vaddio
THE ART OF EASY

Installation and User Guide

VADDIO™ ROBOSHOT™ SERIES CAMERAS

RoboSHOT 12 and RoboSHOT 30, HD Robotic PTZ Camera Systems featuring the Quick-Connect™ Universal CCU Interface

RoboSHOT 12
High-definition Robotic PTZ Conferencing Camera Featuring a 12X, 73º Wide Angle Optical Zoom Lens and Tri-Synchronous Motion

RoboSHOT 30
High-definition Robotic PTZ Camera for Medium to Large Venues Featuring 30X Optical Zoom Lens and Tri-Synchronous Motion. Available in Black or White finishes.

Quick-Connect Universal CCU System Interface

System Model and Part Numbers

RoboSHOT 12 QCCU System, 999-9907-000 (North America), 999-9907-001 (Int'l)
RoboSHOT 30 QCCU System, 999-9917-000 (North America), 999-9917-001 (Int'l)
RoboSHOT 30 QCCU System, 999-9917-000W (North America), 999-9917-001W (Int'l)
(Note: The W suffix on the part number indicates white version of the RoboSHOT 30)

Inside Front Cover - Blank

TABLE OF CONTENTS

OVERVIEW

The extraordinary RoboSHOT HD PTZ cameras are professional quality with super high quality imaging, fine detail and exceptional color reproduction. This camera offers integrators, dealers and end users with an incredible improvement over other conferencing and large venue cameras available today. The RoboSHOT Platform consists of two models; the RoboSHOT 12 and the RoboSHOT 30.

RoboSHOT 12
HD PTZ Camera on Mount

The RoboSHOT 12 is perfect for small to medium sized conference rooms. This model features a 12X optical zoom and a 73° wide angle horizontal field of view, which provides incomparable support for applications including UCC applications, videoconferencing, distance learning, lecture capture, telepresence and more!

The RoboSHOT 30 camera performs brilliantly in medium to large rooms. It features a 30X optical zoom with an impressive 2.3° tele end to 65° wide end horizontal field of view and provides exceptional support for applications including House of Worship productions, large auditorium A/V systems, large distance learning classrooms, live event theatres with IMAG systems, large lecture theatres with lecture capture and more!

RoboSHOT 30
HD PTZ Camera on Mount

The key features of both RoboSHOT cameras are Tri-Synchronous Multi-Axis Motion and the Advanced Image Sensor, lens and ISP (image signal processor) combination. The Tri-Synchronous Motion algorithm in the RoboSHOT cameras is capable of moving all three (pan, tilt and zoom) axes simultaneously. The algorithm calculates the position and velocity of the smooth, direct-drive motor movements between the presets so pan, tilt and zoom arrive at the preset subject simultaneously, which finally allows for smooth and manageable on-air camera movements. Yep, there's no more pan/tilt, then zoom like other PTZ cameras available today.

The lens, image sensor and ISP are the real magic behind the RoboSHOT's remarkable video performance characteristics. Both cameras use the latest generation Exmor® 1/2.8", 2.34 Megapixel, Full HD (1080p/60) high-speed, low noise CMOS image sensor combined with a new ISP, produces vivid, realistic and accurate color with extremely fast, razor sharp automatic focus and auto iris routines.

All RoboSHOT's are equipped with an Ethernet port and a built-in web server, which allows the user to control the camera functions on an internal web page with a browser from anywhere in the world, or in the same room, over the IP network. Telnet, IR Remote and RS-232 control for the camera are available to satisfy almost any system control requirements.

The RoboSHOT platform paired with the Quick-Connect Universal CCU uses the Vaddio EZCamera™ Cat-5 Cable System to transport HSDS™ (differential video), power and control to and from the camera over standard Cat-5 cabling up to 500' (152.4m) with virtually no loss in video quality or any without latency. The most flexible attributes the Universal CCU has is at the outputs.

Quick-Connect Universal CCU
(shown with included rack ears)

The Universal CCU has simultaneous HD-SDI, HDMI and HD Analog component (YPbPr) outputs, all of which can be used concurrently. Resolution throughput from the camera ranges up to and including 1080p/60 on all outputs. The back-lit blue LED screen displays up to eight (8) parameters at a time and the camera's model number so the interrelationship of the controls can easily and quickly be read and understood.

The RoboSHOT cameras were designed for the times and represent a new era in specifying and integrating professional quality cameras into A/V and conferencing system configurations. In short, it has never been easier to integrate cameras into any environment than with the RoboSHOT HD Cameras.

Intended Use:
Before operating the device, please read the entire manual thoroughly. The system was designed, built and tested for use indoors with the power supply provided. The use of a power supply other than the one provided or outdoor operation hasn't been tested and may damage the device and/or create an unsafe operating condition.

Save These Instructions:
The information contained in this manual will help you install and operate your product. If these instructions are misplaced, Vaddio keeps copies of Specifications, Installation and User Guides and most pertinent product drawings (DWG and PDF) for the Vaddio product line on the Vaddio website. These documents can be downloaded from www.vaddio.com free of charge.

Important Safeguards:
Read and understand all instructions before using. Do not operate any device if it has been dropped or damaged. In this case, a Vaddio technician must examine the product before operating. To reduce the risk of electric shock, do not immerse in water or other liquids and avoid extremely humid conditions.

Use only the power supply provided with the system. Use of any unauthorized or extended DC power supplies will void any and all warranties.

Please do not use "pass-thru" type RJ-45 connectors. These pass-thru type connectors do not work well for professional installations and can be the cause of intermittent connections which can result in the RS-232 control line failing and locking up, and/or compromising the HSDS (high speed differential signals). For best results please use standard RJ-45 connectors and test all cables for proper pin-outs prior to use and connection to Vaddio Cat-5e products.

The RoboSHOT HD PTZ camera connectivity for all signals (video, power and control) is over Cat-5 cable (ubiquitously referred to as Cat-5 or Cat-5e). For best results, please use quality Cat-5e cable and ***real*** RJ-45 crimpers. Unlike phone and data lines that use the four center conductors (pairs 3 & 6 and pairs 4 & 5), the Vaddio EZCamera systems use all of the pins in most configurations. When terminated correctly The Vaddio Cat-5e solution provides for the utmost in flexibility for HD video system design, integration and ease of installation.

Unpacking the Camera Systems

Carefully remove the product and all of the included parts from the packaging. Identify the following parts for each camera:

RoboSHOT 12 QCCU System
Part Number 999-9907-000 (North America)
One (1) RoboSHOT 12 HD PTZ Camera (998-9900-000)
One (1) Thin Profile Wall Mount (535-2000-240) with Mounting Hardware
One (1) IR Remote Commander (998-2100-000)
One (1) EZCamera Control Adapter (998-1001-232)
One (1) Quick-Connect Universal CCU Interface (998-1105-034)
One (1) 36 VDC, 2.78 Amp Switching Power Supply with AC Cord Set
One (1) 3-pin Molex 5.0mm Euro style Connector
One (1) Quick Setup Guide
Full Manuals are downloaded from support.vaddio.com

RoboSHOT 12 QCCU System
Part Number 999-9907-001 (International)
One (1) RoboSHOT 12 HD PTZ Camera (998-9900-000)
One (1) Thin Profile Wall Mount (535-2000-240) with Mounting Hardware
One (1) IR Remote Commander (998-2100-000)
One (1) EZCamera Control Adapter (998-1001-232)
One (1) Quick-Connect Universal CCU Interface (998-1105-034)
One (1) 36 VDC, 2.78 Amp Switching Power Supply
One (1) Euro Power Cord
One (1) UK Power Cord
One (1) 3-pin Molex 5.0mm Euro style Connector
One (1) Quick Setup Guide
Full Manuals are downloaded from support.vaddio.com

RoboSHOT 30 QCCU System (North America)
Part Number 999-9917-000 (black), 999-9917-000W (white)
One (1) RoboSHOT 30 HD PTZ Camera (998-9910-000)
One (1) Thin Profile Wall Mount (535-2000-240) with Mounting Hardware
One (1) IR Remote Commander (998-2100-000)
One (1) EZCamera Control Adapter (998-1001-232)
One (1) Quick-Connect Universal CCU Interface (998-1105-034)
One (1) 36 VDC, 2.78 Amp Switching Power Supply with AC Cord Set
One (1) 2-pin Molex 5.0mm Euro style Connector
One (1) Quick Setup Guide
Full Manuals are downloaded from support.vaddio.com

RoboSHOT 30 QCCU System (International)
Part Number 999-9917-001 (black), 999-9917-001W (white)
One (1) RoboSHOT 30 HD PTZ Camera (998-9910-000)
One (1) Thin Profile Wall Mount (535-2000-240) with Mounting Hardware
One (1) IR Remote Commander (998-2100-000)
One (1) EZCamera Control Adapter (998-1001-232)
One (1) Quick-Connect Universal CCU Interface (998-1105-034)
One (1) 36 VDC, 2.78 Amp Switching Power Supply
One (1) Euro Power Cord
One (1) UK Power Cord
One (1) 2-pin Molex 5.0mm Euro style Connector
One (1) Quick Setup Guide
Full Manuals are downloaded from support.vaddio.com

Image: RoboSHOT 12 HD PTZ Camera
Camera Front View with Feature Call-outs

Color: Silver and Black

1) Camera and Zoom Lens: This RoboSHOT model features a 12X optical zoom lens (12X in Super-Wide mode and 10X in normal mode) that is built around an Exmor 1/2.8-Type, high-speed, low noise image sensor with a total of 2.34 megapixels for exceptionally precise HD video image acquisition in a small to medium sized conference room.

2) Camera Support Arm: The RoboSHOT cameras use a single control arm for pan and tilt movements. Both ends of the cast control arm are anchored with silent and smooth BLDC (brushless DC) direct drive motors. These motors provide ultra-accurate and fast camera positioning and are capable of the slowest of crawls, which are suitable for on-air use.

3) IR Sensors: IR sensors are built into the front of the RoboSHOT to receive IR signals from the IR Remote Commander supplied with the camera. The IR sensors sit behind the Makrolon IR Window on the front of the base.

4) Multi-Color LED:
The multi-colored LED indicates the use states of the camera:

- Purple LED is for Boot-up and Standby modes.
- Blue LED is for normal operation and is a power on, ready condition.
- The blue LED will blink when the camera receives a valid IR command.
- Solid red LED is to indicate a tally function illuminating when the camera is on-air.
- Blinking red LED indicates a fault condition.
- Yellow LED illuminates during a firmware update.

5) Logo: Really Cool Logo Badge (RCLB) is located on the IR Window.

6) Camera Base: Cast zinc alloy base for strength and stability, powder coated for toughness with fine texture.

Image: RoboSHOT 30 HD PTZ Camera

The differences between the 12X model and the 30X models center around the power of the optical zoom lens and overall color of the camera models. The 30X is available in both black and white.

Available in Black or White Versions

1) Camera and Zoom Lens: This RoboSHOT model has a powerful 30X optical zoom lens that is built around an Exmor 1/2.8-Typ, high-speed, low noise image sensor with a total of 2.34 megapixels for vibrant, detailed HD video image acquisition in a large to medium sized room.

2) Camera Support Arm: The RoboSHOT cameras use a single control arm for pan and tilt movements. Both ends of the cast control arm are anchored with silent and smooth BLDC (brushless DC) direct drive motors. These motors provide ultra-accurate and fast camera positioning and are capable of the slowest of crawls, which are suitable for on-air use.

3) IR Sensors: IR sensors are built into the front of the RoboSHOT to receive IR signals from the IR Remote Commander supplied with the camera. The IR sensors sit behind the Makrolon IR Window on the front of the base.

4) Multi-Color LED:
The multi-colored LED indicates the use states of the camera:

- Purple LED is for Boot-up and Standby modes.
- Blue LED is for normal operation and is a power on, ready condition.
- The blue LED will blink when the camera receives a valid IR command.
- Solid red LED is to indicate a tally function illuminating when the camera is on-air.
- Blinking red LED indicates a fault condition.
- Yellow LED illuminates during a firmware update.

5) Logo: Really Cool Logo Badge (RCLB) is located on the IR Window.

6) Camera Base: Cast zinc alloy base for strength and stability, powder coated for toughness with fine texture.

Image: RoboSHOT 12X and 30X Rear Panel Connections
Rear panel connections are identical for both models (RoboSHOT 12 shown).

1) CAMERA SETTINGS: Dip switch settings for IR remote frequency, baud rate and image flip can be configured with these switches. See the Switch Settings page for additional information.

2) HD VIDEO SELECT: A rotary switch allows the user to choose the HD video output resolution. See the Switch Settings page for additional information.

3) NETWORK CONTROL Port: The Ethernet 10/100 port allows the camera to be controlled from embedded web server with a web browser or through Telnet session.

4) RS-232 Port (Color Coded Blue): The RS-232 port accepts modified VISCA protocol for camera control over a Cat-5e cable. This port also acts as an IR Forwarding port with the Quick-Connect SR or Quick-Connect DVI/HDMI interfaces, which allows the user to transmit 3rd party IR signals through camera to the head-end.

5) EZ-POWER VIDEO Port (Color Coded Orange and Yellow): The EZ-Power Video port supplies 24 VDC power to the camera and delivers HD video back to the Quick-Connect interface using high speed differential signaling over Cat-5e cable. Color code orange is for use with Quick-Connect SR, DVI/HDMI-SR, USB and USB Mini. Color code yellow is for use with the Quick-Connect Universal CCU video port.

6) 36 VDC FOR CCU ONLY (Color Coded Red): The CCU power port is only used with Quick-Connect Universal CCU and is shipped with a label over the connectors to remind the installer to ***"Please test and mark the Cat-5/5e/6 UTP cable and confirm the connectivity prior to termination".*** Please see the system diagrams of the CCU systems to fully understand the wiring.

ANATOMY OF THE UNIVERSAL CCU

The Universal CCU will automatically sense the connected camera and initialize the firmware for that camera. The next section will look at the controls and how they are laid out for easy access.

Image: Front Panel CCU Controls

Front Panel Controls (left to right):

- **5-Line Blue Back-lit LED:** Displays up to 8 parameters at a time so the interrelationship of the controls can easily and quickly be read and understood.
- **Tally Light:** A contact closure on the back panel lights the blue LED on front panel indicating which Universal CCU and camera combination is the live Program in a multi-camera CCU installation. A tally command will also be sent to the camera via RS-232 to light the LED on cameras with on-board tally lights

Image: Close up View of the Universal CCU Control Panel

Keypad Controls from (left to right): Touch the button for the parameter to be controlled and adjust the value with the rotary encoder, then touch the cancel button to exit. When the rotary encoder button is touched, the SELECT and CANCEL menu buttons will illuminate to remind the user to either…select or cancel.

- **Scenes A, B & C:** Three user definable camera scenes (A, B & C) can be stored into microprocessor memory. When lit (backlit blue button), the scene is activated. To store a scene, the user adjusts the controls and touches and holds the scene button down until the button blinks. To erase a scene press and hold the scene button and the cancel button.
- **Auto White Balance:** The Automatic White Balance controls/adjusts the color levels automatically when engaged. Take it out of Auto to manually adjust the Red and Blue levels.
- **OPWB (One Push White Balance):** When using OPWB, zoom in on a white subject, at least 60% of the image must be white, touch the OPWB button and the coloration of the image will adjust to the white used in this shot.
- **Red & Blue Gain Controls:** The Red and Blue Gain buttons in combination with the encoder adjust the red and blue gain of the signal when Auto White Balance is disengaged.
- **Chroma:** Chroma controls the overall color of the image being captured.
- **Bright:** This is the overall luminance control for the image.
- **Gamma:** Gamma adjusts the overall brightness of an image to compensate for the perception of luminance and chroma.
- **Detail:** The Detail control sharpens or softens objects in the frame. Works well when looking at text.
- **IRIS - Auto or Manual:** The Auto Iris mode automatically adjusts the iris and gain of the camera. To manually adjust the iris or gain, turn off this control. The Manual Iris control allows the user to set the iris manually to one of the several settings available
- **Gain:** The Gain control boosts the signal level when the iris is open all the way, and there is not enough lighting available. To manually adjust the Gain, Auto Iris must be off. Use the Gain last to enhance the image.
- **Rotary Encoder:** Use the encoder to adjust values after the button is selected. This makes for very quick changes.
- **The Menu Buttons:** There are other screens to be accessed other than the camera control screen. Use the SELECT and CANCEL to enter other controls and exit other menus.

Image: Rear Panel CCU Connections and Controls (left to right)

- **Power Supply Input:** The Universal CCU uses a 36VDC, 2.78 Amp power supply on a 5.5mm OD x 2.5mm ID coaxial connector with a positive center.

- **36 VDC to Camera - RED RJ-45:** Power is provided on a Cat-5 cable to the RoboSHOT 36 VDC RJ-45 marked for CCU use only (see page 9). The power is regulated in the camera to 12 VDC.

- **RS-232 IN - GREY RJ-45:** RS-232 Input from ProductionVIEW™ console, Precision Camera Controller or other custom camera control system. Daisy Chain topology is not supported.

- **RS-232 to Camera - BLUE RJ-45:** RS-232 control is sent through this Cat-5 connection.

- **Tally on 2-pin Molex 5.0mm Euro-Style connector:** A contact closure lights the blue LED on front panel showing which Universal CCU and camera combination is the live Program in a multi-camera CCU installation. A tally command will also be sent to the camera via RS-232 to illuminate the LED on the cameras that have on-board tally lights.

- **Camera Feature Switches:** The CCU interface has an 8-position dip switch on the rear panel to allow for certain functionality. All switches should be in the down position for default.
  - **Dip Switch 1:** Put up to allow Scene A to load upon start-up or boot up.
  - **Dip Switch 5:** Put up to access LCD Display Menu settings including Display Mode, Bias and Contrast.

- **Video from Camera** - YELLOW RJ-45: The yellow RJ-45 receives the camera's differential video signals from the RoboSHOT's EZ-POWER VIDEO jack (but there's no power on the cable).

- **HD Video Outputs:** The Universal CCU has 3 (three) simultaneous video output formats that are the same resolution as the video inputs providing the ultimate in connectivity flexibility. The output formats include:
  - HD YPbPr on DE-15-F (HD15) - (supports up to/and including 1080p/60 - not limited)
  - HDMI on HDMI-F (supports up to and including 1080p/60)
  - HD-SDI on Edge Mount Carrier Class, Gold BNC-F (supports 3Gb/s Single Link 1080p/60 HD-SDI)

Big Important Note: The Quick-Connect Universal CCU supports the resolutions with frame rates of above 50 Hz (60, 59.94 and 50). Consequently, the 30, 29.97 and 25 fps from the Vaddio cameras are not supported

RoboSHOT and Quick-Connect Universal CCU Control Menus

The RoboSHOT cameras have individual firmware that auto loads when the camera is plugged in to the Universal CCU and the CCU is turned on (Note: Always turn the camera on first so when the CCU wakes up, it will recognize the RoboSHOT). The menus are organized as follows:

Menu Organization

Main Control Menu 8-Most used Controls displayed	**Shutter and Noise Reduction Menu**	**Wide Dynamic Range Menu**	**CAT-5 Adjust Menu** With Skew, Color Space Y-Gain and Six preset Scene	**Version Info Menu**	**LED Display Menu** For set up of front panel LED display
				For this Menu, put Dip Switch 5 UP	**LCD Display Adjustment Menu**

Image: Main Menu Page

The Main Menu screen shows eight (8) prominent parameters at a time. These controls are directly related to the front panel buttons allowing for quick change access. Simply touch the button of the control to be adjusted, and spin the rotary encoder and watch the value of the control on the display change in real-time. This screen does not need a cursor since the control relates directly to a front panel button.

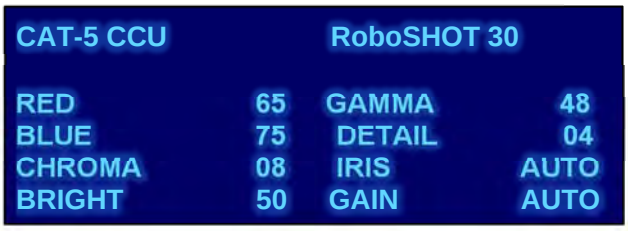


Image: Shutter and Noise Reduction Menu

Access to the shutter speed is allowed in this menu. For the most part, it can be left at the default unless challenging or funky lighting demands the use of the shutter. On this screen and the rest, the cursor is the "@" sign and the ">" appears as the parameter is select and adjusted. Touch cancel to return to the cursor mode.

Image: Wide Dynamic Range Menu

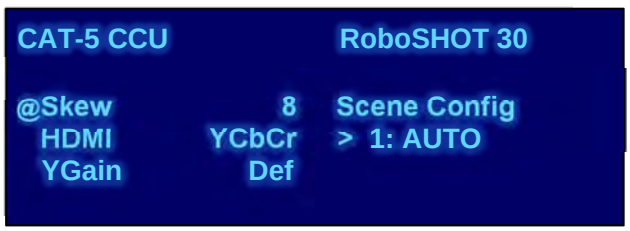
The controls on this screen work together to provide wide dynamic range (WDR. The controls are used in conjunction with the Auto Iris Mode (auto iris has to be on to use WDR).

The WDR controls include:

Wide Dynamic Range:	**ON/OFF**
Display Brightness Level:	**0 - 6**, 0: Dark, 6: Bright
Brightness Compensation:	**0 - 3**, 0: Very Dark, 1: Dark, 2: Standard, 3: Bright
Compensation Level	**0 - 2**, 0: Low, 1: Medium, 2: High

Image: Cat-5 Adjustment Menu Page

The Cat-5 Adjustment Menu allows the operator to adjust the skew of the Cat-5 Cable, the color space of the HDMI output, Y-Gain and the Scene Configuration.



- Adjust the skew of the Cat-5 cable (range of 1 to 16) to compensate for differing lengths of the Cat-5 cable pairs between the camera and CCU. This setting will usually be best in the middle of the range of skew numbers which pass acceptable video.
- Set the HDMI Color Space to YCbCr for HDMI and to sRGB for DVI-D output.
- The Y-Gain is for adjusting the video ±10 IRE at all outputs as needed for associated video equipment.
- Preset Lighting Scene Configurations offer sample settings for fluorescent, incandescent and outdoor lighting environments. Choose the scene (shown in the Screen Config description below) which looks best for the situation and fine tune from there.

Scene Configurations:
Six (6) Generalized Scene Configurations have been added to allow the user to quickly run through preset lighting environment scenes. The admin can set three (3) custom scenes as well. The following presets are included:

1) AUTO (full Auto)
2) Incand Lo (incandescent low)
3) Incand Hi (incandescent high)
4) Fluor Lo (fluorescent low)
5) Fluor Hi (fluorescent high)
6) Outdoor

Image: LCD Screen Adjustment Screen

Put DIP switch 5 in the up position to adjust the front panel LCD. The controls provided on this menu include:

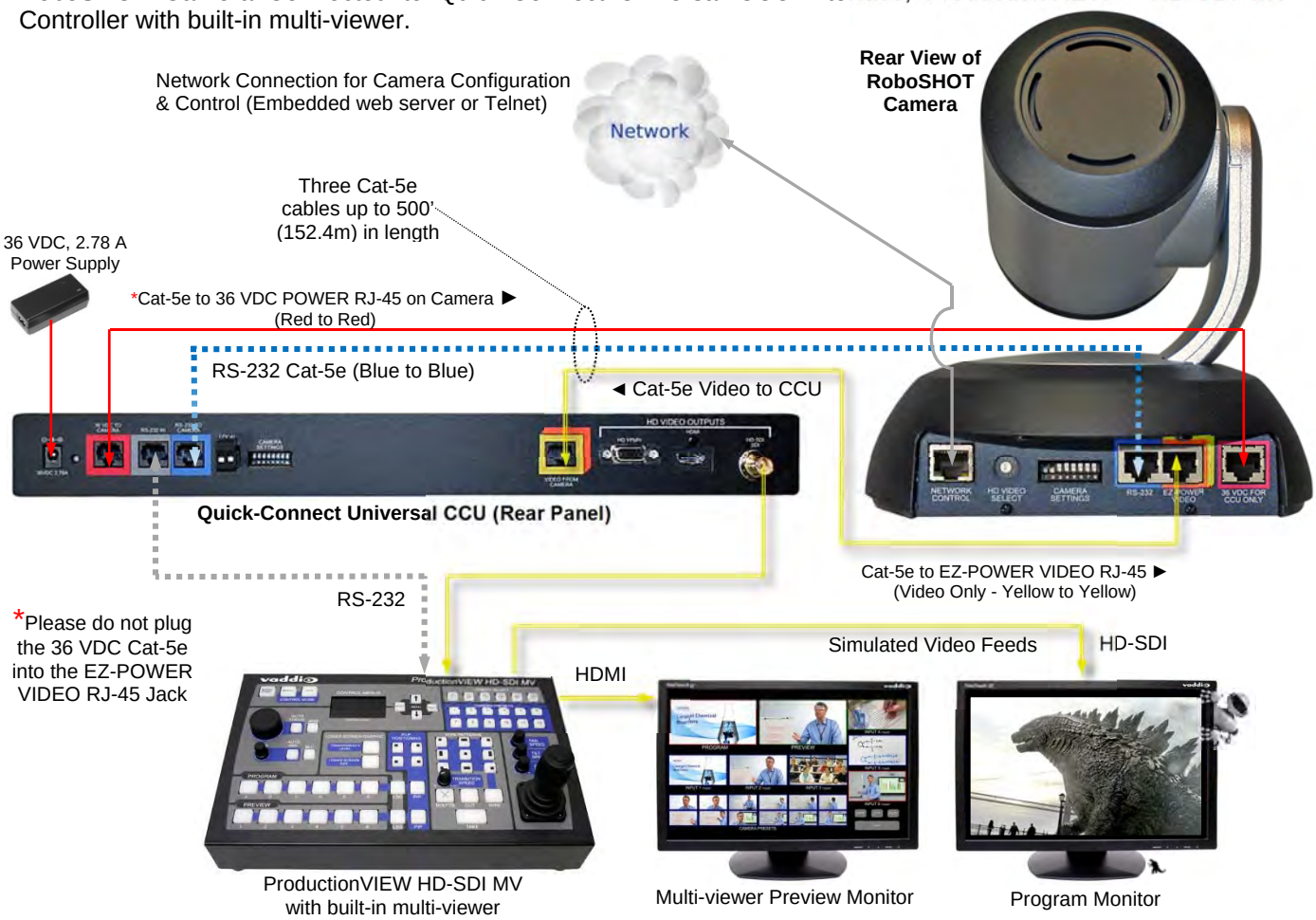
- **Display Mode:** Normal (negative mode) and Inverted (positive mode)
- **Bias:** Serves as a brightness control.
- **Contrast:** For overall adjustment of the LCD contrast. Set these controls to taste with the idea of making the display more readable.
- When finished, put DIP switch 5 back in the down position.

System Configuration Example

The Quick-Connect Universal CCU interface uses three (3) Cat-5e cables to supply power to the camera, return differential video from the camera while providing bi-directional control signaling (RS-232) for the camera over a distance of up to 500' (152.4m).

Diagram: Basic Connectivity Example

RoboSHOT Camera Connected to Quick-Connect Universal CCU Interface, ProductionVIEW™ HD-SDI MV Controller with built-in multi-viewer.



INSTALLATION BASICS:

The RoboSHOT cameras include a Thin Profile Wall Mount for…wall mounting the camera. There are options for IN-Wall™ mounts and IN-Ceiling™ Half-Recessed as well. The Cat-5 cabling ideology is especially convenient for camera mounting when the camera location is not anywhere near an AC outlet. Installation is simplified in that no custom 8-Pin mini-din cables or expensive plenum coax cables or multi-pin cables or power outlets are required near the camera location. All Cat-5 cabling is routed to the head-end using with standard straight through RJ-45 connectors (568B termination). *"Pass-thru" type RJ-45 connectors should be avoided like bad clichés."*

Step 1: Determine Camera Mount Location

When locating the camera, consider viewing angles, lighting conditions, possible line of site obstructions and check for in-wall or in-ceiling obstructions where the camera is to be mounted. Pick a mounting location to optimize the performance of the camera. After determining the optimum location of the camera system, route the required three (3) Cat-5e cables from the camera location back to the head-end. Mark the Cables: POWER, VIDEO and CONTROL.

Note: Please check all Cat-5 cables for continuity in advance of final connection (568B). Plugging the Power Cat-5 cable into the wrong RJ-45 or using the wrong pin-out may cause damage to the camera system and void the warranty, which is typically bad…mostly.

After determining the optimum location of the camera system, route the required Cat-5e cables from the camera to the head-end Quick-Connect. Test and mark the cables accordingly.

Use a level to level the mount…

The Cat-5e cables should feed-through the cable management slots provided by all Vaddio mounting options. If the wall mount is to be mounted on a 2-gang wall box, use the screws supplied with the wall box cover plate to attach the Thin Profile Wall Mount Bracket. If mounting to drywall with wall anchors, use the four (4) quality wall anchors and screws provided.

The mounting holes are slotted and are 90° opposing to provide easy leveling. Level the mount and place the camera on the mount. Check the level again to avoid any of those *weird Batman like camera angles*. Use the provided ¼"-20 x .375" mounting screw to attach the Camera to the mount.

Step 2: System Wiring

Follow the sample wiring diagrams for connecting the Cat-5e cables to the camera and Quick-Connect Universal CCU Interface. Additional diagrams are available on the Vaddio website.

Connect the camera side as follows:

- First, remove the dust cap on the Power RJ-45 and connect the POWER Cat-5e to the 36 VDC FOR CCU ONLY RJ-45 on the RoboSHOT.
- Connect the VIDEO Cat-5e to the EZ-POWER VIDEOV RJ-45 on the RoboSHOT (Only differential video is transported over this Cat-5e - there is no power is on this wire).
- Connect the RS-232 control Cat-5e to the "RS-232 IN" RJ-45 on the RoboSHOT camera.

Connect the Universal CCU side as follows:

- Connect the VIDEO Cat-5 cable to the VIDEO FROM CAMERA RJ-45 jack (yellow) on the CCU.
- Connect the RS-232 Cat-5 cable to the RS-232 TO CAMERA RJ-45 (Blue) on the CCU.
- With the CCU not plugged into a power source, connect the POWER Cat-5e cable

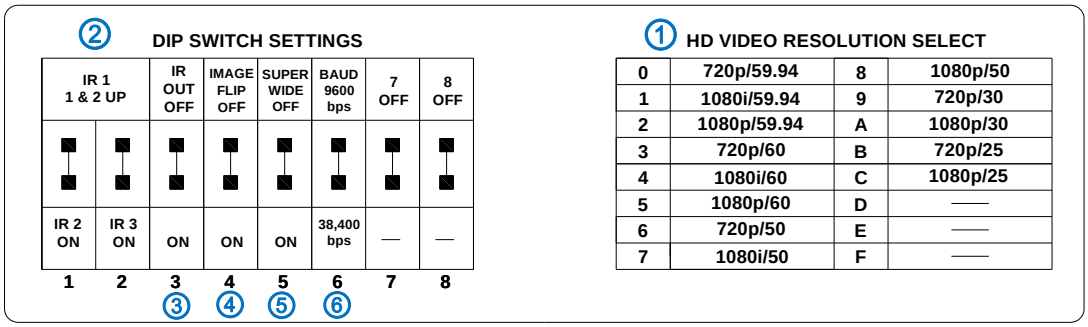
Step 3: It's alive… Plug the 36 VDC adapter into a power source and connect the DC power connector to the CCU. If all the connections are good, the CCU will light up and look for the camera. The camera will boot up, twitch a bit, and move to the home position. The CCU will find the camera and load the RoboSHOT control protocols. If using a Vaddio controller, connect it to the RS-232 IN RJ-45 and turn on the controller. To ensure proper continuity of control, the RS-232 controller (control system or joystick) should be powered on after the CCU and camera.

Important Note: Please refrain from dousing the CCU and RoboSHOT with and type of commands while they are booting up. Wait until the boot cycle of the camera is finished. It has a Linux OS, so let it boot.

SETTING THE ROBOSHOT CAMERA

The RoboSHOT cameras control the resolution of the video signal sent back to the Quick-Connect interface. There is, as explained on the page 9, a rotary switch to set the HD video resolution and a set of eight (8) dip switches that determine certain camera functions. See the drawing and description on how to setup the camera.

Drawing: Dip Switch and Resolution Label on the Bottom of the RoboSHOT



Setting the RoboSHOT Switch Gear:

1) Set the desired and available HD output resolution for the camera with the Rotary Switch.
2) Set the IR control frequency of the camera if it is to respond to the IR remote control.
3) If using the IR forwarding features with a 3rd party codec remote, set the IR OUT switch to ON (SW3).
4) If inverting the camera, turn the IMAGE FLIP ON (SW4).
5) For the RoboSHOT 12X model only, set the Super-wide mode to ON for a 12X, 73º horizontal super-wide angle of view. Normal mode will produce 67.2º horizontal field of view (HFOV). The RoboSHOT 30 does not have a Super Wide mode.
6) Set the Baud Rate dip switch (SW6) to 9600bps for most applications. Default is 9600 bps systems.
7) Setting all dip switches DOWN with a power cycle loads the default camera settings. Return dips to desired operating position after power cycle.

Note: *Switches 7 & 8 are reserved for future use.*

Dip Switch Settings Further Explained (DSSFE):

- **IR 1, 2 and 3 (SW 1 &2):** A single IR remote has the capability of operating up to three different PTZ cameras in a room. Use these selector dip switches and the selector buttons at the top of the IR remote to select the frequency.
- **IR OUT on/off (SW3):** The IR output is sent out on the RS-232 RJ-45 jack on the back of the camera. Turning on the IR output will allow IR signals to be transmitted over the Cat-5 cable to the head end. When using RS-232 control or Vaddio CCU controllers (also via RS-232), turn the IR OUT to ON (down - turns off IR reception for the camera functions).
- **Image Flip (SW4):** To invert the camera, turn the IMAGE FLIP ON (switch down).
- **Super-Wide Mode:** Super-wide works only with the RoboSHOT 12 model and allows the camera to switch from 67.3º wide end HFOV to a Super Wide 73º wide end HFOV.
- **Baud Rate (SW6):** The options for baud rate are either 9600 or 38,400 bps. The 9600 bps works best with Cat-5e over distance. Use 38,400 bps for short control lines only.
- **Dip Switches (SW7 & 8)**: Not used for operation, please leave these dip switches up or in the OFF position.

SETTING THE CCU

Optimizing the Quick-Connect Universal CCU settings will help achieve maximum performance from the system. Difficult lighting is one of the most challenging problems video system integrators face. The Vaddio CCU will provide the flexibility to fine tune for variables such as cable length, day/night lighting transitions and lighting color temperature.

- **Adjust Iris and Digital Gain Settings:** Disable Auto Iris. Set the Iris to its largest aperture (lowest ‘f’ number). Adjust the Gain until the image is too dark and then bring it back until it is properly exposed. Exposures that require high gain settings will have a grainy video image. Adjust the detail settings for a smoother image.

- **Adjust Color to Taste:** Required adjustments will vary based on the environment. The CCU allows the set-up of three (3) scenes so settings are available for a variety of conditions. Adjust the Chroma level to taste. Adjust Red/Blue levels next. Adjusting for skin tones or using a color chart is an easy way to find a good baseline setup.

CONTROLLING THE CAMERA

IR Remote Commander

The following functions are accessible with the Vaddio IR remote:

- Camera Power On/Off (Toggle on/off same button)
- Back Light Compensation (Toggle on/off same button)
- Data Screen: Toggle on/off the OSD for the RoboSHOT's IP/MAC Address
- Camera Select (the remote can operate 3 cameras (with 3-IR Freq.)
- Pan/Tilt and Home controls with Reverse and Std. Pan direction
- Pan/Tilt Reset
- Auto Focus (Toggle on/off same button)
- Zoom In/Out controls Wide & Telephoto
  - Fast speed controls (W & T)
  - Slow speed controls (W & T)
- Manual Focus On/Off control (Toggle on/off same button)
  - Near (-) adjustment
  - Far (+) adjustment
- Six (6) pan/tilt/zoom positioning presets (1 through 6)
- Preset Set (store)
- Preset Reset (clear)
- Red LED that indicates IR Transmission and battery level

Vaddio
IR Remote
Commander

The IR Remote operational characteristics are as follows:

- **Preset Activation:** IR Remote is limited to executing Presets 1 through 6
- **Tri-Sync Speed on Preset**: If a global Tri-Sync speed is stored in the preset by the user/admin, then that speed is used. If no Tri-Sync speed is assigned, then a default (medium) speed will be used.
- **Preset Store:** IR Remote is limited to positional (PTZ) type presets. To set a preset, position the camera, hold down the Preset Button and touch the one of the preset numbered buttons 1 through 6.

Telnet Control

The following *Telnet commands are available through the Ethernet Port.

- Camera Home
- Camera Pan (left, right and speed - real-time operation)
- Camera Tilt (up, down and speed - real-time operation)
- Camera Zoom (zoom in/out/stop and speed - real-time operation)
- Camera Store Preset (Gets or Sets 12 presets with global relative PTZ [Tri-Sync] speed control to destination)
- Camera Image (Gets or sets current image control values, sets in 1 of 3 CCU presets)
  (AWB or manual w/Red and Blue gain, BLC on/off, Auto Iris or manual with Iris value and Gain, Detail and Chroma)
- Camera Sleep (Gets or sets standby power mode - camera has to us less power in this mode)
- Exit (ends Telnet session)
- Help (displays CLISH syntax)
- History (command history)
- Network Ping (send ICMP ECHO_REQUEST to network hosts)
- Network Settings (Gets MAC address, IP address, Subnet Mask, Gateway and NTP server address)
- Network (Gets the current network settings or pings an IP address)
- System Factory Reset
- System Reboot
- Version (system version information)

*Please see the full Telnet command list at the end of this manual

THE SCREEN SHOT TOUR

The RoboSHOT camera platform uses a Linux OS and has a built-in web server. The internal web pages will allow control of the attached camera via an Ethernet network connection. These web pages will allow the user or administrator to control the camera, set PTZ presets, set security passwords, change the IP address, view diagnostics, access the firmware upgrade page and more!

Compatible Web Browsers

You may ask, "What are the approved web browsers that work with the RoboSHOT's embedded web server?" The answer is: Chrome® (latest version), Firefox® (latest version), Internet Explorer® (versions 8 through 11) and Safari® (versions 6 and 7) have been tested thoroughly with RoboSHOT and are compatible.

DHCP IP Set-up (Dynamic Host Configuration Protocol)

DHCP Set-up (skip this section if Static IP). If the LAN has a DHCP (dynamic host configuration protocol) server, then the IP address, gateway and routing information will automatically be assigned. The software is defaulted to DHCP and will attempt to dynamically obtain an IP address using DHCP, but it will fall back to the default address of (169.254.1.1) if no DHCP server can be found.

Static IP Set-up:

The static IP can be assigned either through the network or directly to a computer using a cross-over cable. Depending on the age of the computer, you may not need a cross-over cable. Either way the steps are the same for network or direct connection to a computer. The default address of the camera is 169.254.1.1 and the Subnet mask is 255.255.0.0. Different computer OS types all have their own way of doing things (without question), but they are essentially doing the same stuff, changing the IP address so the web pages of the RoboSHOT are accessible.

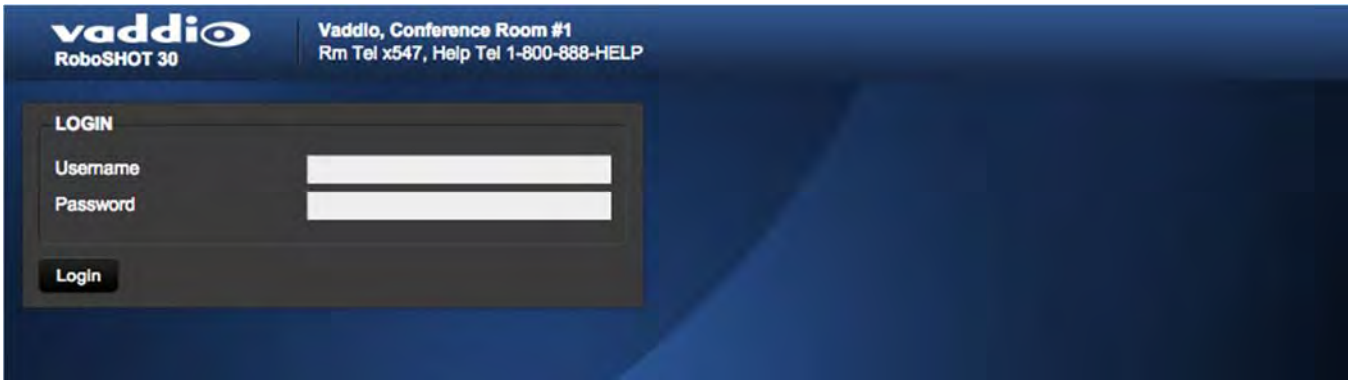
Screen Shot: Login

The RoboSHOT webserver is intended as a user's camera control page at one level, and an administrator's management tool at another level, which requires password authentication for access.

The Login Page will appear if there is a user name assigned by the administrator. Assigning a user name can limit access to the admin menus by a general user.

By default, the User name is: user, and the password for the User account is: password.
The Administrator can set the name and password for the User account.

By default, the Admin user name is: admin, and the password for the admin account is: password



If a user or an admin logs in through this screen, then the next page shown will be the camera control page.

The user will only have access to the camera control page.

The Admin will have complete access to all web pages.

Screen Shot: Camera Control Page

This web page provides access to the camera controls for the User and the Admin.

1) **Pan, Tilt and Home Controls:** These intuitive controls use the up/down and diagonal arrows for camera pan and tilt. The center button will move the camera to the home position.

2) **Zoom Control:** The camera's zoom lens can be controlled with the "+" to zoom-in and the "-"to zoom out.

3) **Standby:** The Standby control puts the camera in low power mode and effectively puts the RoboSHOT to sleep. If the system is on, then the button will be blue and controls will be visible. If the button is red, no controls are accessible and the screen states: Device is in standby. Click to power-up, then you'll know what to do.

4) **The Focus and Settings Buttons:** Clicking the Focus button opens pop-up window that lets the user set auto or manual focus with Near/Far controls. Clicking the Settings button opens a pop-up window that allows the user to reverse either the pan or tilt direction or both.

5) **Pan/Tilt and Zoom Speed Controls:** The speed for both the Pan/Tilt and Zoom controls can be adjusted with the three (3) sliders in this section. For tighter shots, it is recommended that the slower speed is used. These controls are for real-time camera movements only.

6) **Camera Presets:** Twelve (12) camera position presets can be recalled simply by clicking a preset number.

7) **Store Preset Button:** Clicking the Store button opens up a Store Preset pop-up dialog box. To set presets, set up the camera shot, click on choice of preset number (1 through 12). The preset is stored and the dialog box closes. The Store Preset dialog bow will prompt the operator to enter the Tri-Sync speed to the stored camera preset and if the current color settings are to be stored with the preset too (see the next page).

8) **CCU Scenes:** The user has access to the CCU scenes set and stored on the Admin pages. There are three (3) user definable presets and six (6) presets preconfigured by the technical folks at Vaddio (really Scott set them all) that are meant to be used in certain lighting scenarios. These lighting presets included: Automatic, Incandescent Hi, Incandescent Lo, Fluorescent Hi, Fluorescent Lo and Outdoor.

9) **Administration Menu:** By clicking on the Administration menu bar, the Admin Login screen will appear.

Screen Shot: Storing Presets

1) Store Preset: When the Store Preset button is clicked (point 6 on previous page), the Store Preset dialog pops into existence. To save the current camera shot, click one of the Preset buttons (1 through 12), the button will be highlighted and the dialog box will present the Tri-Sync controls and if the CCU setting are to be kept with the preset.

2) Save with Tri-Sync and Setting the Tri-Sync Speed: The Tri-Synchronous Motion algorithm in the RoboSHOT cameras is capable of moving all three (pan, tilt and zoom) axes simultaneously. The algorithm calculates the PTZ position so pan, tilt and zoom arrive at the preset subject simultaneously. Tri-Sync speed is speed at which all other presets will use to get to the preset being stored. All axes will launch at the same time and if the next preset position is not too close or too far, axes should simultaneously arrive at the preset location. Storing the preset with Tri-Sync is fairly straight forward. Here's a quick method to set Tri-Sync:

a) Position the first preset, click on Store Preset and click on Preset 1. Check the Save with Tri-Sync box. Move the tri-Sync speed slider to about the approximate position above (about 1/3 up the speed scale). This is the speed that all the other presets will use to get to this Preset 1. The speed is stored with the destination preset. Click on Save to store the camera location and Tri-Sync speed.

b) Set another camera position, and try a different pan, tilt and zoom position and click on Store Preset. Click on Preset 2 through 12, click on the Save with Tri-Sync box and set the slider to about ½ way this time and click on Save. These two presets are stored with different preset destination speeds.

c) Click between these two recently stored presets and note the different speeds applied to the 2 presets.

Tri-Sync Notes: If a preset is very close to the previous preset, like within10º with no change in zoom, it certainly doesn't need to be Tri-Sync'd. If a preset is super-fast and off-air, Tri-Sync won't be of much use either. Tri-Sync is a cool tool to set for on-air shots, but the process of setting the speeds will need some practice.

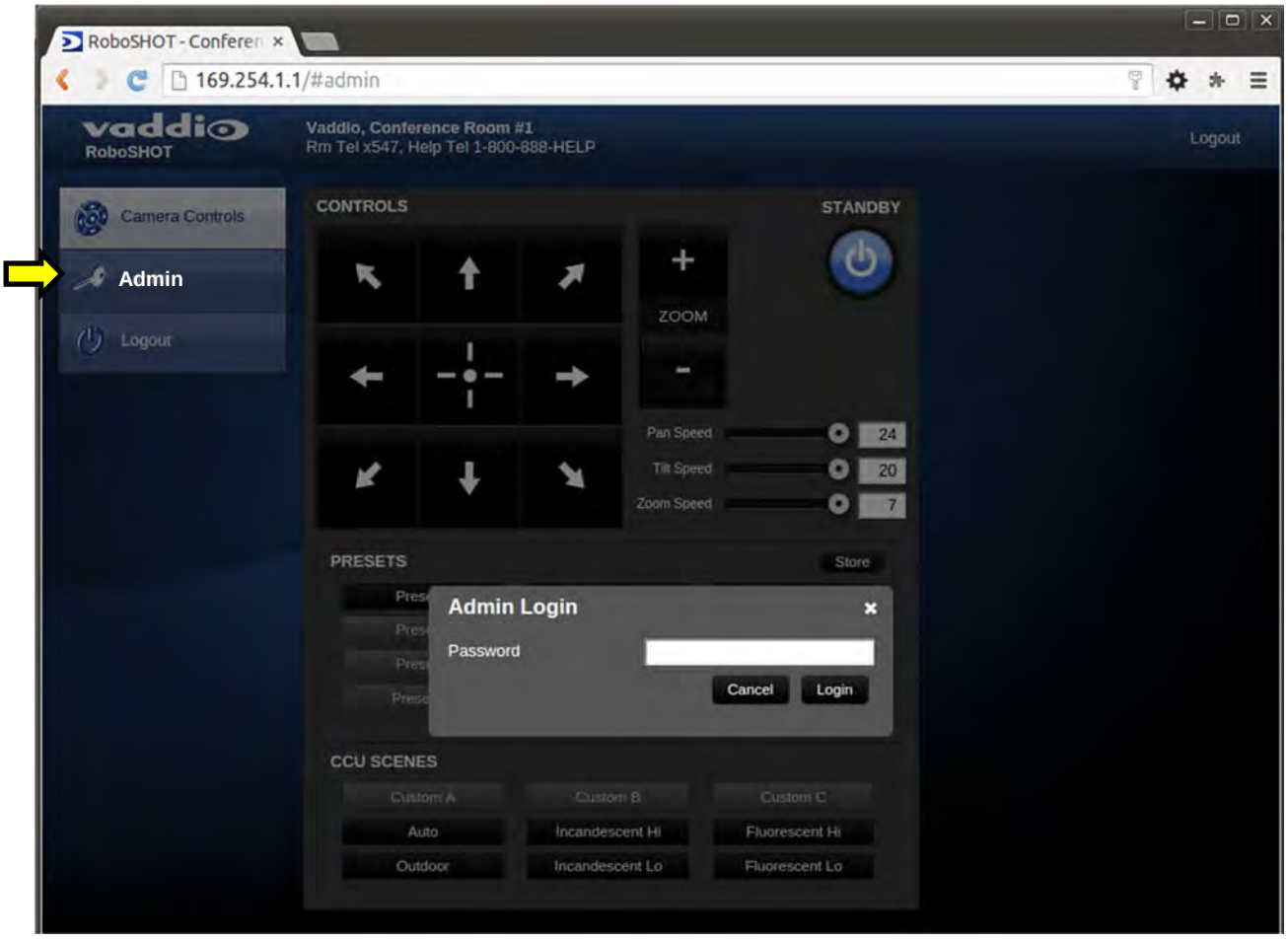
3) Store with Current Color Settings: To save the currently assigned CCU scenes settings, check this box.

4) Click Save or Cancel to exit this pop-up dialog box.

Screen Shot: Admin login from the Camera Control Page

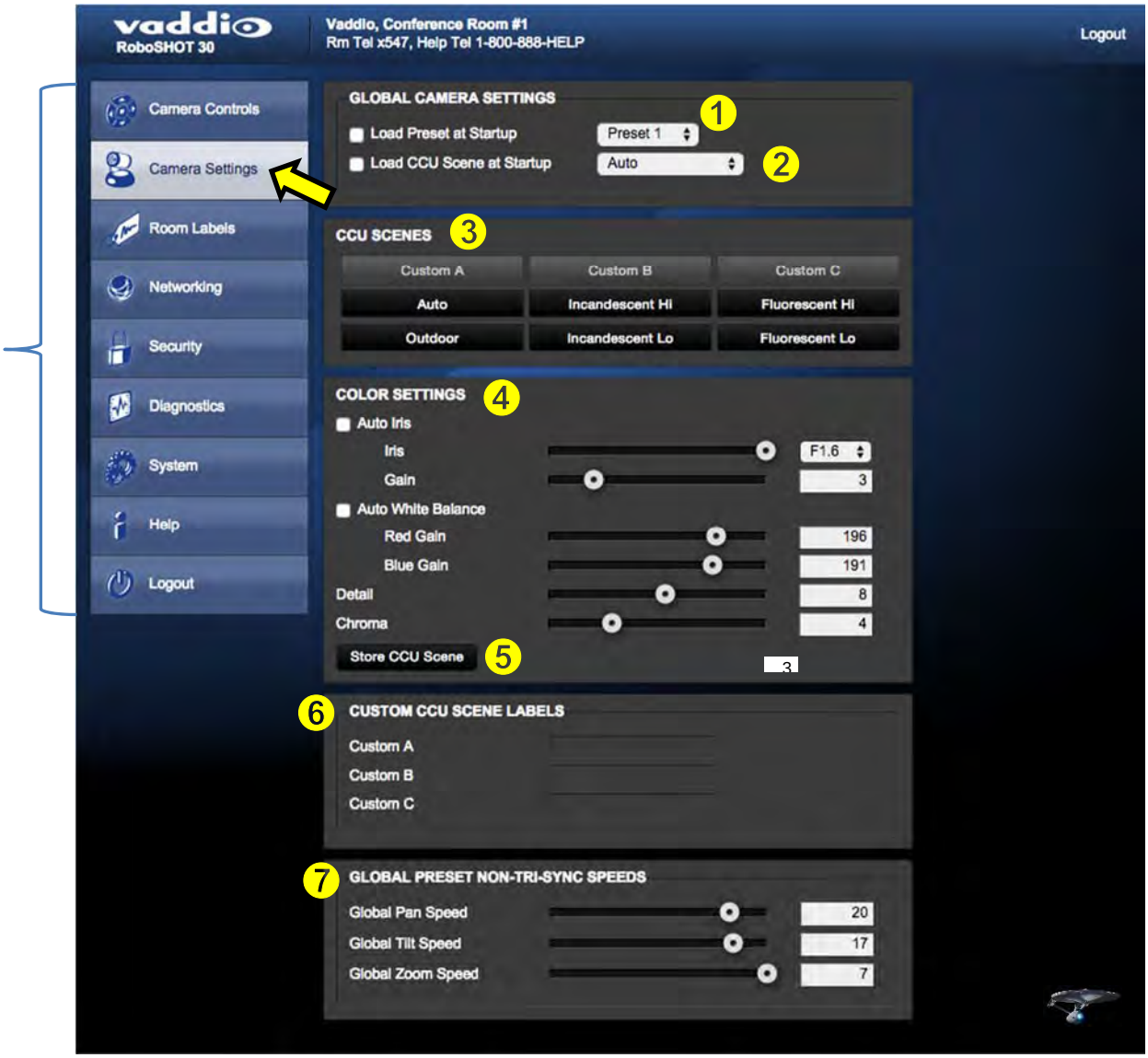
On the security page, which will be reviewed at a bit later in the tour, allows the Admin to set the system to allow automatic guest access to the main camera control page. If guest access is turned on by the Admin, then system will open to the camera control page and an additional Admin Login is provided.

The default Admin password is: password.



Screen Shot: Admin Menu - Camera Settings

Once the Admin logs in, then all the admin menu buttons appear on the left side of the screen. The first menu after camera controls is Camera Settings.



1) **Load Preset at Startup:** Check this box to move the camera to a predefined preset location when the camera powers up. Use the pull down menu to select the Preset 1 through 12 to be loaded when this box is checked.

2) **Load CCU Scene at Startup:** Check this box to load a CCU Scene into the camera when the camera powers up. The pull down menu will allow the selection of one of the 6-factory scenes, or one of the 3 custom scenes.

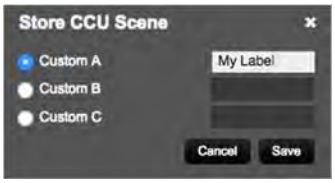
3) **CCU Scenes:** Click on any of these 9 buttons to load one of the CCU scenes into the camera. These Scenes can be fine-tuned if changes are needed, and stored into any of the three User defined scenes.

4) **Color Settings:** When painting or shading camera scenes for specific lighting situations or environments, these parameters can be adjusted for matching cameras in the same area. The parameters within the Color Settings section are defined below (top to bottom):

- **Auto Iris Check Box:** When checked, the camera will operate in Auto Iris mode, when unchecked, the camera will be in Manual Iris mode and allow adjustment of Iris and Iris Gain levels.
- **Iris:** Move adjustment slider as required to adjust the iris opening. A numeric value will be displayed in the box to the right of the slider.

- **Gain**: Move adjustment slider as required for amount of iris gain desired. Numeric value will be displayed in the box to the right of the slider.
- **Auto White Balance check box:** When checked, camera will operate in Auto White Balance mode, when unchecked camera will be in Manual White Balance Mode and allow for adjustment of Red and Blue Gain.
  - **Red Gain:** Move the adjustment slider as required for amount of Red Gain desired. A numeric value will be displayed in the box to the right of the slider.
  - **Blue Gain:** Move the adjustment slider as required for amount of Blue Gain desired. Numeric value will be displayed in the box to the right of the slider.
- **Back Light Compensation:** When checked, Back Light Compensation will be applied to the camera if camera is in Auto White Balance mode.
- **Detail:** Move the adjustment slider as required for amount of detail (Aperture) desired. A numeric value will be displayed in the box to the right of the slider. **Note:** If the detail is too high, the video can look grainy and appear noisy too.
- **Chroma:** Move the adjustment slider as required for the amount of Chroma (Color Vibrancy) desired. A numeric value will be displayed in the box to the right of the slider.

5) **Store CCU Scene button:** Once the desired scene adjustments have been made, this button will activate a pop-up menu that can be used to store this scene into one of the three User Defined Scene locations. These User Defined Scenes can be named as required for clarity. These User Defined CCU Scenes can be adjusted and re-saved at any time.



6) **Custom CCU Scene Labels:** The labels for the (3) User Defined customizable Scenes can be changed as needed. Mouse the cursor into the appropriate window and edit the text. Press Save to store these changes or press Cancel to exit this window.

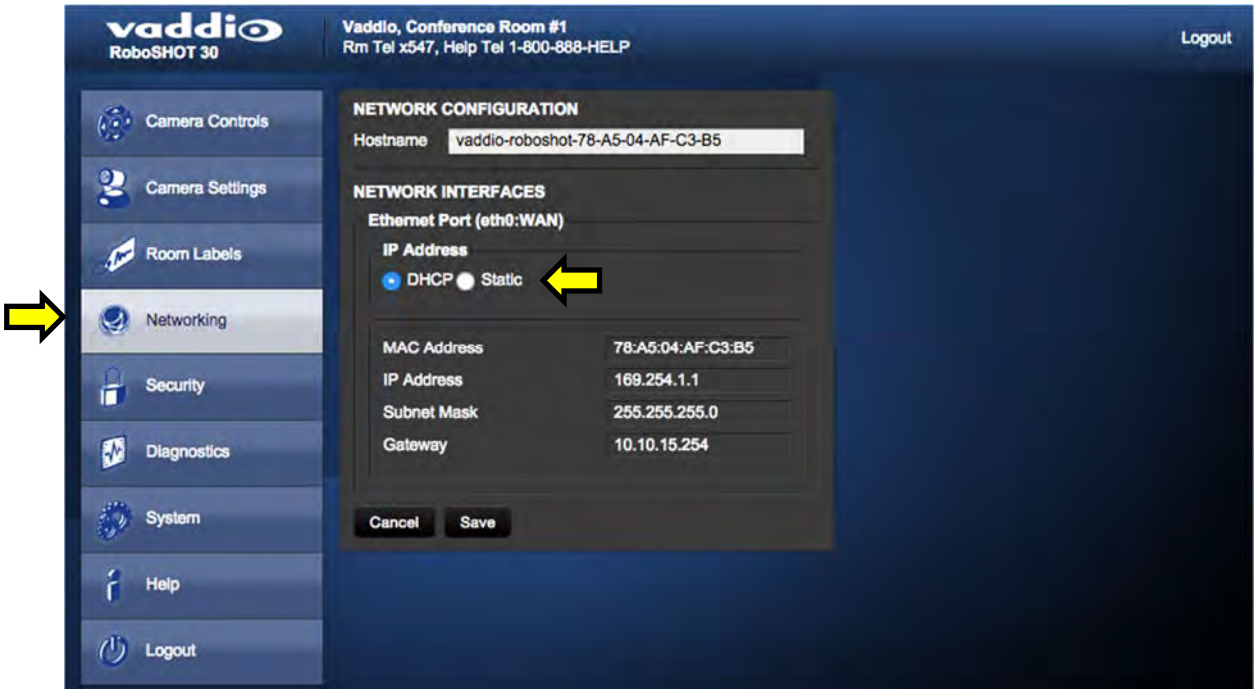
7) **Global Preset Non-Tri-Sync Speeds:** When Tri-Sync Presets are not being used, then this section governs the pan, tilt and zoom speeds between the camera presets. These will be defaulted to a nominal level, but can be tailored to most any application.

Screen Shot: Admin Menu - Room Labels

The Room Labels menu allows the Admin to label the company name, room name, room phone and help phone on a per RoboSHOT basis. The labels appear on every page at the top/middle of the page. Simply enter the room information and click Save.

Screen Shot: Admin Menu - DHCP Network Configuration

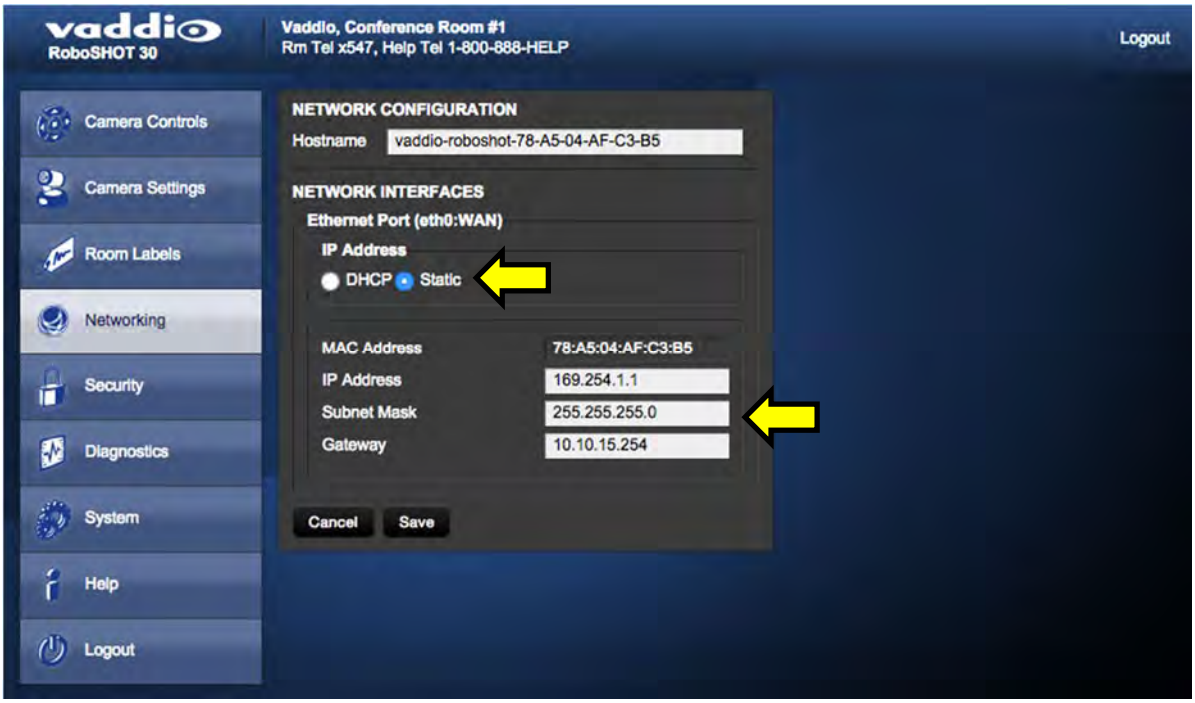
Under the Networking menu, The Network Configuration and Network Interfaces are displayed. This is where the Network administrator assigns either DHCP or a Static address and the associated parameters.



Notes: If the LAN has a DHCP (dynamic host configuration protocol) server, then the IP address, gateway and routing information will automatically be assigned. The software is defaulted to DHCP and will attempt to dynamically obtain an IP address using DHCP, but it will fall back to the default address of (169.254.1.1) if no DHCP server can be found.

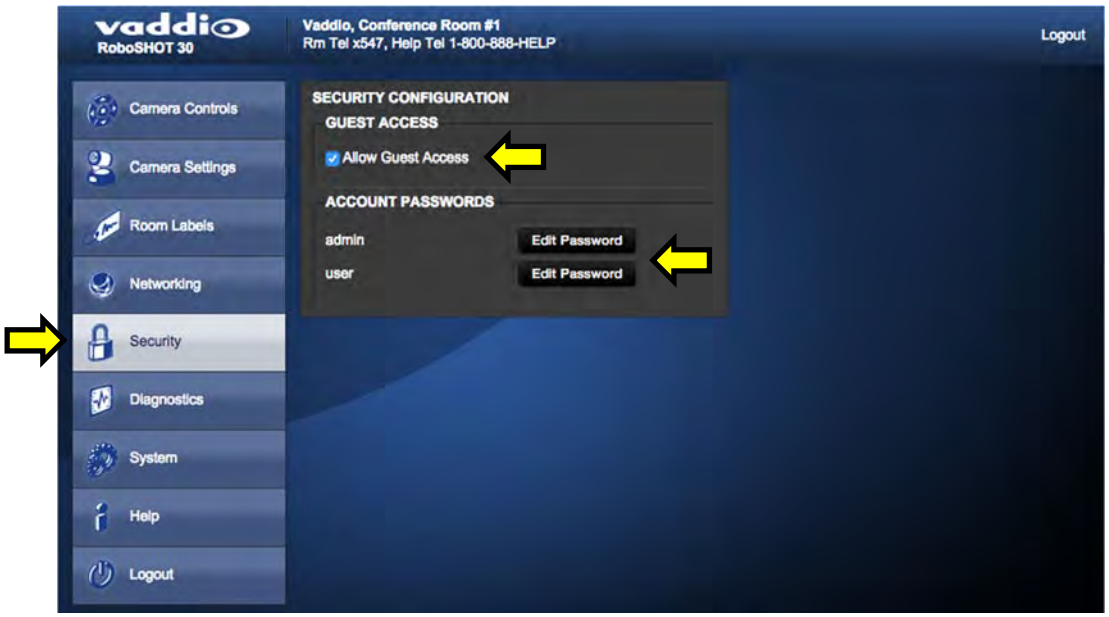
Screen SHOT: Admin Menu - Static IP Configuration

If Static IP is used, the IP Address, Subnet Mask and Gateway are manually entered. Click on Save to keep the Static IP information.



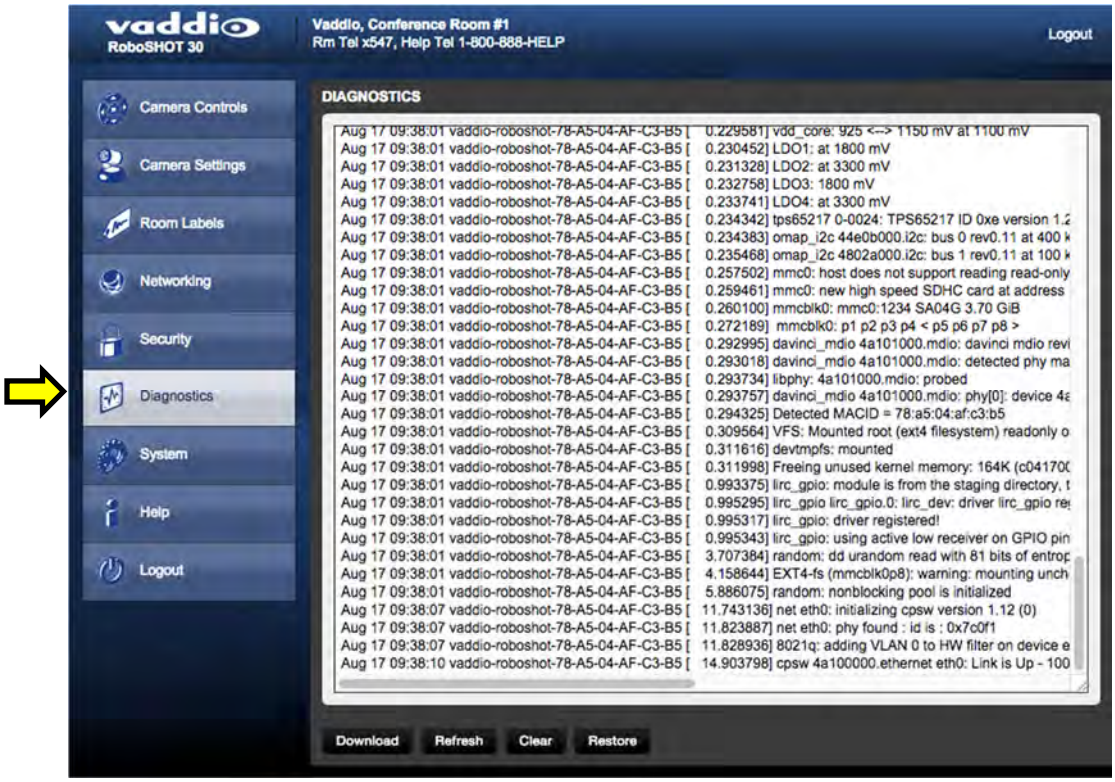
Screen SHOT: Admin Menu - Security

The Security menu allows the Admin to set the Admin and User account names and passwords. There is only one "user" password and only one "admin" password at any given time. If changes are made, click on Save to store the change (it's best to write down the new names and passwords). A Guest Access check box is provided to let any user access the camera control page without logging in. An Admin Login is provided on the camera control page if the "Allow Guest Access" box is checked.



Screen Shot: Admin Menu - Diagnostics

Diagnostics menu button will display a set of self-diagnostics. These diagnostics may help the Vaddio technical support team diagnose a problem with the RoboSHOT camera.



Screen Shot: Admin Menu - System

The System Menu is where the System Info is displayed and Firmware Updates are performed. There will be firmware updates and upgrades over the life of the camera. The file for the firmware update is chosen in this menu and the update is started here too. A remote system Reboot and Restore to Factory Presets is also available.

1) **Firmware Update:** The file for the firmware update is chosen in this menu and the update is started here.

2) **System Utilities:** A remote system Reboot and Restore to Factory Presets is also available.

3) **System Information:** The System version, Pan & Tilt Motor Versions and Sensor version are displayed in this section.

4) **Rear DIP Switch Status:** The DIP Switches on the camera are read and displayed for the Admin's reference. This information is read only. These switches determine the IR remote frequency, image flip, and baud rate of the camera and more!

5) **Rear Rotary Switch Status:** The rotary switch on the back of the RoboSHOT camera determines the video output resolution of the camera. The status is read from the camera (read only) and displayed for the Admin's reference.

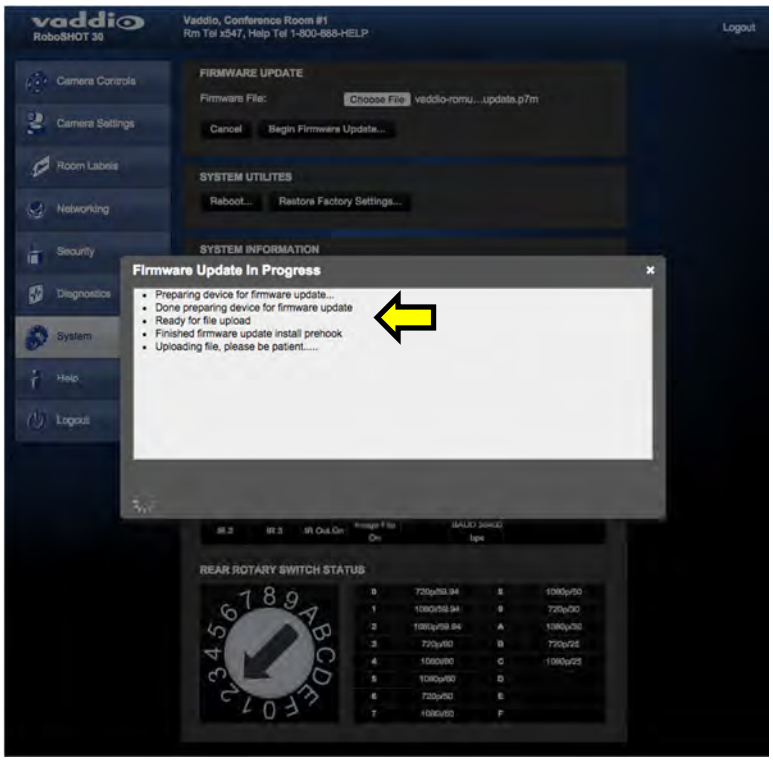
Important Note: Anytime a ***Firmware Update***, a **System Reboot** or a ***Restore to Factory Settings*** button is clicked, then a pop-up dialog box will spring up and ask if the intent is to continue or cancel. Please read and understand all the information in the presented in the dialog box prior to proceeding with any unknown procedure.

Screen Shot: Admin Menu - Update Confirmation

After choosing an update file and clicking on “Begin Firmware Update…” a confirmation pop-up and warning will be displayed. Please contact Vaddio Tech support for assistance with updates. Please read and completely understand the pop-up warnings as it is easy to lose patience waiting for updates. Click on continue to start the update.

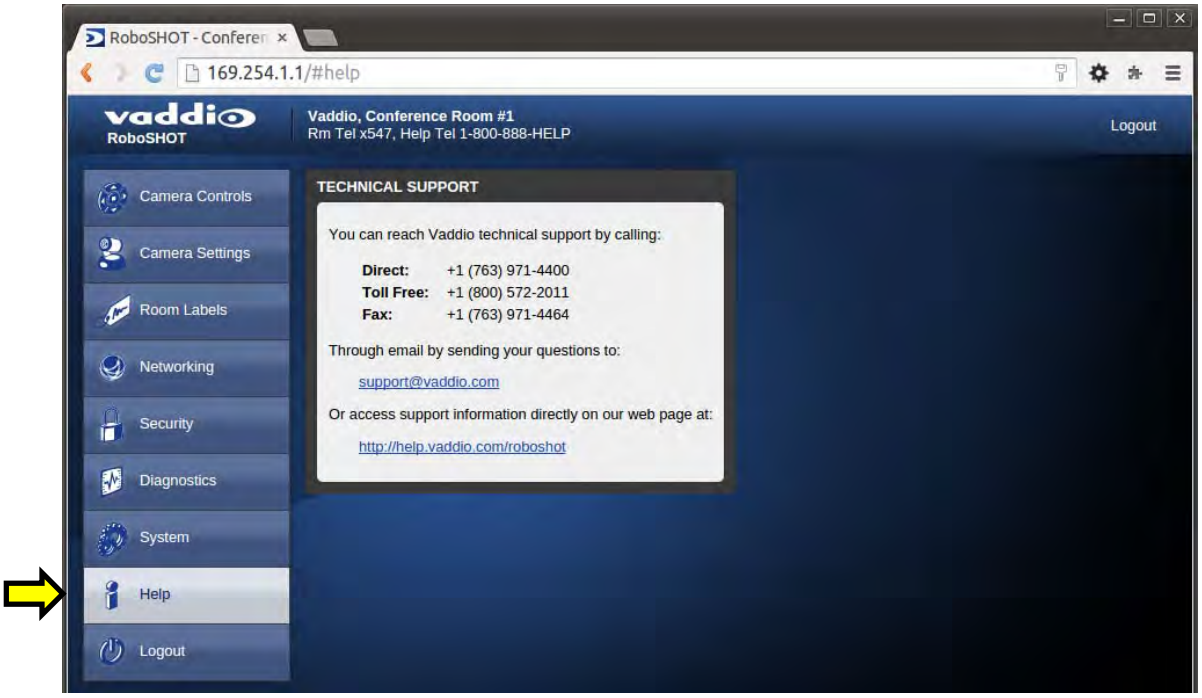
Screen Shot: Admin Menu - Update in Progress

After the firmware load has been started, a pop-up screen will advise patience and notify, in terms of percentage completed, the progress of the firmware update load. Again, please don’t interrupt the firmware load.



Screen Shot - Admin Menu - Help

Service/Help information can be found under the Help menu. Support phone numbers and e-mail, manuals, FAQ's and System information is listed on support@vaddio.com.



TECHNICAL SUPPORT NOTE:
Please work with your Network Administrator prior to calling Vaddio for technical support. Please have on-site network personnel initiate tech support calls with Vaddio.

This concludes the RoboSHOT Screen Shot Tour. Please enjoy yourself while reading the rest of this RoboSHOT Camera Manual.

The Next Sections:
The General Specifications, Communication Specifications, API, Telnet Command List, Warranty Information and Declaration of Compliance are breathtaking, stimulating and provocative as one would expect.

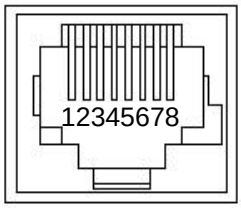
GENERAL SPECIFICATIONS

RoboSHOT Cameras	Description
Part Numbers	RoboSHOT 12 QCCU System, 999-9907-000 (North America), 999-9907-001 (Int'l) RoboSHOT 30 QCCU System, 999-9917-000 (North America), 999-9917-001 (Int'l)
Image Device	1/2.8-Type Exmor CMOS Sensor
Video Resolution/Frequencies	1080p60/59.94/50/30/25, 1080i/60/59.94i/50, 720p/60/59.94/50/30/25
Vaddio Special Features	• Tri-Synchronous Motion: Concurrent PTZ motor movement and simultaneous PTZ arrival at a stored preset • Advanced ISP: Vivid and accurate color reproduction with extremely fast, razor sharp automatic focus and iris routines
Video Aspect Ratio	16:9 Aspect Ratio for all resolutions
Effective Pixels	2.14 Million Effective pixels 2.38 Million Total Pixels
RoboSHOT 12 Lens and Horizontal FOV	12X Optical Zoom, Super Wide Mode: 73.0° (wide) to 6.6° (tele),f=3.91mm to 47.0mm, F1.8 to F3.4 10X Optical Zoom, Normal Mode: 67.3° (wide) to 7.6° (tele), f=3.8mm to 38.0mm, F1.8 to F3.4 NOTE: Default is Normal Mode
RoboSHOT 30 Lens and Horizontal FOV	30X Optical Zoom 65° (wide end) to 2.3° (tele end), F1.6 to F4.7
Minimum illumination **RoboSHOT 12**	1.0 lx (F1.8, 50IRE), recommended illumination >100 lux and <100,000 lux
Minimum illumination **RoboSHOT 30**	1.4 lx (F1.6, 50IRE), recommended illumination >100 lux and <100,000 lux
Minimum working distance **RoboSHOT 12**	10mm (wide), 800mm (tele)
Minimum working distance **RoboSHOT 30**	10mm (wide), 1.2m (tele)
S/N ratio	More than 50 dB
Sync system	Internal
White balance	Auto, ATW, Indoor, Outdoor, One-push, Manual (accessible through external control)
Gain	Auto / Manual (0 to 28 steps - accessible through external control)
Back-light compensation	On/Off (IR Remote)
Focusing system	Auto Focus / Manual Focus Mode / One Push Trigger Mode / Infinity Mode / Near Limit Mode
Noise Reduction	On/Off, 6 Steps, Off through 5 (accessible through external control)
Aperture/Detail	16 Steps (accessible through external control)
Control Interface(s)	• RS-232 API: Modified VISCA Emulation (TTL signal level) Baud rate: 9600 bps and 38,400 bps, 1-Stop bit. Default to 9.6 Kb/s for Cat-5e Distance • Telnet Serial Command API • Internal Web page for Network Set-up, firmware updates and network management • Vaddio IR Remote Commander
Pan & Tilt Angle/Speed	Pan/Tilt Angles: ±160°, Tilt: +90°, -30°, Pan/Tilt Speeds: Both Axes 0.35°/sec to 120°/sec
Rear Panel Connectors	• Network: RJ-45 with Green & Yellow LED to show connection and usage • RS-232 Out: RJ-45, Carries bidirectional control to and from the camera • EZ Power Video: RJ-45 Shielded, carries power and differential video signals for the Quick-Connect Cat-5 systems
Rear Panel Controls	• 16-Position Rotary Switch for Resolution selection • 8-Position Dip Switch for IR Frequency, Image Flip, wide mode and Reset to Default Settings
Power Supply	Powered by Quick-Connect interfaces
Compatible Joystick and Video Control Consoles	ProductionVIEW Precision Camera Controller ProductionVIEW HD ProductionVIEW HD MV with Integrated Multi-viewer, ProductionVIEW HD-SDI MV with Integrated Multi-viewer AV Bridge MATRIX PRO
Operating/Storage Temperature/Humidity	0°C (32°F) to 40°C (104°F), 20% to 80%
Mass	4.85 lbs.(2.199923 kg - Roughly 900 peanut M&Ms)
Dimensions	Small (3 dimensions not counting space/time) 6.942" (176.3mm) H x 7.056" (179.2 mm) W x 6.757" (171.6mm) D,
Quick-Connect Universal CCU	
CCU Connectors	• Power Connector: 5.5mm OD x 2.5mm ID • Power RJ-45: Supplies 36VDC to Camera • RS-232 IN RJ-45: Accepts RS-232 from controllers • RS-232 OUT RJ-45: Passes RS-232 to Camera • Tally: 2-Pin Phoenix type spring cage connector • Video From Camera RJ-45: Accepts differential video from camera (only supports resolutions above 50 Hz)
Video Outputs	• HD-YPbPr on DE-15-F connector • HDMI on HDMI-F connector • HD-SDI on Edge Mount Carrier Class, Gold BNC-F (3Gb/s Single Link 1080p/60 HD-SDI)
Video Adjustments	Y-Gain (+/- up to 10 IRE luminance gain) for fine tuning over longer cable distances, Skew for cabling distance compensation, HDMI color space (YCbCr or sRGB)
Cat-5 Cable Maximum Distance	Up to 500' (152.4m)
Power Supply	36 VDC, 2.78 Amp
Dimensions	1-RU Rack Mount - 1.72" H x 18.93" W x 7" D (43.7mm x 480.1mm x 177.8mm) Rack Ears Included

Note: Specifications and pricing are subject to change without prior notice or obligation.

COMMUNICATION SPECIFICATION

Communication Speed: 9600 bps (default)
Start bit: 1
Stop bit: 1
Data bits: 8
Parity: None
No Flow control



Pin # RJ-45 RS-232 and IR Out Pins
1) Unused
2) Unused
3) Unused
4) IR Output (Diff Signal to Quick-Connect SR)
5) IR Ground (Diff Signal to Quick-Connect SR)
6) GND (GND of IR Short Range - Pin 3)
7) RXD (from TXD of control source)
8) TXD (to RXD of control source)

NOTE: The Vaddio RoboSHOT Control Protocol is similar, but not identical 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 many Vaddio specific commands in the following Command and Inquiry Lists.

RoboSHOT Command List (1/3)

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 2p FF	p= Socket No.(1-2)
CAM_Power	On	8x 01 04 00 02 FF	Power on
	Off	8x 01 04 00 03 FF	Power off
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(std)	8x 01 04 07 02 FF	
	Wide(std)	8x 01 04 07 03 FF	
	Tele(variable)	8x 01 04 07 2p FF	p= speed 0:low to 7:high
	Wide(variable)	8x 01 04 07 3p FF	p= speed 0:low to 7:high
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs=Zoom Position (0h-4000h)
CAM_DZoom		Not supported	
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(std)	8x 01 04 08 02 FF	
	Near(std)	8x 01 04 08 03 FF	
	Far(variable)	8x 01 04 08 2p FF	p= speed 0:low to 7:high
	Near(variable)	8x 01 04 08 3p FF	p= speed 0:low to 7:high
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs=Focus Position (1000h – F000h)
	Auto Focus	8x 01 04 38 02 FF	
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 08 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One push AF Trigger
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	pqrs=Near focus Limit***
CAM_AFSensitivity	Normal	8x 01 04 58 02 FF	AF Sensitivity High / Low
	Low	8x 01 04 58 03 FF	
CAM_AFMode	Normal AF	8x 01 04 57 00 FF	AF movement mode
	Internal AF	8x 01 04 57 01 FF	
	Zoom Trigger AF	8x 01 04 57 02 FF	
	Activate/Internal Time	8x 01 04 27 0p 0q 0r 0s FF	pqrs=movement time, rs=Interval
CAM_IRCorrection	Standard	8x 01 04 11 00 FF	Focus IR compensation data switching
	IR light	8x 01 04 11 01 FF	
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs=Zoom Position (0h – 7AC0h) tuvw=Focus Position (1000h – F000h)
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	Auto Tracing White Balance
	Manual	8x 01 04 35 05 FF	Manual Control mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger
	Outdoor Auto	8x 01 04 35 06 FF	Outdoor auto
	Sodium Lamp Auto	8x 01 04 35 07 FF	Auto including sodium lamp source
	Sodium Lamp	8x 01 04 35 08 FF	Sodium lamp source fixed mode
	Sodium Lamp Outdoor Auto	8x 01 04 35 09 FF	Outdoor auto including sodium lamp source
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual control of red gain
	Up	8x 01 04 03 01 FF	
	Down	8x 01 04 03 02 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq=Red gain (00h – FFh)
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual control of blue gain
	Up	8x 01 04 04 01 FF	
	Down	8x 01 04 04 02 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq=Blue gain (00h – FFh)
CAM_AE	Full Auto	8x 01 04 39 00 FF	Auto Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Auto Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Auto Exposure Mode
	Bright	8x 01 04 39 0D FF	Bright Mode (modified AE mode)

RoboSHOT Command List (2/3)

Command Set	Command	Command Packet	Comments
CAM_Shutter	Reset Up Down Direct	8x 01 04 0A 00 FF 8x 01 04 0A 02 FF 8x 01 04 0A 03 FF 8x 01 04 4A 00 00 0p 0q FF	Shutter Setting pq=Shutter Position (00h – 15h)
CAM_Iris	Reset Up Down Direct	8x 01 04 0B 00 FF 8x 01 04 0B 02 FF 8x 01 04 0B 03 FF 8x 01 04 4B 00 00 0p 0q FF	Iris Setting pq=Iris Position** RoboSHOT 12 (0h, 07h-11h) RoboSHOT 30 (0h, 05h-11h)
CAM_Gain	Reset Up Down Direct +Gain Limit	8x 01 04 0C 00 FF 8x 01 04 0C 02 FF 8x 01 04 0C 03 FF 8x 01 04 4C 00 00 0p 0q FF 8x 01 04 2C 0p FF	Iris Gain Setting pq=Gain Position (01h – 0Fh) p= Gain limit (04h-0Fh)
CAM_Bright	Reset Up Down	8x 01 04 0D 00 FF 8x 01 04 0D 02 FF 8x 01 04 0D 03 FF	Bright Setting
CAM_ExpComp	On Off Reset Up Down Direct	8x 01 04 3E 02 FF 8x 01 04 3E 03 FF 8x 01 04 0E 00 FF 8x 01 04 0E 02 FF 8x 01 04 0E 03 FF 8x 01 04 4E 00 00 0p 0q FF	Exposure Compensation On Exposure Compensation Off pq=ExpComp Position(0h-0Eh)
CAM_BackLight	On Off	8x 01 04 33 02 FF 8x 01 04 33 03 FF	Backlight Compensation On/Off
CAM_Tally	On Off	8x 01 7E 01 0A 00 02 FF 8x 01 7E 01 0A 00 03 FF	
CAM_WD	On Off VE On Set Parameter	8x 01 04 3D 02 FF 8x 01 04 3D 03 FF 8x 01 04 3D 06 FF 8x 01 04 2D 00 0q 0r 0s 00 00 00 00 FF	WD On WD Off VE On p=Display brightness level (0Dark – 6Bright) r=Brightness compensation selection (0:Very dark,1:Dark,2:std,3:bright) s=Compensation level (0:Low,1:Mid,2:High)
CAM_Aperture	Reset Up Down Direct	8x 01 04 02 00 FF 8x 01 04 02 01 FF 8x 01 04 02 02 FF 8x 01 04 42 00 00 0p 0q FF	Aperture Setting pq=Aperture Position (0h-ffh)
CAM_HR	On Off	8x 01 04 52 02 FF 8x 01 04 52 03 FF	High Resolution Mode On/Off
CAM_NR	--	8x 01 04 53 0p FF	p= Noise Reduction level(0:Off,1-5)
CAM_Gamma	--	8x 01 04 5B 0p FF	p= Gamma setting(0:std,1:Straight)
CAM_LR_Reverse	On Off	8x 01 04 61 02 FF 8x 01 04 61 03 FF	LR Reverse On/Off (mirror)
CAM_Freeze	On Off	8x 01 04 62 02 FF 8x 01 04 62 03 FF	Freeze On/Off
CAM_PictureEffect	Off Neg. Art Black & White	8x 01 04 63 00 FF 8x 01 04 63 02 FF 8x 01 04 63 04 FF	Picture Effect Setting
CAM_PictueFlip	On Off	8x 01 04 66 02 FF 8x 01 04 66 03 FF	Image-Flip On/Off
CAM_ICR	On Off	8x 01 04 01 02 FF 8x 01 04 01 03 FF	ICR Mode On/Off
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs=Camer ID (0h-ffffh)
CAM_Memory	Reset Set standard Set standard with ‘scene’ Set Tri-sync Set Tri-Sync with ‘scene’ Recall standard Recall Tri-sync	8x 01 04 3F 00 0p FF 8x 01 04 3F 01 0p FF 8x 01 04 3F 21 0p FF 8x 01 04 3F 11 0p 0q 0r FF 8x 01 04 3F 31 0p 0q 0r FF 8x 01 04 3F 02 0p FF 8x 01 04 3F 12 0p FF	p= preset number(0h-0fh) qr= Speed(01h-18h)

RoboSHOT Command List (3/3)

Command Set	Command	Command Packet	Comments
Cam_Display	On On(alternate) Off Off(alternate) On/Off On/Off(alternate)	8x 01 04 15 02 FF 8x 01 06 06 02 FF 8x 01 04 15 03 FF 8x 01 06 06 03 FF 8x 01 04 15 10 FF 8x 01 06 06 10 FF	Display On/Off
Cam_Mute	On Off On/Off	8x 01 04 75 02 FF 8x 01 04 75 03 FF 8x 01 04 75 10 FF	Mute On/Off
CAM_ColorEnhance	Parameter Set On Off	8x 01 04 20 mm 00 pp qq rr ss tt uu FF 8x 01 04 50 02 FF 8x 01 04 50 03 FF	mm: Threshold level pp: Y fixed color for high-intensity qq: Cr fixed color for high-intensity rr: Cb fixed color for high-intensity ss: Y fixed color for low-intensity tt: Cr fixed color for low-intensity uu: Cb fixed color for low-intensity Each parameter setting 00h to 7Fh Color Enhancement On/Off
CAM_ChromaSuppress		8x 01 04 5F pp FF	pp: Chroma Suppress setting level 00: Off 01h to 03h: On (3 levels). Effect increases as the level number increases.
CAM_ColorGain	Direct	8x 01 04 49 00 00 00 0p FF	p: Color Gain Setting 0h to 4h
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue Setting 0h (-14 degrees) to Eh (+14 degrees)
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)
Pan-TiltDrive	Up Down Left Right UpLeft UpRight DownLeft DownRight Stop	8x 01 06 01 vv ww 03 01 FF 8x 01 06 01 vv ww 03 02 FF 8x 01 06 01 vv ww 01 03 FF 8x 01 06 01 vv ww 02 03 FF 8x 01 06 01 vv ww 01 01 FF 8x 01 06 01 vv ww 02 01 FF 8x 01 06 01 vv ww 01 02 FF 8x 01 06 01 vv ww 02 02 FF 8x 01 06 01 vv ww 03 03 FF	vv= Pan speed (01h-18h) ww=Tilt speed (01h-14h)
	Absolute Position	8x 01 06 02 vv ww 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	vv= Pan speed (01h-18h) ww=Tilt speed (01h-14h) 0Y0Y0Y0Y = Pan position (90E2h-6BD8h) 0Z0Z0Z0Z = Tilt position (EB99h-3D59h)
	Home	8x 01 06 04 FF	
Pan-Tilt-ZoomDrive	Up Down Left Right In Out Stop	8x 01 06 0A vv ww rr 03 01 03 FF 8x 01 06 0A vv ww rr 03 02 03 FF 8x 01 06 0A vv ww rr 01 03 03 FF 8x 01 06 0A vv ww rr 02 03 03 FF 8x 01 06 0A vv ww rr 03 03 01 FF 8x 01 06 0A vv ww rr 03 03 02 FF 8x 01 06 0A vv ww rr 03 03 03 FF	vv= Pan speed (01h-18h) ww=Tilt speed (01h-14h) rr=Zoom speed (00h-07h)
	Absolute Position	8x 01 06 0B vv ww 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z 0R 0R 0R 0R FF	vv: Pan speed (01h-18h) ww: Tilt speed (01h-14h) 0Y0Y0Y0Y = Pan position (90E2h-6BD8h) 0Z0Z0Z0Z = Tilt position (EB99h-3D59h) 0R0R0R0R = Zoom position (0000h-7AC0h)
	Home	8x 01 06 0C FF	
CAM_PTZ_PresetSpeed (Non-Tri-Sync)		8x 01 7e 01 0b pp qq rr FF	pp:pan speed (01h-18h), qq:tilt speed (01h-14h), rr:zoom speed (0h-07h)

RoboSHOT Inquiry List (1/2)

Inquiry Command	Command	Response Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF y0 50 03 FF	On Off (Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusModeInq	8x 09 04 38 FF	y0 50 02 FF y0 50 03 FF	Auto Focus Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_FocusNearLimitInq	8x 09 04 28 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 02 FF y0 50 03 FF	AF Sensitivity Normal AF Sensitivity Low
CAM_AFModeInq	8x 09 04 57 FF	y0 50 00 FF y0 50 01 FF y0 50 02 FF	Normal AF Interval AF Zoom Trigger AF
CAM_AFTimeSettingInq	8x 09 04 27 FF	y0 50 0p 0q 0r 0s FF	pq: Movement Time, rs: Interval
CAM_IRCorrectionInq	8x 09 04 11 FF	y0 50 00 FF y0 50 01 FF	Standard IR Light
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF y0 50 01 FF y0 50 02 FF y0 50 03 FF y0 50 04 FF y0 50 05 FF y0 50 06 FF y0 50 07 FF y0 50 08 FF y0 50 09 FF	Auto Indoor Outdoor One Push WB ATW Manual Outdoor Auto Sodium Lamp Auto Sodium Lamp Sodium Lamp Outdoor Auto
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF y0 50 03 FF y0 50 0A FF y0 50 0B FF y0 50 0D FF	Full Auto Manual Shutter Priority Iris Priority Bright
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_GainLimitInq	8x 09 04 2C FF	y0 50 0q FF	p: Gain Limit
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BackLightModeInq	8x 09 04 33 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_TallyInq	8x 09 7E 01 0A FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_ResolutionInq	8x 09 06 23 FF	y0 50 0p 0q FF	Pq=Video Resolution
CAM_WDModeInq	8x 09 04 3D FF	y0 50 02 FF y0 50 03 FF y0 50 06 FF	On Off VE On
CAM_WDParameterInq	8x 09 04 2D FF	y0 50 00 0q 0r 0s 0t 0u 00 00 FF	q: Display brightness level (0: Dark to 6: Bright) r: Brightness compensation selection (0: Very dark, 1: Dark, 2: Standard, 3: Bright) s: Compensation level (00h: Low, 01h: Mid, 02h: High) tu: Always 0
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_HRModeInq	8x 09 04 52 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_NRInq	8x 09 04 53 FF	y0 50 0p FF	Noise Reduction p: 00h to 05h
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	Gamma p: 00h , 01h

RoboSHOT Inquiry List (2/2)

Inquiry Command	Command	Response Packet	Comments
CAM_LR_ReverseModeInq	8x 09 04 61 FF	y0 50 02 FF y0 50 03 FF	On (mirror) Off
CAM_FreezeModeInq	8x 09 04 62 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_PictureEffectModeInq	8x 09 04 63 FF	y0 50 00 FF y0 50 02 FF y0 50 04 FF	Off Neg. Art Black & White
CAM_PictureFlipModeInq	8x 09 04 66 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_ICRModeInq	8x 09 04 01 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_MemoryInq	8x 09 04 3F FF	y0 50 pp FF	pp: Memory number recalled last
CAM_MemoryStatusInq	8x 09 04 3F 0p FF	y0 50 0p 0q 0r 0s FF	p: Memory number 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 07h (Address) pqrs: 0000h to FFFFh (Data)
CAM_DisplayModeInq	8x 09 04 15 FF (8x 09 06 06 FF)	y0 50 02 FF y0 50 03 FF	On Off
CAM_MuteModeInq	8x 09 04 75 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 10 mn pq 0E 0E 02 FF	mnpq: Model Code
Vaddio_ModelInq	8x 09 08 0e FF	y0 50 05 00 00 00 00 FF y0 50 05 01 00 00 00 FF	RoboSHOT-12 RoboSHOT-30
CAM_RegisterValueInq	8x 09 04 24 mm FF	y0 50 0p 0p FF	mm: Register No. (=00h to 7Fh) pp: Register Value (=00h to FFh)
CAM_ColorEnhanceInq	8x 09 04 20 FF 8x 09 04 50 FF	y0 50 mm 00 pp qq rr ss tt uu FF y0 50 02 FF y0 50 03 FF	mm: Threshold level pp: Y fixed color for high-intensity qq: Cr fixed color for high-intensity rr: Cb fixed color for high-intensity ss: Y fixed color for low-intensity tt: Cr fixed color for low-intensity uu: Cb fixed color for low-intensity On Off
CAM_ChromaSuppressInq	8x 09 04 5F FF	y0 50 pp FF	pp: Chroma Suppress setting level
CAM_ColorGainInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain Setting 0h to 4h
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue Setting 0h (− 14 degrees) to Eh (+ 14degrees)
CAM_TempInq	8x 09 04 68 FF	Y0 50 00 00 0p 0q FF	pq: Lens Temperature
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)
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	wwww= Pan position zzzz=Tilt Position

COMMAND SETTING VALUES

Exposure Control

Shutter Speed	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	Value	RoboSHOT 12	RoboSHOT 30
	0x11	F1.8	F1.6
	0x10	F2	F2
	0x0F	F2.4	F2.4
	0x0E	F2.8	F2.8
	0x0D	F3.3	F3.4
	0x0C	F4	F4
	0x0B	F4.8	F4.8
	0x0A	F5.6	F5.6
	0x09	F6.8	F6.8
	0x08	F8	F8
	0x07	F9.6	F9.6
	0x06	N/A	F11
	0x05	N/A	F14
	0x00	CLOSE	CLOSE

Iris Gain	Value	Steps
	0x0F	28
	0x0E	26
	0x0D	24
	0x0C	22
	0x0B	20
	0x0A	18
	0x09	16
	0x08	14
	0x07	12
	0x06	10
	0x05	8
	0x04	6
	0x03	4
	0x02	2
	0x01	0

Iris Gain Limit	Value	Steps
	0x0F	28
	0x0E	26
	0x0D	24
	0x0C	22
	0x0B	20
	0x0A	18
	0x09	16
	0x08	14
	0x07	12
	0x06	10
	0x05	8
	0x04	6

Exposure Comp.	Value	Iris	Gain
	0x0E	+7	+10.5 dB
	0x0D	+6	+9 dB
	0x0C	+5	+7.5 dB
	0x0B	+4	+6 dB
	0x0A	+3	+4.5 dB
	0x09	+2	+3 dB
	0x08	+1	+1.5 dB
	0x07	0	0 dB
	0x06	-1	-1.5 dB
	0x05	-2	-3 dB
	0x04	-3	-4.5 dB
	0x03	-4	-6 dB
	0x02	-5	-7.5 dB
	0x01	-6	-9 dB
	0x00	-7	-10.5 dB

TELNET SERIAL COMMAND API

The Vaddio Serial Command protocol is a high level text based command line interface supported via telnet session on the RoboSHOT. The command application protocol interface is intended to allow external device such as AMX or Crestron to control the camera. The protocol is based upon ASCII format following the VT100 terminal emulation standard and uses an intuitive text command nomenclature for ease of use. The API is accessed by a telnet client on the Ethernet port. All ASCII characters will be **echoed** to terminal program and appended with VT100 string - **ESC[J** (HEX- 1B 5B 4A). Vaddio Command lines are terminated on carriage return. After the carriage return, the VT100 appends with –**ESC[J**. **(Note:** Most terminal programs automatically strip the VT100 string.) General format usage follows a **get/set** structure. Usage examples for each type are:

Set Example
COMMAND: > camera pan right
RESPONSE: > OK

Get Example
COMMAND: > camera home get
RESPONSE: > OK

Syntax Error Example
COMMAND: > camera right pan
RESPONSE: > ERROR

Additional programming controls associated with the terminal protocol includes:

- **CTRL 5** - Clears the current serial buffer on the device.

Telnet sessions will require access verification and uses the same username and password associated with the Administrator account on the embedded web server. The default Telnet Port is 23. Command lines are terminated with a carriage return.

Telnet Command List

Camera Home

- **NAME**

camera home - Move the camera to the home position

- **SYNOPSIS**

camera *home*

- **DESCRIPTION**

Method used to move the **camera** to the *home* position

- **EXAMPLES**

camera *home*
Move the **camera** back to the *home* position

Image: Invigorating simulated Telnet session.

Camera Pan

- **NAME**

camera pan - Pans the camera left or right

- **SYNOPSIS**

camera *pan* {left|right|stop} [*1-24*]

- **DESCRIPTION**

Method used to *pan* the **camera**

- **OPTIONS**

left Move the **camera** left
right Move the **camera** right
stop Stop the **camera** movement
speed Optional integer from *1-24* that represents the speed (Default: 12)

- **EXAMPLES**

camera *pan* left
Pans the **camera** left at the default speed
camera *pan* right 20
Pans the **camera** right using a speed of 20
camera pan stop

Camera Preset

- **NAME**

camera preset - Recall and storing of camera presets

- **SYNOPSIS**

camera *preset* {recall|store} [*1-6*]

- **DESCRIPTION**

Method used to recall and store **camera** presets

- **OPTIONS**

recall
Recall *preset*
store
Store *preset*
preset
Required value from *1-6* used to indicate the *preset* number

- **EXAMPLES**

camera recall 3
Move **camera** to *preset* position 3
camera store 1
Store current **camera** position as *preset* 1
camera *preset* store 2 *tri-sync* 10 save-ccu
Store current **camera** position and CCU settings as *preset* 2, will recall using *tri-sync* at speed 10
camera *preset* store 4 *tri-sync* 15
Store current **camera** position as *preset* 4, will recall using *tri-sync* at speed 15

Camera Tilt

- **NAME**

camera tilt - Tilts the camera up or down

- **SYNOPSIS**

camera *tilt* {up|down|stop} [*1-20*]

- **DESCRIPTION**

Method used to *tilt* the **camera**

- **OPTIONS**

up Move the **camera** up
down Move the **camera** down
stop Stop the **camera** movement
speed Optional integer from *1-20* that represents the speed (Default: 10)

- **EXAMPLES**

camera *tilt* up
Tilts the **camera** up at the default speed
camera *tilt* down 20
Tilts the **camera** up using a speed of 20
camera *tilt* stop
Stops the *tilt* movement of the **camera**

Camera Zoom

- **NAME**

camera zoom - Zoom the camera in or out

- **SYNOPSIS**

camera *zoom* {in|out|stop} [*1-7*]

- **DESCRIPTION**

Method used to *zoom* the **camera**

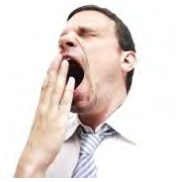
- **OPTIONS**

in Zoom in
out Zoom out
stop Stop the **camera** movement
speed Optional integer from *1-7* that represents the speed (Default: 3)

- **EXAMPLES**

camera *zoom* in
Zooms the **camera** in at the default speed
camera *zoom* out 7
Zooms the **camera** out using a speed of 7
camera *zoom* stop
Stops the *zoom* movement of the **camera**

Camera



- **NAME**

camera - Base command for camera control command.
Used in conjunction with control arguments to include home,
pan, tilt, zoom, preset etc...

- **SYNOPSIS**

camera {ccu|home|pan|preset|standby|tilt|zoom}

- **DESCRIPTION**

The **camera** command is the base command used to control the **camera** movement

- **OPTIONS**

ccu Various commands for getting/setting CCU values and scenes
home Return **camera** to home position
pan Pans the **camera** left or right
preset Recall or set **camera** presets
standby Turn standby mode on/off
tilt Tilt the **camera** up or down
zoom Zoom the **camera** in or out

- **EXAMPLES**

camera pan left 5
Pans the **camera** left at a speed of 5
camera tilt up 10
Tilts the **camera** up at a speed of 10
camera pan stop
Stops the **camera** from panning
camera home
Move **camera** to home position
camera standby toggle
Toggle standby modes
camera preset store 1
Store current **camera** position as preset 1

Camera CCU

- **NAME**

camera ccu get - Gets the ccu settings
SYNOPSIS
camera ccu get {auto_white_balance|red_gain|blue_gain|backlight_compensation|auto

- **DESCRIPTION**

Method used to get the ccu values

- **OPTIONS**

auto_white_balance
Gets auto_white_balance
red gain
Gets red gain value
blue gain
Gets blue gain value
backlight_compensation
Gets backlight compensation
auto iris
Gets auto-iris mode
iris
Gets iris value gain
gain
Gets gain value detail
detail
Gets detail value chroma
chroma
Gets chroma value

- **EXAMPLES**

camera ccu get iris Gets the iris value
camera ccu get red_gain Gets the red_gain

CCU Camera Scene

- **NAME**

camera ccu scene - Stores or recalls the ccu scene

- **SYNOPSIS**

camera *ccu scene* {recall {factory [1-6]|custom [1-3]} | *store* [1-3]}

- **DESCRIPTION**

Method used to get or set the *ccu scene*

- **OPTIONS**

recall
Recalls a *ccu scene*
store
Stores a custom *ccu scene*
custom
A custom *scene* (can be stored or recalled)
factory
A factory *scene* (can be recalled)
index
Integer from 1-6 (factory) or 1-3 (custom) that represents the *scene* index

- **EXAMPLES**

camera *ccu scene* recall factory 2
Recalls the factory *scene* stored at index 2

Camera CCU Set

- **NAME**

camera ccu set - Sets and gets the CCU Settings

- **SYNOPSIS**

camera *ccu set* {auto_white_balance {on/off} I *red_gain* [*0-255*] | *blue_gain* [*0-255*]

- **DESCRIPTION**

Method used to sets the *ccu* values

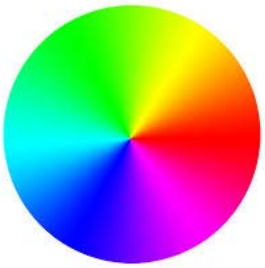
- **OPTIONS**

auto_white_balance
Sets auto white balance to auto/manual
red_gain
Sets red gain value
blue_gain
Sets blue gain value
Backlight_compensation
Sets backlight compensation on or off
auto_iris
Sets auto iris on or off
iris
Sets iris value
gain
Sets gain value
detail
Sets detail value
chroma
Sets chroma value

- **EXAMPLES**

camera *ccu set auto_iris* off
Sets the *auto_iris* off
camera *ccu set red_gain* 10
Sets the red *gain* to be 10

Camera CCU



- **NAME**

camera ccu - Stores and recalls scenes and gets and sets CCU settings

- **SYNOPSIS**

camera *ccu*

- **DESCRIPTION**

Method used to get or set the *ccu* scene or *ccu* setting

- **OPTIONS**

scene
Used for storing/recalling scenes
get
Used for getting CCU settings
set
Used for setting CCU settings

- **EXAMPLES**

camera *ccu* scene recall factory 2
Recalls the factory scene stored at index 2
camera *ccu* get all
Gets all current CCU settings

Camera Focus

- **NAME**

camera focus - Moves the focus near or far

- **SYNOPSIS**

camera focus {{near|far|stop} [1-8] | mode {auto|manual}}

- **DESCRIPTION**

Method used to focus the camera

- **OPTIONS**

near
Move the camera focus near (with optional speed)
far
Move the camera focus far (with optional speed)
stop
Stop the camera focus
mode
Set the focus mode to auto or manual
speed
Optional integer from 1-8 that represents the speed

- **EXAMPLES**

camera *focus near*
Focuses the camera near at the default speed
camera *focus far* 8
Focuses the camera far using a speed of 8
camera focus stop
Stops the focus movement of the camera

Exit

- **NAME**

exit - ends the current API command session

- **SYNOPSIS**

exit

- **DESCRIPTION**

Exit ends the current API command session. If the session is over telnet, the session is ended and the socket is closed. If the session is over serial, a new session is started.

Help

- **NAME**

help - display an overview of the CLI syntax

- **SYNOPSIS**

help

- **DESCRIPTION**

Display an overview of the command line syntax

History

- **NAME**

history - command history

- **SYNOPSIS**

history [*limit*]

- **DESCRIPTION**

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 also recall historic information

- **HISTORY NAVIGATION**

The command **history** can be navigated using the up and down arrow keys. The up arrow will move up a single entry in the command **history** while the down arrow moves down in the command **history**.

- **HISTORY EXPANSION**

The command **history** 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.
Listed below are examples of **history** expansion:
*** !!** Substitute the last command line.
*** !N** Substitute the Nth command line (absolute as per '**history**' command)
*** !-N** Substitute the command line entered N lines before (relative)

- **EXAMPLES**

history
Displays the current command buffer
history 5
Sets the **history** command buffer to remember the last 5 unique entries

Network Ping

- **NAME**

network ping - send ICMP ECHO_REQUEST to network hosts

- **SYNOPSIS**

network *ping* [*count* <*count*>] [*size* <*size*>] <destination-ip>

- **DESCRIPTION**

Use the ICMP protocol's mandatory ECHO_REQUEST datagram to elicit an ICMP ECHO_RESPONSE from a host or gateway. ECHO_REQUEST datagrams have an IP and ICMP header, followed by a struct timeval and then an arbitrary number of pad bytes used to fill out the packet.

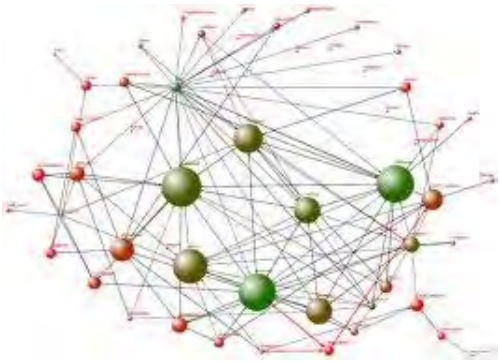
- **OPTIONS**

count Stop after sending *count* ECHO_REQUEST packets. With deadline option, *ping* waits for *count* ECHO_REPLY packets, until the timeout expires. The default is 5.
destination
The destination IP address where the ECHO_REQUESTS are sent
size The data *size* of the ICMP packet to send. The default is 56 bytes

- **EXAMPLES**

network *ping* 192.168.1.1
Attempt to send 5 ICMP ECHO_REQUESTs with data *size* 56 to the host at 192.168.1.1
network *ping count* 10 *size* 100 192.168.1.1
Attempt to send 10 ICMP ECHO_REQUESTs with data *size* of 100 to the host at 192.168.1.1

Network Settings



- **NAME**

network settings - get current network settings

- **SYNOPSIS**

network *settings* {get}

- **DESCRIPTION**

Method used to get the current **network** *settings* of the device

- **OPTIONS**

get Get the current **network** *settings* for the machine

- **EXAMPLES**

network *settings* get
MAC Address:
00:04:a3:85:0a:ee
IP Address:
10.10.8.116
Netmask:
255.255.255.0
Gateway:
10.10.8.100
Returns the current **network** *settings* for mac addres, ip address, netmask, and gateway

Network

- **NAME**

network - Gets the current network settings or pings an IP address

- **SYNOPSIS**

network {settings *get* | *ping* [*count* <*count*>] [*size* <*size*>] <destination-ip>}

- **DESCRIPTION**

Method used to *get* the current **network** settings or check **network**

- **OPTIONS**

settings
Get the current **network** settings
ping Send ICMP ECHO_REQUEST to **network** host

- **EXAMPLES**

network settings *get*
Gets the current **network** settings
---
network *ping count* 1 10.10.10.100
Pings 10.10.10.100 once and displays results

System Factory-Reset

- **NAME**

system factory-reset - Gets or sets factory reset status

- **SYNOPSIS**

system factory-reset {get|on|off}

- **DESCRIPTION**

Method used to get or set the factory reset status

- **OPTIONS**

get
Get the current factory reset status
on
Enable factory reset on reboot
off
Disable factory reset on reboot

- **EXAMPLES**

system factory-reset get
factory-reset (software):
off
factory-reset (hardware): [Hardware reset is designated by rear panel dip switches in down position]
off
Returns the factory reset status
---
system factory-reset on
factory-reset (software): on
factory-reset (hardware): off
Enables factory reset upon reboot

System Reboot

- **NAME**

system reboot - Reboots system

- **SYNOPSIS**

system reboot [<seconds>]

- **DESCRIPTION**

Method used to reboot system

- **OPTIONS**

seconds
The number of seconds to delay the reboot

- **EXAMPLES**

reboot
Reboot system immediately
reboot 30
Reboot the system in 30 seconds

System

- **NAME**

system - gets or Sets the Current System Settings

- **SYNOPSIS**

system {factory-reset {get|on|off} | *reboot* [<seconds>]}

- **DESCRIPTION**

Method used to get/set the current **system** settings or execute **system** commands

- **OPTIONS**

factory-reset
Get or set the factory reset status
reboot Reboot the **system**

- **EXAMPLES**

system factory-reset get
factory-reset (software):
off
factory-reset (hardware):
off
---
system factory-reset on
factory-reset (software):
on
factory-reset (hardware):
off
---
system *reboot*
Broadcast message from root (Thu Jan
1 03:27:40 2266):
The **system** is going down for a *reboot* NOW!
---
system *reboot* 30
OK
> The **system** is going down for a *reboot* NOW!

Version

- **NAME**

version - display the system version information

- **SYNOPSIS**

version

- **DESCRIPTION**

Display an overview of the command line syntax

- **EXAMPLES**

Version
Returns the current software **version**

COMPLIANCE AND CE DECLARATION OF CONFORMITY - ROBOSHOT HD PTZ CAMERAS

Compliance testing was performed to the following regulations:

- **FCC Part 15** (15.107, 15.109)**, Subpart B** — Class A
- **ICES-003, Issue 4: 2004** — Class A
- **EN 55022 A: 2006 + A1: 2007** — Class A
- **KN24 2008 (CISPR 24: 1997 + A1: 2000 + A2: 2002)** — Class A
- **KN22 2008 (CISPR 22: 2006)** — Class A
- **EMC Directive 2004/108/EC** — Class A
- **EN 55024: A2: 2003** — Class A
- **IEC 60950-1:2005 (2nd Edition); Am 1:2009** — Safety
- **EN 60950-1:2006+A11:2009+A1:2010+A12:2011** — 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.

Industry Canada Industrie Canada

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'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicte 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 2004/108/EC
EN 55022 A: 2006 + A1: 2007(CISPR 22:2005/A1:2005) Conducted and Radiated Emissions
EN 55024: 1998 + Amendments A1: 2001 + A2: 2003 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 Safety
EN 60950-1:2006+A11:2009+A1:2010+A12:2011 Safety

COMPLIANCE AND CE DECLARATION OF CONFORMITY - QUICK-CONNECT UNIVERSAL CCU

Compliance testing was performed to the following regulations:

- FCC Part 15, Subpart B — Class A
- ICES-003, Issue 4: 2004 — Class A
- European Standard EN 55022 A: October 2007 — Class A
- European Standard EN 55024/A2 January 2003 — Class A
- IEC 60950-1:2005 (Second Edition); Am 1:2009 — Safety
- EN 60950-1:2006+A11:2009+A1:2010+A12:2011 — Safety
- EMC Directive 89/336/EC — Class A

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'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicte 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 89/336/EC

EN 55022 A: 1998 + A1: 2000 — Conducted and Radiated Emissions

EN 55024: 1998 + Amendments A1: 2001 + A2: 2002 — Immunity

- 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 (Second Edition); Am 1:2009 — Safety
EN 60950-1:2006+A11:2009+A1:2010+A12:2011 — Safety

WARRANTY INFORMATION

(See Vaddio Warranty, Service and Return Policies posted on vaddio.com for complete details):

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 through one of the following resources: e-mail support at support@vaddio.com or online at 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. RMA's 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 product 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.

Other General Information:

Care and Cleaning

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

- Do not spill liquids in the product
- Keep this device away from food and liquid
- 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.

Operating and Storage Conditions:

Do not store or operate the device under the following conditions:

- Temperatures above 40°C (104°F) or temperatures below 0°C (32°F)
- High humidity, condensing or wet environments
- In inclement weather
- In swimming pools or drainage estuaries
- Dry environments with an excess of static discharge
- Inside a partially leaking hadron collider
- Under severe vibration

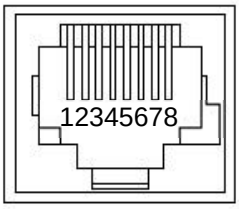
APPENDIX 1: CABLE PIN-OUTS FOR THE QUICK-CONNECT CCU SYSTEM

Quick-Connect CCU Pin-out Assignments:

Power Connector RJ-45 (Red)

Pin #	Function	Pairs
Pin - 1	Power +	1
Pin - 2	Power -	1
Pin - 3	Power +	2
Pin - 4	Power -	3
Pin - 5	Power +	3
Pin - 6	Power -	2
Pin - 7	Power +	4
Pin - 8	Power -	4

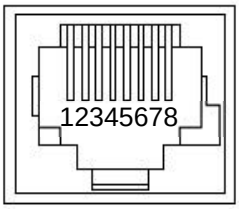
36 VDC TO CAMERA



RS-232 IN RJ-45 (Grey)

Pin #	Function	Pairs
Pin - 1	N/A	Not Used
Pin - 2	N/A	Not Used
Pin - 3	N/A	Not Used
Pin - 4	N/A	Not Used
Pin - 5	N/A	Not Used
Pin - 6	Digital GND	
Pin - 7	RXD (from TXD of control source)	
Pin - 8	TXD (to RXD of control source)	

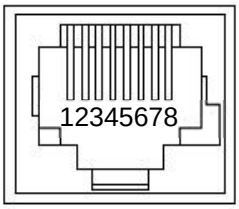
RS-232 IN



RS-232 OUT RJ-45 (Blue)

Pin #	Function	Pairs
Pin - 1	N/A	Not Used
Pin - 2	N/A	Not Used
Pin - 3	N/A	Not Used
Pin - 4	N/A	Not Used
Pin - 5	N/A	Not Used
Pin - 6	Digital GND	
Pin - 7	TXD (to RXD of control source)	4
Pin - 8	RXD (from TXD of control source)	4

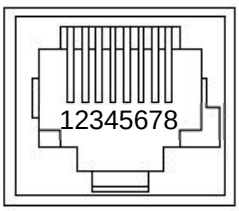
RS-232 OUT



Video (HSDS-differential) RJ-45 (Yellow)

Pin #	Function	Pairs
Pin - 1	N/A	Not Used
Pin - 2	N/A	Not Used
Pin - 3	Y+	2
Pin - 4	PB+	33
Pin - 5	PB GND	3
Pin - 6	Y GND	2
Pin - 7	PR+	4
Pin - 8	PR-	4

VIDEO FROM CAMERA



Toll Free: 800-572-2011 ▪ Phone: 763-971-4400 ▪ FAX: 763-971-4464
www.vaddio.com