vaddio
REDEFINING CAMERA CONTROL

Installation and User Guide

ClearVIEW™ HD-USB PTZ

USB, H.264 and Analog HD Pan/Tilt/Zoom Conferencing Camera

Part Numbers:
999-6990-000 - North America
999-6990-001 - International

© 2013 Vaddio - All Rights Reserved. ClearVIEW HD-USB PTZ Conferencing Camera - Document Number 342-0437 Rev D
Camera Software Revision 2.1.0

Table of Contents

OVERVIEW:

The extraordinary Vaddio™ ClearVIEW™ HD-USB PTZ Conferencing Camera system includes many of the features that you would expect out of a professional PTZ camera, plus much more! The ClearVIEW HD-USB is the world's first broadcast-quality HD PTZ camera with USB 2.0 output, Ethernet streaming and analog component (YPbPr) outputs built right into the camera. Simply plug the HD-USB camera directly into your PC and there is no need for a separate capture device. The ClearVIEW HD-USB uses standard USB 2.0 UVC drivers and no special USB drivers require installation. As a result the HD-USB camera works seamlessly with any software application running on any OS that supports USB 2.0 devices. All this, and the ClearVIEW HD-USB PTZ cameras are made in the USA.

ClearVIEW HD-USB Conferencing Camera

The ClearVIEW HD-USB combines impressive performance with an equally impressive feature set. Using the Universal Video Class (UVC) standard drivers for USB 2.0 video, the HD-USB camera is a plug and play PTZ camera for Unified Communications soft client conferencing systems such as Skype®, Google+, Jabber® and Lync®, which offers a vast improvement over the "inexpensive webcam" systems available today.

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The HD-USB is a high definition conferencing camera suitable for the small, medium or even the largest conferencing space available. The HD Zoom lens allows HD-USB to capture a wide angle of view (58.1°) to view everyone at a conference room table, as well as capture an individual from a long distance (3.2°) in a larger room.

The HD-USB PTZ Camera was released with two (2) major software releases with several intermediate releases. Release 1.0 allowed USB 2.0 streaming now with the 2.0 software, the ClearVIEW HD-USB will also support H.264 video streaming. It has a built in Ethernet network interface where both IP control with a built-in web server and IP streaming can be initiated directly from the camera. It supports either RTSP or HLS streaming protocols. The software is easily upgradeable in the field.

The motorized zoom lens offers 19X optical zoom and is built around a 1/3-Type Sony® Exmor, progressive scan, high-speed, low noise CMOS image sensor with a total of 1.3 Megapixels for precise and vibrant HD color video images. The HD-USB achieves improved picture quality even in low light environments requiring a minimum illumination rated at an amazingly low 0.7 LUX (F1.6 - 50IRE).

Intended Use:

Before operating the device, please read the entire manual thoroughly. The system was designed, built and tested for use indoors, and with the provided power supply and cabling. The use of a power supply other than the one provided or outdoor operation has not been tested and could damage the device and/or create a potentially unsafe operating condition.

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. Do not connect Ethernet or Power over Ethernet (POE) cables directly to the RJ-45 ports on the device as damage may result.

Use only the power supply provided with the system. Use of any unauthorized power supply 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/or locking up. For best results please use standard RJ-45 connectors and test all cables for proper pin-outs prior to use.

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

UNPACKING

North American Version 999-6990-000
Carefully remove the device and all of the parts from the packaging. Unpack and identify the following parts in 999-6990-000.

- One (1) ClearVIEW HD-USB PTZ Camera (998-6990-000)
- One (1) Vaddio IR Remote Commander
- One (1) EZCamera™ Control Adapter (RJ-45 to DB-9)
- One (1) Vaddio PowerRite™ 12 VDC, 3.0 Amp Power Supply
- One (1) AC Cord Set for North America
- One (1) 10' (3.05m) USB 2.0 Type A-male, to USB B-male Cable
- Documentation

International Version 999-6990-001

- One (1) ClearVIEW HD-USB PTZ Camera (998-6990-000)
- One (1) Vaddio IR Remote Commander
- One (1) EZCamera Control Adapter (RJ-45 to DB-9)
- One (1) Vaddio PowerRite 12 VDC, 3.0 Amp Power Supply
- One (1) Euro Power Cable
- One (1) UK Power Cable
- One (1) 10' (3.05m) USB 2.0 Type A-male, to USB B-male Cable
- Documentation

CLEARVIEW HD-USB PTZ CONFERENCING CAMERA

Diagram: Front View with Feature Call-outs:

1) Zoom Lens and Image Sensor:
The 19X optical zoom lens is built around a 1/3-Type, high-speed, progressive scan CMOS image sensor with a total of 1.3 Megapixels for precise HD color video image acquisition.

2) Blue Power Light:
A Vaddio blue power light is illuminated when the camera is turned on.

3) IR Sensors:
IR sensors are built into the front of the HD-USB to receive IR signals from the IR remote control supplied with the camera.

4) Red Tally Light:
The red tally light is not used with the HD-USB Camera

ClearVIEW HD-USB PTZ Conferencing Camera
Diagram: Rear View Connectors with Feature Call-outs:

Connectors and Functions:

1) 12 VDC Input:
Power input on EIAJ-04 connector for local power.

2) HD Video Select:
A rotary switch that allows the user to choose the component HD output video resolution and format. All USB 2.0 UVC resolutions are derived from 720p/59.94. The USB 2.0 processor can accept rotary positions 0 through 6. Please see the sections on available resolutions and concurrent resolutions when using USB 2.0 and analog component outputs.

3) Camera Settings (Dip Switch Settings):
Settings for IR remote frequency, baud rate, SD output format, and image flip, test bars can be configured on these switches.

4) RS-232 IN & IR Out:
The upper RS-232 Port is not implemented on the HD-USB Camera. Use the RS-232 Port on the lower card.

Connectors and Functions (continued)

5) YPbPr Output:
Component HD video is fed through the DE-15 connector (HD-15 for the shell sized challenged). YPbPr and Composite signals are simultaneous. Note: This is an HD camera and the SD signals are down converted and are really not the sweet spot of this camera. This is a courtesy feature only.

6) Composite Video (CVBS) Output:
The CVBS output feeds out SD video signals and is configurable with the dip switches to choose between 480i/NTSC or 576i/PAL in 4:3 formats. Squeeze and letterbox modes are also available (see dip switches).

7) EZ Power/Video Port:
This RJ-45 connector is only used with the Quick-Connect SR Interface and the Quick-Connect DVI-D/HDMI SR Interface to supply power and return HSDS (high speed differential signaling) video from the camera.

8) 5 VDC Output:
The 5 VDC output is on an EIAJ-03 connector was added to supply power to the active Extreme USB Extender transmitter side. The receiver side is powered by the computer's USB port or powered USB Hub.

9) USB 2.0 Connector:
The USB 2.0 is on a Type-B female and attaches to a PC running a soft-client UC video conferencing system or video capture software that uses UVC (USB Video Class) standard drivers. No other drivers are required to plug the HD-USB into a computer and have it actually work. The UVC drivers will auto negotiate the highest resolution that the PC and HD-USB Camera can accomplish together and auto implements it, and bob's your uncle.

10) Settings Rotary Switch:
The Settings rotary switch is essentially for future applications. Leave this switch on position "**0**" for normal operation. Position "**C**" is used for a reset to factory defaults. To reset the camera and erase all the stored internal data, place this switch on "C" and power cycle the camera. Move the switch to "**0**" again for normal operation.

11) Ethernet 10/100 Port (H.264 Streaming Active with Firmware Release 2.0.x):
The network port has green and yellow LEDs that indicate ready and usage states. The port allows for access to the internal web pages for camera set-up and control (nice). The network port will stream (unicast) H.264 video (from CIF up to and including 1080p/30). IP Streaming supports RTSP and HLS formats.

12) RS-232 Port:
The RS-232 Port allows external control systems to engage a rudimentary API. Basic functions include pan, tilt zoom, on/off etc. The functions on the Vaddio IR Remote Commander are mirrored in the API. Most control is expected to come from the internal web page via Ethernet, Telnet or over USB 2.0. See the Telnet command list at the end of this manual for more information.

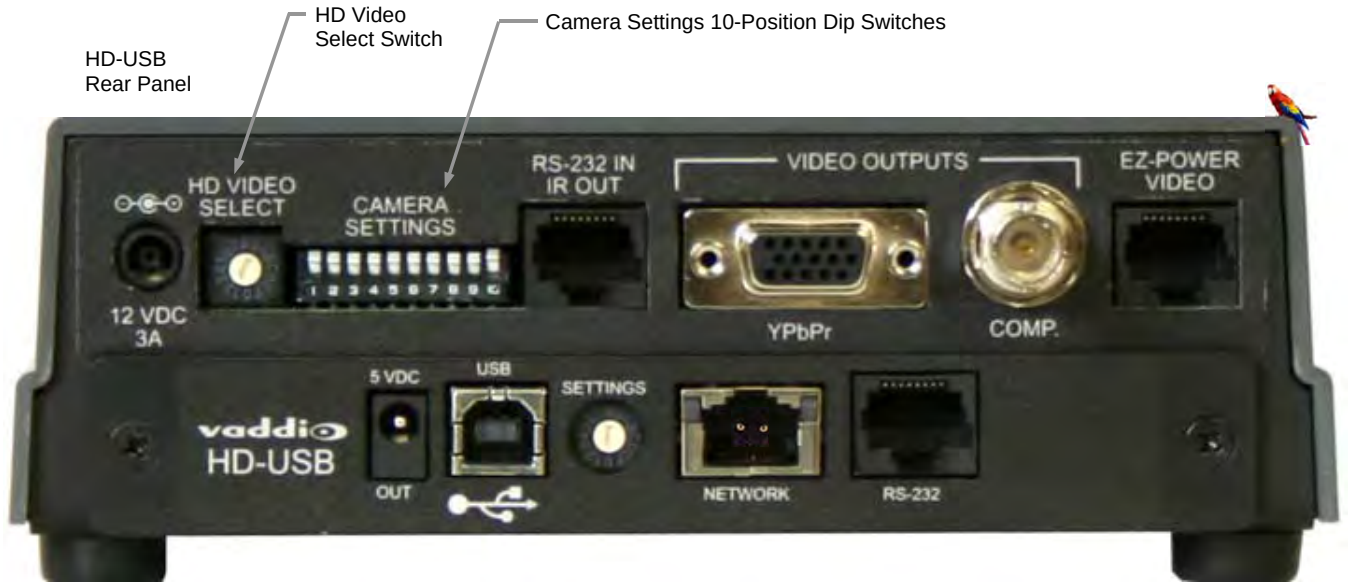
13) Permanent USB/IP Resource Slot Card:
The lower row of connectors and the brains of the HD-USB Camera are located on this permanent slot card. The card is not removable and is not compatible with any other Vaddio camera (really). Please do not try to remove this card at any time (please note the adverb "please").

FIRST TIME SET-UP WITH THE CLEARVIEW HD-USB PTZ CAMERA

The ClearVIEW HD-USB PTZ Camera was designed to be exceptionally easy to use and operate. There is documentation at the back of the manual for pin-outs. These pin-outs are also available, along with application TechNotes, from the Vaddio website www.vaddio.com.

Getting Started:

Step 1: Using the HD Video Select Rotary Switch and Camera Settings Dip Switch on the back of the camera, set up the camera's output resolution and functional preferences. A reference label is on the bottom of the camera.



Switch Setting Label on Bottom of the HD-USB Camera:

DIP SWITCH SETTINGS

IR 1 1 & 2 UP		IR OUT OFF	9600 bps	SD NTSC	SD 4:3 6 & 7 UP		IMAGE FLIP OFF	TEST BARS OFF	10 OFF
IR 2 ON	IR 3 ON	ON	38400 bps	SD PAL	SD SQ	SD LB	ON	ON	ON
1	2	3	4	5	6	7	8	9	10

HD VIDEO AND USB 2.0 SELECT

0	720p/59.94 - USB	8	576i/25
1	1080i/59.94	9	——
2	1080p/59.94	A	——
3	1080p/60	B	——
4	720p/50	C	——
5	1080i/50	D	——
6	1080p/50	E	1080p/30
7	480i/29.97	F	1080p/25

USE ROTARY SETTINGS 0 through 6 FOR USB 2.0 OUT

Step 2: For the best USB 2.0 video**,** set the HD VIDEO SELECT rotary switch to "0" (720p/59.94) on the HD-USB Camera. All USB 2.0 UVC resolutions are derived from 720p/59.94. The USB 2.0 processor can accept rotary positions 0 through 6, but please be aware that if 1080p/30 is scaled down to 320 x 180, well let's just say…the image will look much better if the PC scales from 720p than from 1080p (see note below).


SCALER

Important Note: When using 1080p as the input, very low USB 2.0 resolutions such as 352 x 240 and 320 x 180 will either not look so good, won't work or the user may wish they didn't work, due to how far the signal is scaled (squeezed/smashed/crushed) down by the PC from the original input. Please use 720p or position "0" for the lower resolutions. Always start from a HD resolution closest to what the UC client wants to use, send and display. In some cases the sharpness control can clean up the image (both sharpen or smooth out the jaggies) if the native resolution of the application is too low.

- For concurrent USB 2.0 and Analog Component (YPbPr), switch settings 0 through 6 are the resolutions that can be both digital (USB 2.0 or H.264) and Analog (YPbPr). These resolutions are the most used resolutions for HD video in both HD videoconferencing and broadcast.
- For Analog (YPbPr) output, all of the HD VIDEO SELECT switch settings will operate.
- The Composite output on the BNC connector is independent from the USB 2.0 / IP resolutions. The SD settings and are formatted by dip switches 5, 6 and 7.

Step 3: Choose the IR frequency (1, 2 or 3) on the camera for use with the IR Remote Commander. Since only one USB camera can be plugged into a PC at a time, recommended default is Freq. 1 (dip switches 1 & 2 up).

Step 4: Leave the IR out OFF (up) as default.

Step 5: Use 9600bps for control speed as default.

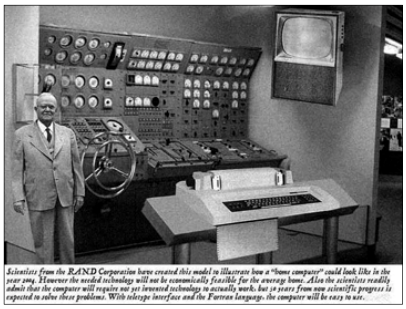
- If the camera is mounted inverted, then set the Image Flip to ON, otherwise leave it off.
- The test bars are really, really, totally non-standard (horizontal - just to mess with the old-timers) and will override the video output. These test bars are 75% IRE. Use the test bars for…testing.

The H.264 stream is available and shipping with Release 2.0.0. Position "0" on the HD video select, will give the camera the ability to auto-negotiate with the host PC and automatically decide the highest resolution (MJPEG video up to and including 720p/30) that the computer and UC client/application can accept, display and process within the application software (not provided). The operating systems will be able to process 1080p/30 using H.264 and MJPEG video at 720p/30 is the limit of USB 2.0.

The HD-USB camera uses UVC drivers and does not require the loading of any other drivers to run on the PC. As long as the operating systems and soft-client software support UVC drivers, no additional software, other than the application, is required.

COMPATIBILITY

The HD-USB Camera will work with the following web browsers, soft codecs, computer operating systems and media players:


Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but in years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use.

Compatibility - Web Browsers:

1) Internet Explorer (IE 8 and above)
2) Safari (Rev 4 and 5)
3) Safari/iOS (Rev 4 and 5)
4) Chrome (the latest and current release - auto updating)
5) Firefox (the latest and current release - auto updating)

Compatibility - Soft Clients: HD-USB Camera is compatible with the following soft codecs or applications, in no particular order:

Release 2.0.x (See Release notes for versions tested)**:**

1)	Skype	Win 7 & Mac OS X
2)	Web Ex (WBS 28.7 and up)	Win 7 & Mac OS X
3)	Microsoft Lync	Win7
4)	Cisco Jabber	Win 7 & Mac OS X
5)	Vidyo Desktop	Win 7 & Mac OS X
6)	Google Plus	Win 7
7)	Adobe Connect 8	Win 7 & Mac OS X
8)	LifeSize ClearSea	Win 7
9)	GoToMeeting (Citrix)	Win 7 & Mac OS X
10)	Polycom M100	Win7
11)	Panaopto (lecture capture)	Win 7

Compatibility - Media Players:

The UVC with MJPEG and IP with H.264 video are compatible with the industry leading PC media players.

1) Quick-Time 10.2
2) VLC Media Player 2.0.4
3) Real Player 16.0

Compatibility - Operating Systems

1) Apple OS X (10.7 and above)
2) Windows XP w/Service Pack 3 with known issues and errata
3) Windows 7
4) Linux

Evolving Compatibilities:

As more UC soft-client and lecture capture programs are released and gain popularity, Vaddio will provide a continuing research and development effort to ensure the camera's viability and compatibility with other manufacturer's products.

Compatibility (*continued*)
The USB 2.0 UVC (Universal Video Class) video driver resolution table is basically an internal list of resolutions available for the Host PC and the Camera to negotiate and use for the application. Typically, the highest resolution possible between both the PC and camera is used. However, not all OS and application combinations are typical. Some applications are assigned to a lower value, or the lowest resolution to purposely minimize the bandwidth requirement. In order to avoid selection of the smallest resolution possible, the resolutions of 160 x 120 and 160 x 90 were removed from the camera due to the selection of the lowest resolution by some UC Clients and because it looked sort of wicked awful (in some respects).

Table: Supported UVC Resolutions

Format	Resolution	Frame Rate	Aspect Ratio
MJPEG	1280 x 720	15/30	16:9
	960 x 544	15/30	16:9
	704 x 576	15/30	4:3
	640 x 480	15/30	4:3
	640 x 360	15/30	16:9
	424 x 240	15/30	4:3
	352 x 240	15/30	4:3
	320 x 240	15/30	4:3
	320 x 180	15/30	16:9
YUY2	640 x 480	10	4:3
	640 x 360	10	16:9
	424 x 240	15/30	4:3
	352 x 240	15/30	4:3
	320 x 240	15/30	4:3
	320 x 180	15/30	16:9

Keyboard Hot Keys for PTZ functions:

The keyboard hot keys can control the Pan/Tilt/Zoom functions of the HD-USB Camera when using the Camera Control Web Page (shown in the next section). The table below explains operation.

Table: Keyboard Hotkeys

Function	Hot Key		Function	Hot Key
Zoom IN	+ (plus)		Tilt Up & Pan Right	Num. Pad Key 9, PgUp
Zoom OUT	- (minus)		Tilt Down & Pan Right	Num. Pad Key 3, PgDn
Tilt Up	Num. Pad Key 8, Up Arrow		Tilt Up & Pan Left	Num. Pad Key 1, End
Tilt Down	Num. Pad Key 2, Down Arrow		Tilt Down & Pan Left	Num. Pad Key 7, Home
Pan Right	Num. Pad Key 6, Right Arrow			
Pan Left	Num. Pad Key 4, Left Arrow			

NOTE: Shift key not required for + and - keys on number row. Caps Lock can be ON or OFF. Num Lock must be off to use the Numeric Keypad for pan and tilt.

INTERNAL WEB PAGES AND CONTROL:

The internal web pages will allow control of the HD-USB and allow the user to control the camera via an internet connection. These web pages will allow the user or administrator to set security passwords, change the IP address if not dynamic, view diagnostics, access the firmware upgrade page and more.

To access the HD-USB's web pages, first talk to your Network Administrator about the network on which the camera will be placed. Access to the internal web pages can be achieved three ways in order to set-up the HD-USB's IP address and other administrative functions.

DHCP 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 HD-USB software is defaulted to DHCP.

The HD-USB 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.

Connect to the Local Area Network or to a computer with a Cross-over cable

To display the HD-USB's IP Address:

1) Plug in the camera and let it go through the boot up procedure. The IP Address will be displayed at the top and middle of the screen for 15 seconds and then automatically turns off.

To see the IP address for longer than 15 seconds at boot up:

2) Pick up the Vaddio IR Remote Commander and locate the Data Screen button.
3) Press and hold the Data Screen button on the remote for 4 seconds.
4) The IP Address will appear on the display. The system is capable of displaying and address up to 15 characters arranged in the format: xxx.xxx.xxx.xxx. The default static IP address for the HD-USB camera is 169.254.1.1.
5) To turn off the IP Address display, press and hold the Data Screen button for 4 more seconds or until the IP Address turns off.

Displaying the IP address for the network administrator is advantageous especially in a network that is DHCP. It makes it easier to find the camera on the network and assign addresses permanently within the DHCP protocol. Whatever protocols are used, always have the network guys available when attaching the Vaddio HD-USB camera to the network.

Notes:

The Data screen button is also used for the Camera's on-screen display where many of the camera's parameters can be set. It is easy to tell the difference between these modes as one quick touch enters the OSD for the camera and a "four (4) second press and hold" displays the web address and turns off the web address display.

The IP Address will be displayed on screen out of the composite video, analog component video (YPbPr) and the USB output. It will display at the top, middle of the screen to ensure that ancient 4:3 displays can show the address as well as the prevalent 16:9 monitors.

Simulated IP Address On-Screen Display

Static IP Set-up:

It is highly recommended that the Network Administrator and/or network personnel are involved on the Static IP set-up of the HD-USB camera. Please do not try to set the Static IP of the camera without help from network personnel…please?

The static IP address 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 connect to a computer.

The default address of the HD-USB 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 HD-USB are accessible.

Examples (directly connected to a computer for set-up):
For Windows XP Pro, the routine to get to the network settings is fairly simple. Click on the Start button > Control Panels > Network Connections > Right Click Local Area Connection > click on Properties > click on Internet Protocol (TCP/IP) > click on Properties and IP Address and Subnet Mask numbers are displayed. It is best to record the addresses that are in the computer so they can be re-assigned when the operation is finished. Enter 169.254.1.2 (which is the default address 169.254.1.1 plus 1) and Subnet mask is 255.255.0.0 and click OK > and then OK again. Bring up one of the approved web browsers (like Chrome) and enter http://169.254.1.1 and the Log-in page will appear.

With Apple OS X (10.7 and above), the steps are a bit different but essentially the same…Go to > System Preferences > Network > Ethernet > Configure IPv4: Manually > Enter in 169.254.1.2 and Subnet mask of 255.255.0.0 and click Apply. Bring up one of the approved web browsers (like Safari) and enter http://169.254.1.1 and the Log-in page will appear.

Windows 7 has its own set-up that is a bit different from Windows XP Pro, but similar in that the whole purpose of the Static IP first time set up is to give the HD-USB PTZ Camera an address that can be used over and over again by users or administrators to control the camera.

LOGIN Page:

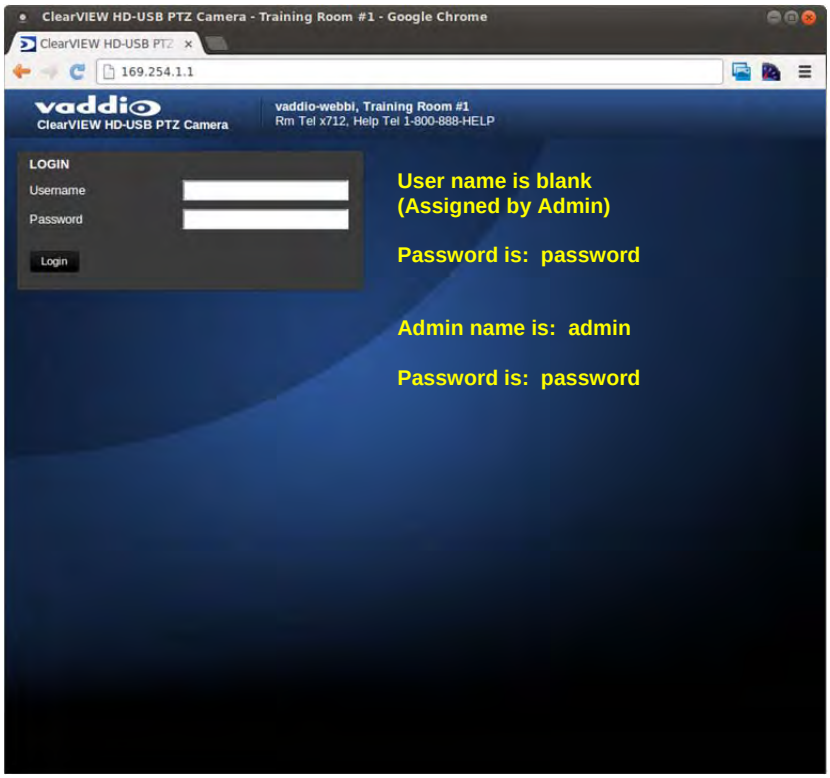
The Login Page will appear if there is a user name assigned by the administrator.

Assigning a user name can limit access to the admin menus by a general user.

By default, the password for the User account is: **password**.

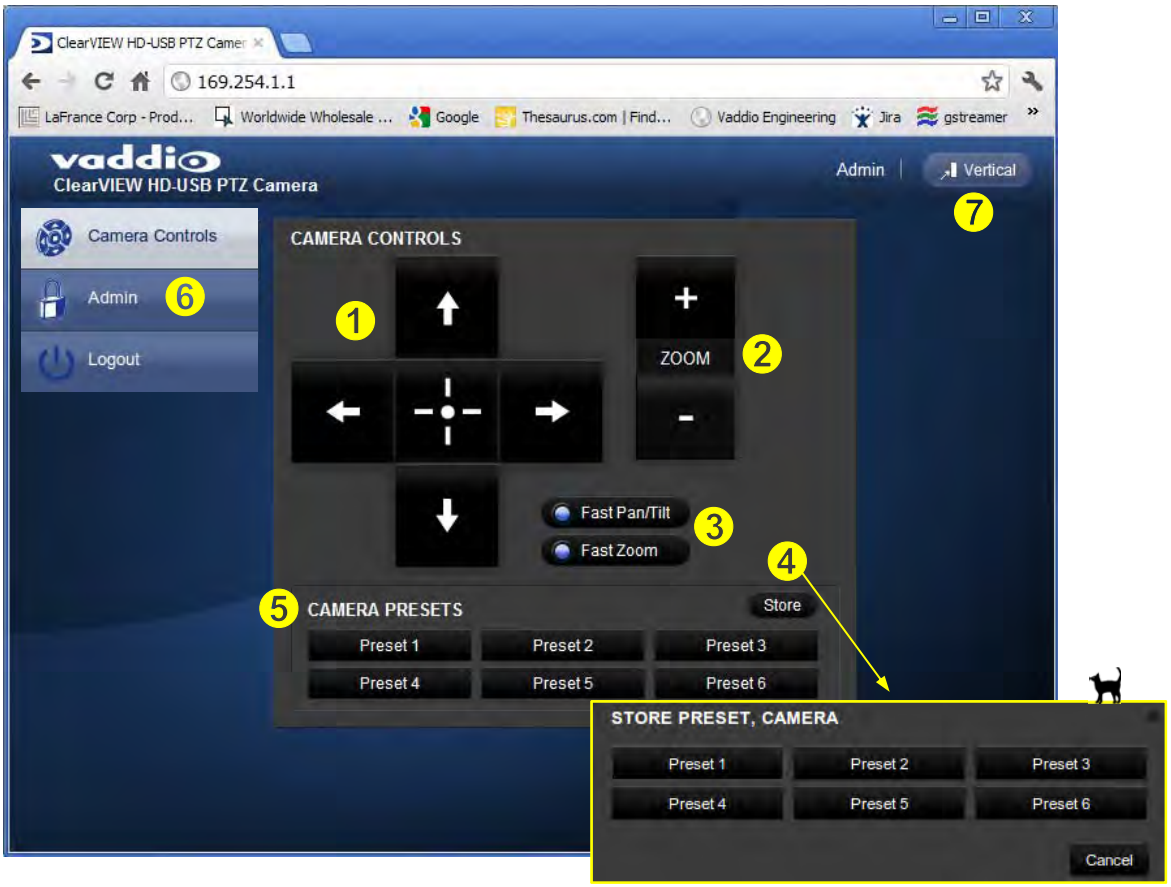
The Administrator can set the name and password for the User account.

If no user name is assigned, the web page will automatically open to the camera control page.



SCREEN SHOT TOUR:

The **Camera Control** page (functions called out below).



Store Preset pop-up menu dramatization

1) **Pan, Tilt and Home Controls:** These intuitive controls use the up/down arrows for camera tilt, the left/right arrows for camera pan and the center button to 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) **Pan/Tilt and Zoom Speed Controls:** The speed for both the Pan/Tilt and Zoom controls can be adjusted for with the two (2) buttons in this section. For tighter shots, it is recommended that the slower speed is used.

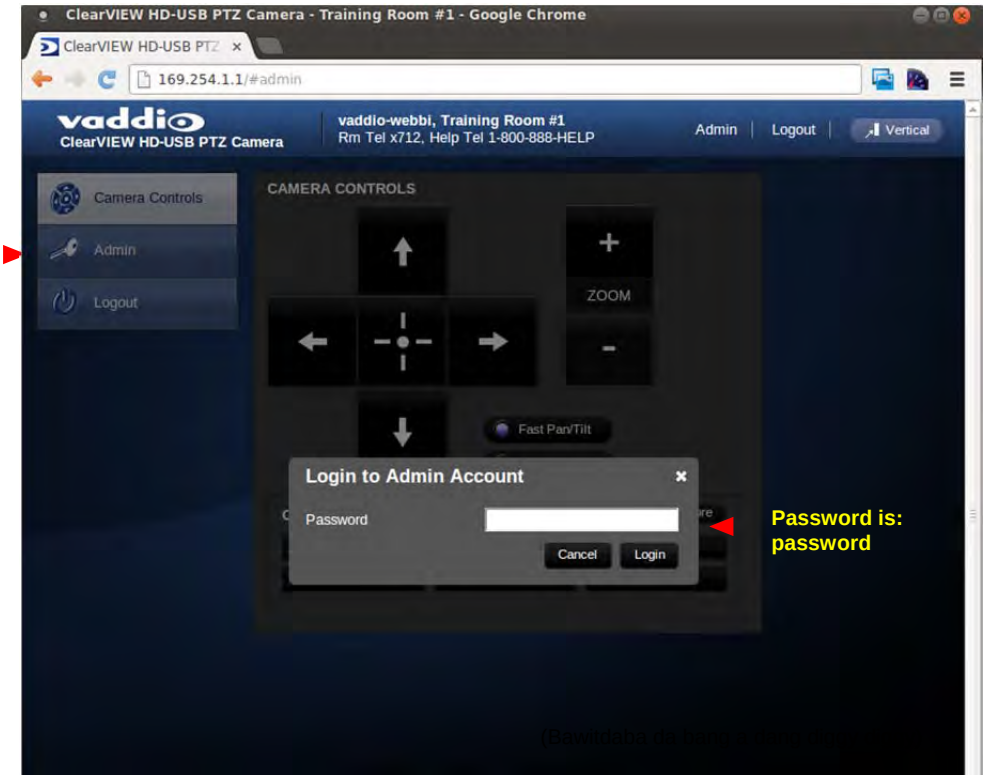
4) **Store Preset Button:** Clicking the Store button opens up a Store Preset pop-up dialog box. To set presets, set up the camera shot, click on choice of preset number (1 through 6). The preset is stored and the dialog box closes.

5) **Camera Presets:** Six (6) presets can be recalled simply by clicking a preset number.

6) **Administration Menu:** Clicking on the Administration menu bar, the Admin Log-in screen will appear. The default Admin password is: **password**.

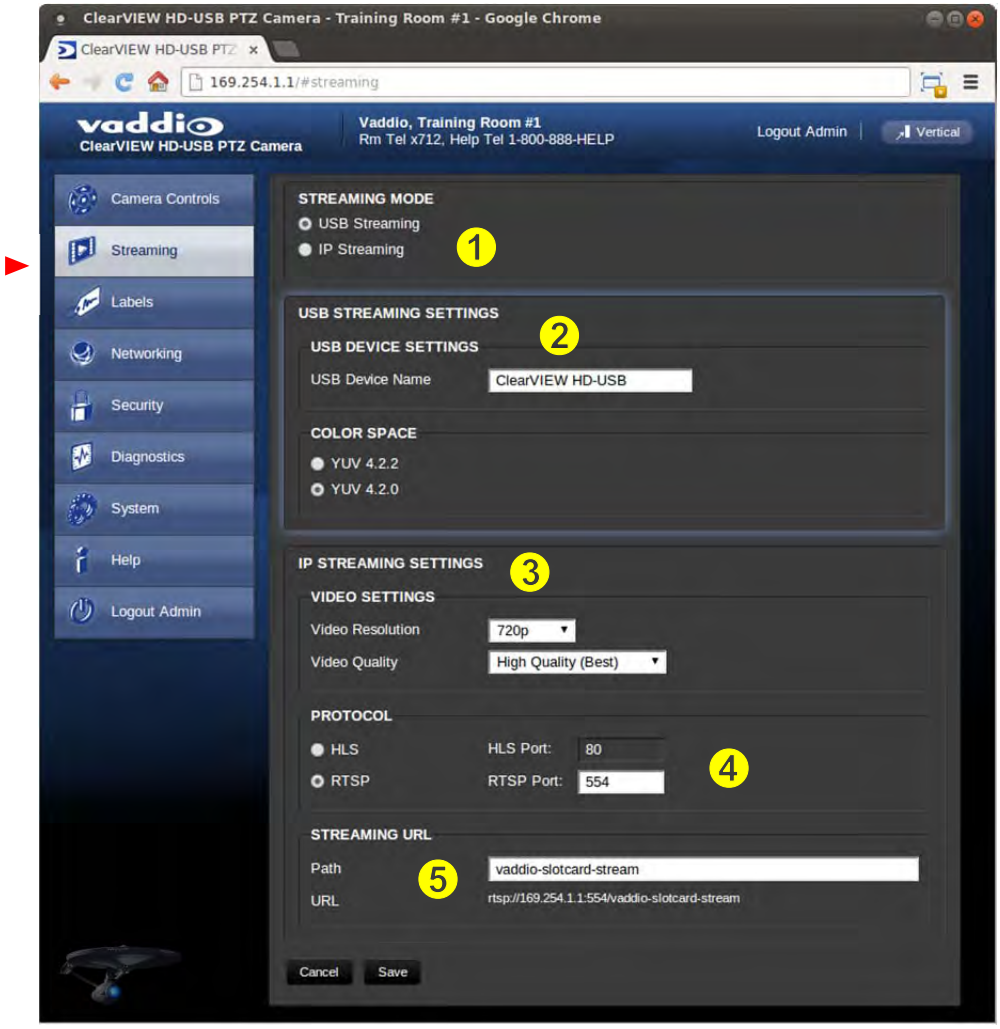
7) **Vertical:** The vertical button will reduce the size of the window for the user controls and remove the menu tabs on the left side of the screen. The vertical sizing works well when using it with a soft-client codec. Examples of the vertical box are at the end of the tour.

Admin Pages: Clicking on the Admin link button will open the Log-in window. Enter the default password (password) on this line and click on Log-in.



After Login, the Admin link buttons are exposed and include Streaming, Labels, Networking, Security, Diagnostics, System, Help and Logout Admin.

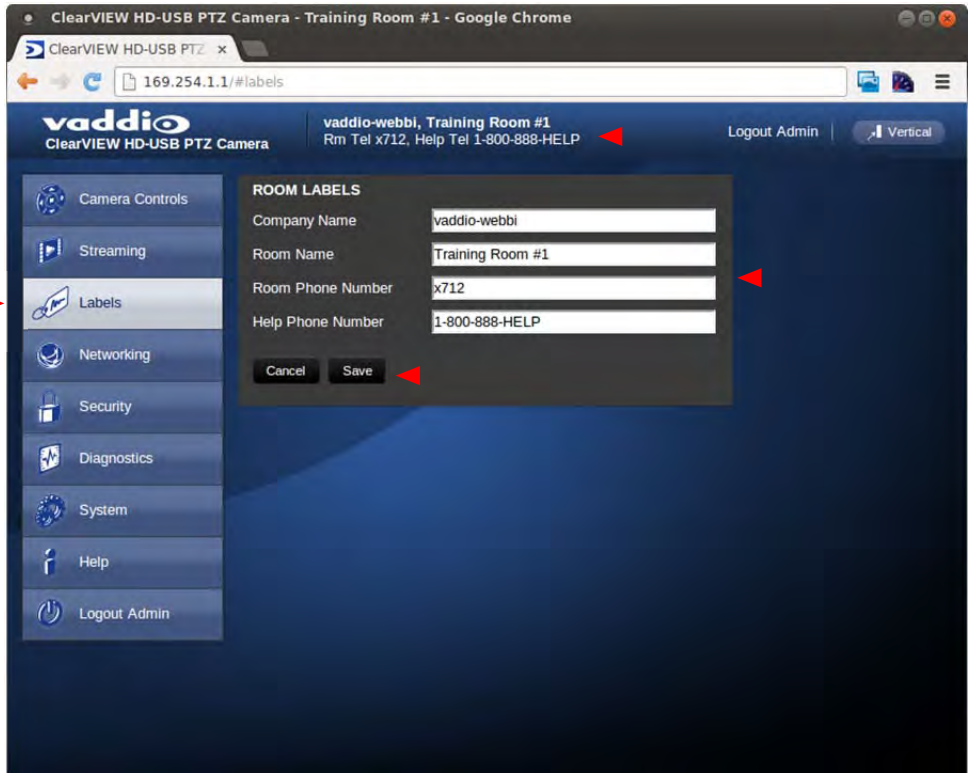
Streaming: The Streaming Menu allows an administrator to set up the type of streaming, color depth, video speed and quality, protocol and path.



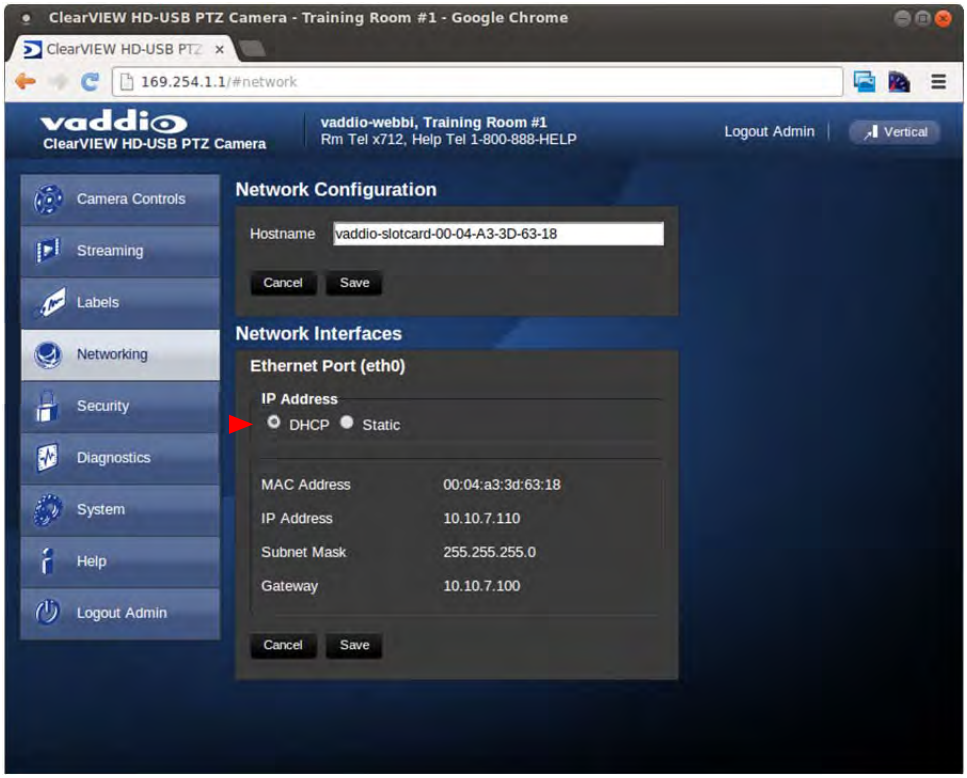
The Streaming Menu:

1) The Streaming mode is set for either USB 2.0 streaming (MJPEG) or IP streaming (H.264); however the HD-USB cannot do both at the same time. It can stream USB and accept IP control, or it can IP stream with IP control. Choose the streaming mode here.
2) USB Image Settings allows the admin to set a "friendly" name allowing each system to have its own identity. This is handy for a user that uses several rooms. It also allows the admin to reduce the color depth to 4:2:0, which is used with the older/cheaper webcams and applications, where image quality is not as critical. The 4:2:2 color is used by many applications that take advantage of the performance of the camera where the colors are more vivid.
3) The IP Streaming - Video Settings allow the selection of the target performance for the IP Streaming. The HD-USB camera is set up for a variable bit rate, which is much simpler to use. The user can select the resolution and the quality, such as High Quality (Best), Standard Quality (Better) and Low Bandwidth (Good). Every effort to eliminate bad combinations with the 5 or 6 parameters that make up the image size, quality, rate etc… has been made, so you can't pick 1080p at a bit rate of 128Kbps, which would look totally wicked awful - and probably wouldn't work anyway.
4) The IP Streaming Protocol also allows the admin to choose the streaming type and the port number for RTSP. The HLS port is always on 80. The supported protocols are RTSP and HLS (Apple's HTTP Live Streaming). RTSP is best for live applications, where HLS serves the Apple iOS devices and is better for playback due to the amount of buffering the HLS has built-in. The Streaming URL auto populates and that path can be changed.
5) When finished setting up the streaming parameters, click on save to put the changes into effect or cancel to……cancel it.

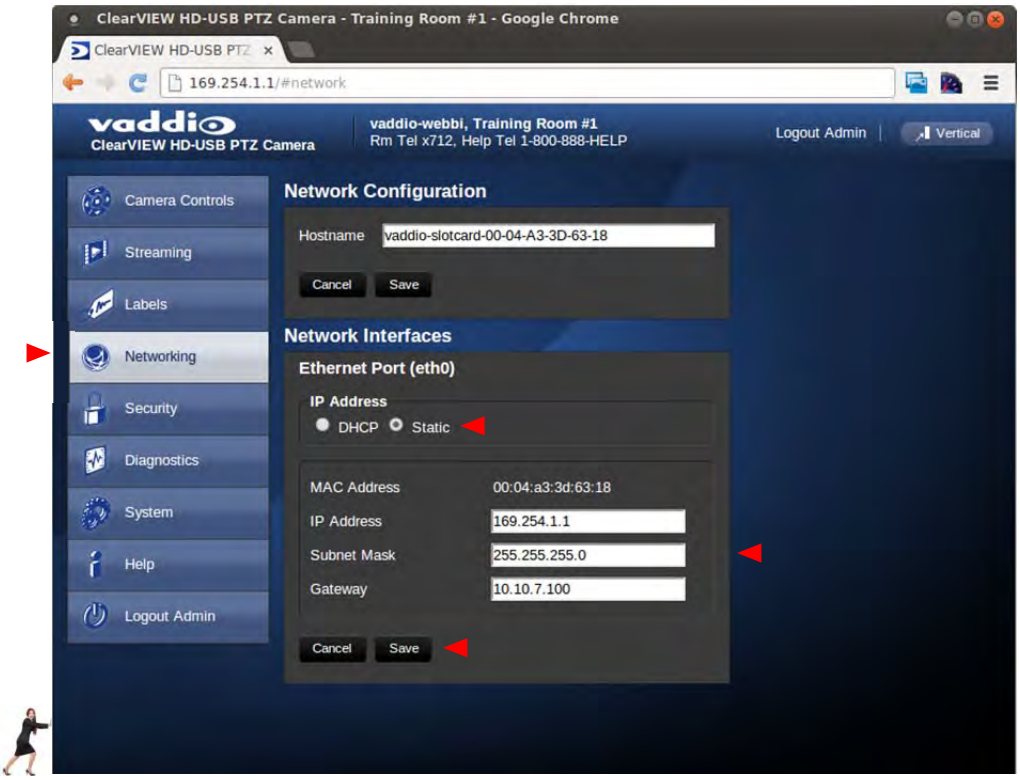
Room Labels: The Room Labels menu allows the administrator to label the company name, room name, room phone and help phone on a per camera basis. The labels appear on every page at the top/middle of the page. Simply enter the room information and click Save.



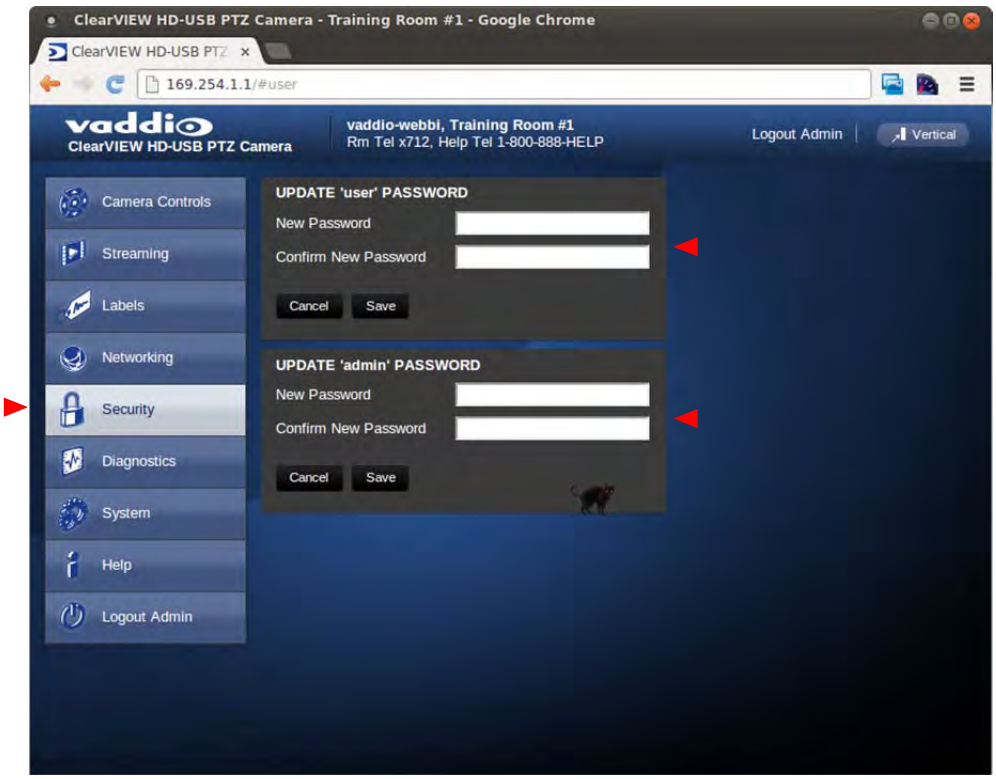
By clicking on the **Networking** link button, the Network Configuration and Network Interfaces are displayed. This is where the Network administrator assigns either DHCP or a Static address and the associated parameters.



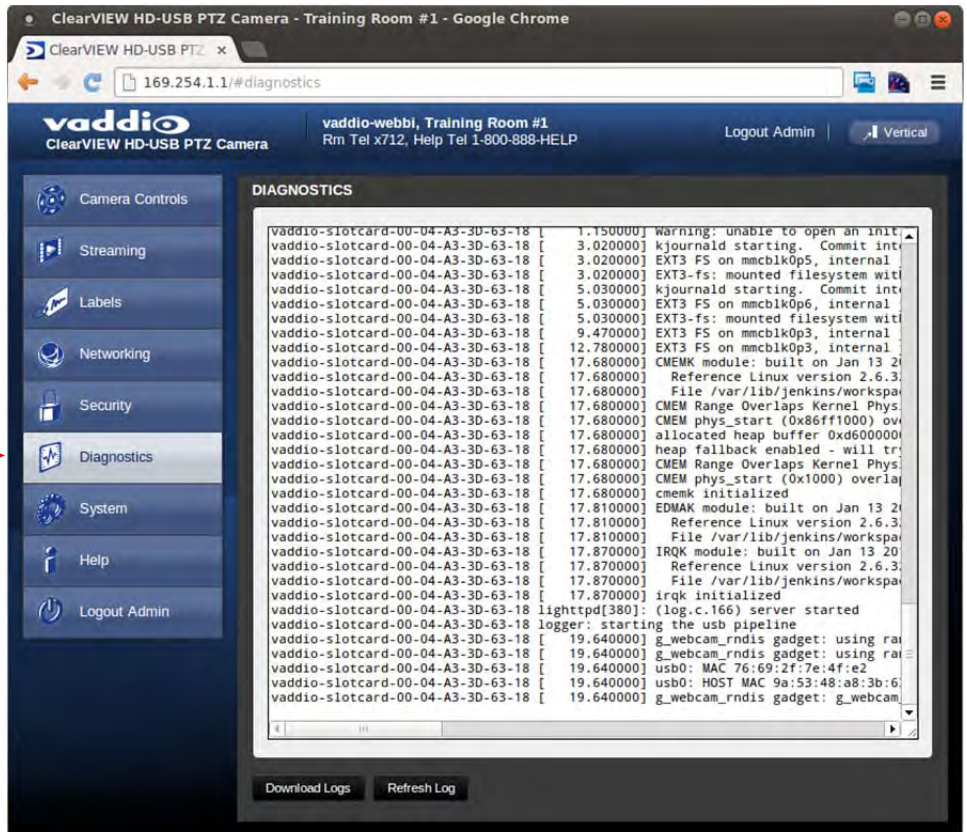
If **Static IP** is chosen, a new menu “pops up" where the IP Address, Subnet Mask and Gateway are entered. Click on Save to keep the Static IP information.



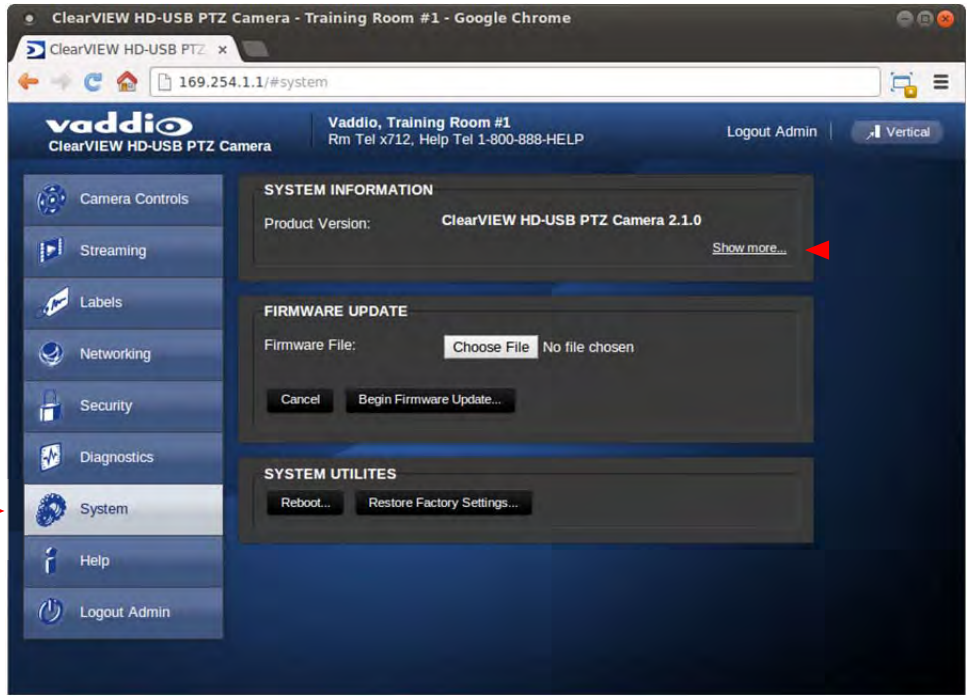
By clicking on the **Security** link button, the **UPDATE “user” PASSWORD** and **UPDATE “admin” PASSWORD** control sections are displayed. The default “user” password is: **password.** The default “admin” password is also: **password**. The Network administrator can reassign the user name and password as well as the Admin password. There is only one “user” password and one “admin” password at any given time.



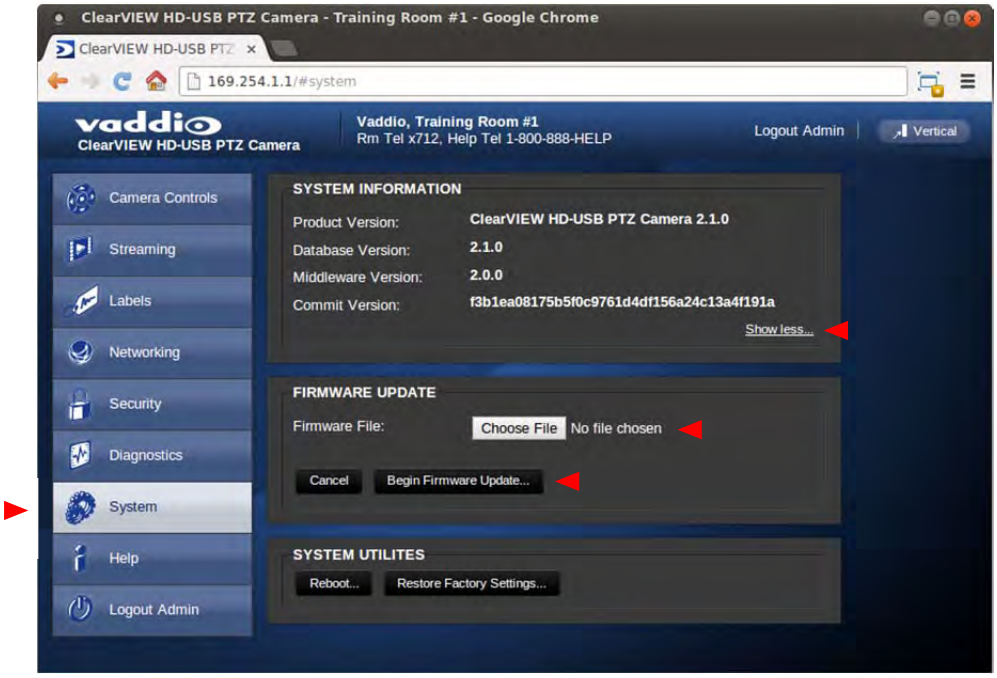
By clicking the **Diagnostics** link button, a set of self-diagnostics will be displayed. These diagnostics may help the Vaddio technical support team diagnose a problem with the HD-USB camera.



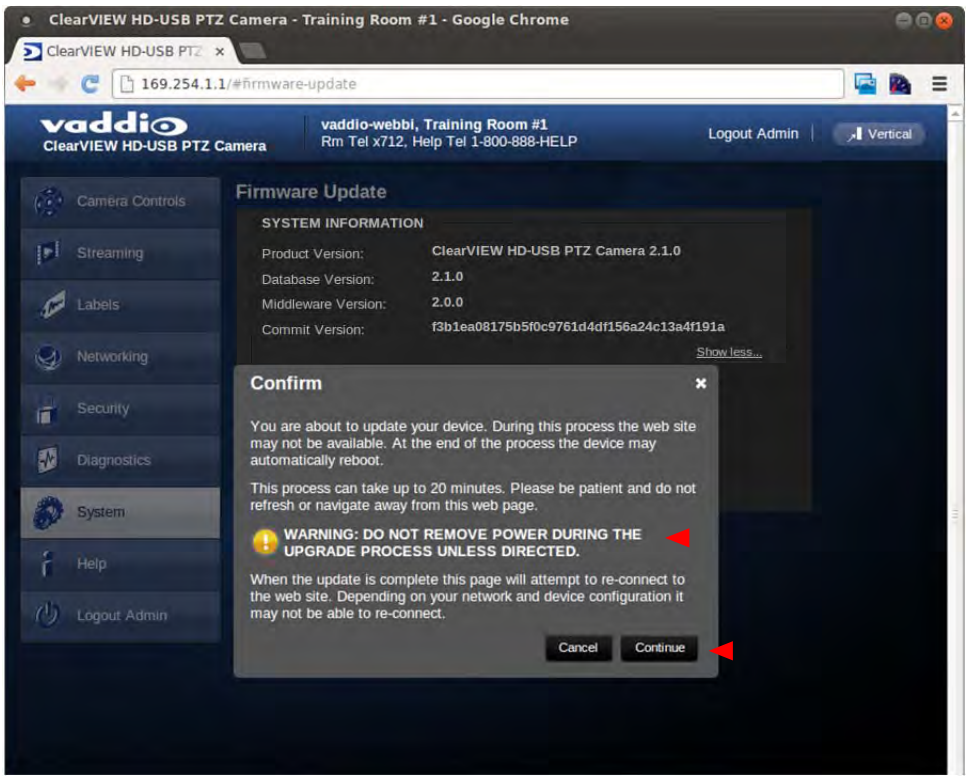
The **System** link button is where the Firmware Updates will be loaded. There will be several firmware updates and upgrades over the life of the camera. Click “Show more” for detail about the current software. A Reboot button and a Restore Factory Settings control rounds out the System Page.



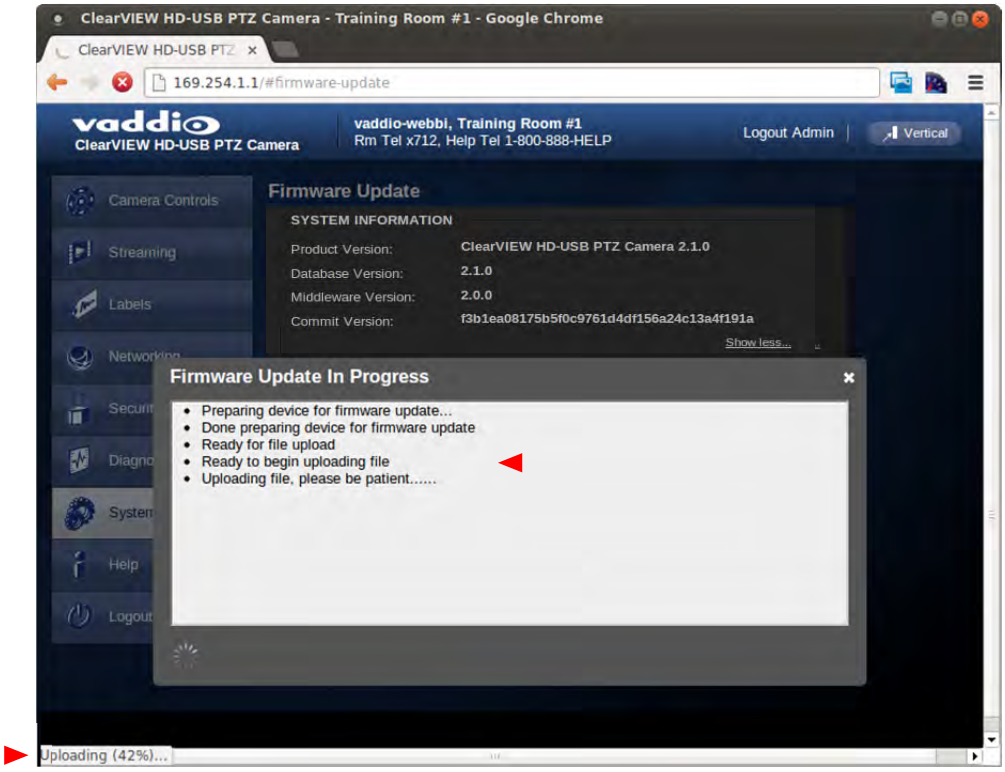
By clicking on "**Show more…**" the software versions are displayed. To update the firmware files, chose the appropriate file and click on Begin Firmware Update. When in doubt, call Vaddio Tech Support for assistance.



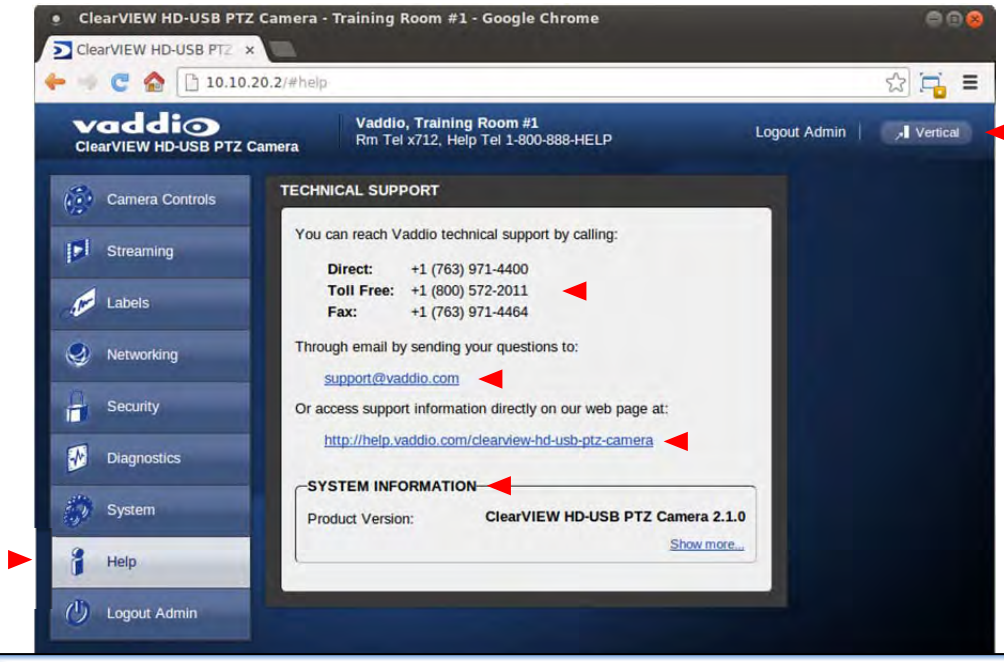
After clicking on "Begin Firmware Update…" a confirmation pop-up and warning will be displayed. Please contact Vaddio Tech support for directions or assistance. Please read and completely understand the pop-up warnings as it is easy to lose patience waiting for updates. If the update is interrupted, it is never really ever a good thing.



After the firmware load has been started, a pop-up screen will advise patience and notify, in terms of a percentage completed, the progress of the firmware load. Please do not interrupt the firmware load.



Service/Help information can be found under the **Help** tab. Support phone numbers and e-mail, manuals, FAQ's and System information is listed on this page. Have this page open when calling Vaddio Tech Support.



See next page for "Vertical" button function.

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 only.

Finally, the **Vertical** button at the top right of the camera control page reduces the size of the camera control window and drops the menu bars to allow the controls to be open and on screen along with any soft-codec application without taking up too much space. This control page can be sized with the mouse, moved around the screen and minimized to not block any part of the screen. The Full button returns the web page to normal size.

Click on full to go back to full sized web pages

SYSTEM CONNECTIVITY

Diagram: Basic Connectivity Example 1:

HD-USB Camera and a Soft-client videoconferencing system (audio is not included in this example).

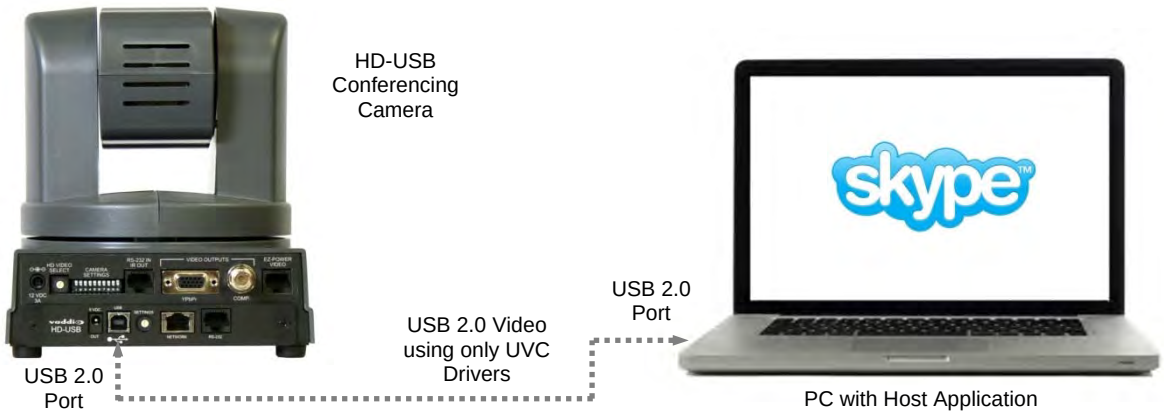


Diagram: Connectivity Example 2:

This example uses the HD-USB PTZ Camera and Vaddio's EasyUSB™ Mixer/Amp, two (2) Echo Cancelling EasyMic™ MicPODs and Two (2) Bose® Ceiling Speakers to create a complete room system using programs such as Skype®, Jabber®, Google+®, Microsoft Lync® and others, with Vaddio's USB 2.0 video and acoustic echo cancelled (AEC) audio.

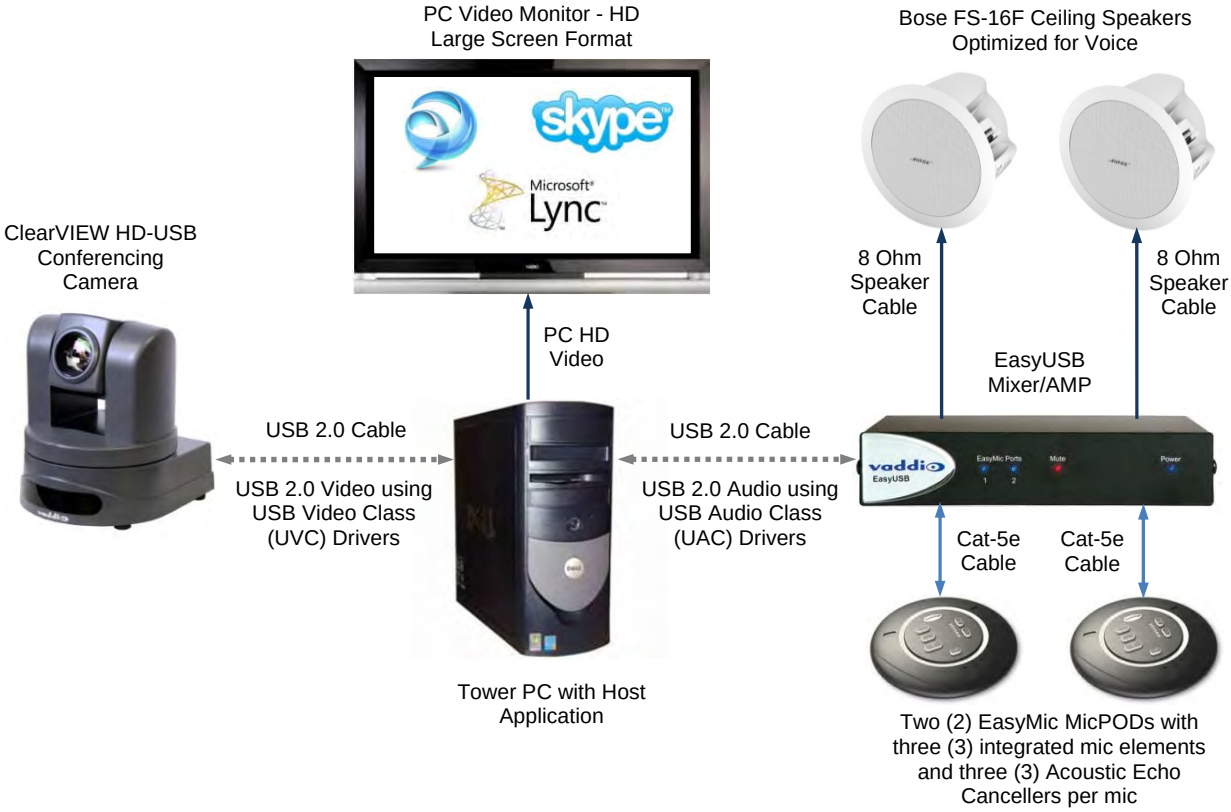


Diagram: H.264 Streaming Connectivity (for Release 2.0.0 and later):

The HD-USB Camera has a Unicast streaming output suitable for up to four (4) concurrent users (at lower resolutions and lower quality). This configuration shows four (4) concurrent users.

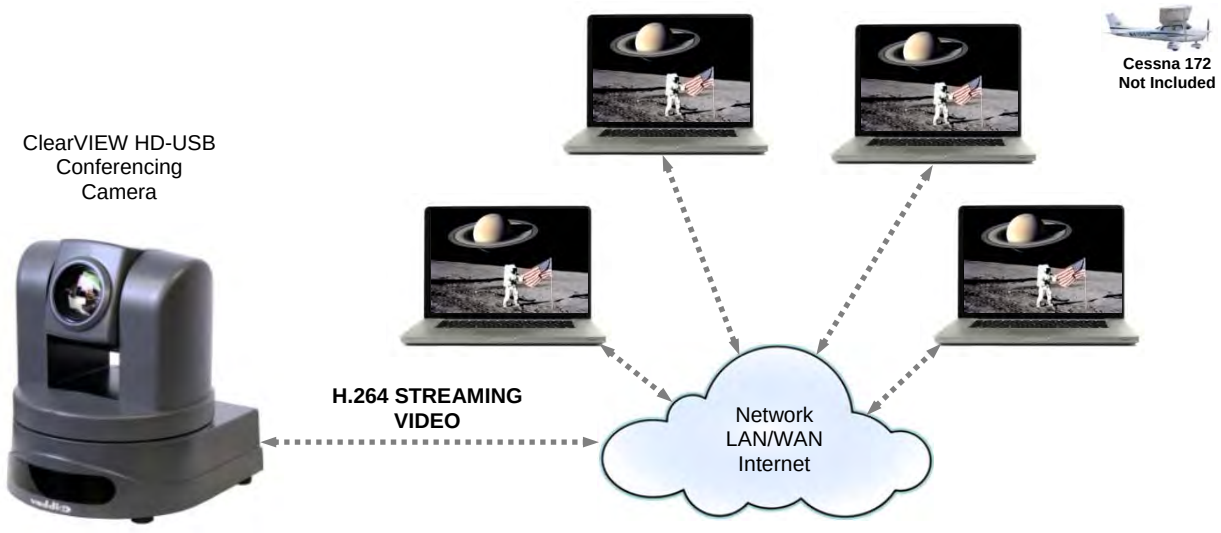
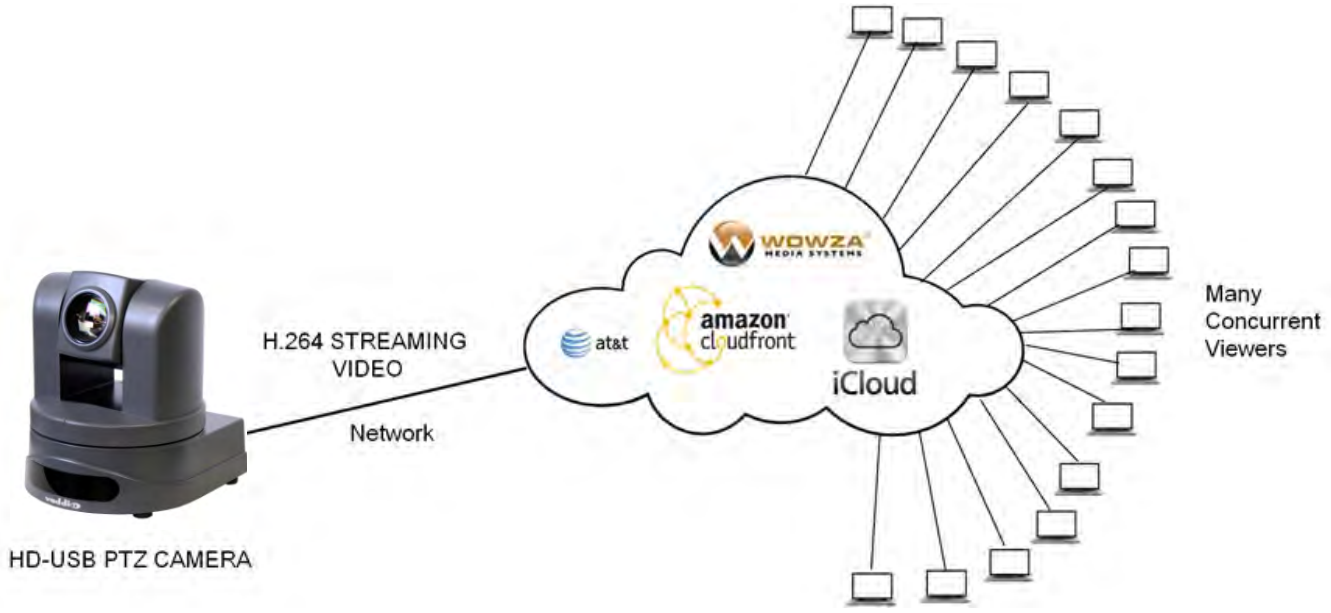


Diagram: Connection Diagram Example using A CDN (for release 2.0 when IP is enabled):
For a Large Number of Viewers, use a CDN (Content Distribution Network) such as WOWZA, Amazon or iCloud and more…



CONNECTING THE CAMERA TO THE PC AND PROGRAM OF CHOICE:

The HD-USB PTZ Camera is compatible with many programs and media players. The following is an attempt to generally describe the steps to plug in the HD-USB camera and get an image.

Skype Example:

1) First, with a quality USB 2.0 cable, plug the USB-B port of the camera to the USB-A port of the computer. A pop up window on the computer monitor will display the following:
    a. Found ClearVIEW HD-USB
    b. Found USB Composite Device
    c. Found USB Video Device

2) Open Skype and perform the following steps:
    a. Open the Tools Menu and drop down to Options
    b. Click on Video Settings and under Webcam choose USB Video Device

The systems will negotiate the highest resolutions possible, depending on the computer speed, network quality, cabling etc..., and display the video signal of the camera. The camera can be controlled with the supplied Vaddio IR Remote Commander or through IP as described earlier through the cameras web pages. Make a test call to ensure the system is working properly.

VLC Media Player Example:

1) Same first step as above.

2) Open VLC Media Player and perform the following steps:
   a. Click on the Media menu and drop down to Open Capture Device and click it.
   b. Under Device Name, go to the Video Device Name drop down and choose USB Video Device.
   c. Under Options, enter the Video Size as 1280x720
   d. Click on Play
   e. From there, VLC needs some instruction on the aspect ratio, so click on Tools and drop down to Aspect Ratio and drop down again to 16:9 for 720p (1280x720).

VLC is a powerful record/playback system will buffer the images creating some delay in the way VLC displays the image. This expected and normal.

With all the compatible software available, in general terms, the video device, aspect ratio, and resolution may need to be set manually the first time through initial set-up. Some systems are easier than others (like Skype) and others are more technical in nature and tend to do more stuff.

TECHNICAL SPECIFICATIONS:

Part Numbers	999-6990-000 North America, 999-6990-001 International
Video Outputs	• USB 2.0 (MJPEG) o Resolution up to 720p/30 USB 2.0 (MJPEG) o Color Space 4.2.2 or 4.2.0 o Use “HD VIDEO AND USB 2.0 VIDEO SELECT” rotary positions ‘**0**’ for USB.2.0 Video • H.264 (IP) - Release 2.0.x o Resolution up to 1080p/30 (H.264) • Analog Component (YPbPr), o Analog resolutions up to and including 1080p/60 (YPbPr) • CVBS - Analog only o 480i and 576i (4:3, LB and SQ)
USB Interface	Connector: Type-B, USB 2.0 Compliant Drivers: Standard UVC device (no pesky custom drivers)
Network Interface	Connector: RJ-45, 10/100 Base-T, Supported Protocols: RTSP Streaming, HLS Streaming (apple’s variant of HTTP streaming) - Release 2
H.264 Resolutions (Release 2.0.0)	CIF, 640x480 (VGA), 576p, 720p/30 1080p/30
User Control	Vaddio IR Remote Commander, On Screen Display for camera set-up, RS-232, Ethernet (web pages)
Supported Media Players	Apple Quick-Time, VLC Media Player and Real Player
Supported Browsers	Internet Explorer 8 & 9, Safari 4 &5, Safari/iOS, Chrome, Firefox
Image Sensor	1/3-Type Exmor High-speed, Progressive Scan CMOS Sensor with 1.3 Megapixels
Minimum Illumination	0.7 LUX (F1.6, 50IRE)
Lens/ Focal Length	19X Optical Zoom, F=4.5mm wide to 85mm tele (F1.6-F2.9), Min. Focus Distance 1.0m
Horizontal Viewing Angle	58.1° Wide End to 3.2° Tele End - 16:9 Format
Pan Range	Pan: +170 degrees to -170 degrees, Tilt: +90 degrees to -30 degrees, Invertible for Ceiling Mount
Preset Positions	• 16 (0-15 internal) accessible through RS-232, • 6 (0-5) recalled via Vaddio IR Remote Commander
General Information	
Operating Temperature	32° to 104° F (0° to 40° C) / 20% to 80% Relative Humidity
Dimensions / Weight	7.81” (198.37mm) H x 6.67” (169.42mm) W x 7.057” (179.25. mm) D / 6.04 lbs. (2.7397kg.)
Software Release Information (Highlights)	**Release 1.0.0:** Includes USB 2.0 Outputs and Analog Outputs simultaneously on and ready to use. Ethernet control via an internal web page and upgrading software capability is active. **Release 1.2.0:** Improvements, additions to functionality, Telnet control, UC client compatibility and UVC resolutions. **Release 2.0.0:** H.264 activated for IP Streaming

COMPLIANCE AND CE DECLARATION OF CONFORMITY: CLEARVIEW HD-USB PTZ CAMERA

Compliance testing was performed to the following regulations:

- FCC Part15, Sections 15.107, 15.109 Subpart B — Class A
- ICES-003 ISSUE 4, 2004 — Class A
- EN55022 A1 2007 — Class A
- EMC Directive 2004/108/EC — Class A
- IEC 60950-1:2005 (2nd Edition); Am 1:2009 — Class A
- EN 60950-1:2006+A11:2009+A1:2010+A12:2011 — 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
ICES-003, Issue 4: 2004

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 B 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

EN55024/A2:2003 Information Technology Equipment
Immunity Characteristics Limits and Methods of Measurement

- 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: Second Edition: 2004 — Voltage Dips, Interrupts and Fluctuations
- IEC 60950-1:2005 (2nd Edition); Am 1:2009 — Information technology equipment - Safety
- EN 60950-1:2006+A11:2009+A1:2010+A12:2011 — Information technology equipment - 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 products and 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.

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.

*Vaddio manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry standard practices.

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, especially caviar.
- 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.

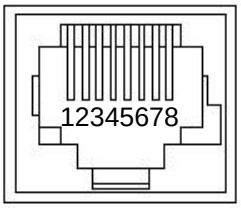
Operating and Storage Conditions:

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 lawn mower bags or trailers
- In inclement weather
- Dry environments with an excess of static discharge
- In or on hybrid grain silos
- Under severe vibration

APPENDIX 1: RS-232 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)	Unused
5)	Unused
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 ClearVIEW HD-USB Control Protocol is similar, but not identical to the Sony® VISCA™ command set and is not compatible with Vaddio Joysticks. This is an abbreviated Command set intended to give external control systems basic control over the camera. This list is not the same list as found in the other ClearVIEW (HD-18, HD-19, HD-20 and HD-22) cameras.

HD-USB Command List

Command Set	Command	Command Packet	Comments
Address Set	Broadcast	88 30 01 FF	Address Set (Daisy chain)
IF_Clear	Broadcast	88 01 00 01 FF	IF Clear
Command Cancel		8x 2p FF	p:socket number(1,2)
CAM_Power	On Off(Standby)	8x 01 04 00 02 FF 8x 01 04 00 03 FF	Power On/Off
CAM_Zoom	Stop Tele(Standard) Wide(Standard) Tele(Variable) Wide(Variable) Direct Direct(Variable)	8x 01 04 07 00 FF 8x 01 04 07 02 FF 8x 01 04 07 03 FF 8x 01 04 07 2p FF 8x 01 04 07 3p FF 8x 01 04 47 0p 0q 0r 0s FF 8x 01 7E 01 4A 0v 0p 0q 0r 0s FF	 pqrs: Zoom Position* v:(Speed) 0-7
CAM_Focus	Stop Far(Standard) Near(Standard) Far(Variable) Near(Variable) AutoFocus ManualFocus Auto/Manual Direct	8x 01 04 08 00 FF 8x 01 04 08 02 FF 8x 01 04 08 03 FF 8x 01 04 08 2p FF 8x 01 04 08 3p FF 8x 01 04 38 02 FF 8x 01 04 38 03 FF 8x 01 04 38 10 FF 8x 01 04 48 0p 0q 0r 0s FF	 pqrs: Focus position*
CAM_Backlight	On Off	8x 01 04 33 02 FF 8x 01 04 33 03 FF	
CAM_Memory	Reset Set Recall	8x 01 04 3F 00 0p FF 8x 01 04 3F 01 0p FF 8x01 04 3F 02 0p FF	 p:Memory No(=0-0xe)
Pan-tiltDrive	Up Down Left Right UpLeft UpRight DownLeft DownRight Stop Absolute Position Home Reset	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 81 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF 8x 01 06 04 FF 81 01 06 05 FF	WW: Pan Speed (0x01-0x18) VV:Tilt Speed(0x01-0x14) YYYY: Pan Position** ZZZZ: Tilt Position**
Tally	On Off	8x 01 7E 01 0A 00 02 FF 8x 01 7E 01 0A 00 03 FF	
Preset Pan Speed	Pan/Tilt/Zoom Speed	81 01 7E 01 0B WW SS ZZ FF	WW: Pan Speed (0x01-0x18) SS:Tilt Speed(0x01-0x14) ZZ:Zoom Speed(0-7);

***Zoom and Focus Data:**
CAM_Zoom: Range(0x000–0x6B3)
CAM_Focus: Range (0x000-0xC000) dependent on Zoom Position
****Additional Information:**
Pan Range: 8044 – 7FBC (-32,700 to +32,700)
Tilt Range: E891 – 4C2B (-5,999 to +19,499)

HD-USB Inquiry List

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	pqr: 0-0x6B3
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_BacklightModeInq	8x 09 04 33 FF	y0 50 02 FF y0 50 03 FF	On Off
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p:Preset 0-0xf
Pan-TiltMaxSpeedInq	8x 09 06 11 FF	y0 50 pp qq FF	pp:Pan 0x01-0x18 qq:Tilt 0x01-0x14
Pan-tiltPositionInq	8x 09 06 12 FF	FF y0 50 0p 0p 0p 0p 0q 0q 0q 0q FF	pppp: Pan 0x8044-0x7FB2 qqqq: Tilt 0xE890-0x4C2C
TallyInq	8x 09 7E 01 0A FF	y0 50 02 FF y0 50 03 FF	On Off
PresetSpeedInq	8x 09 7E 01 0B FF	y0 50 pp qq rr FF	pp:Pan 0x01-0x18 qq:Tilt 0x01-0x14 rr:Zoom 0x00-0x07
Motor Config	8x 09 7E 01 70 FF	y0 50 00 FF y0 50 01 FF	Hard Motor Stops Soft Motor Stops

FIRMWARE VERSION 2.1.0 RELEASE NOTES:

Component	Version
Database	2.1.0
Middleware	2.0.0

New Features and Functions

- Under the USB Streaming section the USB Device Name was added, which allows the admin to use a friendly name for the camera. The camera will be listed as a UVC Camera in the device manager without this function and moving from room to room in the enterprise with multiple systems or controlling two cameras in a single room, is not exactly easy. The friendly name is preferred over a generic term for firms with more than one camera.
- The camera's scaler for lower resolutions has been improved. The HD-USB camera is optimized for HD video, and some applications scale the video down significantly from 720p to 360p and even as low as 180p. Some improvements were made to accommodate these lower resolutions.
- A system reboot function and a return to factory defaults were added to the webpages for additional convenience especially when managing the camera over the internet.

Fixed Issues

- **Mac OS 10.8.X and 10.9 Compatibility:** This release fixed an USB video streaming compatibly issue with Mac's Mountain Lion and Maverick operating system. In release 2.0.0, the USB video stream could stop or freeze when a software application requested video resolution changes on Mac's running Mountain Lion or Maverick operating systems. Release 2.1.0 fixes the interoperability problem and will no longer freeze or stop.

FIRMWARE VERSION 2.0.0 PREVIOUS RELEASE NOTES:

Component	Version
Database	2.0.0
Middleware	2.0.0

New Features & Functions

RTSP or HLS IP Streaming: Release 2.0 includes the Real Time Streaming Protocol (RTSP) or HLS (Apple's variant on HTTP streaming) for IP Streaming of the camera's video signal. The IP streaming is configurable within the camera's internal web server. The camera can be configured as either USB **or** IP streaming device, however not simultaneously.

Improved USB Colors: The ClearVIEW USB has an expanded color space range for USB 2.0 streaming creating a vivid HD image with blacker black and whiter whites.

Serial Command API Updates: Added new serial commands for setting streaming functions from Telnet client.

Fixed Issues: N/A

Known Issues:

IP Streaming: Video quality of IP stream will degrade with more than one media player directly connected to the camera's IP stream. This is a processor limitation on the streaming engine within the camera and is normal. For many participants, please use a CDN.

Sharpness Setting on Camera: Sharpness setting on HD-USB Camera can create scaling artifacts with UC clients using low resolution video (lower than 480p). The root cause of image artifacts are related to the MJPEG decoder in some UC soft-clients. The sharpness can be disabled on the camera from the IR remote. Press Data Screen and navigate to Special >Image Adj > Sharpness, then disable sharpness. This should reduce scaling artifacts ("the jaggies") with some software clients using low resolution video.

RTSP Port: The RTSP port can be assigned on the internal web pages as 554, or between the ranges of 1024 to 65535. Other ports are reserved for internal purposes.

Interoperability Testing & Findings

The following interoperability testing was performed for this release. A detailed list of all interoperability findings can be found in the EasyUSB Tools Interoperability FAQ document.

Table: HD-USB PTZ Camera and UC Client Software Interoperability Testing

Software Client	Tested Version	Major Findings	Comment
Cisco Jabber	4.4	None	
Web Ex	WBS 28.7	None	Must have WebEx client version 28.7 to work with Vaddio USB Video Products. AV Bridge color space should be set to 4:2:0
Skype	6.0	720p only supported on Skype Certified Camera	Workaround for HD by downloading shareware to force HD.
Adobe Connect	9.0.1	UVC Conflict with some built-in Laptop Cameras	MAC version of Connect squeezes to 4:3 aspect ratio.
Microsoft Lync	4.0.7	None	No Comment (N/C)
Gotomeeting (Citrix)	5.4	None	N/C
Vidyo Desktop	2.2.1	None	Certified with VidyoRoom 2.2.2.x
Polycom M100	1.0.4	None	N/C
LifeSize ClearSea	8.2.0	None	N/C
Google Plus	N/A	None	N/C
Panopto	4.2.5602	None	N/C
Quick Time Media Player	10.2	None	N/C
VLC Media Player	2.0.4	None	N/C
Real Player	16.0	None	N/C

HD-USB IP Streaming Interoperability Testing

Media Player	Test Version	Major Findings	Comment
QuickTime Media Play	10.2 (MAC) 7.7 (Win 7)	Direct X plugins may need to be disabled on Windows in order to accept the RTSP stream. **Note:** QuickTime does not support PCM audio.	N/C
Real Player	16.0	Real Player uses QuickTime for a decoder and launches a small video window.	N/C
VLC Media Player	2.0.x	None	N/C
WOWZA Media Server	5.4	None	Tested as push-stream to WOWZA via RTSP

Windows Media Player Note: Windows Media Player is not compatible with standard RTSP streams. It will not play IP streams originating from the HD-USB camera, AV Bridge encoder or any other RTSP streaming device.

Backward Compatibility:
The Rev 2.1.0 and up software will not allow device to be downgraded to previous versions.

PREVIOUS RELEASE NOTES:

Firmware Version 1.2.0 Release Notes: ClearVIEW HD-USB PTZ Camera

Component	Version
Database	1.2.0
Middleware	1.2.0

Note: Most of the version 1.2.0 Release notes have been added to the body of the manual as the data is important to the operation of the HD-USB camera. The notes listed below are the highlights of the Firmware Release 1.2.0.

- **New Features and Functions:**
  WebEx Compatibility: The video compatibility problem between HD-USB and WebEx has been resolved with a new software release of the WebEx client. Version WBS 28.7 and above is compatible with Vaddio USB devices.

- **Improved Interoperability with Various UC software Clients:** Additional USB video resolution support was added to the UVC endpoint to improve video quality for some UC soft clients that only use standard definition video resolution.

- **Keyboard Hot Keys**: Keyboard hot keys were added for the Pan/Tilt/Zoom functions on the Camera Control Web Page. The Shift key not required for + and - keys on number row. Caps Lock can be ON or OFF. Num Lock must be off to use the Numeric Keypad for pan and tilt.

- **USB Color Space Option:** A user configurable option for setting the video color space to 4:2:0 or 4:2:2 was added to the Web Pages. It was noted that using the 4:2:0 color space will reduce USB bandwidth by up to 25**.**763413125463% and may improve video quality with some UC soft clients.

- **Telnet Command API:** A Telnet Client to the HD-USB Camera was added for control via the network. This includes the Pan/Tilt/Zoom function. The telnet format is not a VISCA command protocol. A modified VISCA command protocol is only supported on the RS-232 port.

- **Additional UVC resolutions added:** See table on page 10.

APPENDIX 2 - TELNET SERIAL COMMAND API

The Vaddio Serial Command protocol is a high level text based command line interface supported via telnet session on the ClearVIEW HD-USB PTZ Camera. The Vaddio Serial Command protocol is not supported on the RS-232 port. The RS-232 port is dedicated for VISCA commands only. The command application protocol interface is intended to allow external device such as AMX and Crestron to control the camera. The protocol is based upon ASCII format following the VT100 terminal emulation standard and uses an intuitive textual 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	**Get Example**	**Syntax Error Example**
COMMAND: > camera pan right	COMMAND: > stream mode get	COMMAND: > camera pan right
RESPONSE: > OK	RESPONSE: > streaming mode usb	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 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

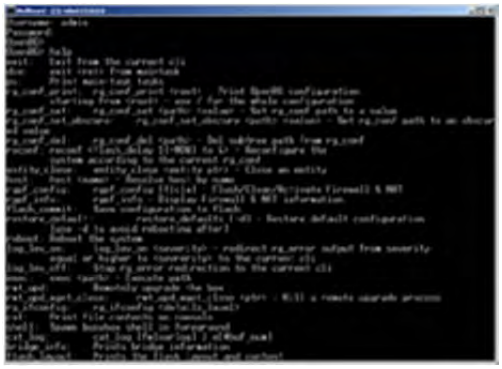


Image: Riveting example of simulated Telnet session

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
Stops the *pan* movement of the **camera**

Camera Preset

- **NAME**

camera preset - Recall and set 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 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 functionality. Used in conjunction with control arguments to include home, pan, tilt, zoom, and preset.

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.

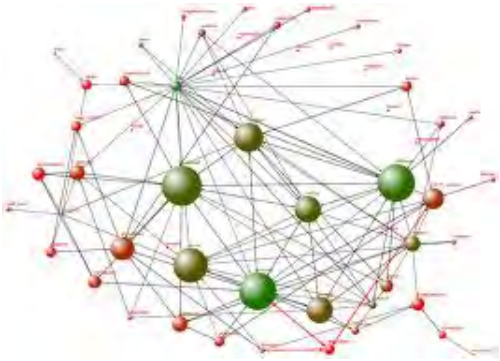
- **OPTIONS**

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

Streaming Mode

- **NAME**

streaming mode - Gets or sets the current streaming mode

- **SYNOPSIS**

streaming *mode* {get|usb|network}

- **DESCRIPTION**

Method used to get or set the current **streaming** settings

- **OPTIONS**

get Get the current **streaming** *mode*
usb
Set the current **streaming** *mode* to USB
ethernet
Set the current **streaming** *mode* to Ethernet

- **EXAMPLES**

streaming *mode* get
*mode***:** usb
Returns the current **streaming** *mode*
streaming *mode* usb
---
streaming *mode* ethernet
OK
Sets the **streaming** *mode* to Ethernet

Streaming Quality

- **NAME**

streaming quality - Gets or sets the current streaming quality

- **SYNOPSIS**

streaming *quality* {get|low|standard|high}

- **DESCRIPTION**

Method used to get or set the current **streaming** *quality*

- **OPTIONS**

get Get the current **streaming** *quality*
low Set video *quality* to low
standard Set video *quality* to standard
high Set video *quality* to high

- **EXAMPLES**

streaming *quality* get
*quality***:**low
Returns the current **streaming** *quality*
---
streaming *quality* standard
OK
Sets the **streaming** *quality* to standard

Streaming Resolution

- **NAME**

streaming resolution - Gets or sets the current streaming quality

- **SYNOPSIS**

streaming *resolution* {get|1080p|720p|4cif|480p|cif}

- **DESCRIPTION**

Method used to get or set the current **streaming** *resolution*

- **OPTIONS**

get Get the current **streaming** *resolution*
1080p Set video *resolution* to 1080p
720p Set video *resolution* to 720p
4cif Set video *resolution* to 4cif
480p Set video *resolution* to 480p
cif Set video *resolution* to cif

- **EXAMPLES**

streaming *resolution* get
*resolution***:**720p
Returns the current **streaming** *resolution*
---
streaming *resolution* 720p
OK
Sets the **streaming** *resolution* to 720p

Streaming

- **NAME**

streaming - Gets or sets the current streaming settings

- **SYNOPSIS**

streaming {mode {get|usb|ethernet}} | *resolution* **{get|1080p|720p|4cif|480p|cif} |***quality* {get|low|standard|high}}

- **DESCRIPTION**

Method used to get or set the current **streaming** settings

- **OPTIONS**

mode Get or set the current **streaming** mode
resolution Get or set the current **streaming** video *resolution*
quality Get or set the current **streaming** video frame rate and bit rate

- **EXAMPLES**

streaming mode get
mode: usb
Returns the current **streaming** mode
---
streaming mode ethernet
Sets the **streaming** mode to Ethernet
---
streaming *quality* standard
Sets the **streaming** *quality* to standard
---
streaming *resolution* 720p
Sets the **streaming** *resolution* to 720p

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

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**
version

- **DESCRIPTION**

Display an overview of the command line syntax

- **EXAMPLES**

Version
Returns the current software **version**

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