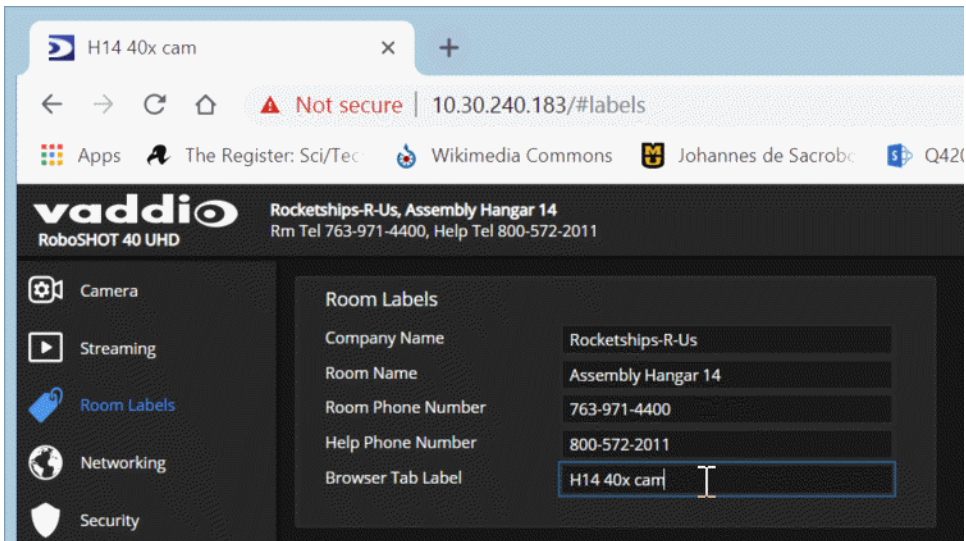
Your browser may present messages warning you that your connection is not secure, because the site's certificate is not valid. This happens when HTTPS is used but no SSL certificate is installed.

3. To require HTTPS connections, clear the box labeled HTTP Access Enabled. The camera's web interface will only be available via an HTTPS connection.

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.



Saving (Exporting) or Restoring (Importing) a Camera Configuration

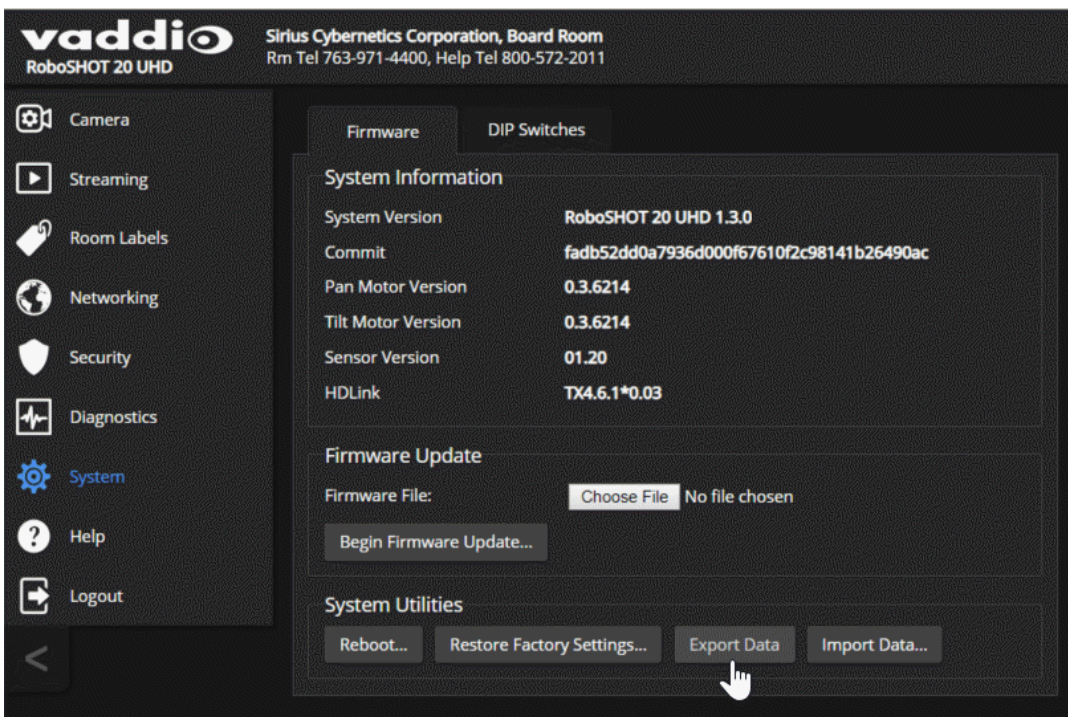
SYSTEM PAGE, FIRMWARE TAB

You can import a configuration to several cameras if you need to configure them the same way. Cameras must be of the same model, and must have a compatible firmware version installed. Configuration data does not include passwords or unique information such as hostname.

1. Configure the first camera.
2. Export its configuration (Export Data button). The export downloads to your computer as a .dat file. The filename is the camera's hostname.
3. Import the configuration to the other cameras (Import Data button in each camera's web interface).

Note

If the camera is using an older firmware version, it may be unable import a configuration that was exported from a camera using a different version of firmware.



Installing a Camera Firmware Update

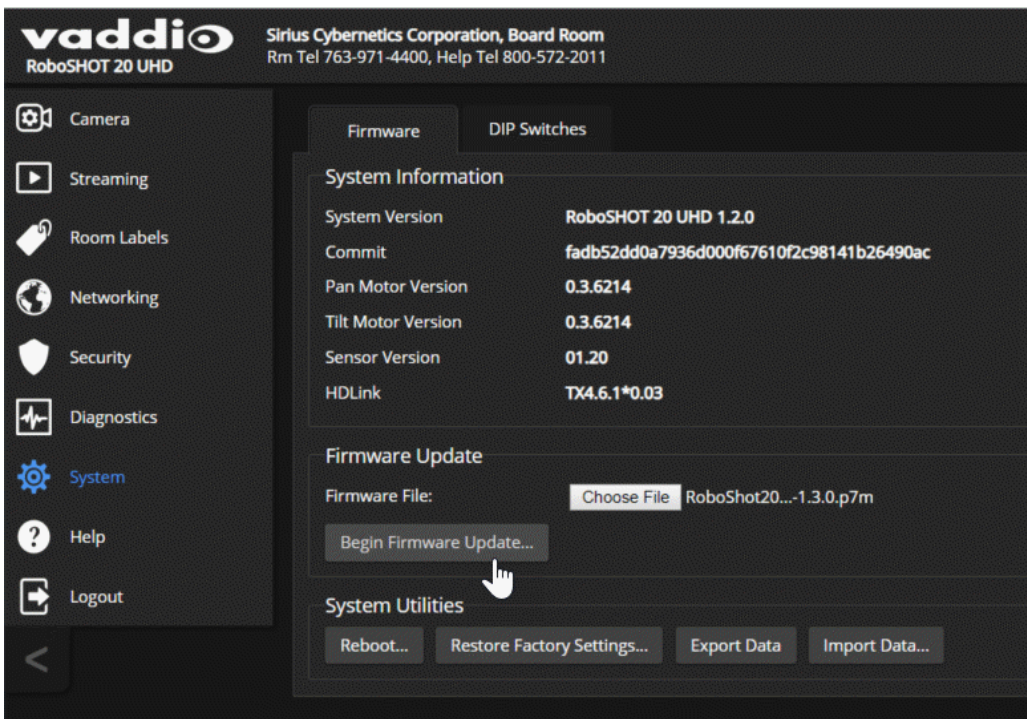
SYSTEM PAGE, FIRMWARE TAB

1. Download the firmware and its release notes.
2. Select Choose File, then browse to the downloaded firmware and select it. The filename ends with .p7m.
3. Select Begin Firmware Update.
4. Read and understand the information in the Confirm dialog box. It's dull, but it could save you some time and aggravation.
5. Select Continue. A progress message box opens and the indicator light on the front of the camera turns yellow. If the update process presents warnings or error messages, read them carefully.

The camera reboots when the update is complete.

Caution

The camera must remain connected to power and to the network during the update. Interrupting the update could make the camera unusable.

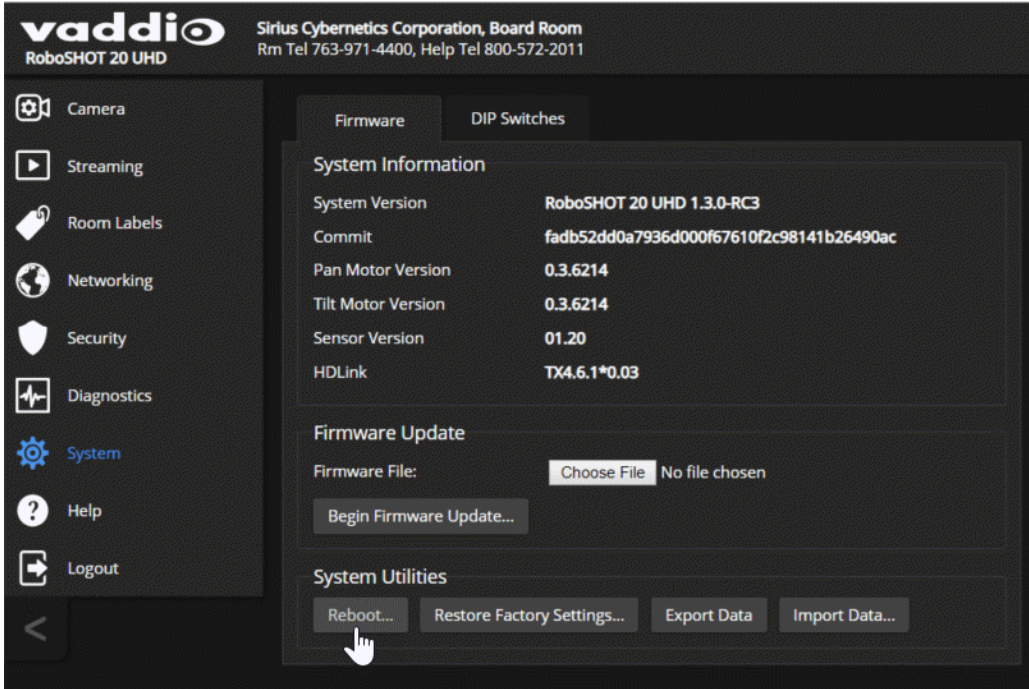


Rebooting the Camera

SYSTEM PAGE, FIRMWARE TAB

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

In the System Utilities section, select Reboot.

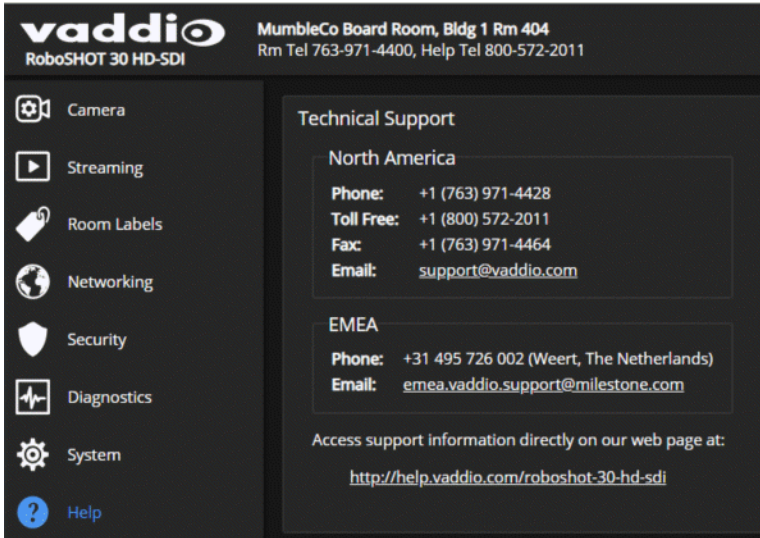


Contacting Vaddio Technical Support

HELP PAGE

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

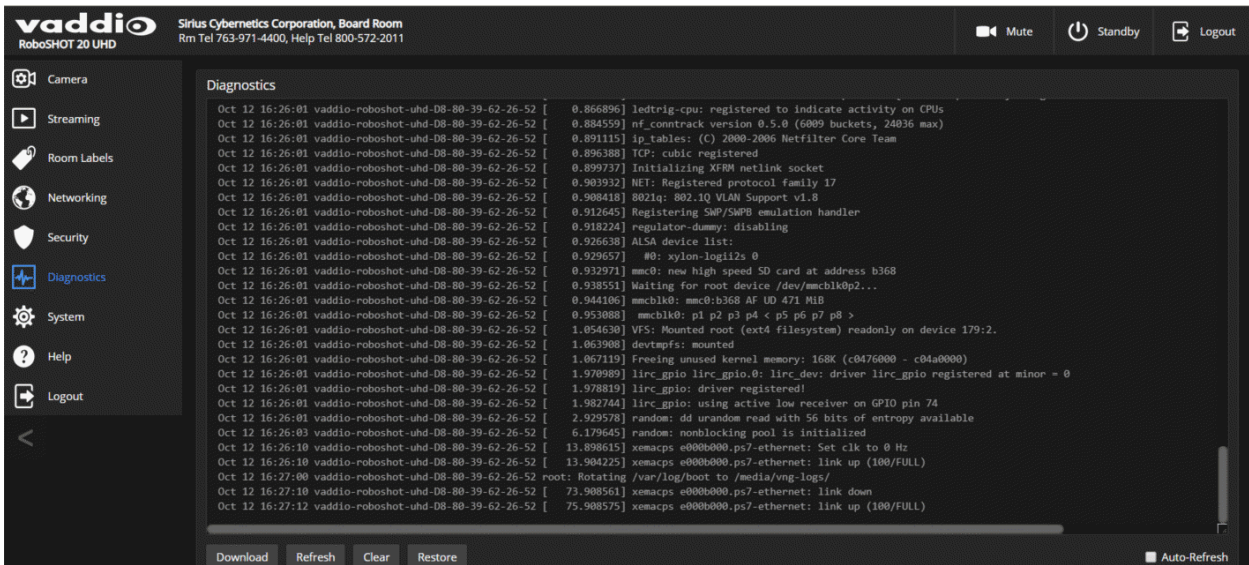
You'll find information for contacting Vaddio Technical Support on the Help page. The link for support information varies depending on the camera model.



Accessing the Diagnostic Logs

DIAGNOSTICS PAGE

When you contact Vaddio technical support, your support representative may ask you to download and email the log file available from the Diagnostics page.



Configuring Camera Behavior

Camera configuration tasks are available on these pages:

- Camera – Color and lighting adjustments, presets (including custom Home), and real-time camera control
- Streaming – Resolution, quality, bandwidth, and more
- System (DIP Switches tab) – Camera identification (Camera 1, 2, or 3 on the remote), status light behavior, codec control mode, and more

Note

Vaddio's RoboSHOT series cameras all have very similar web interfaces. Some of the screen shots in this manual may be from other models in the RoboSHOT series.

Some of the screen shots in this manual are from the RoboSHOT 20 UHD web interface; some are from the RoboSHOT 40 UHD web interface. Any differences will be noted.

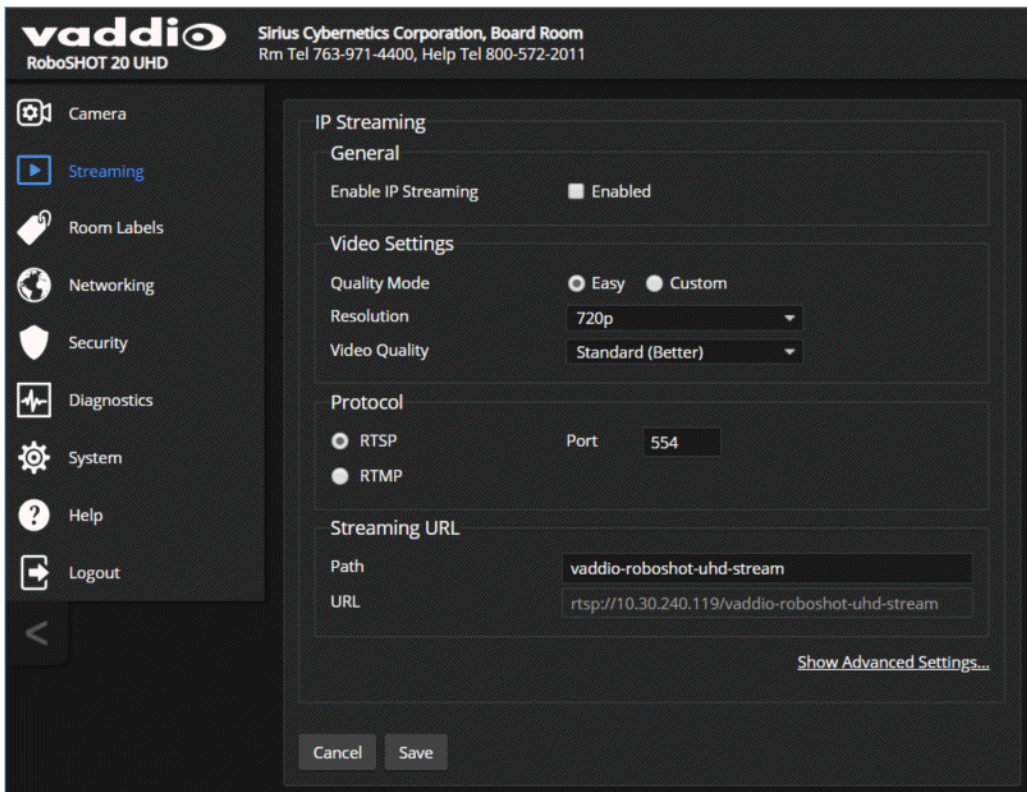
Configuring IP Streaming

STREAMING PAGE

IP streaming is enabled by default. *Just as your camera outputs video unless you mute it, the camera also streams except when you disable the stream.*

Two IP streaming protocols are available: RTSP and RTMP.

- RTSP is the camera's default protocol for IP streaming. This delivers an IP stream that people can access from your network using a media player.
- RTMP streaming sends a stream to a content service provider. No local preview is available. To use RTMP streaming, you must have an account with a streaming service.

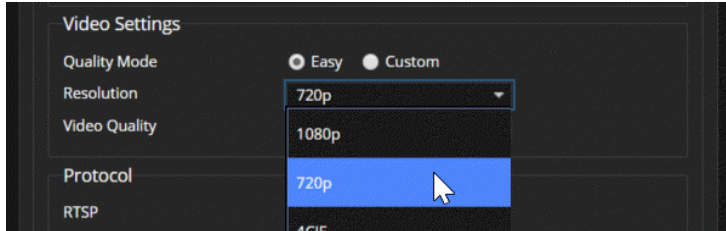


Setting up RTSP Streaming in Easy Mode

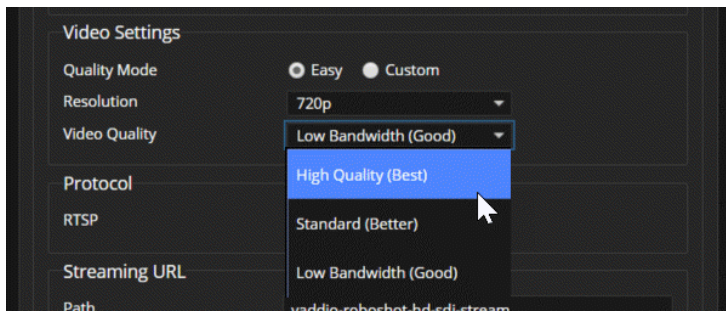
STREAMING PAGE

If you are not sure how to configure streaming settings, start with the Easy mode defaults. This configures most settings automatically.

1. Select Easy quality mode.
2. Select the desired IP streaming resolution. This determines the size of the window in which the stream is displayed.



3. Easy quality mode only: Select Video Quality.



4. Save your changes.

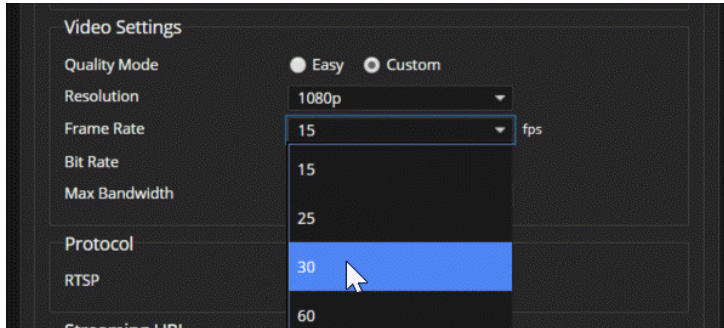
Pro Tip

If streaming video quality is poor, try a lower resolution or bandwidth.

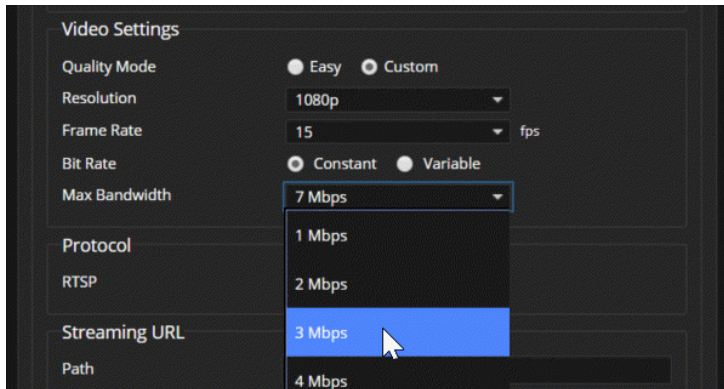
Setting up RTSP Streaming in Custom Mode

STREAMING PAGE

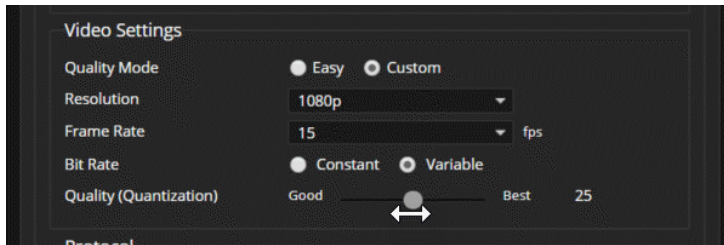
1. Select Custom quality mode.
2. Select the desired resolution.
3. Select the desired IP streaming frame rate.



4. Select Constant or Variable bit rate.
5. Constant bit rate only: Set Max Bandwidth.



6. Variable bit rate only: Set the Quality (Quantization) slider.



7. Save your changes.

RTSP Streaming Protocol and URL

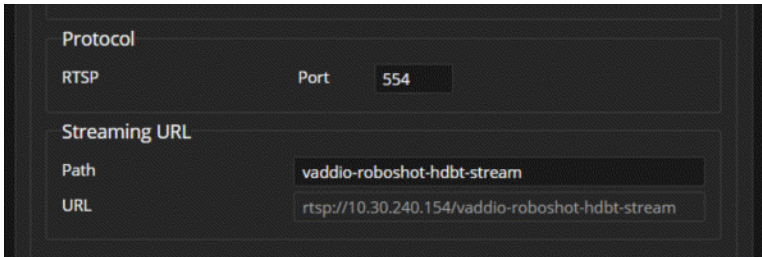
STREAMING PAGE

RTSP is the default streaming protocol. When IP streaming is enabled, the RTSP stream is automatically available at the streaming URL shown.

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

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

URL: The location where the stream can be viewed. This will change if you edit the path.



Your camera will present somewhat different information from this image, as the streaming URL incorporates the camera's model and IP address.

To view the RTSP stream:

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

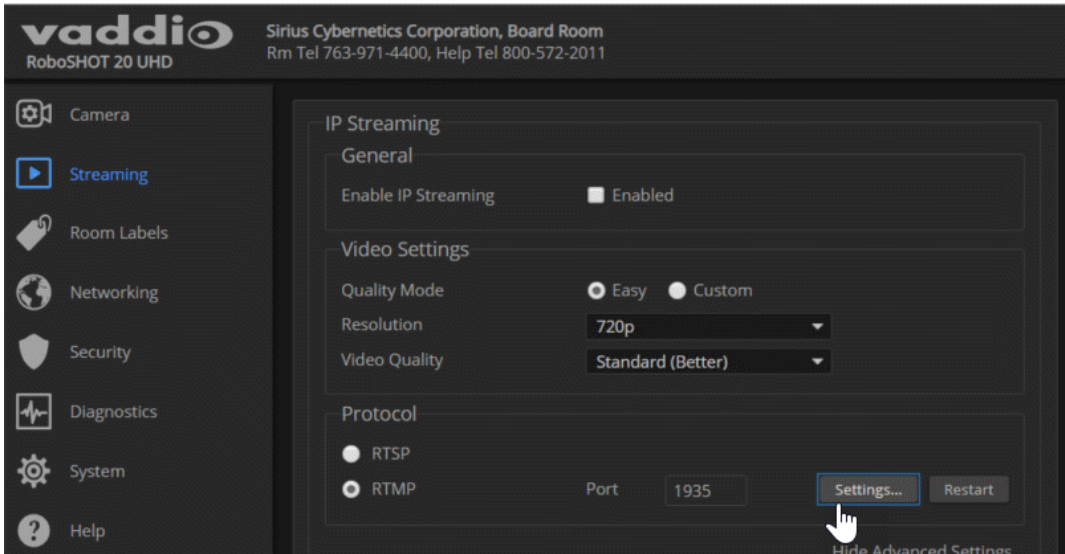
Configuring RTMP Streaming

STREAMING PAGE

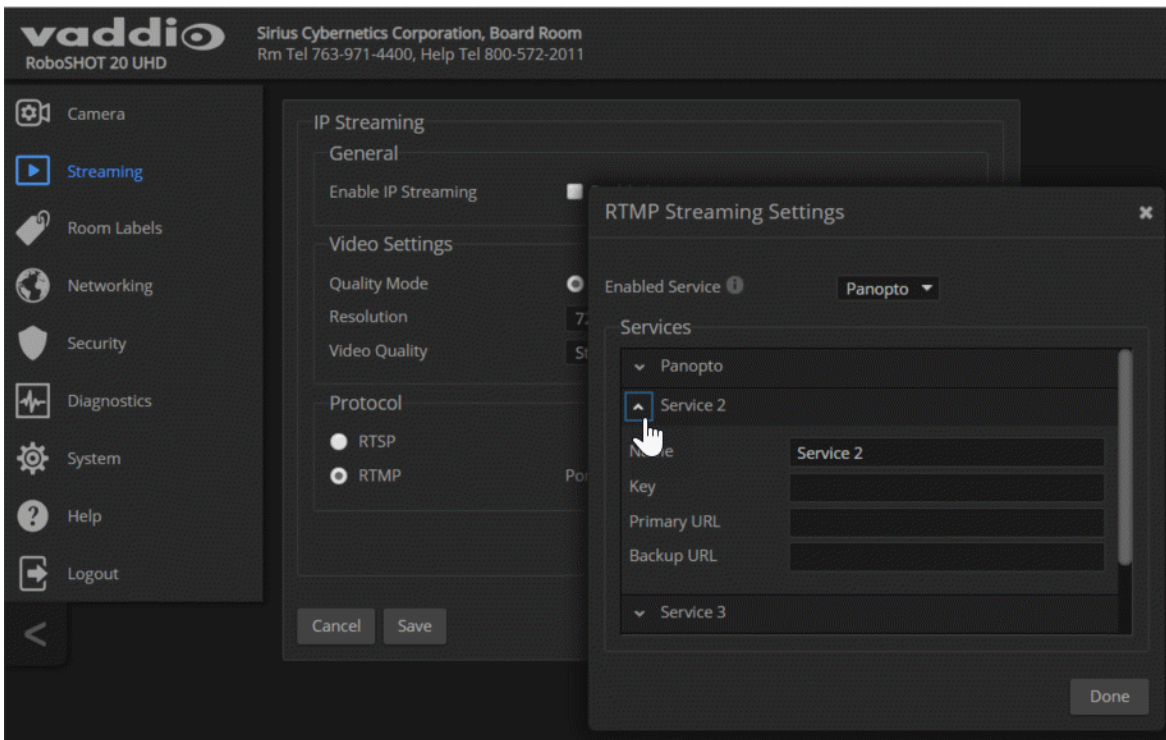
To use RTMP streaming, you must have an account with a streaming service.

To configure an RTMP streaming service:

1. Select RTMP streaming, and select Settings.



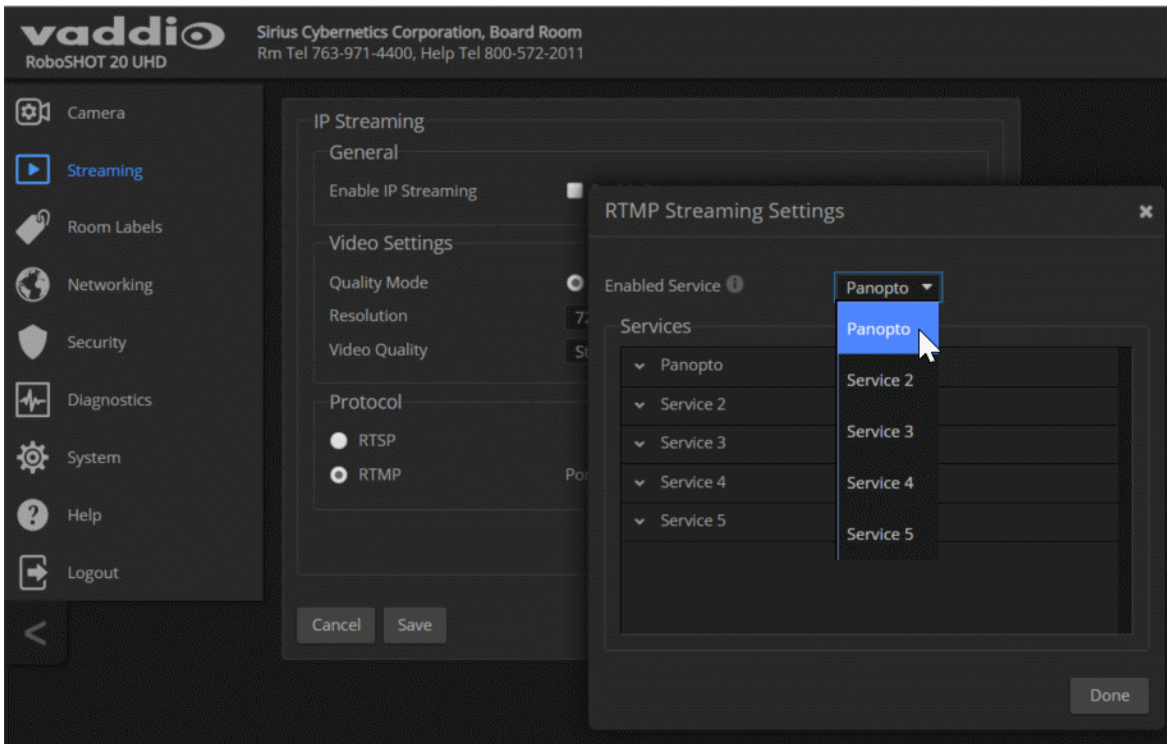
2. Expand the information box for the service.



3. Enter the name of the service.
4. Paste in the key and URL(s) provided by the service.

To select the enabled RTMP streaming service:

Expand the list of available streaming services, and select the one to use.



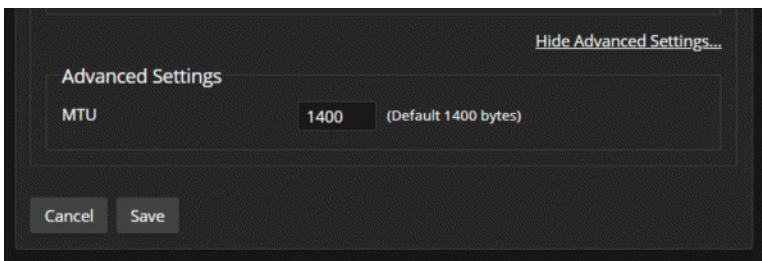
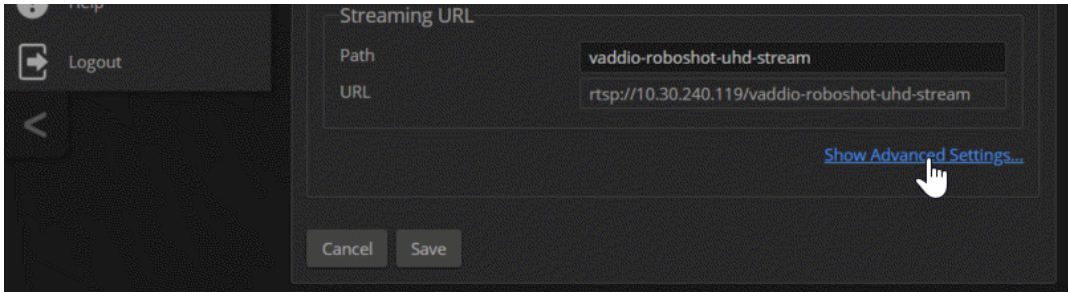
Note

When RTMP streaming is selected and a service is configured, the camera streams to that service until you stop the stream.

Advanced: Changing MTU

STREAMING PAGE

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



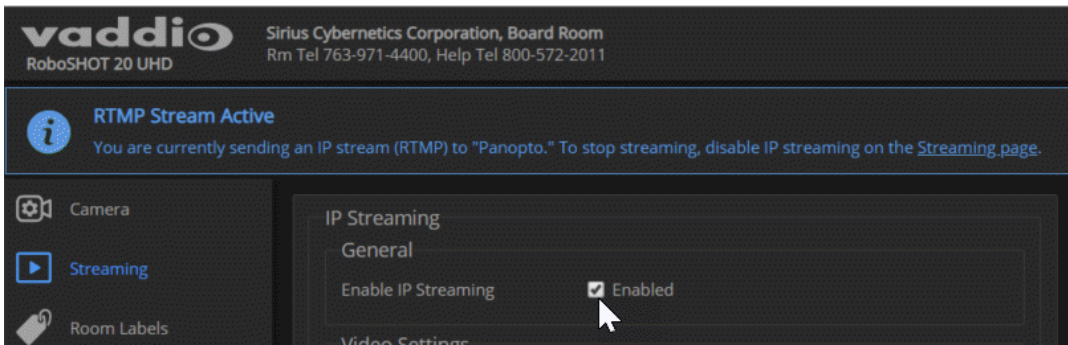
Stopping the IP Stream

STREAMING PAGE

Just as the camera outputs video unless you mute it or put it in standby, the camera also streams except when you disable the stream.

Options:

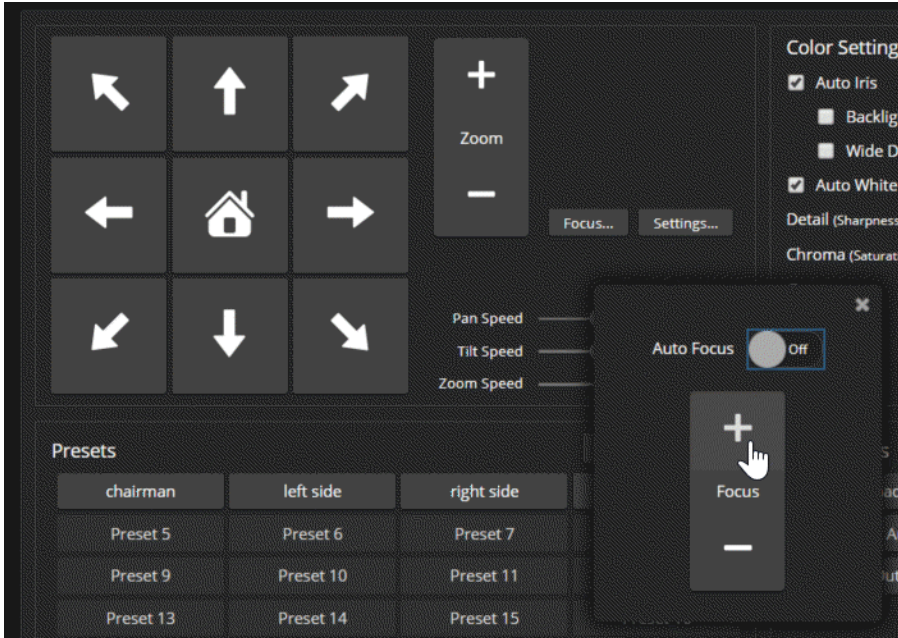
- **To stop IP streaming entirely:** Clear the Enable IP Streaming check box.
- **To stop the video portion of the stream, but leave the stream running:** Mute the video. This also stops the video locally, so the connected display is blank.
- **To stop sending the stream to a content service provider but make it available as a network stream:** Change from RTMP to RTSP streaming.



Adjusting the Focus

CAMERA PAGE

Open the Focus control to select Auto-focus, or set manual focus with the + (near) and – (far) buttons. I know you already understand this, but I’m going to say it anyway: The + and – buttons don’t work when Auto Focus is selected.

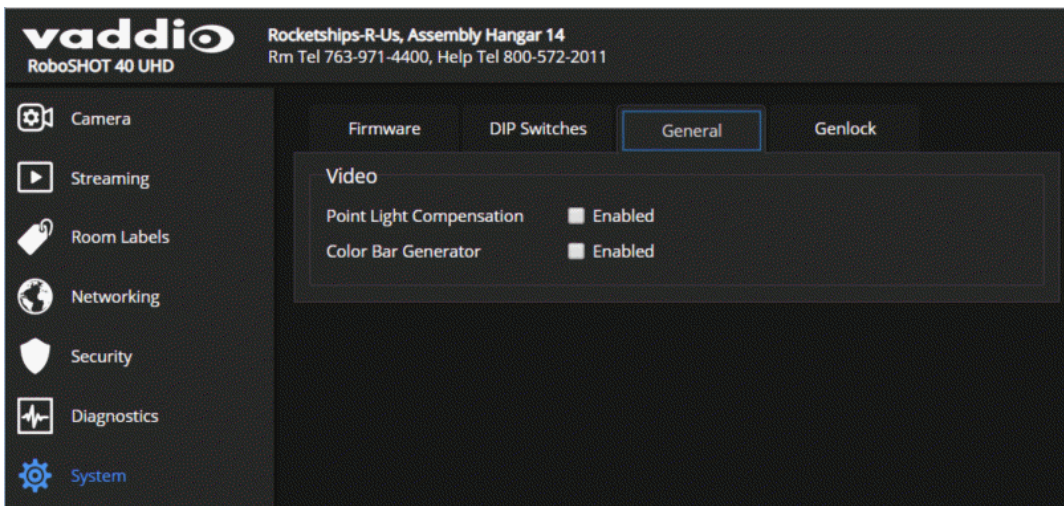


For users who are not logged in as admin, Focus control is available via the IR Remote Commander only.

Defining Video Mute Behavior for the RoboSHOT 40 UHD Camera

By default, Vaddio cameras send black video when video mute is selected.

To set the RoboSHOT 40 UHD camera to send a pattern of color bars instead, open the General tab on the System page and check the Color Bar Generator Enabled box.



Lighting and Color Adjustments: Setting up Custom CCU Scenes

CAMERA PAGE

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 presets 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.

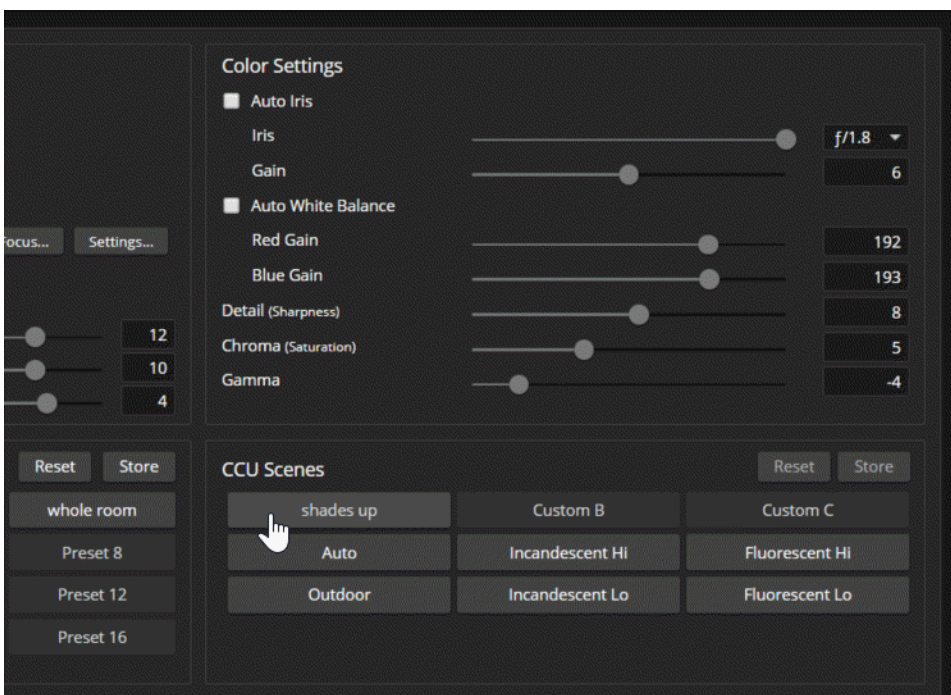
When adjusting for the room lighting, start with a factory-defined CCU scene and adjust as needed. After you customize the camera's color and lighting settings, you can save the adjustments as a custom CCU scene.

Note

Color adjustments are not available when the Auto CCU scene is selected.

To make the initial adjustments:

Click one of the active CCU scene buttons to load a CCU scene into the camera.



The [Lighting and Image Quality Cheat Sheet](#) and the [Color Adjustment Cheat Sheet](#) may be helpful.

Lighting Adjustments

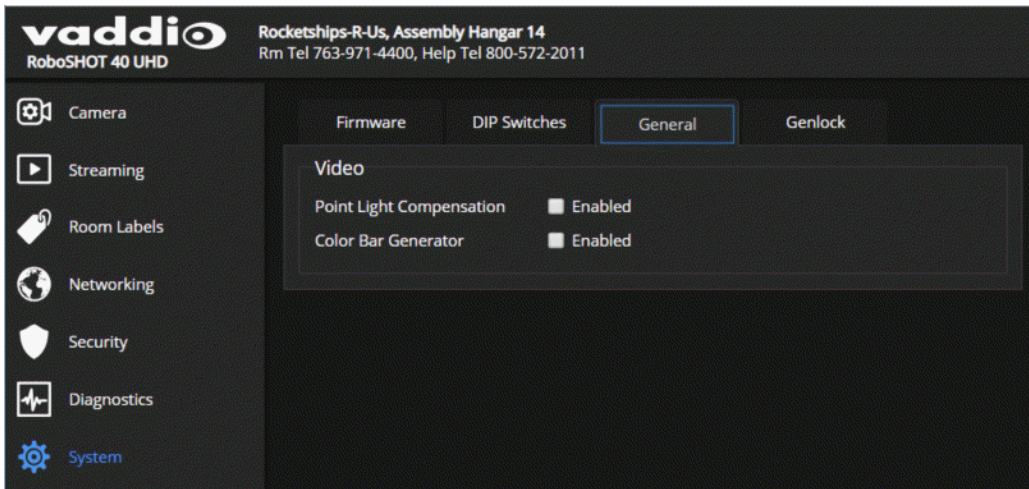
CAMERA PAGE AND SYSTEM PAGE (GENERAL TAB)

The camera provides settings to compensate for common lighting problems.

Backlight Compensation reduces contrast to adjust for bright light behind the main subject of the shot. Use this if the subject is in front of a window, projector screen, or other bright area and appears as a silhouette. This setting can't be used with Wide Dynamic Range.

Wide Dynamic Range automatically darkens bright areas and brightens dark areas to provide a more properly exposed image in challenging lighting conditions. This setting can't be used with Backlight Compensation.

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. *This setting is only available on the RoboSHOT 40 UHD. It is on the General tab of the System page.*



Fine-Tuning Image Quality and Color

CAMERA PAGE

Fine-tune the color and lighting as needed using the Color Settings controls.

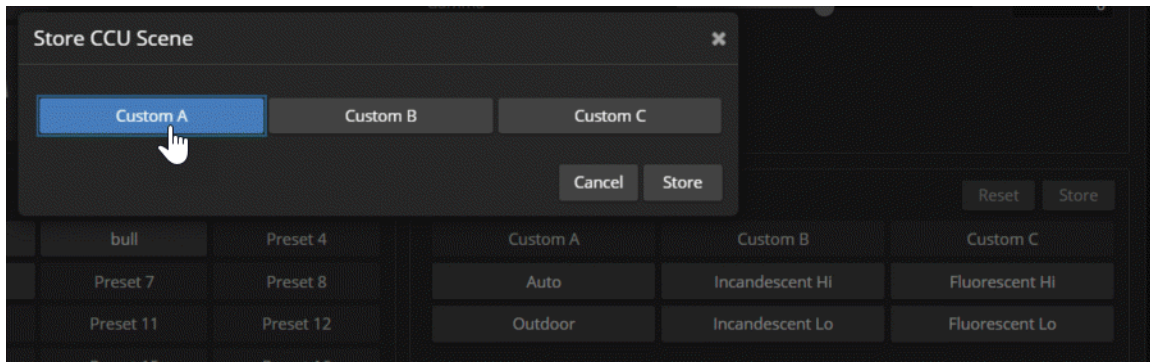
- **Auto Iris** allows the camera to compensate automatically for the light level.
- **Auto White Balance** adjusts color automatically. Red gain and blue gain controls are not available when Auto White Balance is selected.
- **Red Gain** and **Blue Gain** provide manual color adjustment.
- **Detail** adjusts the image sharpness. If the video looks grainy or “noisy,” try a lower Detail setting. (As in conversation, too much detail is bad.)
- **Chroma** adjusts the color intensity.
- **Gamma** adjusts the range (grey density) between bright areas and shadows.

If you change Red Gain or Blue Gain and you don't like the results, start over by selecting and then deselecting Auto White Balance.

Saving Color and Lighting Settings

CAMERA PAGE

1. Adjust lighting, image quality, and color.
2. When the scene looks the way you want it to, click Store CCU Scene.
3. In the Store CCU Scene dialog box, select which custom scene to store (Custom A, B, or C) and select Save.



4. Optional: Name the new scene by right-clicking its button. A dialog box opens. Enter the name and save it.


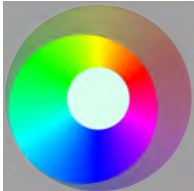
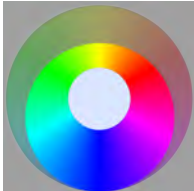


Lighting and Image Quality Cheat Sheet

Here are some tips for using the CCU settings for lighting and image quality. For more detailed information on each setting, see [Lighting Adjustments](#) and [Fine-Tuning Image Quality and Color](#).

| 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 |
| Small sources of bright light (point sources) make it hard to see details in areas with less intense lighting. | Enable Point Light Compensation (RoboSHOT 40 UHD only) |
| 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 |

Color Adjustment Cheat Sheet

Here are some tips for using the color-related CCU settings. For more detailed information on each setting, see [Fine-Tuning Image Quality and Color](#).

| 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 <ul style="list-style-type: none"> ■ adjust Red Gain (decrease for less red, increase for less green) ■ adjust Blue Gain (decrease for less blue, increase for less yellow) |
| <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Too much red</p>  </div> <div style="text-align: center;"> <p>Not enough red</p>  </div> <div style="text-align: center;"> <p>Too much blue</p>  </div> <div style="text-align: center;"> <p>Not enough blue</p>  </div> <div style="text-align: center;"> <p>Balanced</p>  </div> </div> | |

If you are adjusting for lighting conditions that are likely to recur, you can save your adjustments as a custom scene. See [Lighting and Color Adjustments: Setting up Custom CCU Scenes](#).

Setting the Custom Home Position and Other Preset Shots

CAMERA PAGE

The camera's default home position is 0° pan and 0° tilt; you can set a different home position.

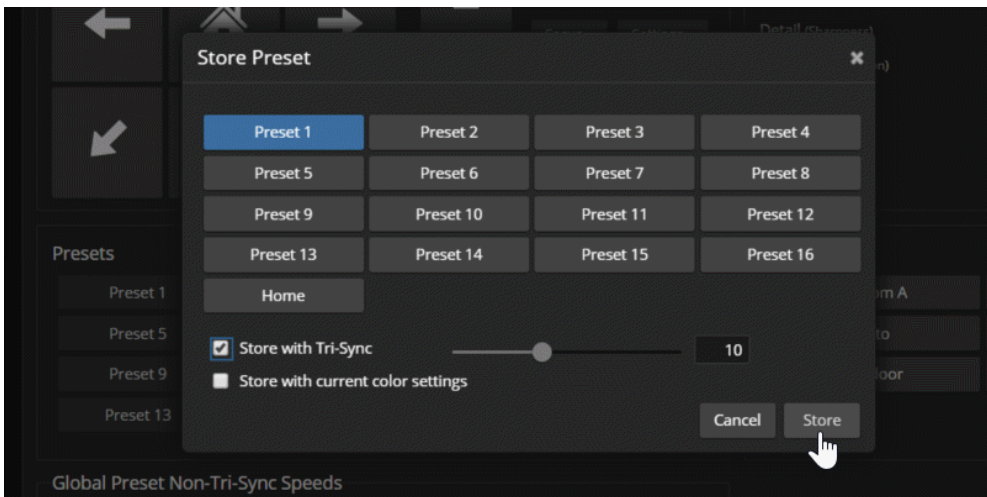
You can also define other presets, for shots that you will want to use repeatedly. Presets may include lighting and color settings and may specify Tri-Synchronous Motion or global preset speed settings.

Note

Storing a preset overwrites any information that was previously associated with that preset. The Store Preset dialog does not show which presets have already been defined. Vaddio recommends renaming presets when you store them.

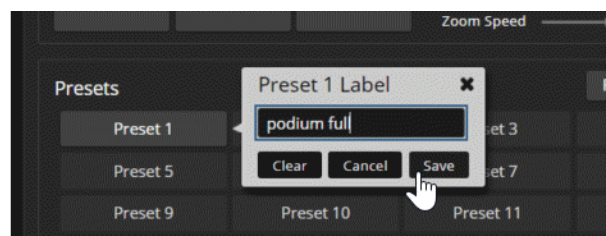
To store a preset or custom home position:

1. Set up the shot.
2. Select Store to open the Store Preset dialog.
3. Select the preset to define, then save it.



Renaming Presets and Custom CCU Scenes

You can rename presets and custom scenes. The process is the same for both. Right-click the button for the custom scene or preset, and edit the label.

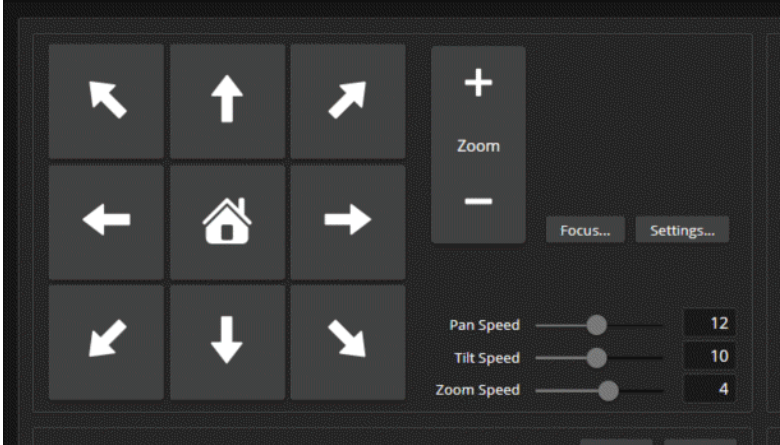


Setting the Speed for Manual Movements

CAMERA PAGE

The Pan Speed, Tilt Speed, and Zoom Speed sliders control how fast the camera moves in response to the direction and zoom controls on the IR remote and in the web interface. These speeds are also used in moving to presets saved without Tri-Synchronous Motion information.

Use the arrow and Zoom controls to check camera speed, and use the Speed sliders to adjust as needed.

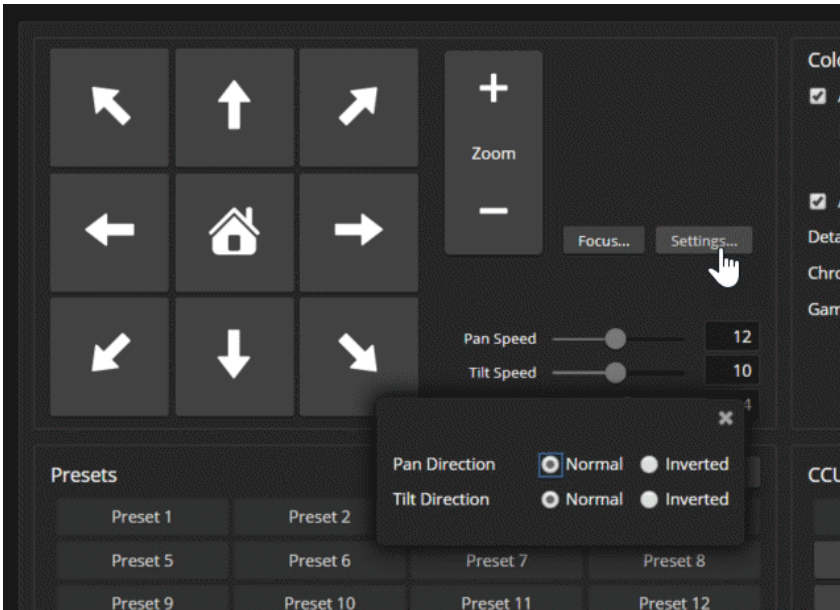


Setting the Direction for Camera Movements

CAMERA PAGE

By default, the arrow buttons on the remote and in the web interface show the direction you would see the camera move if you were looking the same direction as the camera. If a person facing the camera is controlling it with the remote, using the right arrow pans the camera to the person's left.

To make the arrow buttons indicate camera movement from the perspective of a person facing the camera, open the Settings control and invert the pan direction.



Genlock Settings and Adjustments – RoboSHOT 40 UHD Only

SYSTEM PAGE, GENLOCK TAB

The web interface presents error messages if the camera is not connected to a sync signal source.

The table of valid resolutions shows which resolution is currently selected on the camera.

Genlock

Input Sync Present ✔ Resolution Detected: NTSC
 480i/59.94

Input Sync Valid ✔ Valid

Vertical Offset Lines

Horizontal Offset Pixels

Frame % Offset -50% +50%

| Rotary | Camera Resolution | Tri-State Sync | | NTSC Black Burst | PAL Black Burst |
|--------|-------------------|----------------|----------|------------------|-----------------|
| | | 1080i/59.94 | 1080i/50 | | |
| 0 | 1080p/59.94 | ✔ | | ✔ | |
| 1 | 1080p/50 | | ✔ | | ✔ |
| 2 | 1080i/59.94 | ✔ | | ✔ | |
| 3 | 1080i/50 | | ✔ | | ✔ |
| 4 | 1080p/29.97 | ✔ | | ✔ | |
| 5 | 1080p/25 | | ✔ | | ✔ |
| 6 | 720p/59.94 | ✔ | | ✔ | |
| 7 | 720p/50 | | ✔ | | ✔ |
| 8 | 2160p/29.97 | ✔ | | ✔ | |
| 9 | 2160p/25 | | ✔ | | ✔ |

Reading the Camera's Switches

SYSTEM PAGE, DIP SWITCHES TAB

Open the DIP Switches tab to see the camera's current switch settings and configure certain camera behaviors.

Note:

Sorry, you have to physically move the physical switch(es) on the back of the camera if you need to change them.

This screen shot shows the DIP Switches tab for the RoboSHOT 20 UHD. Where this camera has rear DIP switches, the RoboSHOT 40 UHD camera has a second array of soft DIP switches with the same functions and labels.

vaddio Sirius Cybernetics Corporation, Board Room
Rm Tel 763-971-4400, Help Tel 800-572-2011
RoboSHOT 20 UHD

Camera | Streaming | Room Labels | Networking | Security | Diagnostics | **System** | Help | Logout

Firmware | **DIP Switches**

Soft DIP Switches

| | | | | | |
|-------------|------------|--------------------------|---------|-----------------------|------------------------|
| Color YCbCr | 3G Level A | Pro A/V LED Color Scheme | LED On | Standard Control Mode | Enable LED in Standby |
| Color sRGB | 3G Level B | UC LED Color Scheme | LED Off | Codec Control Mode | Disable LED in Standby |

Rear DIP Switches

| | | | | | | |
|------|------|------|------|-------|----------------|----------------|
| | SW1 | SW2 | IR 1 | IR On | Image Flip Off | BAUD 9600 bps |
| IR 1 | UP | UP | SW1 | SW2 | SW3 | SW4 |
| IR 2 | DOWN | UP | IR 2 | IR 3 | IR Off | Image Flip On |
| IR 3 | UP | DOWN | | | | BAUD 38400 bps |

Rear Rotary Switch

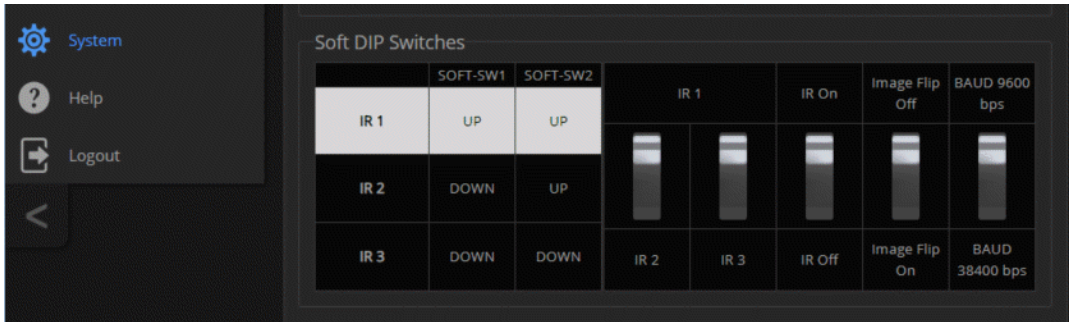
| | | | |
|---|-------------|---|-------------|
| 0 | 1080p/59.94 | 8 | 2160p/29.97 |
| 1 | 1080p/50 | 9 | 2160p/25 |
| 2 | 1080i/59.94 | A | |
| 3 | 1080i/50 | B | |
| 4 | 1080p/29.97 | C | |
| 5 | 1080p/25 | D | |
| 6 | 720p/59.94 | E | |
| 7 | 720p/50 | F | |

Software Switch Settings – RoboSHOT 40 UHD Only

On the RoboSHOT 20 UHD, these settings are available using the physical switches on the back of the camera. See [Camera Behavior Settings for RoboSHOT 20 UHD](#).

SYSTEM PAGE, DIP SWITCHES TAB

- **IR Settings (Camera ID)** – The IR Remote Commander can control up to three cameras in the same room with different IR frequencies. Use the IR Settings switches to select the frequency to identify the camera as camera 1, camera 2, or camera 3. Refer to the settings table beside the soft DIP switches.
- **IR On/IR Off** – Enable/disable the camera's IR sensors. The camera does not respond to the IR remote if IR is off.
- **Image Flip** – If mounting the camera upside-down, set IMAGE FLIP ON.
- **Baud Rate** – RS-232 serial communication rate (9600 bps or 38400 bps), for communication with a controller via a OneLINK device.

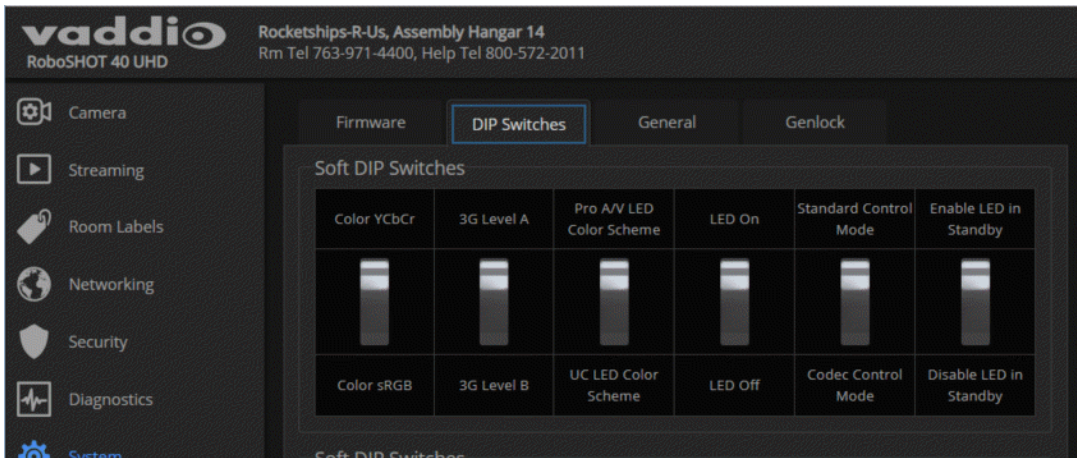


Software Switch Settings – Both Models

SYSTEM PAGE, DIP SWITCHES TAB

The DIP Switches tab of the System page provides access to these features:

- **Color** – YCbCr (default) or sRGB.
- **3G Level A/Level B** – Default is Level A.
- **LED color scheme** – Status light color codes for Pro AV (broadcast, the default setting) or UC (unified conferencing).
- **LED on/off** – When the LED is set to OFF, it remains off even when the camera is sending video.
- **Standard Control Mode/Codec Control Mode** – Select Codec Control Mode if using the camera with a third-party codec.
- **Enable LED in Standby** – When the LED is enabled in standby mode, it illuminates purple to show that the camera is in standby but connected to power. When the LED is disabled in standby mode, it is only on when the camera is active (sending video or updating firmware).



Operating the Camera from the Web Interface

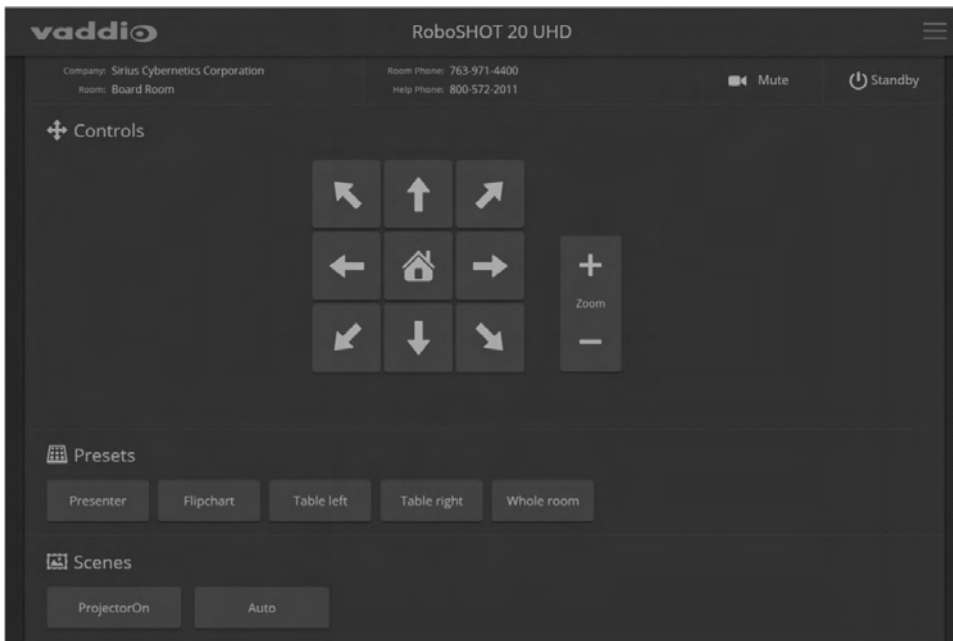
CONTROLS PAGE

The Controls page does not require administrative access. If guest access is enabled, you do not need to log in to access this page. If guest access is disabled, you will need to log in as `user`.

The Controls page provides most of the same controls as the IR Remote Commander.

- Move to camera presets, if any have been stored
- Pan, tilt, zoom, or return it to its home position
- Put the camera in standby or bring it back to the ready state
- Select a custom lighting adjustment, if any have been stored

Since the web interface is specific to the camera you are working with, it does not offer camera selection.



Switching the Camera Off or On (Standby)

Use the Standby button to switch between low-power (standby) and ready states. On entering standby mode, the camera moves to its standby position and stops sending video.

Stop or Resume Sending Video (Mute)

Use the Mute button to stop sending live video without putting the camera in standby mode. When the video is muted, the camera sends a blue or black screen. If the camera is part of a conferencing system, this does not mute the audio.

Moving the Camera

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

Zooming In or Out

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



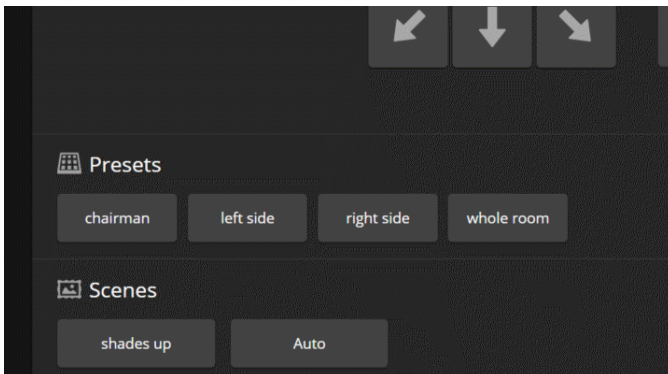
Moving the Camera to a Preset Position

Presets are camera shots that have been stored. They include pan, tilt, and zoom information, and may include color and speed information as well. If no presets are defined, the Controls page does not present the Presets section.

Use the Preset buttons to move the camera to any of its preset positions.

Adjusting the Color and Lighting

If any color and lighting adjustments (CCU scenes) have been saved, they are available in the Scenes area, along with the Auto setting. In most cases, the Auto setting is appropriate. This setting allows the camera to adjust to current conditions automatically.



Telnet Command Reference

Vaddio's Telnet command protocol allows external devices to control the camera. It is a high-level, text-based command line interface supported via Telnet session to the camera.

Network connectivity and a Telnet client are required; Telnet port 23 is used. Telnet sessions require the administrator account login.

In addition to the camera control commands, Telnet session management commands are available - help, history, and exit.

```

Telnet 192.168.1.66
BoardroomCamControl login: admin
Password:
Last login: Wed Mar 30 13:19:52 -0500 2016 on /dev/tty0
*****
Vaddio Interactive Shell
*
* WARNING: Authorized Access Only
*****
Welcome admin
? version
Serial      25120cea444ca884c4202702a214efba9e5e06c7
System Version PCC Premier 1.1.0-RC3
OK
? network settings get
Name      eth0 WDM
MAC Address 60:1E:C0:8D:89:58
IP Address 192.168.1.66
Netmask   255.255.255.0
VLAN      Disabled
Gateway   192.168.1.254
OK
  
```

Things to know about Telnet:

- The > character is the command prompt.
- Using a question mark as a command parameter will bring up a list of available subcommands or parameters. Example:

```

camera focus ?
camera focus
near      Focus the camera near
far       Focus the camera far
stop      Stop the camera focus
mode      Camera focus mode
  
```

- CTRL-5 clears the current serial buffer on the device.

Typographical conventions used in this manual:

- { **x** | **y** | **z** } – Choose x, y, or z. Example: camera led { on | off | toggle }
- <**variable**> – Substitute the desired value here. Example: camera ccu get <param>
- < **x** - **y** > – Valid range of values is from x through y. Example: camera ccu set detail <0 -15>
- [**parameter**] – Parameter is not required. Example: camera pan left [<speed>]

camera home

Moves the camera to its home position.

| | |
|----------|------------------------------------|
| Synopsis | camera home |
| Example | <pre>>camera home OK ></pre> |

camera pan

Moves the camera horizontally.

| | | |
|----------|---|---|
| Synopsis | camera pan { left [<speed>] right [<speed>] stop get set } | |
| Options | left | Moves the camera left. |
| | right | Moves the camera right. |
| | speed <1 – 24> | Optional: Specifies the pan speed as an integer (1 to 24). Default speed is 12. |
| | stop | Stops the camera's horizontal movement. |
| | get | Returns the camera's current pan position. |
| | set <position> | Sets the camera's absolute pan position in degrees, as a floating point value between approximately -150.00 and 150.00. This is the minimum range. Individual cameras may have an additional degree or two of travel before they reach their physical limits. If the value is out of range, the camera returns an error message and no motion occurs. |
| Examples | <pre>>camera pan left OK ></pre> <p>Pans the camera left at the default speed.</p> <pre>>camera pan right 20 OK ></pre> <p>Pans the camera right using a speed of 20.</p> <pre>>camera pan stop OK ></pre> <p>Stops the camera's horizontal motion.</p> | |

camera tilt

Moves the camera vertically.

| | | |
|----------|---|--|
| Synopsis | camera tilt{ up [<speed>] down [<speed>] stop get set} | |
| Options | up | Moves the camera up. |
| | down | Moves the camera down. |
| | speed <1 – 20> | Optional: Specifies the tilt speed as an integer (1 to 20). Default speed is 10. |
| | stop | Stops the camera's vertical movement. |
| | get | Returns the camera's current tilt position. |
| | set <position> | Sets the camera's absolute tilt position in degrees, as a floating point value between approximately -30.00 and 90.00. This is the minimum range; individual cameras may have an additional degree or two of travel before they reach their physical limits. If the value is out of range, the camera returns an error message and no motion occurs. |
| Examples | <pre>>camera tilt up OK > Tilts the camera up at the default speed. >camera tilt down 20 OK > Tilts the camera down using a speed of 20. >camera tilt stop OK > Stops the camera's vertical motion.</pre> | |

camera zoom

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

| | | |
|----------|--|--|
| Synopsis | camera zoom { in [<speed>] out [<speed>] stop get set} | |
| Options | in | Moves the camera in. |
| | out | Moves the camera out. |
| | speed [1 – 7] | Optional: Specifies the zoom speed as an integer (1 to 7). Default speed is 3. |
| | stop | Stops the camera's zoom movement. |
| | get | Returns the camera's current zoom level. |
| | set <1 – n> | Sets the zoom level as an integer value. The value of n (maximum zoom) depends on the camera's capabilities. For example, the range is 1 to 12 for a 12x camera. If the value is out of range, the camera returns an error message and no zoom change occurs. |
| Examples | <pre>>camera zoom in OK > Zooms the camera in at the default speed. >camera zoom out 7 OK > Zooms the camera out using a speed of 7. >camera zoom stop OK > Stops the camera's zoom motion. >camera zoom set 14 OK > Sets the camera's zoom level to 14x. >camera zoom get 14 OK > Returns the camera's current zoom level.</pre> | |

camera focus

Changes the camera focus.

| | | |
|----------|---|--|
| Synopsis | <code>camera focus { near [<speed>] far [<speed> stop mode {get auto manual}}</code> | |
| Options | <code>near</code> | Brings the focus nearer to the camera. Can only be used when camera is in manual mode. |
| | <code>far</code> | Moves the focus farther from the camera. Can only be used when camera is in manual mode. |
| | <code>speed <1 – 8></code> | Optional: integer (1 to 8) specifies the focus speed. |
| | <code>stop</code> | Stops the camera's focus movement. |
| | <code>mode {get auto manual}</code> | Returns the current focus mode, or specifies automatic or manual focus. |
| Examples | <pre> camera focus near OK > </pre> <p>Brings the focus near at the default speed.</p> <pre> camera focus far 7 OK > </pre> <p>Moves the focus farther from the camera at a speed of 7.</p> <pre> camera focus mode get auto_focus: on OK > </pre> <p>Returns the current focus mode.</p> | |



camera preset

Moves the camera to the specified preset, or stores the current camera position and optionally CCU information, either with or without specifying that Tri-Synchronous Motion is to be used when moving to this position.


Note

This command corresponds to the CAM_Memory commands in the RS-232 command set.

| | | |
|----------|---|--|
| Synopsis | camera preset { recall store} <1 – 16> [tri-sync <1 – 24>] [save-ccu] | |
| Options | recall <1 – 16> | Moves the camera to the specified preset, using Tri-Synchronous Motion if this was saved with the preset. If CCU information was saved with the preset, the camera switches to the CCU setting associated with the preset. |
| | store <1 – 16> | Stores the current camera position as the specified preset. |
| | tri-sync <1 – 24> | Optional: Specifies that the camera uses Tri-Synchronous Motion to move to this position, using the specified speed. |
| | save-ccu | Optional: Saves the current CCU settings as part of the preset. If not specified, the last color settings are used when recalled. |
| Examples | <pre>>camera preset recall 3 OK > Moves the camera to preset 3. >camera preset store 1 OK > Saves the camera's current position as preset 1. >camera preset store 4 tri-sync 15 OK > Stores the camera's current position as preset 4. The camera will use Tri-Synchronous Motion at speed 15 when it is recalled to this preset. >camera preset store 2 save-ccu OK > Stores the camera's current position as preset 2. The camera applies the current CCU settings when it is recalled to this preset.</pre> | |


camera ccu get

Returns CCU (lighting and color) information.

| | | |
|---|--|--|
| Synopsis | <code>camera ccu get <param></code> | |
|  | Options | |
| | <code>all</code> | Returns all current CCU settings. |
| | <code>auto_white_balance</code> | Returns the current state of the auto white balance setting (on or off). |
| | <code>red_gain</code> | Returns red gain as an integer (0 to 255). |
| | <code>blue_gain</code> | Returns blue gain as an integer (0 to 255). |
| | <code>backlight_compensation</code> | Returns the current state for backlight compensation (on or off). |
| | <code>auto_iris</code> | Returns the current auto-iris state (on or off). |
| | <code>iris</code> | Returns the iris value as an integer (0 to 11). |
| | <code>gain</code> | Returns gain as an integer (0 to 11). |
| | <code>detail</code> | Returns detail as an integer (0 to 15). |
| | <code>chroma</code> | Returns chroma as an integer (0 to 14). |
| | <code>gamma</code> | Returns gamma as an integer (-64 to 64) |
| <code>wide_dynamic_range</code> | Returns the current state for Wide Dynamic Range (on or off). Not available for RoboSHOT 20 UHD. | |
| Examples | <pre>>camera ccu get iris iris 6 OK ></pre> <p>Returns the current iris value.</p> <pre>>camera ccu get red_gain red_gain 201 OK ></pre> <p>Returns the current red gain value.</p> <pre>>camera ccu get all auto_iris on auto_white_balance on backlight_compensation off blue_gain 193 chroma 2 detail 8 gain 3 iris 11 red_gain 201 wide_dynamic_range off OK ></pre> <p>Returns all current CCU settings.</p> | |

camera ccu set

Sets the specified CCU (lighting and color) information.

| | | |
|--|---|--|
| Synopsis | <code>camera ccu set <param> <value></code> | |
| Options  | <code>auto_white_balance {on off}</code> | Sets the current state of the auto white balance setting (on or off). Auto white balance overrides red gain and blue gain manual settings. |
| | <code>red_gain <0 – 255></code> | Sets the red gain value as an integer (0 to 255). Can only be used when auto white balance is off. |
| | <code>blue_gain <0 – 255></code> | Sets the blue gain value as an integer (0 to 255). Can only be used when auto white balance is off. |
| | <code>backlight_compensation {on off}</code> | Sets the current state of the backlight compensation setting (on or off). Can only be used when wide dynamic range mode is off. |
| | <code>iris <0 – 11></code> | Sets the iris value as an integer (0 to 11). Can only be used when auto-iris is off. |
| | <code>auto_iris {on off}</code> | Sets the auto-iris state (on or off). Auto-iris disables manual iris and gain when it is on. |
| | <code>gain <0 – 11></code> | Sets gain value as an integer (0 to 11). Can only be used when auto-iris is off. |
| | <code>detail <0 – 15></code> | Sets the detail value as an integer (0 to 15). |
| | <code>chroma <0 – 14></code> | Sets the chroma value as an integer (0 to 14). |
| | <code>gamma <-64 – 64></code> | Sets the gamma value as an integer (-64 to 64). |
| | <code>wide_dynamic_range {on off}</code> | Sets Wide Dynamic Range mode on or off. Can only be used when backlight compensation is off. Not available for RoboSHOT 20 UHD. |
| Examples | <pre>>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.</pre> | |

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 to 6 or custom 1 to 3) . |
| | store custom <1–3> | Saves the current scene as the specified custom scene. |
| Examples | <pre>>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.</pre> | |


camera led

Set or change the behavior of the indicator light.

| | | |
|----------|--|--|
| Synopsis | camera led { get off on } | |
| Options | get | Returns the indicator light's current state (on or off). |
| | off | Disables the indicator light. |
| | on | Enables the indicator light. |
| Examples | <pre>>camera led off OK > Disables the indicator light. 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 indicator light.</pre> | |

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 camera's standby state – if it was not in standby mode, it enters standby; if it was in standby mode, it "wakes up." |
| Examples |  <pre>>camera standby off OK > Brings the camera out of standby mode. >camera standby get standby: on OK > Returns the current standby state.</pre> | |

video mute

Gets or sets the camera's video mute status. When video is muted, the camera sends 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 } | |
| Parameters | get | Returns the current video mute status. |
| | off | Unmutes the video. Normal video resumes. |
| | on | The connected display shows either a black screen with a message or a color-bar pattern. (The color-bar option is only available on the RoboSHOT 40 UHD camera.) |
| | toggle | Changes the camera's video mute status. |
| Examples | <pre>video mute get mute: off Returns video mute status.</pre> | |
| | <pre>video mute on Transmits black video.</pre> | |

streaming settings get

Retrieves IP streaming settings. These are configured in the web interface.

| | | |
|------------|---|--|
| Synopsis | streaming settings get | |
| Parameters | IP Custom_Frame_Rate | Frame rate selected in Custom quality mode. |
| | IP Custom_Resolution | Resolution selected in Custom quality mode. |
| | IP Enabled | True if IP streaming is enabled, False if it is not. |
| | IP MTU | Maximum packet size. |
| | IP Port | The port number used for IP streaming. The default port for RTSP streaming is 554; default for RTMP streaming is 1935. |
| | IP Preset_Quality | Video quality selected in Easy video quality mode. |
| | IP Preset_Resolution | Resolution selected in Easy video quality mode. |
| | IP Protocol | The IP streaming protocol in use (RTSP or RTMP). |
| | IP URL | The URL where the RTSP stream is available. |
| | IP Video_Mode | Video quality mode selected (preset or custom) |
| Example | <pre>>streaming settings get IP Custom_Frame_Rate 30 IP Custom_Resolution 1080p IP Enabled true IP MTU 1400 IP Port 554 IP Preset_Quality Standard (Better) IP Preset_Resolution 720p IP Protocol RTSP IP URL vaddio-roboshot-uhd-stream IP Video_Mode preset OK ></pre> <p>Returns the current streaming settings.</p> | |

streaming ip enable

Set or change the state of IP streaming.

This command is currently available only for RoboSHOT 40 UHD.

| | | |
|------------|---|--|
| Synopsis | streaming ip enable { get on off toggle } | |
| Parameters | get | Returns the current state of IP streaming |
| | on | Enables IP streaming. |
| | off | Disables IP streaming. |
| | toggle | Changes the state of IP streaming (on if it was off, or off if it was on). streaming ip enable toggle has the same effect as selecting the Enable IP Streaming checkbox in the web interface. |
| Example | <pre>>streaming ip enable on > OK Enables IP streaming. >streaming ip enable get enabled: true > OK Returns the current state of IP streaming.</pre> | |

network ping

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

| | | |
|----------|--|--|
| Synopsis | network ping [count <count>] [size <size>] <destination-ip> | |
| 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. |
| | <destination-ip> | The IP address where the ECHO_REQUEST packets will be sent. |
| Examples | <pre>>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.</pre> | |
| | <pre>>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.</pre> | |

network settings get

Returns the current network settings for MAC address, IP address, subnet mask, and gateway.

| | |
|----------|---|
| Synopsis | <code>network settings get</code> |
| Example | <pre>> network settings get Name eth0:WAN MAC Address 48:6F:77:64:79:21 IP Address 192.168.1.67 Netmask 255.255.255.0 VLAN Disabled Gateway 192.168.1.254 OK ></pre> |


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).

| | | |
|----------|--|--|
| Synopsis | <code>system reboot [<seconds>]</code> | |
| Options | <code><seconds></code> | The number of seconds to delay the reboot. |
| Examples | <pre>>system reboot OK > The system is going down for reboot NOW! roboshot-uhd-48-6F-77-64-79-21 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.</pre> | |

system factory-reset

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

| | | |
|----------|---|--|
| Synopsis | system factory-reset { get on off } | |
| Options | get | Returns the camera's current factory reset status. |
| | on | Enables factory reset on reboot. |
| | off | Disables factory reset on reboot. |
| Examples |  <pre>>system factory-reset get factory-reset (software): off factory-reset (hardware): off OK ></pre> <p>Returns the factory reset status.</p> <p>This evaluates the most recent <code>system factory-reset on</code> or <code>off</code> command, if one has been received, then reads the rear panel DIP switches and returns the status <code>on</code> if they are all in the down position.</p> <pre>>system factory-reset on factory-reset (software): on factory-reset (hardware): off OK ></pre> <p>Enables factory reset upon reboot.</p> <p>Note <i>This command does not initiate a factory reset. The factory reset takes place on the next reboot.</i></p> | |

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 | <p>history Displays the current command buffer.</p> <p>history 5 Sets the history command buffer to remember the last 5 unique entries.</p> | |
| Additional information | <p>You can navigate the command history using the up and down arrow keys.</p> <p>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.</p> <p>Examples of history expansion:</p> <ul style="list-style-type: none"> * !! 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) | |



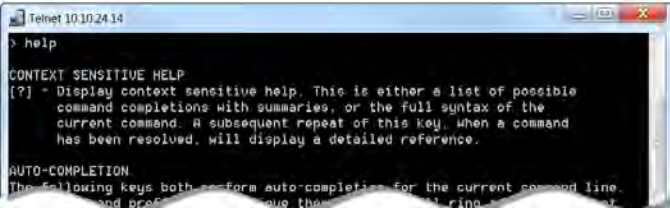
version

Returns the current firmware version.

| | |
|----------|---|
| Synopsis | version |
| Example | <pre>> version Commit d033ddb2378357a871011eb820706dcaa64ec0e2 HDLink TX4.6.1*0.03 Pan Motor Version 0.32.6214 Sensor Version 01.20 System Version RoboSHOT 20 UHD 1.3.0 Tilt Motor Version 0.3.6214 OK Returns current firmware version information. Your camera may return slightly different information.</pre> |

help

Displays an overview of the CLI syntax.

| | |
|----------|--|
| Synopsis | help |
| Example | <p>help</p>  <pre> Telnet 10.10.24.14 > help CONTEXT SENSITIVE HELP [?] - Display context sensitive help. This is either a list of possible command completions with summaries, or the full syntax of the current command. A subsequent repeat of this key, when a command has been resolved, will display a detailed reference. AUTO-COMPLETION The following keys both perform auto-completion for the current command line. and prof... </pre> |

exit

Ends the command session and then closes the socket.

| | |
|----------|-------------|
| Synopsis | exit |
| Example | exit |

RS-232 Serial Command Reference

The Vaddio RS-232 Serial Control Protocol is similar to the Sony® VISCA command set in order to be compatible with several popular control devices. Not all VISCA commands are supported, and there are Vaddio-specific commands in the following command and inquiry lists.

Be sure the camera is set to the same baud rate as the device originating the commands. For the RoboSHOT 20 UHD, this is DIP switch 5 on the back of the camera. For the RoboSHOT 40 UHD, this is a soft DIP switch available in the web interface on the System page (DIP Switches tab).

Camera Movement, Zoom, and Focus Commands

| Command Set | Command | Command Packet | Comments |
|--|------------------|----------------------------|---|
| CAM_Zoom | Stop | 8x 01 04 07 00 FF | Variable speed: p = 0 (low) to 7 (high) Direct: pqrs = zoom position (0h-7AC0h) |
| | Tele (std) | 8x 01 04 07 02 FF | |
| | Wide (std) | 8x 01 04 07 03 FF | |
| | Tele (variable) | 8x 01 04 07 2p FF | |
| | Wide (variable) | 8x 01 04 07 3p FF | |
| | Direct | 8x 01 04 47 0p 0q 0r 0s FF | |
| Corresponds to <code>camera zoom</code> in Telnet API | | | |
| CAM_Focus | Stop | 8x 01 04 08 00 FF | Variable speed: p = 0 (low) to 7 (high) Direct and Near Limit: pqrs = focus position (1000h – F000h) |
| | Far (std) | 8x 01 04 08 02 FF | |
| | Near (std) | 8x 01 04 08 03 FF | |
| | Far (variable) | 8x 01 04 08 2p FF | |
| | Near (variable) | 8x 01 04 08 3p FF | |
| | Direct | 8x 01 04 48 0p 0q 0r 0s FF | |
| | One Push Trigger | 8x 01 04 18 01 FF | |
| | Near Limit | 8x 01 04 28 0p 0q 0r 0s FF | |
| Corresponds to <code>camera focus</code> in Telnet API | | | |
| CAM_Focus Mode | Auto Focus | 8x 01 04 38 02 FF | |
| | Manual Focus | 8x 01 04 38 03 FF | |
| | Auto/Manual | 8x 01 04 08 10 FF | |

| Command Set | Command | Command Packet | Comments |
|--------------------|-------------------|---|---|
| Pan-TiltDrive | Up | 8x 01 06 01 vv ww 03 01 FF | vv= Pan speed (01h-18h) ww=Tilt speed (01h-14h) |
| | Down | 8x 01 06 01 vv ww 03 02 FF | |
| | Left | 8x 01 06 01 vv ww 01 03 FF | |
| | Right | 8x 01 06 01 vv ww 02 03 FF | |
| | UpLeft | 8x 01 06 01 vv ww 01 01 FF | |
| | UpRight | 8x 01 06 01 vv ww 02 01 FF | |
| | DownLeft | 8x 01 06 01 vv ww 01 02 FF | |
| | DownRight | 8x 01 06 01 vv ww 02 02 FF | |
| | Stop | 8x 01 06 01 vv ww 03 03 FF | |
| | Home | 8x 01 06 04 FF | Returns the camera to its default position |
| Pan-TiltDrive | Absolute Position | 8x 01 06 02 vv ww 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | 0Y0Y0Y0Y = Pan position (1008h-EFF0h) 0Z0Z0Z0Z = Tilt position (12C0h-DFE0h) |
| Pan-Tilt-ZoomDrive | Up | 8x 01 06 0A vv ww rr 03 01 03 FF | vv= Pan speed (01h-18h) ww=Tilt speed (01h-14h) rr=Zoom speed (00h - 07h) |
| | Down | 8x 01 06 0A vv ww rr 03 02 03 FF | |
| | Left | 8x 01 06 0A vv ww rr 01 03 03 FF | |
| | Right | 8x 01 06 0A vv ww rr 02 03 03 FF | |
| | In | 8x 01 06 0A vv ww rr 03 03 01 FF | |
| | Out | 8x 01 06 0A vv ww rr 03 03 02 FF | |
| | Stop | 8x 01 06 0A vv ww rr 03 03 03 FF | |
| | Home | 8x 01 06 0C FF | Returns the camera to the default position and zoom |
| Pan-Tilt-ZoomDrive | Absolute Position | 8x 01 06 0B vv ww 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z 0R 0R 0R 0R FF | 0Y0Y0Y0Y = Pan position (1008h-EFF0h) 0Z0Z0Z0Z = Tilt position (12C0h-DFE0h) 0R0R0R0R = Zoom position(0h-4000h) |
| Pan-Tilt-ZoomDrive | Absolute Position | 8x 01 06 0B vv ww 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z 0R 0R 0R 0R FF | 0Y0Y0Y0Y = Pan position (1008h-EFF0h) 0Z0Z0Z0Z = Tilt position (12C0h- |

| Command Set | Command | Command Packet | Comments |
|---------------------|---|----------------------------|---|
| | | | DFE0h) 0R0R0R0R = Zoom position (0h-????h) |
| CAM_Memory | Reset | 8x 01 04 3F 00 0p FF | Corresponds to camera preset in Telnet API. p= preset number(0h-0Fh) qr= Speed(01h-18h) |
| | Set standard | 8x 01 04 3F 01 0p FF | |
| | Set standard with 'scene' | 8x 01 04 3F 21 0p FF | |
| | Set Tri-sync | 8x 01 04 3F 11 0p 0q 0r FF | |
| | Set Tri-Sync with 'scene' | 8x 01 04 3F 31 0p 0q 0r FF | |
| | Recall | 8x 01 04 3F 02 0p FF | |
| | Corresponds to camera preset in Telnet API. | | |
| CAM_PTZ_PresetSpeed | | 8x 01 7e 01 0b pp qq rr FF | pp: pan speed (01h-18h) qq: tilt speed (01h-14h) rr: zoom speed (0h-07h) |

Movement, Zoom, and Focus Inquiry Commands

| Inquiry Command | Command | Response Packet | Comments |
|-------------------|----------------|-------------------------------|---|
| Pan-TiltPosInq | 8x 09 06 12 FF | y0 50 0w 0w 0w 0z 0z 0z 0z FF | www= Pan position zzzz=Tilt Position |
| CAM_ZoomPosInq | 8x 09 04 47 FF | y0 50 0p 0q 0r 0s FF | pqrs: Zoom position |
| CAM_FocusPosInq | 8x 09 04 48 FF | y0 50 0p 0q 0r 0s FF | pqrs: Focus position |
| CAM_FocusModelInq | 8x 09 04 38 FF | y0 50 02 FF | Auto focus |
| | | y0 50 03 FF | Manual focus |

| Inquiry Command | Command | Response Packet | Comments |
|------------------------|--|----------------------|--|
| | Corresponds to <code>camera focus mode get</code> in Telnet API. | | |
| CAM_MemoryInq | 8x 09 04 3F FF | y0 50 pp FF | pp: Preset number recalled last (00h - 0Fh) |
| CAM_MemoryStatusInq | 8x 09 04 3F 0p FF | y0 50 0p 0q 0r 0s FF | p: Preset number (00h - 0Fh) q: mode (00-std, 10-std /w ccu, 01-trisync, 11-trisyc /w ccu) rs: speed (0x1-0x18) 1 - 24 |
| CAM_MemSaveInq | 8x 09 04 23 0X FF | y0 50 0p 0q 0r 0s FF | X: 00h to 0Fh (preset number) pqrs: 0000h to FFFFh (Data) |
| CAM_PTZ_PresetSpeedInq | 8x 09 7E 01 0B FF | y0 50 p q r FF | p: pan speed (01h-18h) q: tilt speed (01h-14h) r: zoom speed (0h-07h) |

Color and Light Management Commands

| Command Set | Command | Command Packet | Comments |
|-------------|--|----------------------------|---|
| CAM_WB | Auto | 8x 01 04 35 00 FF | Normal auto |
| | Manual | 8x 01 04 35 05 FF | Manual control mode |
| | Corresponds to <code>camera ccu set auto_white_balance</code> in Telnet API. | | |
| CAM_RGain | Reset | 8x 01 04 03 00 FF | Manual control of red gain pq = red gain (00h – FFh) |
| | Up | 8x 01 04 03 02 FF | |
| | Down | 8x 01 04 03 03 FF | |
| | Direct | 8x 01 04 43 00 00 0p 0q FF | |
| | Corresponds to <code>camera ccu set red_gain</code> in Telnet API. | | |
| CAM_BGain | Reset | 8x 01 04 04 00 FF | Manual control of blue gain pq = blue gain (00h – FFh) |
| | Up | 8x 01 04 04 02 FF | |
| | Down | 8x 01 04 04 03 FF | |
| | Direct | 8x 01 04 44 00 00 0p 0q FF | |
| | Corresponds to <code>camera ccu set blue_gain</code> in Telnet API. | | |
| CAM_AE | Auto | 8x 01 04 39 00 FF | Auto exposure mode |
| | Manual | 8x 01 04 39 03 FF | Manual control mode |
| | Corresponds to <code>camera ccu set auto_iris</code> in Telnet API. | | |

| Command Set | Command | Command Packet | Comments |
|---|-------------|----------------------------------|--|
| CAM_Shutter | Reset | 8x 01 04 0A 00 FF | Shutter setting |
| | Up | 8x 01 04 0A 02 FF | pq = shutter position (00h – 15h) |
| | Down | 8x 01 04 0A 03 FF | See Shutter Speed Values – CAM_Shutter Command |
| | Direct | 8x 01 04 4A 00 00 0p 0q FF | |
| CAM_Iris | Reset | 8x 01 04 0B 00 FF | Iris setting |
| | Up | 8x 01 04 0B 02 FF | pq = iris position (0h, 05h-11h) |
| | Down | 8x 01 04 0B 03 FF | See Iris Values – CAM_Iris Command |
| | Direct | 8x 01 04 4B 00 00 0p 0q FF | |
| Corresponds to <code>camera ccu set iris</code> in Telnet API. | | | |
| CAM_Gain | Reset | 8x 01 04 0C 00 FF | Iris gain setting |
| | Up | 8x 01 04 0C 02 FF | pq = gain position (01h – 0Fh) |
| | Down | 8x 01 04 0C 03 FF | p = gain limit (04h-0Fh) |
| | Direct | 8x 01 04 4C 00 00 0p 0q FF | See Iris Gain and Gain Limit Values – CAM_Gain Command |
| | +Gain Limit | 8x 01 04 2C 0p FF | |
| Corresponds to <code>camera ccu set gain</code> in Telnet API. | | | |
| CAM_BackLight | On | 8x 01 04 33 02 FF | Backlight compensation On/Off |
| | Off | 8x 01 04 33 03 FF | |
| Corresponds to <code>camera ccu set backlight_compensation</code> in Telnet API. | | | |
| CAM_WD | On | 8x 01 04 3D 02 FF | Wide Dynamic Range On |
| | Off | 8x 01 04 3D 03 FF | Wide Dynamic Range Off |
| Corresponds to <code>camera ccu set wide_dynamic_range</code> in Telnet API. May be unavailable on some cameras. | | | |
| CAM_Aperture | Reset | 8x 01 04 02 00 FF | Aperture setting pq = aperture position (0h-0fh) |
| | Up | 8x 01 04 02 01 FF | |
| | Down | 8x 01 04 02 02 FF | |
| | Direct | 8x 01 04 42 00 00 0p 0q FF | |
| Corresponds to <code>camera ccu set detail</code> in Telnet API. | | | |
| CAM_Chroma | Direct | 8x 01 7E 55 00 00 0p 0q FF | pq: 00h – 14h |
| Corresponds to <code>camera ccu set chroma</code> in Telnet API. | | | |
| CAM_GammaOffset | Direct | 8x 01 04 1E 00 00 00 0s 0t 0u FF | s: polarity offset (0 is plus, 1 is minus) tu: offset s=0 (00h to 40h) offset s=1 (00h to 10h) |
| Corresponds to <code>camera ccu set gamma</code> in Telnet API. | | | |

Shutter Speed Values

Command: CAM_Shutter

| Value | 60/59.94/30/29.97 | 50/25 |
|-------|-------------------|---------|
| 0x15 | 1/10000 | 1/10000 |
| 0x14 | 1/6000 | 1/6000 |
| 0x13 | 1/4000 | 1/3500 |
| 0x12 | 1/3000 | 1/2500 |
| 0x11 | 1/2000 | 1/1750 |
| 0x10 | 1/1500 | 1/1250 |
| 0x0F | 1/1000 | 1/1000 |
| 0x0E | 1/725 | 1/600 |
| 0x0D | 1/500 | 1/425 |
| 0x0C | 1/350 | 1/300 |
| 0x0B | 1/250 | 1/215 |
| 0x0A | 1/180 | 1/150 |
| 0x09 | 1/125 | 1/120 |
| 0x08 | 1/100 | 1/100 |
| 0x07 | 1/90 | 1/75 |
| 0x06 | 1/60 | 1/50 |
| 0x05 | 1/30 | 1/25 |
| 0x04 | 1/15 | 1/12 |
| 0x03 | 1/8 | 1/6 |
| 0x02 | 1/4 | 1/3 |
| 0x01 | 1/2 | 1/2 |
| 0x00 | 1/1 | 1/1 |

Iris Position Values

Command: CAM_Iris

| Value | RoboSHOT 20 UHD |
|-------|-----------------|
| 0x11 | F1.8 |
| 0x10 | F2 |
| 0x0F | F2.4 |
| 0x0E | F2.8 |
| 0x0D | F3.4 |
| 0x0C | F4 |
| 0x0B | F4.8 |
| 0x0A | F5.6 |
| 0x09 | F6.8 |
| 0x08 | F8 |
| 0x07 | F9.6 |
| 0x06 | F11 |
| 0x05 | F14 |
| 0x00 | CLOSE |

Iris Gain Values

Command: CAM_Gain

| Value | Gain |
|-------|-------|
| 0x10 | 45 dB |
| 0x0F | 42 dB |
| 0x0E | 39 dB |
| 0x0D | 36 dB |
| 0x0C | 33 dB |
| 0x0B | 30 dB |
| 0x0A | 27 dB |
| 0x09 | 24 dB |
| 0x08 | 21 dB |
| 0x07 | 18 dB |
| 0x06 | 15 dB |
| 0x05 | 12 dB |
| 0x04 | 9 dB |
| 0x03 | 6 dB |
| 0x02 | 3 dB |
| 0x01 | 0 dB |

Note

Values 0D to 10 can be set only when the high-sensitivity mode is ON. By default, it is off at power-up/reboot.

Iris Gain Limit Values

Command: CAM_Gain

| Value | High Sensitivity Off | High Sensitivity On |
|-------|----------------------|---------------------|
| 0x0C | 33 dB | 45 dB |
| 0x0B | 30 dB | 42 dB |
| 0x0A | 27 dB | 39 dB |
| 0x09 | 24 dB | 36 dB |
| 0x08 | 21 dB | 33 dB |
| 0x07 | 18 dB | 30 dB |
| 0x06 | 15 dB | 27 dB |
| 0x05 | 12 dB | 24 dB |
| 0x04 | 9 dB | 21 dB |

Color and Light Management Inquiry Commands

| Inquiry Command | Command | Response Packet | Comments |
|-----------------------|----------------|----------------------------|--|
| CAM_WBModelInq | 8x 09 04 35 FF | y0 50 00 FF | Auto |
| | | y0 50 05 FF | Manual |
| CAM_RGainInq | 8x 09 04 43 FF | y0 50 00 00 0p 0q FF | pq: Red gain |
| CAM_BGainInq | 8x 09 04 44 FF | y0 50 00 00 0p 0q FF | pq: Blue gain |
| CAM_AEModelInq | 8x 09 04 39 FF | y0 50 00 FF | Auto |
| | | y0 50 03 FF | Manual |
| CAM_ShutterPosInq | 8x 09 04 4A FF | y0 50 00 00 0p 0q FF | pq: Shutter position |
| CAM_IrisPosInq | 8x 09 04 4B FF | y0 50 00 00 0p 0q FF | pq: Iris position |
| CAM_GainPosInq | 8x 09 04 4C FF | y0 50 00 00 0p 0q FF | pq: Gain position |
| CAM_WDModelInq | 8x 09 04 3D FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_BackLightModelInq | 8x 09 04 33 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_ApertureInq | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF | pq: Aperture gain |
| CAM_ChromaInq | 8x 09 7E 55 FF | y0 50 05 00 00 00 0p FF | p: 0 – Eh |
| CAM_GammaOffsetInq | 8x 09 04 1E FF | y0 50 00 00 00 0s 0t 0u FF | s: Polarity offset (0 is plus, 1 is minus) tu: Offset s=0 (00h to 40h) Offset s=1 (00h to 10h) |

Other Commands

| Command Set | Command | Command Packet | Comments |
|---------------|---|-------------------------|---|
| CommandCancel | | 8x 2p FF | p= socket (1 or 2) |
| CAM_Power | On | 8x 01 04 00 02 FF | Power on |
| | Off | 8x 01 04 00 03 FF | Power off |
| | Corresponds to <code>camera standby</code> in Telnet API. | | |
| CAM_Tally | On | 8x 01 7E 01 0A 00 02 FF | |
| | Off | 8x 01 7E 01 0A 00 03 FF | |
| CAM_NR | -- | 8x 01 04 53 0p FF | p = noise reduction level (0: off, 1 – 5) |
| CAM_Mute | On | 8x 01 04 75 02 FF | Video mute on/off |
| | Off | 8x 01 04 75 03 FF | |
| | Toggle | 8x 01 04 75 10 FF | |
| | Corresponds to <code>video mute</code> in Telnet API. | | |

Other Inquiry Commands

| Inquiry Command | Command | Response Packet | Comments |
|------------------|--|--|----------------------------------|
| CAM_PowerInq | 8x 09 04 00 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off (standby) |
| | Corresponds to <code>camera standby get</code> in Telnet API | | |
| CAM_IPAddress | 8x 09 08 4E 00 00 FF | y0 50 49 50 00 00 00 0p 0p 0p 0q 0q 0q 0r 0r 0s 0s 0s FF | IP address = ppp.qqq.rrr.sss |
| CAM_TallyInq | 8x 09 7E 01 0A FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_NRIrq | 8x 09 04 53 FF | y0 50 0p FF | Noise reduction p: 00h to 05h |
| CAM_MuteModelInq | 8x 09 04 75 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| | Corresponds to <code>video mute get</code> in Telnet API | | |
| Vaddio_ModelInq | 8x 09 08 0e FF | y0 50 06 01 00 00 00 FF | RoboSHOT 20 UHD |
| Vaddio_ModelInq | 8x 09 08 0e FF | | RoboSHOT 40 UHD |

Specifications

Video and Image

| | | | |
|-------------------------------------|---|---|---|
| Outputs/protocols | HDMI, HDBT, HD-SDI, IP (H.264) Streaming | Aspect ratio | HDMI: 16:9 (all resolutions) IP (H.264) Streaming: 16:9, 3:2, 4:3 |
| HDMI resolutions/frame rates | QFHD: 2160p/30/25 (3840 x 2160) FHD: 1080p/59.94/50/29.97/25, 1080i/59.94/50 HD: 720p/59.94/50 | 3Gb/s HD-SDI resolutions/frame rates | FHD: 1080p/59.94/50/29.97/25, 1080i/59.94/50 HD: 720p/59.94/50 |
| IP Streaming | RTSP with H.264 compression up to 1080p/30 RTMP up to 1080p/30 | | |

Camera

| | | | |
|--|--|--|---|
| Image device | RoboSHOT 20 UHD: 1/2.3-Type Exmor R™ backlit CMOS sensor RoboSHOT 40 UHD: 1/2.5-Type Exmor R™ backlit CMOS sensor | | |
| Pixels | RoboSHOT 20 UHD: 8.93 Megapixels (Effective) RoboSHOT 40 UHD: 8.5 Megapixels (Effective) | | |
| Zoom (RoboSHOT 20 UHD) | 1x to 12x: Optical Zoom 12x to 20x: Combined Optical and Digital Zoom | Zoom (RoboSHOT 40 UHD) | 1x to 20x: Optical Zoom 20x to 40x: Combined Optical and Digital Zoom |
| Pan angle and speed | ±160°, 0.35°/sec to 120°/sec | Tilt angle and speed | +90°/-30°, 0.35°/sec to 120°/sec |
| Horizontal FOV (RoboSHOT 20 UHD) | 74° (wide) to 4.8° (tele) | Horizontal FOV (RoboSHOT 40 UHD) | 70° (wide) to 4.1° (tele) |
| Minimum illumination | 1.6 lux (100+ lux recommended) | Aperture/detail | 16 Steps |
| Min. working distance (RoboSHOT 20 UHD) | 10 mm (wide), 1500 mm (tele) | Min. working distance (RoboSHOT 40 UHD) | 80 mm (wide), 800 mm (tele) |
| Gain | RoboSHOT 20 UHD: Auto / Manual (0 to 33 dB) RoboSHOT 40 UHD Auto / Manual (0 to 48 dB) | | |
| Focusing system | Auto Focus / Manual Focus Mode / One Push Trigger Mode | | |
| White balance | Auto, ATW, Indoor, Outdoor, One-push, Manual | | |
| Backlight compensation | On/off | Sync system | Internal |
| Noise reduction | 6 steps | S/N ratio | Over 50 dB |
| Control and management | Vaddio IR Remote Commander, web interface, Telnet, RS-232 API (modified VISCA) | | |
| Power | 12 VDC, 3.0 Amp power supply; LTPoE++ | | |

Physical and Environmental

| | | | |
|---------------|------------------|--------------------------------------|--|
| Height | 7.9 in (20 cm) | Weight | 6 lbs (2.7 kg) (2883 plain M&M candies) |
| Width | 8.0 in (20.3 cm) | Operating/storage temperature | 0 °C to 40°C (32°F to 104°F) |
| Depth | 7.7 in (19.6 cm) | Operating/storage humidity | 20% to 80% RH (non-condensing) |

Troubleshooting and Care

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

Check the Status Light First

When the camera doesn't behave as you expect, check the indicator light before you do anything else.

- **Blue:** Normal operation (blinks once when the camera receives a command from the remote)
- **Red:** On-air tally (Pro A/V color scheme only)
- **Purple:** In standby mode or booting
- **Yellow:** Firmware update in progress

If the status light is off, check whether you can access the camera via its web interface or Telnet. If so, the status light is disabled.


Check the Cables Next

If the equipment behaves in a way that suggests even a remote possibility of a bad cable, please try a known good cable with the same pin-out.

Cables can be defective, whether they are purchased from a vendor or made at the installation site. 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, or does not pass enough power to the connected device.

(The author would like to confess having made a certain number of almost-good cables. It happens.)

Power/Responsiveness Issues

| What is it doing? | Possible causes | Check and correct |
|--|--|---|
| Nothing. The status light is off, there is no video, and the camera does not respond to the remote.  | At least one of the cables is bad. | Check using known good cables. |
| | If a OneLINK extension is used: The camera is not connected to the OneLINK. | Plug the OneLINK into the camera. |
| | If a OneLINK extension is used: The OneLINK system is not working properly. | Disconnect the OneLINK and connect the camera directly to the 12V power pack that was shipped with it to determine where the problem is. If the camera works without the OneLINK extension, the OneLINK is bad. Contact your reseller or Vaddio Technical Support. |
| | Caution: Do not connect the camera to the 48 VDC OneLINK power pack. This will damage the camera and void its warranty. | |
| | 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. |

| What is it doing? | Possible causes | Check and correct |
|---|--|--|
| | The camera or its power supply is bad. | Contact your reseller or Vaddio Technical Support. |
| The camera never finishes initializing and the light is purple. The web interface is not available. | The camera is not receiving enough power. Is a PoE or PoE+ power injector connected? | Use PoE++ instead. PoE and PoE+ do not deliver enough power for this camera. |
| | The PoE++ power injector is bad. | Contact your reseller or Vaddio Technical Support. |
| The camera does not respond to the remote and the light is yellow. | A firmware update is in progress. | Wait a few minutes, and try again when the light turns blue. |

Video and Streaming Issues

| What is it doing? | Possible causes | Check and correct |
|---|---|---|
| Blue or black video. The camera's web interface is available and the camera responds to the directional controls on the remote. | Video is muted. | Select the Mute button in the web interface. This button is available on every page of the web interface. |
| Color bar pattern on video outputs. (RoboSHOT 40 UHD only) | Video is muted. | Select the Mute button in the web interface. This button is available on every page of the web interface. |
| No IP stream. | Streaming is not enabled. | Enable streaming: Streaming page in the web interface. |
| | The camera is not currently using the expected streaming protocol. | Select the appropriate streaming protocol: Streaming page in the web interface. |
| The video stream displays poorly - for example, there is a jagged band where the image is not displayed | The stream requires more bandwidth than is available to the viewer. | Reduce the streaming resolution. |

Camera Control and Other Issues

| What is it doing? | Possible causes | Check and correct |
|--|--|--|
| The camera does not respond to the remote, but the web interface is available. | The remote and the camera are not using the same IR channel. | Press the Camera Select 1 button on the remote. Try the other Camera Select buttons if necessary. |
| | IR is switched off | Turn IR on (DIP switch 3 up on RoboSHOT 20 UHD, or the corresponding soft DIP switch on RoboSHOT 40 UHD) - see Camera Behavior Settings for RoboSHOT 20 UHD or Software Switch Settings – RoboSHOT 40 UHD Only for more information. |
| | The remote's batteries are dead. | Put new batteries in the remote. |
| The camera responds to the remote but not to the web interface. | The web interface is controlling a different camera. (Check by removing power from the camera; the web interface should become unavailable.) | Check the camera's IP address. See Getting the camera's IP address . |
| | More than one device is using this IP address. | |
| 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. |
| | The camera is not connected to the network. | Connect the network cable. |
| The camera responds to the web interface but does not respond to commands via RS-232 connection. | The RS-232 cable is not connected, or is bad. | Connect a known good cable. |
| | The camera's baud rate setting doesn't match the settings on the controlling device. | Check the baud rate setting at both ends to be sure they match. The camera's baud rate setting can be viewed on the System page in the web UI. Correct the setting where it's more convenient to do so. |
| The camera loses all its settings when power is cycled. | All the DIP switches are in the ON (down) position. | Set the DIP switches to their proper positions. Default is all OFF (up). See DIP Switches: Camera Behavior Settings for more information. |

Restoring Factory Settings from the Web Interface

SYSTEM PAGE, FIRMWARE TAB

Sometimes it's easiest to just start over. To restore the original factory settings...click Restore Factory Settings. This will overwrite everything you have customized – custom CCU scenes and presets, soft DIP switch settings, passwords, room labels, and more. For this reason, you may want to back up (export) the camera's configuration after you set up the customizations you want. See [Saving \(Exporting\) or Restoring \(Importing\) a Configuration](#).



Restoring Factory Default Settings Via Hardware – RoboSHOT 20 UHD

If the camera's administrative controls are not accessible, you can restore factory defaults using the DIP switches on the back of the camera.

To restore factory default settings:

Set all DIP switches DOWN and cycle the power. Then return all DIP switches to the desired settings.

Restoring Factory Default Settings Via Hardware – RoboSHOT 40 UHD

If the camera's administrative controls are not accessible, you can restore factory defaults using the rotary switch on the back of the camera.

To restore factory default settings:

1. Note the position of the rotary switch.
2. Set the rotary switch to position C and cycle the power.
3. Return the rotary switch to its previous position.

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 40°C (104°F) or below 0°C (32°F)
- High humidity, condensing or wet environments
- Inclement weather
- Severe vibration
- Inside the Large Hadron Collider or other particle accelerator
- Dry environments with an excess of static discharge

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

And a friendly reminder from our Training department...

As much as you might love our gear, do not attempt to romance your camera. As a robot it cannot return your love.



Compliance Statements and Declarations of Conformity

Compliance testing was performed to the following regulations:

| | |
|--|---------|
| FCC Part 15 (15.107, 15.109), Subpart B | Class A |
| ICES-003, Issue 54: 2012 | Class A |
| EMC Directive 2014/30/EU | Class A |
| EN 55032: 2015 | Class A |
| EN 55024: November 2010 | Class A |
| KN24 2008 (CISPR 24: 1997 + A1: 2000 + A2: 2002) | Class A |
| IEC 60950-1:2005 (2nd Edition); Am 1: 2009 + Am 2: 2013 | Safety |
| EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013 | Safety |

FCC Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B, of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference including interference that may cause undesired operation of the device.

Changes or modifications not expressly approved by Vaddio can affect emission compliance and could void the user's authority to operate this equipment.



ICES-003 Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.



European Compliance

This product has been evaluated for Electromagnetic Compatibility under the EMC Directive for Emissions and Immunity and meets the requirements for a Class A digital device. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Standard(s) To Which Conformity Is Declared:



EMC Directive 2014/30/EU

EN 55032: 2015

Conducted and Radiated Emissions

EN 55024: November 2010

Immunity

EN 61000-4-2: 1995 + Amendments A1: 1998 + A2: 2001

Electrostatic Discharge

EN 61000-4-3: 2006 + A1: 2008

Radiated Immunity

EN 61000-4-4: 2004 + Corrigendum 2006

Electrical Fast Transients

EN 61000-4-5: 2006

Surge Immunity

EN 61000-4-6: 2009

Conducted Immunity

EN 61000-4-8: 2010

Power Frequency Magnetic Field

EN 61000-4-11: 2004

Voltage Dips, Interrupts and Fluctuations

KN24 2008 (CISPR 24: 1997 + A1: 2000 + A2: 2002)

IT Immunity Characteristics

EN 61000-4-2

Electrostatic Discharge

EN 61000-4-3

Radiated Immunity

EN 61000-4-4

Electrical Fast Transients

EN 61000-4-5

Surge Immunity

EN 61000-4-6

Conducted Immunity

EN 61000-4-8

Power Frequency Magnetic Field

EN 61000-4-11

Voltage Dips, Interrupts and Fluctuations

IEC 60950-1: 2005 (2nd Edition); Am 1: 2009 + Am 2: 2013

Safety

EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013

Safety

Warranty and Return Policy

Hardware warranty: Two (2) year limited warranty on all parts and labor for Vaddio manufactured products. Vaddio warrants its manufactured products against defects in materials and workmanship for a period of two years from the day of purchase, to the original purchaser, if Vaddio receives notice of such defects during the warranty. Vaddio, at its option, will repair or replace products that prove to be defective. Vaddio manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry standard practices.

Exclusions: The above warranty shall not apply to defects resulting from improper or inadequate maintenance by the customer, customers applied software or interfacing, unauthorized modifications or misuse, mishandling, operation outside the normal environmental specifications for the product, use of the incorrect power supply, modified power supply or improper site operation and maintenance. OEM and special order products manufactured by other companies are excluded and are covered by the manufacturer's warranty.

Vaddio Customer Service: Vaddio will test, repair, or replace the product or products without charge if the unit is under warranty. If the product is out of warranty, Vaddio will test then repair the product or products. The cost of parts and labor charge will be estimated by a technician and confirmed by the customer prior to repair. All components must be returned for testing as a complete unit. Vaddio will not accept responsibility for shipment after it has left the premises.

Vaddio Technical Support: Vaddio technicians will determine and discuss with the customer the criteria for repair costs and/or replacement. Vaddio Technical Support can be contacted by email at support@vaddio.com or by phone at one of the phone numbers listed on support.vaddio.com.

Return Material Authorization (RMA) number: Before returning a product for repair or replacement request an RMA from Vaddio's technical support. Provide the technician with a return phone number, e-mail address, shipping address, product serial numbers and original purchase order number. Describe the reason for repairs or returns as well as the date of purchase. See the General RMA Terms and Procedures section for more information. RMAs are valid for 30 days and will be issued to Vaddio dealers only. End users must return products through Vaddio dealers. Include the assigned RMA number in all correspondence with Vaddio. Write the assigned RMA number clearly on the shipping label of the box when returning the product. All products returned for credit are subject to a restocking charge without exception. Special order products are not returnable.

Voided warranty: The warranty does not apply if the original serial number has been removed or if the product has been disassembled or damaged through misuse, accident, modifications, use of incorrect power supply, use of a modified power supply or unauthorized repair.

Shipping and handling: Vaddio will not pay for inbound shipping transportation or insurance charges or accept any responsibility for laws and ordinances from inbound transit. Vaddio will pay for outbound shipping, transportation, and insurance charges for all items under warranty but will not assume responsibility for loss and/or damage by the outbound freight carrier. If the return shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

Products not under warranty: Payment arrangements are required before outbound shipment for all out of warranty products.

General RMA Terms and Procedures: RMA's are valid for 30 days and will be issued to Vaddio dealers only.

- End users must return products through Vaddio dealers.
- Before a defective product can be authorized to send in for repair, it must first go through the troubleshooting process with a member of the Vaddio Technical Support team.
- Products authorized for repair must have a valid RMA (Return Material Authorization) number.
 - Vaddio RMA Team will issue the RMA number.
 - An RMA number is to be included in all correspondence with Vaddio.
 - The RMA number must appear clearly on the shipping label (not the box) when the product is returned.
 - A packing slip must be included on the inside of the box with the RMA number listed and reason for RMA return.
- Products received at Vaddio that do not have a valid RMA number clearly marked on the outside of the shipping container may be refused and returned to sender.
- Boxes showing external damage will be refused and sent back to the sender regardless of the clearly marked RMA number and will remain the responsibility of the sender.

RMA Charges (Restocking): All qualified returns must be made in unopened, original packaging with all original materials.

- Initial shipments of equipment that are refused upon attempted delivery, for any reason, are subject to restocking charges.
- The Dealer has up to 60 days from the date of purchase to return Vaddio product for credit for future purchases of Vaddio product only.
- The Dealer has 61 to 90 days from the date of purchase to return Vaddio product with a 15% restocking fee or \$50.00 fee, whichever amount is greater
- The Dealer has up to 30 days from the date of purchase to return OEM and other manufacturer's products with a 15% restocking fee or \$50.00 fee, whichever amount is greater.
- NOTE: Special Order products from other manufacturers (identified in the Vaddio Price Guide as noncancelable, nonreturnable and not refundable) are not eligible for advance replacement from Vaddio.

Advance Replacement Policies: For Vaddio manufactured products, advance replacement will be provided for up to one (1) year after the initial shipment of products.

- NOTE: OEM and other manufacturer's products are excluded from the Vaddio advance replacement policy. Advance replacement will be provided for up to 30 days after initial shipment of OEM products. Thereafter, a return to Vaddio and factory repair is offered during the other manufacturer's warranty period. Vaddio will determine if the returned product is qualified for the OEM warranty.
- NOTE: Special Order products from other manufacturers (identified in the Vaddio Price Guide as noncancelable, nonreturnable and not refundable) are not eligible for advance replacement from Vaddio.

Advance Replacement Procedures: The Vaddio Dealer must submit a non-revocable purchase order for advance replacement equipment at normal dealer pricing. Credit shall be issued upon complete product return (including all accessories) for dealers with Net 30 terms. For credit card accounts, charges will be assessed to the credit card for the replacement and credited back upon complete product return.

- Returns must be made in the original Vaddio packaging with all original materials if at all possible. Vaddio products with missing original materials will be billed to the dealer at dealer price.
- NOTE: OEM products must be returned in the original packaging with all materials and the RMA number written on the shipping label only and not on the OEM box. If the return is incomplete and/or the OEM box is defaced, the product shall be returned to the dealer and the RMA will not be credited.
- Equipment returned with “No Trouble Found” after advanced replacement will be assessed a full 15% or \$50.00 restocking fee (whichever is greater) for each item and may also be assessed for additional charges to compensate for wear, damages and reconditioning.
- All returns must be accompanied by RMA # as stated above.
- All Advanced Replacement products are sent via 2-day service in the continental USA. If the product is requested to be sent via priority or overnight shipping, the Dealer shall pay shipping costs. The dealer can elect to supply their preferred shipping account number.
- International customers are responsible for all freight charges for equipment returned to Vaddio, including international shipping, taxes, and duties, insurance and all other associated logistic charges.

Warranty Repair Terms and Procedures: Vaddio will repair any product free of charge, including parts and labor, within the terms outlined in the warranty agreement for that product.

- Customers must provide proof of the product’s purchase date.
- Product that is within the warranty period will be repaired under the non-warranty terms if:
 - The equipment has been damaged by negligence, accident, act of God, mishandling, used with the incorrect, modified or extended power supply or has not been operated in accordance with the procedures described in the operating and technical instructions.
 - The equipment has been altered or repaired by other than the Manufacturer or an authorized service representative.
 - Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the equipment, which in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the equipment; or the equipment’s original serial number has been modified or removed.
- Customer is responsible for shipping charges to send defective product under warranty to Vaddio. Vaddio will pay ground service return shipping charges during the 2nd year of the warranty period.
- Standard return shipping method for products under warranty, but out of the advance replacement warranty period, is ground shipment. Extra charges associated with priority shipping, when requested, will be the responsibility of the customer.

Non-Warranty Repair Terms: Vaddio will repair any non-obsolete product that does not meet the terms of the warranty. Non-warranty repair terms are as follows:

- The customer is responsible for, and agrees to pay, all parts and labor costs associated with the repair. Standard non-warranty repair charges are outlined below.
- Customers must provide payment method and one of the following, prior to receiving an RMA:
 - Hard copy of a PO, for dealers with Net 30 terms and in good standing with Vaddio.
 - Valid credit card number - Credit card will be charged upon shipping repaired product back to customer.
- Request for COD: Customers will be notified of COD charges prior to shipping repaired unit.
- Customer is responsible for all shipping charges both to and from Vaddio, and may use their own carrier.
- Customers will receive a courtesy call notifying them of total repair charges prior to return shipping.

Non-Warranty Repair Charges: Total repair charges (per unit) for a non-warranty repair consist of the following:

- Cost of any replacement parts needed to repair the defect.
- Labor costs billed per hour after minimum charges/time.
- Labor charges include troubleshooting and repair time only.
- Burn-in time and final test time is not included in the labor charges.
- Labor time is rounded to the nearest quarter hour.
- Labor charges are billed at the prevailing rate for the category of equipment repaired, after minimum charges/time. For prevailing labor rates, please contact the Vaddio technical support.
- All shipping and handling costs are the responsibility of the customer for non-warranty repairs.

Minimum Labor Charges: All non-warranty repairs are subject to a minimum evaluation/repair labor charge even if there is no problem found. Please contact Vaddio technical support for the current applicable rate.

Repair Charge Estimates: Estimates on repair charges for a specific problem will not be given before an RMA is issued and the actual product has been evaluated by a Vaddio technician. Repair estimates will be given after the repair department receives and evaluates the unit.

- Customers requesting an estimate on repair charges must do so up front when they call in for an RMA. The RMA team will call or email with the estimate after evaluating the unit and before proceeding with the repair.
- Any product evaluated for a repair estimate is still subject to the minimum labor charges even if the customer decides not to proceed with the repair.
- Vaddio does not guarantee estimates given on repair charges. Actual repair costs may exceed the estimate.
- Customer is responsible for actual repair charges, regardless of estimate.

Repair Policy Notes:

- **Duration of Repair:** Products are repaired on a first come first serve basis. The turn-a-round time of a particular repair is dependent upon circumstances such as product type, the nature of the problem and current repair volumes. Requests for expedited repair service will be considered on a case-by-case basis.
- **Repair Warranty:** Vaddio guarantees all of its repair work, performed on non-warranty items, for 90 days from the day the repaired product is shipped back to the customer. If the original problem described was not resolved or reoccurs within the 90-day period, Vaddio will repair the unit free of labor charges. However additional material charges may apply unless the parts used to affect the repair are again deemed defective.

Photo Credits

This manual may include some or all 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

By NASA - https://blogs.nasa.gov/ISS_Science_Blog/2015/03/06/women-in-space-part-two-whats-gender-got-to-do-with-it/, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=38834990>

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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<https://commons.wikimedia.org/w/index.php?curid=36743173>

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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European Space Agency astronaut Luca Parmitano, Expedition 36 flight engineer, outside the International Space Station

By NASA - <http://spaceflight.nasa.gov/gallery/images/station/crew-36/html/iss036e016704.html>, Public

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Chris Cassidy, Luca Parmitano, and Karen Nyberg, ISS, 2013. Photo Credit: NASA

Nicolas Altobelli, Rosetta Scientist at ESA's European Space Astronomy Centre, Villanueva de la Cañada, Madrid, Spain

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Andrea Accomazzo, ESA Rosetta Spacecraft Operations Manager, providing a live update from the Main Control Room at ESA's European Space Operations Centre, Darmstadt, Germany during the Rosetta wake-up day.

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Sleeping goose

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STS-123 and Expedition 16 crews on the STS-123 crew's last full day onboard the International Space Station.

By NASA - <http://www.spaceflight.nasa.gov/gallery/images/shuttle/sts-123/html/iss016e033684.html>,

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