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IV-CAMHK-12-SLVR-1B

1 Beyond Hawk™ Dual-Camera
Speaker Tracking Solution, 12x Optical
Zoom

Product Manual

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HDMI

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Overview

1 Beyond intelligent video technology brings an essential video conferencing solution into the Crestron® ecosystem. Enabling the best video experience for both in-room and remote attendees is vital to hybrid work and ensuring productive and effective collaboration. Technologies such as speaker tracking, group framing, and presenter tracking ensure that every person can be seen, no matter where they are, and provide the best view for the remote attendees.

The IV-CAMHK-12-SLVR-1B is a participant tracking solution that uses two HD PTZ cameras to automatically cut to a new participant. Ideal for small to medium sized rooms, deploy the IV-CAMHK-12-SLVR-1B when a close-up view of the meeting participants is desired.

Features

Refer to the following sections for more information on the features provided by the Hawk IV-CAMHK-12-SLVR-1B camera.

Key features include:

- Automatically tracks, frames, and switches between participants using voice and facial detection
- Clean switching with broadcast-style cuts
- Side-by-side dialog mode captures multiple participants in conversation
- Intended for spaces up to 25 ft from the participants
- Smooth tracking and quiet operation
- High quality video supporting resolutions up to 1080p60
- Compatible with a variety of audio solutions

Participant Tracking

The IV-CAMHK-12-SLVR-1B uses voice and facial recognition to automatically switch to a shot of the active speaking participant. With production-style switching, the IV-CAMHK-12-SLVR-1B allows remote participants to follow an in-room conversation without excessive camera switching.

Third Party Microphone and Speaker Support

The camera works with a variety of microphones and audio speakers and offers an echo cancel audio input. Just add your favorite microphone and route the audio to the camera for echo cancellation.

High-Quality Video

A high quality Sony Exmor® CMOS sensor enables the camera to output up to 1080p60 resolution video via the 3G-SDI or HDMI® ports. The IV-CAMHK-12-SLVR-1B works well in low light and in front of bright screens.

Conferencing Compatibility

Optimize video conferencing, recording, or streaming by using the 1 Beyond Hawk camera camera with Microsoft Teams®, Cisco WebEx®, MediaSite®, or Panopto® software. output.

Preset Switching

Up to 256 pan, tilt, and zoom combination presets can be configured. The camera will move to the selected preset point. A quiet, fast motor (120°/s pan speed) sets camera angles quickly.

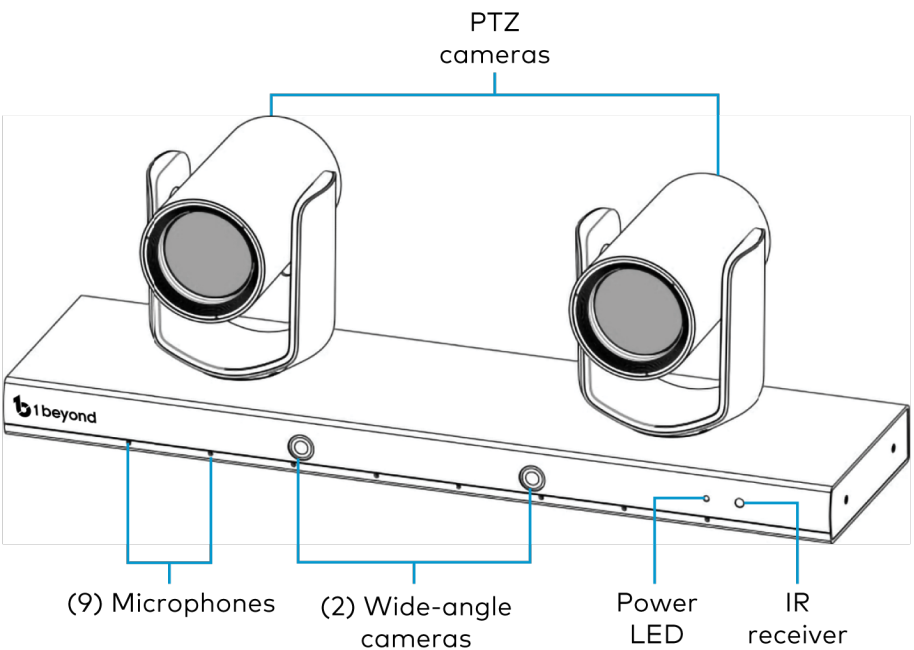
Manual Control Options

Use VISCA over IP to control the camera with a Crestron® control system. 1B Cam Manager Software is included for easy configuration from a computer on the network.

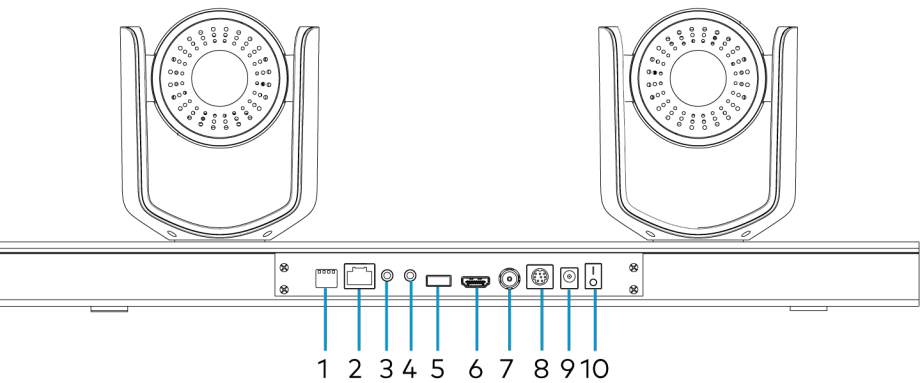
Physical Description

The camera provides the following connectors and indicators.

Front



Rear



No.	Name	Description
1	Dip Switches	Override the Onscreen Menu (OSD) and force resolution settings. Use the Dip switches only when absolutely necessary
2	Ethernet Port	Connects the camera to the network. A network connection is required for initial configuration but not for day-to-day operation.
3	Reference Audio	Feeds the echo cancellation signal into the camera. This is required for conferencing operation. Refer to Echo Cancellation on page 25 .
4	Audio Input	Feeds audio into RTSP stream.

No.	Name	Description
5	USB Port	For future use.
6	HDMI Output	Uncompressed video output at up to 1080p60.
7	3G-SDI Output	Uncompressed video output at up to 1080p60.
8	Serial I/O	Combination input/output for RS232 / 422 / 485 serial connection.
9	DC Input	Connects the included power adapter to the power source.
10	Power Switch	Turns the camera on or off.

DIP Switch Settings

DIP No.	1	2	3	4	
Video Format	OFF	OFF	OFF	OFF	1080p60
	ON	OFF	OFF	OFF	1080pP5
	OFF	ON	OFF	OFF	1080i60
	ON	ON	OFF	OFF	1080i50
	OFF	OFF	ON	OFF	720p60
	ON	OFF	ON	OFF	720p50
	OFF	ON	ON	OFF	1080p30
	ON	ON	ON	OFF	1080p25

1 Beyond Camera Manager Software

The 1 Beyond Camera Manager software is the central hub for configuring, monitoring, and controlling 1 Beyond IP cameras.

The 1 Beyond Camera Manager software provides the following features:

- Discover 1 Beyond cameras on the network
- Upgrade camera firmware
- Modify camera network settings
- Modify camera RTMP (Real-Time Messaging Protocol) settings
- Set authentication credentials for the camera
- Modify general settings, such as the camera name
- Set a secondary connection to the camera from a control device (such as a touch screen)
- View up to four camera video streams (close-up or panorama) simultaneously
- Use the PTZ Lens controls to adjust the camera's pan, tilt, zoom, focus, and iris levels
- Create, recall, and delete camera presets
- Use the OSD (on-screen display) menu to adjust advanced settings
- Start and stop tracking for the camera
- Define tracking and blocking zones and adjust tracking parameters for the camera

CAUTION: The 1 Beyond Camera Manager software enables changing of critical camera settings that impact the camera's functionality and effectiveness. Ensure that all procedures in this document are followed carefully for optimal camera performance.

Specifications

Product specifications for the Hawk IV-CAMHK-12-SLVR-1B camera.

Optics and Processing

Image Sensor	Tracking Cameras: 1/2.8 in. Sony Exmor CMOS, 2.14MP; Wide-Angle Camera: 1/2.8 in. CMOS, 2.14MP
Recommended Range	5-25 ft from subject, 4-6 ft from ground
Focal Length & Iris-Tracking Cameras	f=3.9-46.8 mm, F1.6 - F2.8
Field of View	72.5° - 6.3° (PTZ Cameras), 86° (Wide-Angle Camera)
Focus System	Auto, Manual, PTZ Push, One Push
Minimum Illumination	0.5 Lux (Color), 0.1 Lux (B/W)
Shutter Speed	1/25 - 1/10,000 sec
Gain	Auto, Manual
White Balance	Auto, Indoor, Outdoor, One Push, Manual, Auto Track
Exposure	Auto, Manual, Shutter Priority, Iris Priority
Number of Presets	Up to 256
Serial Control	PELCO-D, VISCA, PELCO-P
Protocol	HTTP, RTP, TCP, UDP
Control	TCP/IP

Pan, Tilt, Zoom

Tilt/Pan Angle	Tilt: -30° - +90°, Pan: 90° - 90°
Tilt/Pan Speed	Tilt: 0.1° - 80° /s, Pan: 0.1° - 120° /s
Zoom	12x Optical, 12x Digital

Connectivity

Ethernet	RJ-45, 100Mb
-----------------	--------------

Video

Video Outputs¹	1x HDMI output, 1x 3G-SDI output, Convert to USB using certified adapter
Signal Formats (HD)	1080p60/50/30/25, 1080i60/50, 720p60/50
IP Video Compression	H.265, H.264 (Four streams)
Streaming	RTSP, RTMP
Streaming Resolution	Up to 1080p60, User-selectable framesize/framerate/bitrate

Audio

IP Audio Compression	AAC (IP Stream Only)
Audio Input	2x Line In (one with echo cancellation), 1x Line Out

Power

Power	12VDC, <50 W
--------------	--------------

Environmental

Temperature	32° to 104°F (0° to 40°C)
--------------------	---------------------------

Construction

Mounting	3x 1/4 in. threaded mount hole for 90° Wall Shelf Mount; Wall shelf mount included
Color	Silver
S/N	≥50dB

Dimensions

Dimensions	19.69 in. x 6.4 in. x 5.71 in. (500 mm x 163 mm x 145 mm)
-------------------	---

Weight

6.61 lb (3 kg)

Note:

1. The IV-CAMHK-12-SLVR-1B camera includes integrated circuits produced by HiSilicon (part numbers HI3516ARBCV100 and HI3516ARFCV200), a subsidiary of Huawei Technologies Company.

Installation

Use the following procedures to install the Hawk IV-CAMHK-12-SLVR-1B camera.

NOTES: Observe the following points.

- Carefully lift the camera out of its packaging by holding it from the base. Holding it by the PTZ camera assemblies may cause damage to sensitive mechanical parts.
- Do not remove the rubber lens caps until the camera is mounted to avoid scratching the lenses.
- Only use the power supply included with this product to power it as non-specified products may cause damage to the unit.
- Do not operate the camera beyond the specified temperature and humidity limits. Operating range of the camera is between 32°F - 104°F (0°C -40°C). Ambient humidity should be less than 95%RH.
- Do not remove any screws from the camera. There are no user-serviceable parts inside. Contact [Crestron True Blue Support](#) if the camera is damaged or malfunctioning.
- Do not aim the camera lens at the sun or extremely bright lights. Doing so can damage the image sensor.
- Do not move the camera head manually. Doing so can cause damage to the camera and inner gear systems. Do not carry the camera by the head; always handle the camera by the base.
- Do not directly expose the camera to rain, water, or high moisture.
- This camera is for indoor use only.

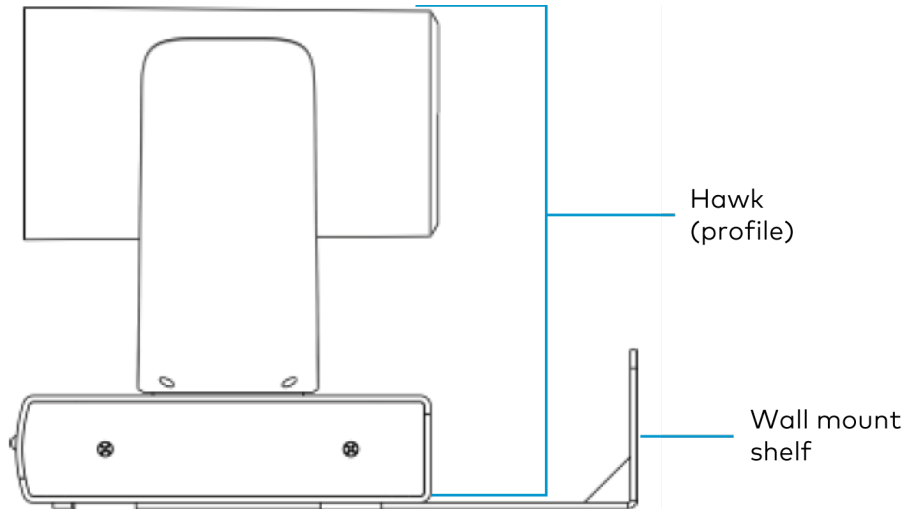
In the Box

Qty.	Description
1	IV-CAMHK-12-SLVR-1B, 1 Beyond Hawk™ Dual-Camera Speaker Tracking Solution, 12x Optical Zoom
Additional Items	
1	IR Remote Control (2060159)
1	Power Supply, 12VDC @ 2.5A, 100-240V (2060156)
1	Power Cord (2060157)
1	Mini DIN-8 Pin to RS-232 Cable Adapter, 3 m (2060121)
1	1 Beyond Wall Mount Shelf, IVA-WMT-SHELF-HK-1B (2060163)
6	Mounting Screws (2060162)
6	Drywall Anchors, Plastic (2060161)

Qty.	Description
2	Tripod-style screws, 1/4-20 UNC (ISO 1222:2010) (2060160)

Mount the Camera

Install the camera using the included 2-point shelf mount to ensure optimum stability. Since both PTZs are moving frequently, a mount with a center-only connection to the camera can cause undesirable shaking.

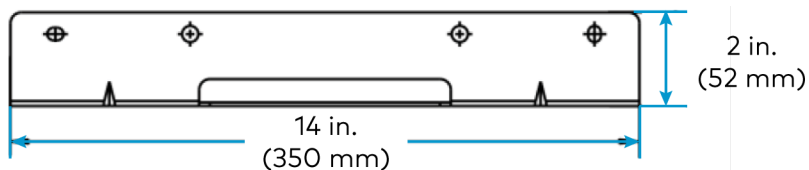


For the best possible tracking performance, observe the following mounting requirements.

- Center the camera horizontally, facing the meeting participants.
- Mount the camera at a height between 4 ft (1.2m) and 6 ft (1.8 m). If the camera is mounted lower than 4 ft (1.2 m) or higher than 6 ft (1.8 m) facial detection, audio location accuracy, and shot quality may be affected.
- The camera detects faces at a distance up to 25 ft (7.6 m). In rooms where people are further away from the camera, satisfactory operation cannot be guaranteed.

To mount the camera:

1. Following diameter and position of the four installation holes on the bracket, drill four holes in the wall.
2. Use four of the included anchors and mounting screws to attach the bracket to the wall.



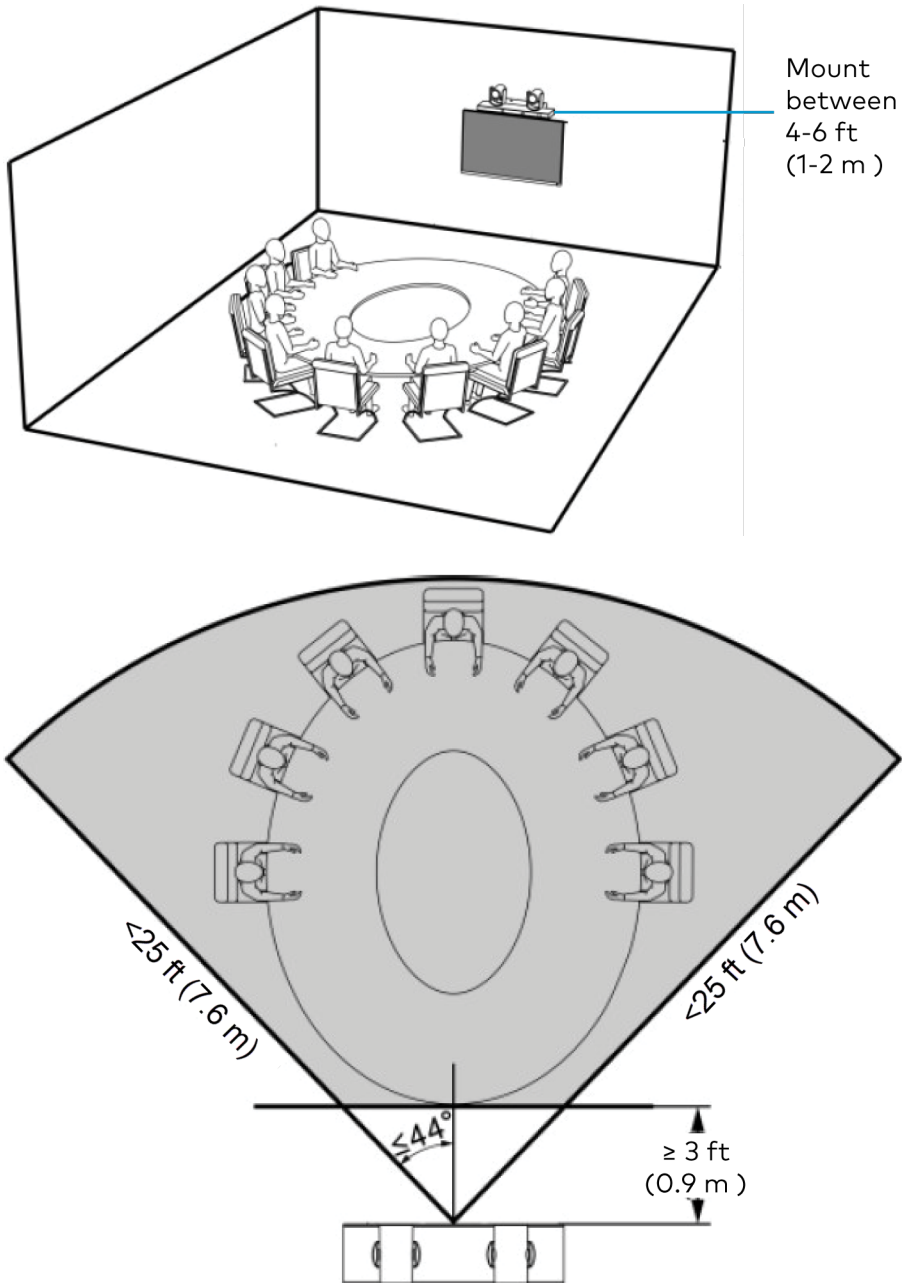
3. Use the two tripod-style screws to affix the camera to the bracket.

CAUTION: This camera cannot be inverted.

Position the Camera

The camera is able to detect faces at a distance of up to 25 ft (7.6 m). Ensure that the wide-angle camera has a line of sight towards participant seating locations. Camera framing will suffer if there are objects obstructing the line of sight.

NOTE: If participants are further than the 25 ft (7.6 m) range, satisfactory operation cannot be guaranteed.



Connect the Camera

Connect the camera to power using the included 12VDC power supply. If cabling needs to be extended to reach the camera, utilize a longer IEC power cord.

Network Connection

The camera must be connected to a network for initial configuration. Once configured, the camera does not need be connected to a network. A consistent network connection is recommended in case any configuration adjustments are performed later.

Video Output

To connect the camera to a conferencing codec or capture device, an HDMI or SDI connection is required. SDI is recommended for longer cable runs of over 50 ft (15 m). USB converters are available for both HDMI and SDI if the camera is to be connected to a computer or codec via USB.

Reference Audio

An echo cancellation signal is required for the camera to work correctly in video conferencing applications. Refer to [Echo Cancellation on page 25](#).

1 Beyond Camera Manager System Requirements

Ensure the host computer running the 1 Beyond Camera Manager software meets the following system requirements.

- Windows® 10 OS or later
- Dual-core processor
- 4GB (or greater) memory
- 1GB (or greater) storage
- Ethernet or Wi-Fi™ Network connection to the local network

1 Beyond Camera Manager Initial Setup

Use the following procedures to set up the 1 Beyond Camera Manager software on a computer.

Install the Software

To install the 1 Beyond Camera Manager software:

NOTE: Ensure the software is installed onto a computer that meets or exceeds the specifications described in [1 Beyond Camera Manager System Requirements on page 18](#).

1. Download the 1 Beyond Camera Manager installation package from www.crestron.com/Support/Resource-Library or from the 1 Beyond camera product pages on Crestron.com
2. Open the installer executable file and follow all prompts to install the software.

Configuration

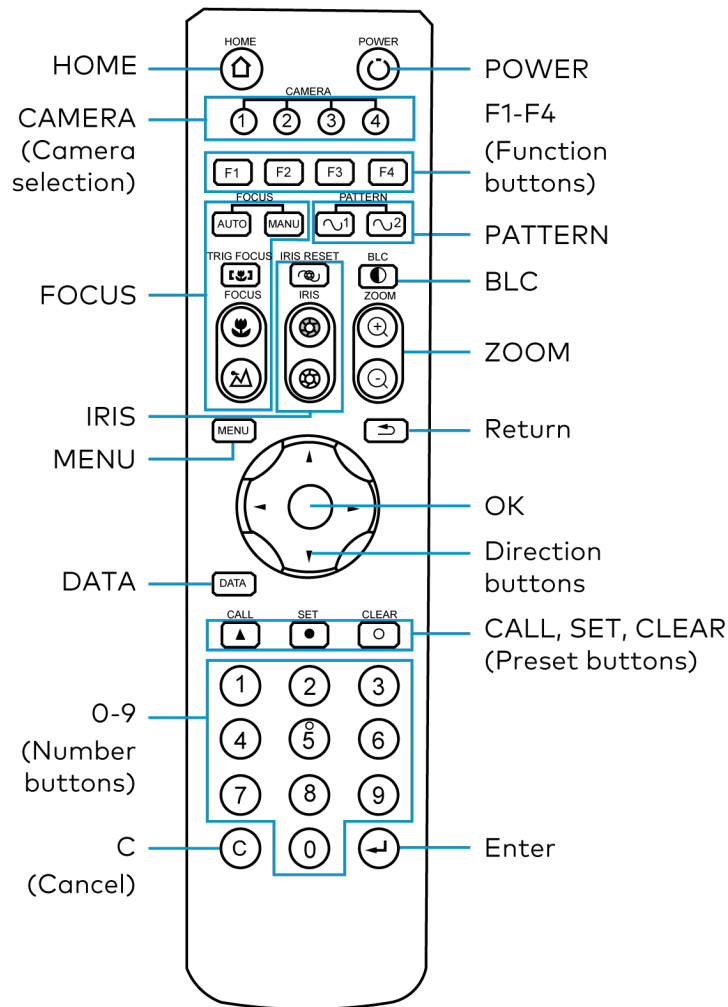
A one-time configuration is required to tailor the tracking parameters to your environment. Once configured, the camera will work autonomously, and the software will not be required for operation.

This section provides the following information:

- [IR Remote Control](#)
- [Echo Cancellation](#)
- [1 Beyond Camera Manager Software Configuration](#)
- [VISCA Commands](#)

IR Remote Control

Use the IR remote to control the camera when tracking is turned off.

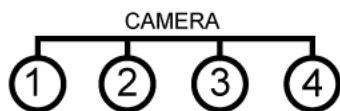


Home






Press  to move the camera back to the home position where pan, tilt, and zoom are at 0.

Camera Selection




Control the cameras by selecting either Camera 1 or Camera 2. The selected camera number lights when the respective button is pressed. Camera 1 is assigned to the left PTZ camera and Camera 2 is assigned to the right PTZ camera. Two additional PTZ cameras (not included) can be added.



Focus

- Press  to switch to Auto Focus.
- Press  to switch to Manual Focus.
- Press  to focus close.
- Press  to focus far.
- Press  to engage Auto Focus. Triggers Auto Focus until a preset is called. Auto Focus can also be triggered by activating Zoom.

Iris

- Press  to reset the iris to default.
- Press  to open the iris (brighten).
- Press  to close the iris (darken).

Menu

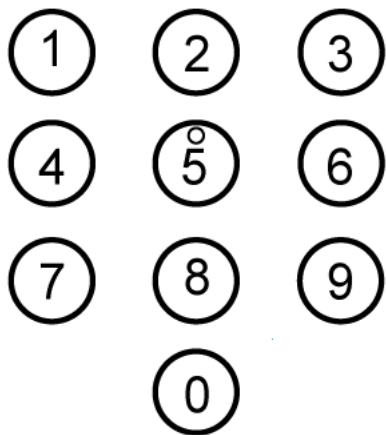
Press  to enter/exit OSD menu

Data


Press  to enable/disable display of pan, tilt, or zoom values.

0-9 (Number Buttons)


Input numbers for calling /storing presets.



C (Cancel)

Press  to cancel a number input or to return to the previous OSD menu

Power

Press  to put the camera into or out of standby mode.



F1-F4 (Function Buttons)

- **F1** enables Tracking.
- **F2** disables Tracking.
- **F3** switches the output between two PTZ cameras and displays the outputs side by side.
- **F4** reserved for future use.




Pattern



Activates pattern 1 and/or 2.

-  Pattern-1 pans the camera 45° left & right.
-  Pattern-2 pans the camera 90° left & right.
(Scanning uses the current zoom and tilt position.)

BLC

Press to  activate/deactivate Backlight Compensation, which helps to properly expose subjects in front of a bright projection screen or window.

Zoom

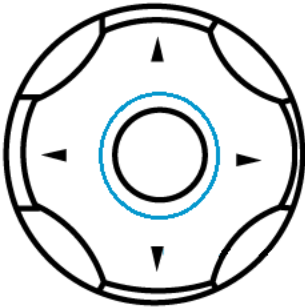
- Press  to zoom in.
- Press  to zoom out.

Return

Press to  return to the previous page of the OSD menu.

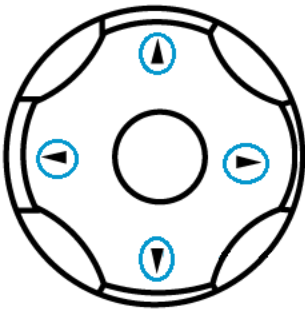
Ok

Press to confirm the menu selection.



Direction Buttons

Press to control pan or tilt operation or navigate the OSD menu.



Call, Set, Clear (Preset Buttons)


Press CALL, SET, or CLEAR following a number input to call, store, or erase a preset.



Examples:

- 95 + CALL calls preset 95.
- 75 + SET stores the current camera position as preset 75.
- 15 + CLEAR will delete preset 15.

Enter

Press  to confirm the menu selection.

Echo Cancellation

The camera utilizes audio-locating technology to determine who is speaking in the room. Echo cancellation will need to be set up for the camera to be able to distinguish the audio between remote meeting participants and the rest of the people in the room.

By feeding the audio output of the conferencing codec into the Ref. Audio input on the camera, the camera automatically performs echo cancellation. If a remote participant speaks for an extended period, the camera automatically switches to a wide shot of all the participants in the room.

The Ref. Audio input is unbalanced mono. Increase the volume level if the camera is not performing Echo Cancellation properly.

Routing from Audio Hardware

If using external audio hardware, such as devices enabled with Dante® Audio, route an analog connection from the audio device to the camera.

If no analog output is available, Dante audio can be routed to the camera by using a Dante AVIO™ adapter (not included) with analog outputs along with an XLR to 1/8 in. TRS Y-type adapter. Then route your conferencing codecs or PC's audio output to the virtual input of the Dante AVIO adapter to send digital audio to the camera.

Similarly, the camera can be connected to an analog output available on your DSP with an appropriate adapter. Reference your DSP's manual or contact the vendor for the ideal specifications.

The camera requires a line-level signal on the Ref. Audio input and will work with stereo or mono audio signals. Increase the volume level if the camera is not performing Echo Cancellation.

1 Beyond Camera Manager Software Configuration

The 1 Beyond Camera Manager software is the central hub for configuring, monitoring, and controlling 1 Beyond IP cameras. It allows monitoring of up to four video streams simultaneously and lets you configure the latest 1 Beyond cameras.

Add to Camera List

Once 1 Beyond Camera Manager software is installed on the host computer and the camera is connected to the network or directly via Ethernet, launch the software to start configuring the camera. Use the **Device Management** tab of the software to add the camera to the Camera List.

The screenshot shows the 1 Beyond Camera Manager software interface. The title bar indicates the application name and system status (NET CPU RAM, 15:59:21). The interface has two tabs: "Device Management" (selected) and "Main View".

Under the "Device Management" tab, there is a "Camera List" section. It includes a search bar and buttons for "+ Add by IP", "Delete", and "Settings". Below these is a table with the following data:

Name	IP	Firmware	Main session	Sub session
CAMPTZ-12 1B10306	10.1.10.233	3.1.15	connected	connected
CAMFR-12 C12345	10.1.10.217	1.0.14	connected	connected

Below the "Camera List" is a "Network Search" section. It includes buttons for "+ Add to Camera List", "Modify netinfo", "Refresh", and "Stop search". Below these is a table with the following data:

IP	MAC	Camera Name	Firmware
10.1.10.233	00:04:05:0A:2A:A6	CAMPTZ-12 1B10306	3.1.15
10.1.10.217	00:04:05:0B:4A:78	CAMFR-12 C12345	1.0.14
10.1.10.202	00:04:05:02:81:04	AT3 NDI 1B6753	5.1.82

1. Click **Start Search** to start scanning the network for 1 Beyond cameras. The camera appears with its IP address, MAC Address, camera name (for example, CAMHK-12 and serial number), and firmware version displayed.

Network Search			
+ Add to Camera List		<input checked="" type="checkbox"/> Modify netinfo	Refresh
		Stop search	
IP	MAC	Camera Name	Firmware
10.1.10.233	00:04:05:0A:2A:A6	CAMPTZ-12 1B10306	3.1.15
10.1.10.217	00:04:05:0B:4A:78	CAMFR-12 C12345	1.0.14
10.1.10.202	00:04:05:02:81:04	AT3 NDI 1B6753	5.1.82

2. To change the camera's network settings to match your network's information, click **Modify netinfo**, which will bring up the network settings panel.

Modify Network Parameter

Ethernet

Device information:

CameraName

CAMPTZ-12 1B10306

Mac

00:04:05:0A:2A:A6

Network information:

ConnType

DHCP

IP

10.1.10.233

Mask

255.255.255.0

GateWay

10.1.10.1

DNS1

10.1.10.1

DNS2

0.0.0.0

Modify

- Under **Network information**, confirm that the **ConnType** (Connection Type) is correct for how the camera is connected. Set it to either Static IP or DHCP.

By default, the camera is set to DHCP.

NOTES:

- If an Ethernet cable is connected directly to a computer running 1 Beyond Camera Manager software, the computer's network port will need to be set to an address on the same subnet in order to communicate with the camera.
- If the camera is set to **DHCP** for **ConnType**, it will receive its IP address dynamically from a network router. This option does not work when the camera is connected directly to the host computer for configuration.
- If the installation requires a different static address (for example, the IP address of the camera needs to match the subnet of the computer), enter the IP, Mask and Gateway info and then click **Modify**.

- After modifying the IP address, click **Refresh** to update the camera list.
- Select the camera and click **Add to Camera List**. The **Add** panel appears where the camera's network settings can be verified. By default, 1 Beyond cameras do not require any administrator credentials to be controlled. Once added, the camera will appear in your camera list.

View the Connection Status

When the 1 Beyond Camera manager software connects to a camera, the camera shows as connected in the **Main session** and **Sub session** columns. These columns indicate the camera's main and substream connection status for IP (RTSP) video.

NOTE: When the chosen camera is set to match your IP address, its status will read connected for both columns.

The following connection status messages will be displayed:

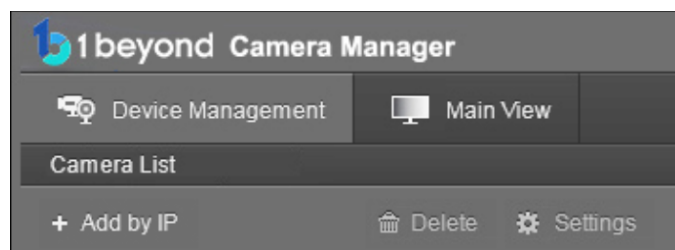
- **Connected:** The 1 Beyond Camera Manager software has received RTSP video streams from the camera and has connected to the camera.
- **Connection Failed:** The 1 Beyond Camera Manager software discovered the camera on the network, but video streams cannot be received. The camera is likely connected to a different subnet from the host computer.
- **Disconnected:** The camera is not currently accessible on the network.

NOTE: When a camera is first connected to the network, it can take up to 30 seconds after powering the camera on for it to be discovered by the 1 Beyond Camera Manager software. This is because the camera performs a diagnostic routine prior to activating the video encoder.

Configure Camera Settings

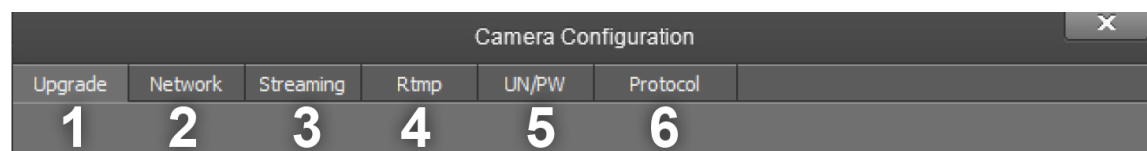
Once a camera has been added to the 1 Beyond Camera Manager software as described in [Device Management](#), select **Settings** to configure general settings for the camera.

Camera Manager - Settings Button



Selecting **Settings** opens the **Camera Configuration** dialog box, which provides access to many of the camera's system settings.

Camera Configuration Dialog Box



The numbers in the preceding image correlate with the following functions.

1. **Upgrade:** Select this tab to upgrade the firmware on the camera.
2. **Network:** Select this tab to change the camera's network settings (similar to the **Modify Netinfo** function in the **Device Management** tab).
3. **Streaming:** Select this tab to customize the camera's IP video streams. The bit rate and encoding level of each stream can be adjusted manually.
4. **RTMP:** Select this tab to enter up to 4 URLs or IP addresses that can receive video streams from the camera.
5. **UN/PW:** Select this tab to change the camera name, to set authentication credentials for the camera, and to change the system time.
6. **Protocol:** Select this tab to configure the camera to be operated from a control device (such as a Crestron® touch screen).

Upgrade Tab

Select the **Upgrade** tab to perform a firmware update for the camera.

Upgrade Tab



To upgrade firmware, use the ellipses button (...) next to the **Upgrade File** field to navigate to and select the appropriate firmware file for the camera. After the file has been selected, select **Upgrade** to initiate the firmware upgrade. The camera will restart automatically after the process is complete.

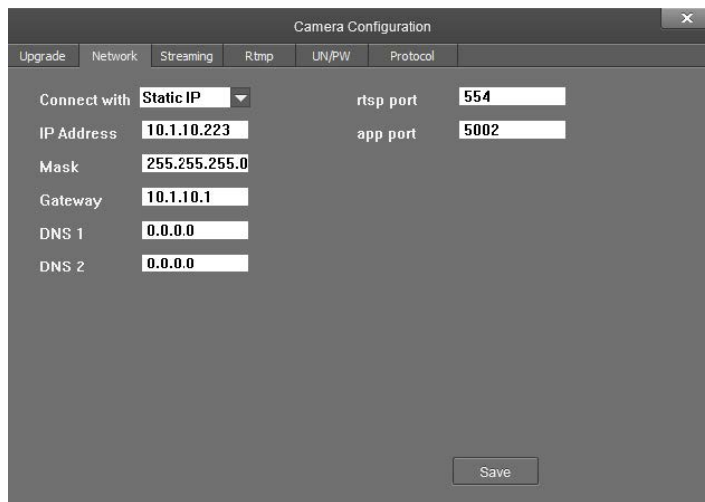
CAUTION: Note the following when performing a firmware upgrade:

- Before attempting to upgrade camera firmware, verify that you have received the appropriate firmware file for your camera model. Firmware files are specific to individual 1 Beyond camera models.
- Only use Crestron firmware files. Attempting to upgrade the device using third-party files may prevent the camera from functioning correctly.
- Do not disconnect the camera or attempt to control it while upgrading firmware. This may cause the firmware file to become corrupted and prevent the camera from functioning correctly.
- Only perform a firmware upgrade if recommended by [Crestron True Blue Support](#) during a support call.

Network Tab

Select the **Network** tab to modify the camera's network settings and to configure the port for the camera's IP video streams.

Network Tab



The screenshot shows the 'Camera Configuration' window with the 'Network' tab selected. The window has a title bar with a close button. Below the title bar are tabs for 'Upgrade', 'Network', 'Streaming', 'Rtmp', 'UN/PW', and 'Protocol'. The 'Network' tab is active. It contains the following fields: 'Connect with' (a dropdown menu set to 'Static IP'), 'IP Address' (text box with '10.1.10.223'), 'Mask' (text box with '255.255.255.0'), 'Gateway' (text box with '10.1.10.1'), 'DNS 1' (text box with '0.0.0.0'), 'DNS 2' (text box with '0.0.0.0'), 'rtsp port' (text box with '554'), and 'app port' (text box with '5002'). A 'Save' button is located at the bottom right of the form area.

The following settings can be modified:

- **Connect with:** Use the drop-down menu to select whether the camera connects to the network over a static IP or dynamically over DHCP.
- **IP Address:** If **Connect with** is set to **Static IP**, enter a static IP address for the camera.
- **Mask:** If **Connect with** is set to **Static IP**, enter a static subnet mask address for the camera.
- **Gateway:** If **Connect with** is set to **Static IP**, enter a static address for the default gateway router.
- **DNS 1:** If **Connect with** is set to **Static IP**, enter a static primary DNS (Domain Name Server) lookup address.
- **DNS 2:** If **Connect with** is set to **Static IP**, enter a static secondary DNS (Domain Name Server) lookup address.
- **rtsp port:** Enter the port that will be used for the camera's RTSP video-over-IP streams. The default port for most cameras is 554 or 5000.
- **app port:** Enter the port that will be used for communication between the 1 Beyond Camera Manager software and the camera.

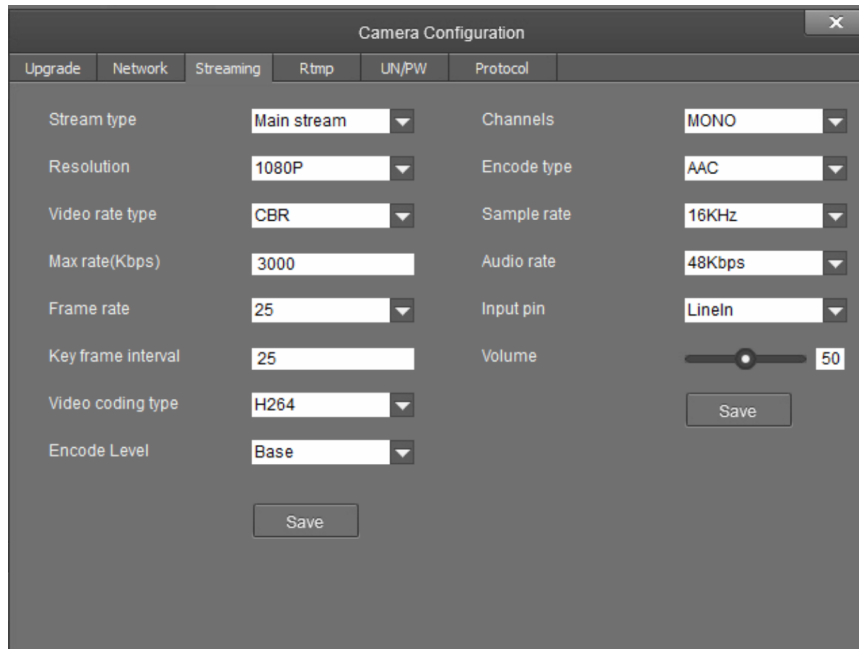
NOTE: The **app port** value should not be changed unless instructed to do so by [Crestron True Blue Support](#).

Select **Save** to save any changes made to these settings.

Streaming Tab

Select the **Streaming** tab to modify the camera's streaming settings.

Streaming Tab



The screenshot shows the 'Camera Configuration' window with the 'Streaming' tab selected. The window has a title bar with a close button. Below the title bar are tabs for 'Upgrade', 'Network', 'Streaming', 'Rtmp', 'UN/PW', and 'Protocol'. The 'Streaming' tab is active, displaying various settings in a two-column layout. The settings include: Stream type (Main stream), Resolution (1080P), Video rate type (CBR), Max rate(Kbps) (3000), Frame rate (25), Key frame interval (25), Video coding type (H264), Encode Level (Base), Channels (MONO), Encode type (AAC), Sample rate (16KHz), Audio rate (48Kbps), Input pin (LineIn), and Volume (50). There are two 'Save' buttons: one at the bottom left and one at the bottom right.

Setting	Value
Stream type	Main stream
Resolution	1080P
Video rate type	CBR
Max rate(Kbps)	3000
Frame rate	25
Key frame interval	25
Video coding type	H264
Encode Level	Base
Channels	MONO
Encode type	AAC
Sample rate	16KHz
Audio rate	48Kbps
Input pin	LineIn
Volume	50

The **Streaming** tab is used to adjust the properties of the native IP video streams that are encoded and transmitted by the camera. 1 Beyond intelligent camera output up to four simultaneous RTSP streams, while all other supported 1 Beyond cameras output two simultaneous streams. Each video stream can be configured individually.

The following settings can be modified:

- **Stream type:** Use the drop-down menu to select the stream that will be configured. The following stream selections are available:
 - Main Steam
 - Sub Stream
 - Stream 3
 - Stream 4
- **Resolution:** Use the drop-down menu to select the desired stream resolution independent of the camera's operating resolution. The following stream resolutions are available:
 - QVGA
 - D1
 - HD720
 - 1080p
- **Video rate type:** Use the drop-down menu to select whether the video will be encoded with constant (**CBR**) or variable (**VBR**) bit rate. Selecting variable bit rate causes reduced stream bit rate during static shots with little movement. The bit rate increases as motion increases.

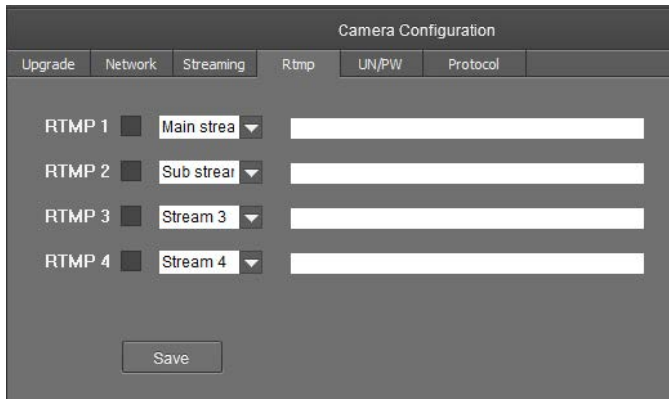
- **Max rate[Kbps]:** Enter the maximum bit rate of the video stream. The maximum supported value varies by camera model.
- **Frame rate:** Use the drop-down menu to select the stream's frame rate. This value should always equal the camera's native frame rate. The following frame rates are available:
 - fullfps
 - 1
 - 2
 - 4
 - 6
 - 8
 - 10
 - 12
- **Key frame interval:** Enter the desired frame rate for the video stream. This value does not have to equal the camera's native frame rate.
- **Video coding type:** Use the drop-down menu to select whether the video stream will use **H.264** or **H.265** encoding.
- **Encode Level:** Use the drop-down menu to select whether the video stream will use a **low**, **base**, or **high** encoding type.
- **Channels:** Use the drop-down menu to select **Mono** or **Stereo** as the audio channel type for the camera's analog audio input.
- **Encode type:** Use the drop-down menu to select the encoding type for the camera's analog audio input.
- **Sample rate:** Use the drop-down menu to select **16khz** or **48khz** as the sampling rate for the camera's analog audio input.
- **Audio rate:** Use the drop-down menu to select the audio rate for the camera's analog audio input. The following audio rates are available:
 - 48Kbps
 - 64Kbps
 - 96Kbps
 - 128Kbps
- **Input pin:** Use the drop-down menu to select **MicIn** or **LinIn** as the input type for the camera's analog audio input.
- **Volume:** Use the slider to set the default volume level for the camera's analog audio input.

Select **Save** under the video or audio settings to save any changes made.

RTMP Tab

Select the **RTMP** tab to modify the camera's RTMP (Real-Time Messaging Protocol) settings.

RTMP Tab



The screenshot shows the 'Camera Configuration' window with the 'Rtmp' tab selected. It displays four RTMP stream configurations. Each configuration has a checkbox, a stream type dropdown menu, and a text field for the destination. The stream types are 'Main stream', 'Sub stream', 'Stream 3', and 'Stream 4'. A 'Save' button is located at the bottom.

RTMP	Stream Type	Destination
RTMP 1	Main stream	
RTMP 2	Sub stream	
RTMP 3	Stream 3	
RTMP 4	Stream 4	

Save

The **RTMP** tab is used to configure 1 Beyond cameras to broadcast video streams to RTMP destinations such as servers or web services. Up to four RTMP streams can be configured.

NOTE: This feature will work only with RTMP destinations that do not require a stream key for authentication.

To configure the camera's video stream to RTMP destinations:

1. Select the check box next to a stream to activate it.
2. Set the stream type using the drop-down menu. The following stream types are available:
 - Main Stream
 - Sub Stream
 - Stream 3
 - Stream 4
3. Enter the host name or IP address of the RTMP destination in the text field.
4. Select **Save** to save any changes made.

UN/PW Tab

Select the **UN/PW** tab to modify the camera name, authentication credentials, and other administrative settings.

UN/PW Tab

The screenshot shows the 'Camera Configuration' window with the 'UN/PW' tab selected. The window has a dark grey background and a light grey border. At the top, there are tabs for 'Upgrade', 'Network', 'Streaming', 'Rtmp', 'UN/PW', and 'Protocol'. The 'UN/PW' tab is active. Below the tabs, there are several sections: 1. Password section: 'Old password' and 'New password' are text input fields. Below 'New password' is a 'Confirm' text input field. To the right of these fields is a 'Local Time' display showing '2022-07-21 16:20:07' and an 'OK' button. 2. Reboot section: There are 'Reboot' and 'Reset' buttons. 3. Camera name section: A text input field contains 'CAMP TZ-12 1B1030'. Below it is a 'Save' button. 4. Time and NTP section: A 'Timezone' dropdown menu is set to '+00:00'. Below it is an 'NTP Server' text input field and an 'OK' button. There is also an 'Enable NTP' checkbox which is currently unchecked. 5. Action buttons: A 'Save' button is located below the password fields.

The following settings can be modified:

- Password settings
 - **Old password:** If applicable, enter the existing admin password set for the camera.
 - **New password:** Enter a new admin password for the camera.
 - **Confirm:** Enter the admin password specified in the **New password** field.
 - Select **Save** to change the password.

CAUTION: Do not lose the admin password, as it cannot be reset if it is forgotten.

- Reboot
 - Select **Reboot** to restart the camera.
 - Select **Reset** to restore the camera to its factory default settings.

CAUTION: Resetting a camera associated with an Automate™ VX camera switcher system will clear all camera presets.

- **Camera Name:** Enter a new camera name for identification and management purposes. By default, the camera name includes the device's serial number.
- **Local Time:** View the local time on the host computer. Select **OK** to refresh the time.
- **NTP Settings**

- Select the **Enable NTP** check box to synchronize the camera's internal clock to an external NTP (Network Time Protocol) server.

NOTE: Using an external NTP server requires a constant network connection for the camera.

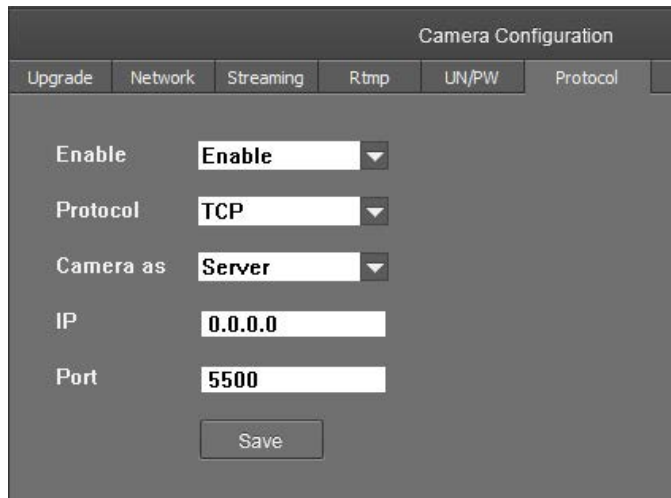
- **TimeZone:** Use the drop-down menu to set the time zone for the camera.
- **NTP Server:** Enter the URL or IP address of the external NTP server, then select **OK**.

Select **Save** to save any changes made to these settings.

Protocol Tab

Select the **Protocol** tab to set a secondary connection to the camera from a control device (such as a Crestron touch screen).

Protocol Tab



The screenshot shows the 'Camera Configuration' window with the 'Protocol' tab selected. The interface includes a top navigation bar with tabs: Upgrade, Network, Streaming, Rtmp, UN/PW, and Protocol. The main area contains the following settings:

Setting	Value
Enable	Enable
Protocol	TCP
Camera as	Server
IP	0.0.0.0
Port	5500

A 'Save' button is located at the bottom of the settings area.

The following settings can be modified:

- **Enable:** Use the drop-down menu to enable or disable a secondary connection.

NOTE: For 1 Beyond Intelligent cameras, a secondary connection is disabled by default, as it is not required in most circumstances since port 5500 supports VISCA control over TCP.

- **Protocol:** Use the drop-down menu to select **TCP** or **UDP** as the communication protocol for the secondary connection.
- **Camera as:** Use the drop-down menu to select **Client** or **Server** as the role for the camera for the secondary connection.
- **IP:** Enter the IP address for the secondary connection device. The default value of "0.0.0.0" should be retained for most setups.
- **Port:** Enter the port number for the secondary connection. The default value of "5500" should be retained for most setups.

Select **Save** to save any changes made to these settings.

Access Video Feeds

Proceed to the **Main View** tab to monitor the video feeds and begin setting up the tracking parameters. In the Camera List, right-click on the camera name and select the desired stream:

- Close Up (1) - PTZ 1
- Panorama (1) - Reference
- Close Up (2) - PTZ 2
- Panorama (2) - Output

Up to four streams can be displayed at the same time.

PTZ Movement

Use the PTZ Lens arrow buttons to control the camera position and direction the camera's lens is facing.

To select the camera for control, first add it to the multiview section as described in [1 Beyond Camera Manager Software Configuration on page 26](#), and then select the video stream of the desired camera.

PTZ Controls



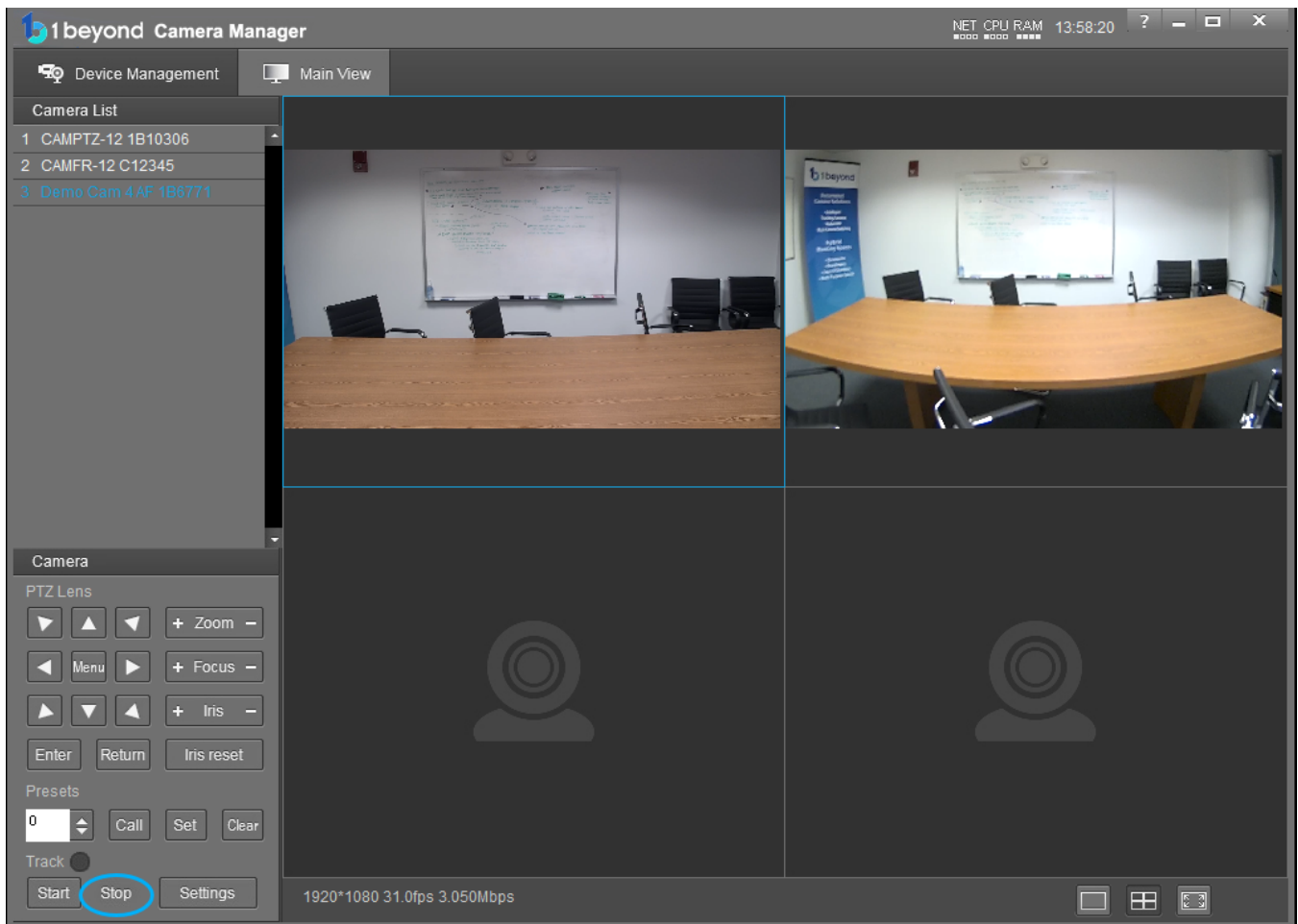
- Press the plus (+) or minus (-) button next to **Zoom** to zoom the camera in or out.
- Press the plus (+) or minus (-) button next to **Focus** to increase or decrease the camera focus.
- Press the plus (+) or minus (-) button next to **Iris** to increase or decrease the camera brightness.
- Use the **Iris** control to adjust exposure compensation by adding or subtracting exposure stops to or from the camera's autoexposure value.

NOTE: By default, 1 Beyond cameras are configured to retrigger autofocus every time the camera is moved.

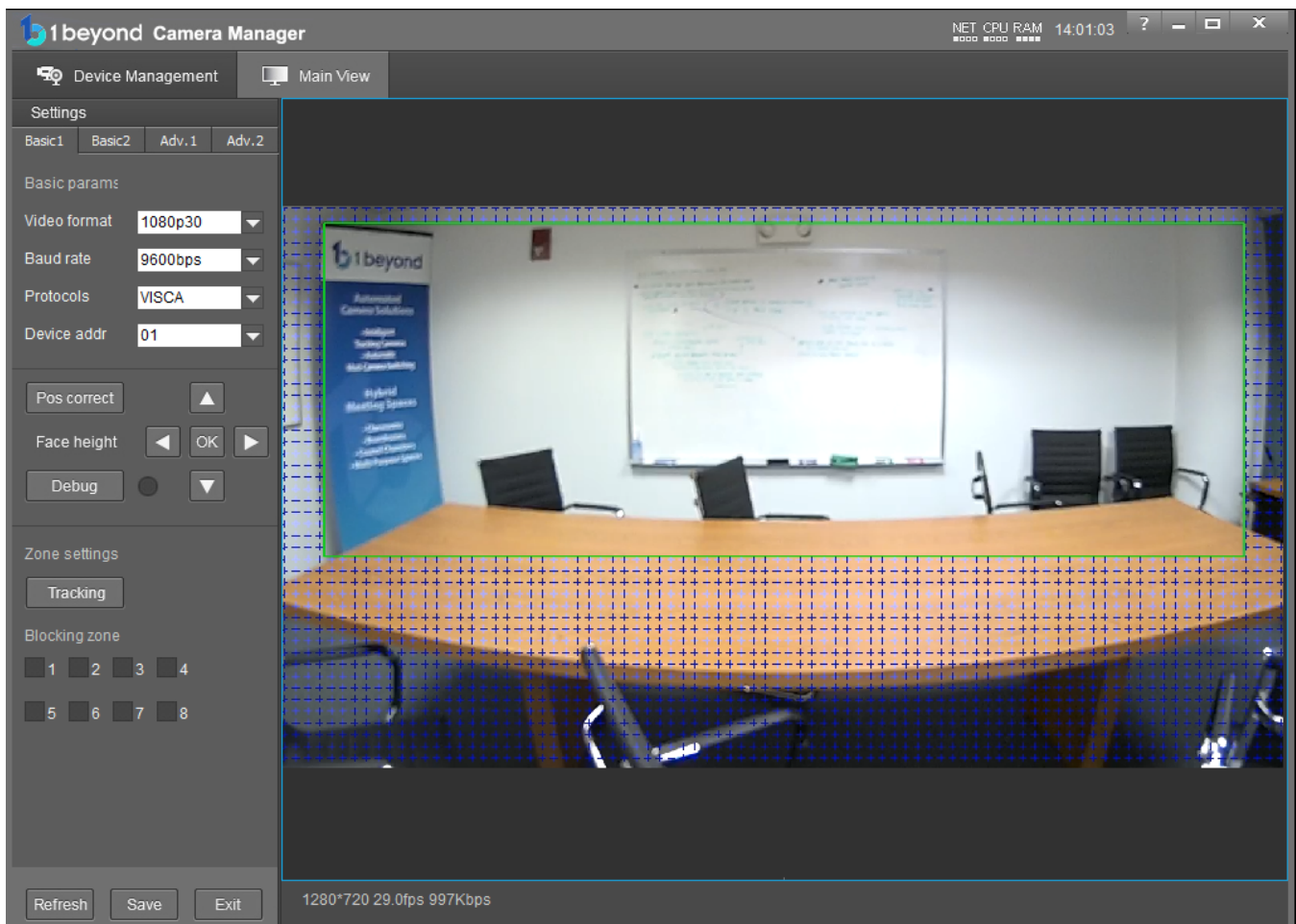
Tracking Settings

Now that the camera is connected and streaming video to the host computer, the tracking settings must be set.

NOTE: Tracking has to be disabled before configuring tracking settings. To disable tracking on the camera, click **Stop** in the lower left corner.



To access the camera's tracking properties, click **Settings**. This opens the settings panel and shows a full view of the wide-angle with the Tracking Zone shown as a green rectangle.



Set the Tracking Zone

The camera detects motion within the tracking zone of the wide-angle lens. The camera uses the tracking zone to detect faces with the PTZ lens. Limit the tracking zone to the presentation area to prevent false motion triggers.

NOTE: The camera does not auto-save settings. Save frequently during the camera setup process.

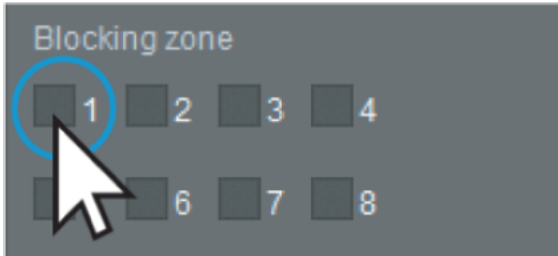
To draw a Tracking Zone:

1. Click **Tracking** in the **Zone settings** panel. The cursor will move into the video frame.
2. Hold the left mouse button down, then drag the mouse to draw the Tracking Zone. Ensure that the Tracking Zone contains the entire area where participants will be situated.
3. Let go of the left mouse button when the Tracking Zone is drawn over the participant space.
4. Click **Save** to store the Tracking Zone to the camera.

Set the Blocking Zone

Set Blocking Zones within the Tracking Zone to prevent projection screens, windows, or moving objects from triggering the camera's facial detection. Up to 8 blocking zones can be configured.

To set up a Blocking Zone, click on one of the check boxes in the **Blocking zone** area of the settings pane and draw the zone in your desired spot within the tracking zone. This process is identical to setting up the Tracking Zone.



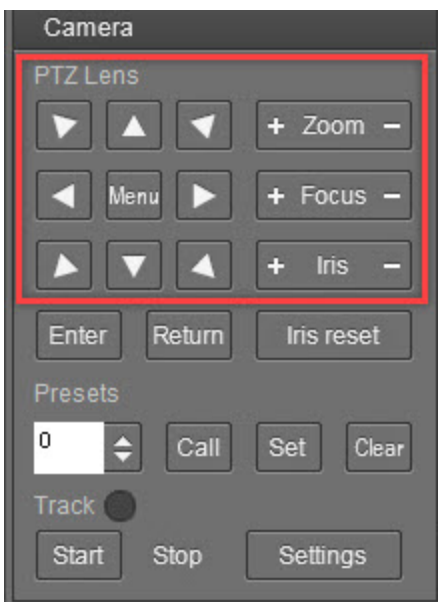
NOTE: Blocking Zones are only active within the Tracking Zone and will not have any effect outside of it.

Set Preset 0

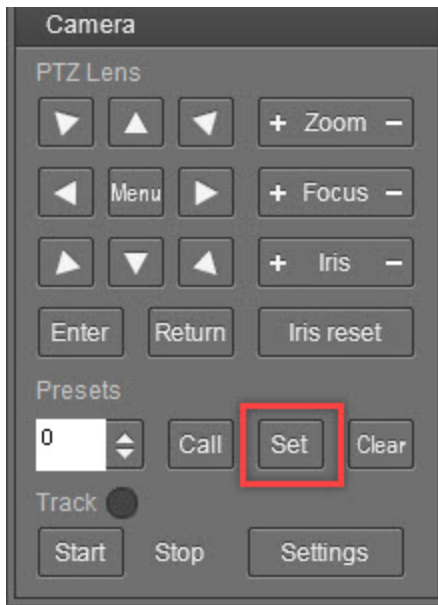
Preset 0 is the shot that the camera reverts to when no presenters are detected.

To set Preset 0:

1. Navigate to the Main View tab.
2. To move the camera, use the arrow buttons and Zoom + / - in the PTZ Lens section.



3. To store Preset 0, select the number 0 from the **Presets** drop-down menu and click **Set**.



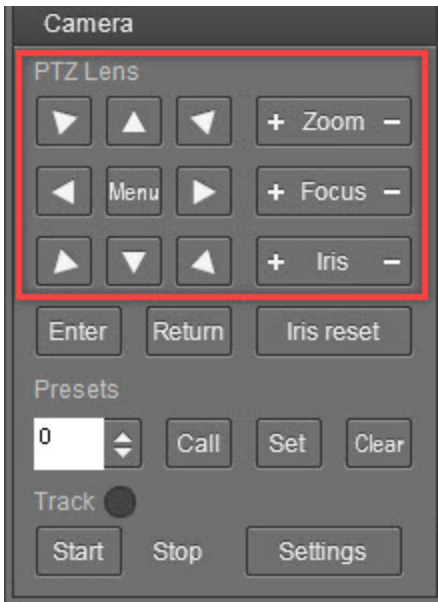
NOTE: Do not overwrite Preset 0 because it serves as the camera's home position. Use Presets 2 and higher if manual preset calling is desired.

Set Preset 1

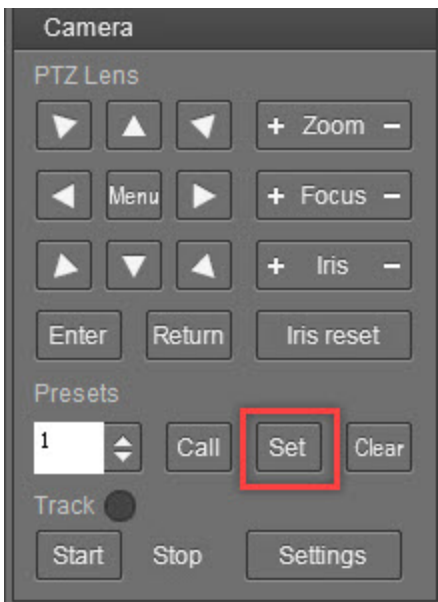
Preset 1 is the default shot that is switched to when remote participants speak. Echo Cancellation needs to be routed for the default shot to function. for more information about Echo Cancellation, refer to [Echo Cancellation on page 25](#).

To set Preset 1:

1. Navigate to the Main View tab.
2. To move the camera, use the arrow buttons and Zoom + / - in the PTZ Lens section.



3. To store Preset 1, select the number 1 from the **Presets** drop-down menu and click **Set**.



4. Navigate to the **Basic 2** Tab.

- Set the **Target Lost Action** setting to **No.1 preset** (Preset 1).

The screenshot shows the '1beyond Camera Manager' interface. At the top is the 'Device Management' tab. Below it is the 'Settings' section with four tabs: 'Basic1', 'Basic2', 'Adv.1', and 'Adv.2'. The 'Tracking setting' section contains two checkboxes: 'Tilt motion' and 'Outside platform', both of which are unchecked. Below this is the 'Tracking params' section with a 'Reset' button and five sliders: 'Track Sens.' (set to 6), 'Pan speed' (set to 6), 'Tilt speed' (set to 6), 'Lost timeout' (set to 3), and 'In/Out podium' (set to 1). The 'Target lost action' section features a dropdown menu that is currently open, showing four options: 'No.0 preset', 'No.0 preset', 'No.1 preset' (which is highlighted in blue), and 'Stay'. Below the dropdown are three more dropdown menus: 'Feature' (set to 'Feature'), 'Video auto switch' (set to 'Close'), and 'Power On State' (set to 'Track'). At the bottom of the window are three buttons: 'Refresh', 'Save', and 'Exit'.

NOTE: Do not overwrite Preset 1 because it serves as the camera's default shot. Use Presets 2 and higher if manual preset calling is desired.

Basic 1 Tab

The settings panel shown above also allows the camera resolution to be changed between 1080p, 1080i, and 720p at frame rates of 25, 30, or 60.

The **Baudrate** setting sets the baud rate for serial communication (optional).

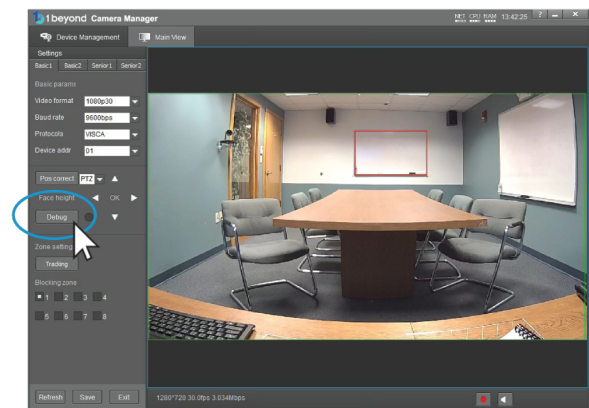
Protocols determines which control protocol will be used to control the camera using external hardware or software. VISCA is recommended for maximum compatibility with 1 Beyond and third-party products.

Device Address sets the camera's serial address.

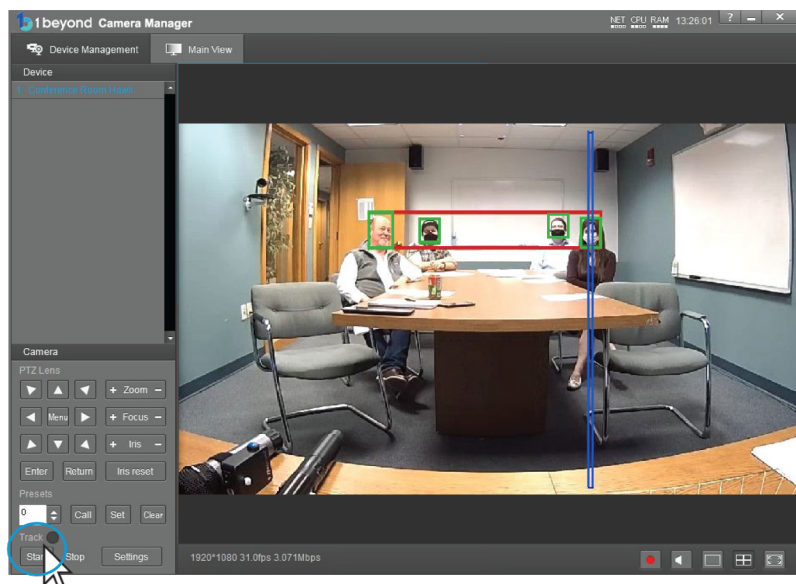
NOTE: The right PTZ camera needs to be addressed by the main camera's address +1. If the camera's address is 1, the left PTZ's serial address is 2.

Verify Performance in Debug Mode

Select **Debug** to enable Debug Mode. Debug Mode is used to verify that the camera is operating correctly. This is best tested in an active video conferencing meeting with a few participants in the room. Debug Mode will show the operation of camera's detection algorithms overlaid on the Reference feed.



With tracking active, detected faces are framed by green rectangles, a bounding rectangle is drawn around all faces in the room as a red rectangle. The location of audio in the room is shown as a vertical blue bar.



Observe the tracking performance:

- The faces of everyone sitting in the room is highlighted with a green rectangle. Similarly, a red rectangle appears around the area in the room where participants are located.
- When someone in the room is speaking, a vertical blue bar appears either centered on or very close to the speaker's face. Small deviations (such as the blue line being slightly off center) due to speaker distance and room acoustics are to be expected.
- With echo cancellation working correctly, far-end audio should not cause a blue bar (signifying audio being detected in the room) to appear on the video feed.
- If the blue bar is visible when no one in the room is talking, ensure Echo Cancellation settings are configured correctly. For more information, refer to [Echo Cancellation on page 25](#).
- On the second output feed or the camera's SDI/HDMI output, the camera switches cleanly between meeting participants with each switch taking no longer than 5 seconds, depending on the speaker's distance from the camera.

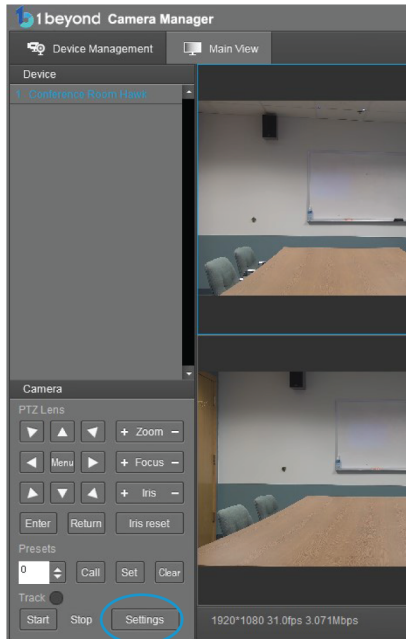
If needed, make changes to the setup of Tracking and Blocking Zones or adjust the [Advanced Settings on page 47](#) to eliminate these issues.

NOTE: Side-by Side Dialogue mode cannot be previewed on the IP stream.

Advanced Settings

To fine-tune tracking settings and correct any errors, the tracking settings provide a number of accessible parameters. This section will explain when these changes might be necessary as well as how to perform them.

All the settings described herein are accessed by clicking the **Settings** button in the bottom left corner of the **Main View** within the 1 Beyond Camera Manager Software.



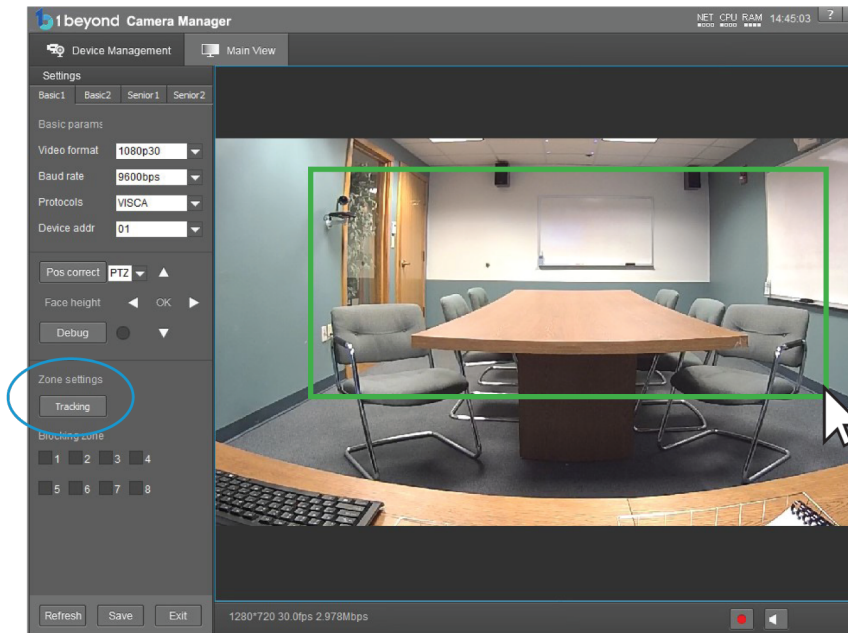
Set the Tracking Zone

By default, the camera detects faces, motion, and audio within its entire field of view. In certain cases, for example in rooms with bench seating at the sides, it may be desirable to limit the tracking area.

NOTE: The camera does not auto-save settings. Make sure to save frequently during the setup process.

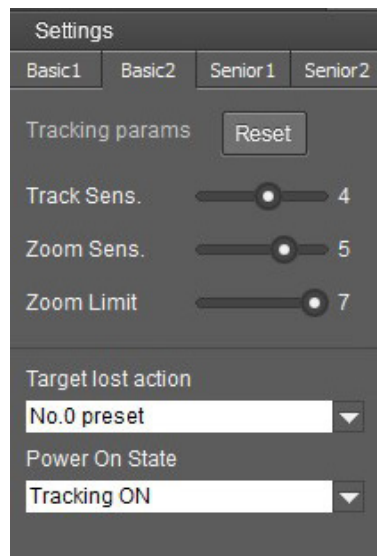
To draw a Tracking Zone:

1. Click **Tracking** in the lower half of the settings panel. The cursor will move into the video frame.
2. While holding down the left mouse button, drag the mouse to draw the tracking zone.
3. Let go of the left mouse button to release the cursor from the video frame.
4. To correct a Tracking Zone, click **Tracking** to draw a new zone.
5. Once the Tracking Zone is set, click **Save** to store the setting in the camera's memory.



Basic 2 Tab

The Basic 2 tab contains settings that influence the camera's tracking behavior and helps adjust it to the room's environment.



Track Sensitivity

This setting controls how quickly facial detection scans for faces in the room and is how facial detection occurs.

NOTE: High sensitivity can lead to erratic switching behavior. The sensitivity can be lowered to combat erratic switching.

Zoom Sensitivity

The **Zoom Sensitivity** slider determines the distance from the framed subjects to the camera. Increase **Zoom Sensitivity** if room participants are not framed tight enough.

Zoom Limit

The **Zoom Limit** slider determines the maximum limit the camera will zoom to frame far away participants. Use the slider to increase or decrease the maximum zoom the camera will perform to frame far away participants.

Target Lost Action

This setting allows you to define camera behavior when everyone has left the room. When set to Preset 0 or Preset 1, the camera automatically moves to Preset 0 or 1 respectively once the room is empty.

Choose **Stay** to have the camera remain in its last position until someone steps into the room again.

NOTE: Setting Preset 1 will also change the Default Shot. For more information about the Default Shot, refer to [Set Preset 1 on page 42](#).

Power on State

Determines whether the camera tracks or stays static when it is powered on.

Advanced 2 Tab

This settings tab contains network settings pertaining to control via external hardware or software. By default, the camera accepts TCP VISCA over IP control via TCP port 5500.

In order to maintain compatibility with 1 Beyond hardware and Crestron control modules, these settings should not be changed.

If the control system required a different port or the UDP protocol, these settings can be changed accordingly.

Position Camera

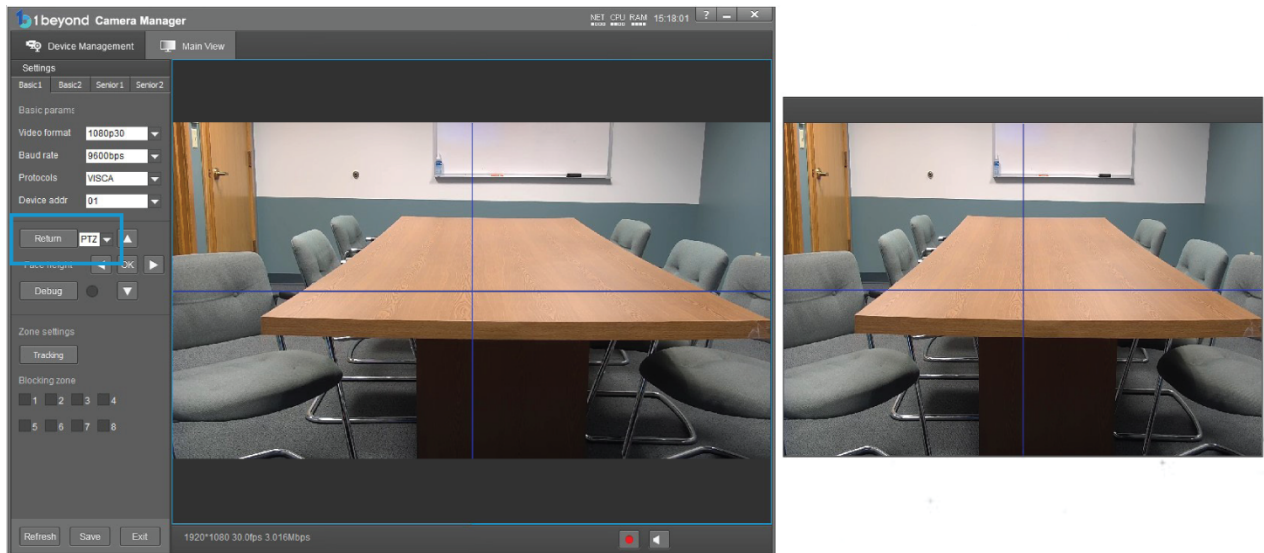
These settings should only be adjusted if you find that shots of the meeting participants in the room are consistently off-center or misaligned and a restart of the camera did not resolve these issues.

PTZ Alignment Correction

To correct the alignment of the two PTZ cameras in relation to the static wide-angle cameras:

1. Open the **Settings** located in the bottom left corner of the **Main View**.
2. Locate the **POS Correct** button and drop-down menu in the **Basic 1** tab of the settings panel.

3. Use the drop-down menu to select which PTZ you wish to correct.
4. Once the desired PTZ is selected, click the **POS Correct** button.
5. A secondary window appears, displaying the selected PTZ's video feed overlaid with a blue cross hair. Move this window over to one side so you can see both the wide-angle feed as well as the PTZ feed.



6. Use the PTZ control buttons in the settings panel to move the PTZ into position so that the cross hairs in both video feeds point at exactly the same location in the room. It is advisable to place an object in the center of the crosshair for reference.
7. If you are satisfied with the adjustments, click the **Return** button and make sure to save your settings before exiting. If you mistakenly entered position correction mode, click **Exit** on the bottom left to exit without saving.

Audio Positioning Correction

In rooms with large acoustically reflective surfaces, like windows or video walls, the camera's audio location skews to one side as the camera perceives audio to be slightly louder on one side of the room.

Similarly to visual position correction, these anomalies can be reduced by calibrating the camera's audio positioning.

To access Audio Position Correction, select Audio in the POS Correct drop-down menu and then click the **POS Correct** button. No secondary video feed will appear as you review audio positioning using the reference feed and its overlaid debug information.

To correct audio positioning:

1. Have someone speak in the center of the room, ideally in the center of the frame, and observe where the vertical blue bars for their audio location appear. In the example above the audio is skewed slightly to the right.



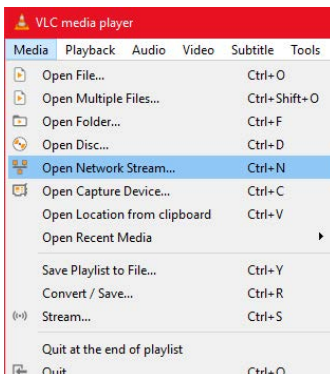
2. Use the directional buttons to correct the location of the blue bars. While the person in the room continues to speak, click the directional buttons slowly and observe the change in location of the blue audio bars. There may be a slight delay between making adjustments and the adjustments to be reflected visually.
3. Line up these bars as close as possible to the center of the face of the person talking. Once completed, click **Return** and **Save** to save your adjustments.

NOTE: Be sure to verify that audio positioning is accurate around the entire room before saving.

Monitor RTSP Streams

The RTSP IP video streams that are being broadcast by the camera can also be previewed and monitored in third-party apps like VLC Media Player® software. The following example demonstrates how to access the streams in the VLC® player.

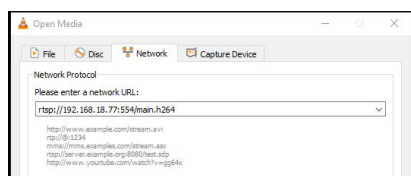
1. Launch VLC player and click **Media > Open Network Stream**.



2. Select **Open Media > Network** (tab) and enter the RTSP URL using the following syntax:

rtsp://xx.xx.xx.xx:554/4.h264

Substitute "sub" for the secondary stream from the wide-angle camera or "3" / "4" for subsequent streams.



To monitor the camera's other streams type in the following strings after the "/" :

- main.h264 - Left PTZ
- sub.h264 - Wide-Angle
- 3.h264 - Right PTZ
- 4.h264 - Switched Output

To learn how to adjust the bit rate and resolution settings for the camera's RTSP streams, refer to the [1 Beyond Camera Manager](#) manual.

NOTE: The VLC player induces noticeable latency when monitoring RTSP streams.

Onscreen (OSD) Menu

```
<MENU>
VIDEO...
EXPOSURE...
COLOR...
PAN TILT ZOOM...
SYSTEM...
STATUS...
RESTORE DEFAULTS...
```

[▲▼] SELECT [OK] [↵] NEXT

All 1 Beyond cameras feature an integrated on-screen menu which can be accessed by pressing **Menu** in the PTZ controller section of 1 Beyond Camera Manager or on the IR remote control. The menu is then displayed overlaid on the camera's PTZ video feed.



Here you can adjust various settings to tailor the camera's performance to the setup.

Navigate the menu using the directional buttons in the software. In the software, press **Enter** to confirm a menu selection, and use the left and right directional buttons to adjust the selected parameter.

To return to a previous menu page, press **Return**.

Pressing the **Menu** button on any control device while anywhere in the menus will close the menu.

CAUTION: Always stop tracking before entering the OSD menu as it may cause random changes in system settings that can severely impact image quality.

NOTE: Restoring the settings to factory default will not reset Address, Protocol, Baud Rate, Video Format and Mount settings. Likewise, tracking settings will remain unaffected.

OSD Menu Tree

VIDEO	SHARPNESS	0 - 15	Increase / decrease video sharpening.
	BRIGHTNESS	0 - 14	Adjust video brightness.
	CONTRAST	0 - 14	Adjust video contrast
	GAMMA MODE	0 - 4	Adjust video gamma correction.
	2DNR LEVEL	OFF, 1 - 5	2D Noise Reduction level.
	3DNR LEVEL	OFF, 1 - 5	3D Noise Reduction level.
	WIDE DYNAMIC	OFF, 1-5	Adjust intensity of dynamic range extension.
EXPOSURE	MODE	FULL AUTO	Automatically adjust exposure.
		MANUAL	Manually adjust exposure.
		SHUTTER PRI	Shutter priority mode.
		IRIS PRI	Iris priority mode.
		BRIGHT PRI	Brightness priority mode.
	EXP COMP	ON / OFF	Exposure compensation on / off.
	LEVEL	-7 - +7	Adjust level of exposure compensation.
	BLC	ON / OFF	Turn Back Light Compensation on / off.
	ANTI FLICKER	OFF / 50Hz / 60 Hz	Reduces flicker induced by 25p / 30p frame rates.
COLOR	WB MODE	AUTO	Fully automatic white balance.
		ATW	Auto-Tracing white balance mode.
		ONE PUSH	Trigger one-time WB adjustment.
		INDOOR	Best for warm lighting.
		OUTDOOR	Best for natural sunlight.
		MANUAL	Fully manual white balance adjustment.
		SODIUM LAMP	Best for sodium gas light.
		FLUO LAMP	Best for fluorescent light sources.
	R. / G. / B. GAIN	-7 - +7	Adjust color channel balance.
	SATURATION	0 - 14	Increase / decrease color saturation.
	HUE	0 - 14	Adjust hue for color tint compensation.

PAN TILT ZOOM	PAN / TILT SPEED	0 - 8	Adjust the speed of camera movement.
	PTZ TRIG AF	x1 - x12	Auto-focus after moving camera.
	RATIO SPEED	ON/OFF	Pan/Tilt speed relative to zoom ratio.
SYSTEM	ADDRESS	1 - 7	Choose cam address for serial comm.
	PROTOCOL	VISCA	Choose protocol for serial communication.
		PELCO-D	
		PELCO-P	
	BAUDRATE	2400 - 34800	Set baud rate for serial port.
	VIDEO FORMAT	720p50 - 1080p60	Change video resolution & frame rate.
	CLOSEUP MODE	SINGLE/DIALOGUE	Dialogue enables automatic side-by-side when people talk back and forth.
STATUS	SHOWS SYSTEM SETTINGS		
RESTORE DEFAULTS	YES / NO		

Video Settings

The VIDEO menu adjusts various settings that can help adjust the camera's video output to your specific needs.

DNR – Digital Noise Reduction

The Sony Exmor image sensor in this camera offers integrated 2-step noise reduction that helps combat noise that may appear when the camera has to compensate for dim lighting.

2DNR is the first level of noise reduction. When on, up to five levels can be set. High levels of 2DNR should only be used in low-color settings.

3DNR offers dynamic noise reduction ideal for conferencing, streaming, and more. When on, up to five levels can be set. Setting the level too high may lead to "ghosting" when the camera is picking up fast movement or is being moved.

WIDE DYNAMIC

WDR (Wide Dynamic Range) is a technology that extends the camera's dynamic range to compensate for high contrast image content. This can improve visibility in settings with bright lights and dark shadows as it makes details in the dark parts of the image more easily discernible.



Fig 1: The entire dynamic range of a scene.



Fig 2: The dynamic range (shown in red) captured with WDR OFF. The area to the left is underexposed, and the area to the right is overexposed.

Exposure Settings

The **EXPOSURE** menu is used to adjust image brightness and the properties of the camera's automatic exposure adjustment features.

In **FULL AUTO**, the camera automatically adjusts gain (ISO), iris (aperture), shutter speed, and exposure compensation to maintain image brightness. Exposure settings can also be tailored to the needs of your venue using a variety of different parameter priority or manual modes.

SHUTTER PRI: Gain and shutter values are adjusted automatically while the shutter speed can be set manually.

IRIS PRI: Gain and iris values are adjusted automatically while Iris value can be set manually (in F-stops from 1.6 to 14).

BRIGHT PRI: Manually adjust the video brightness.

SMART: Set the smart Auto Exposure area (AREA 1~AREA4). When the camera reaches any of these areas, the camera automatically recalls a manual exposure setting. When the camera moves out of the area, the AE mode will default to AUTO.

EXP-COMP: Once EXP-COMP is set to ON, you will be able to set a level between -7 and +7 to darken or brighten the image.

BLC: Back Light Compensation can be activated if the background of the frame is a bright light source (for example, windows or a projection screen behind a presenter) to maintain proper exposure for foreground subjects.

ANTI FLICKER: Fluorescent light sources and computer displays can induce image flickering when outputting at frame rates of 25 or 30 fps. If you are outputting at either of these frame rates, set the **ANTI FLICKER** setting to twice that value (for example, 60 Hz for a 30 fps video signal).

White Balance

WHITE BALANCE adjusts the color levels of the camera image to reproduce what the human eye sees in any given lighting.

AUTO is recommended if the lighting conditions in your venue are influenced by weather changes or if you frequently use projections or colored lighting. Other settings are detailed in the **OSD Menu Tree** table above.

ONE PUSH is the most reliable way to achieve accurate static white balance. To perform a **ONE PUSH** white balance configuration:

1. Hold a pure white piece of paper in front of the camera lens at a distance where it is properly lit.
2. Select **ONE PUSH**, and press **OK**.
3. Continue holding the piece of paper for 10 seconds until the process is complete.

MANUAL mode allows you to set the levels for each color channel individually, whereas HUE can be used to compensate for any form of color tint that may be introduced by certain light sources.

Pan/Tilt/Zoom

PAN/TILT SPEED lets you adjust the speed of camera movement when controlled manually. The speed is fastest when in 1x zoom compared to longer focal lengths. For any given Pan/Tilt Speed setting, pressing the **OK** button on the remote control toggles between a faster and slower Pan/Tilt speed.

- High speed: 15° ~ 50° / sec
(max. zoom ~ min. zoom)
- Low speed: 4° ~ 11° / sec
(max. zoom ~ min. zoom)

PTZ TRIG AF: When enabled, autofocus is triggered whenever the camera tilts, pans, or zooms. We recommended leaving this setting enabled.

RATIO SPEED dynamically adjusts the speed of pan/tilt motion proportional to the amount of zoom. This ensures the pan and tilt speed will be identical at any focal length.

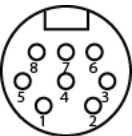
Side-by-Side Dialogue

If desired, the camera can automatically switch to a side-by-side view of two meeting participants if they talk back and forth at least four times. To enable this mode, access the OSD via the process described in the [Onscreen \(OSD\) Menu on page 52](#), navigate to **SYSTEM** and switch **CLOSEUP MODE** to **DIALOGUE**.

NOTE: Side-by-Side Dialogue mode cannot be previewed in the IP stream.

Serial Wiring

The EXT port contains pins for both RS-485 and RS-232 serial control. It is recommended to use RS-485 (not included) as it supports longer cable runs as well as connecting multiple cameras to a single terminal block.



Pin Number	Pin Definition
1	/
2	/
3	232 TXD
4	232 GND
5	232 RXD
6	232 GND
7	485 D+
8	485 D-

RS-232 cables are included with the camera.

Reserved Presets

To ensure backwards compatibility with various different control systems, some proprietary camera functions are mapped to fixed preset numbers and can be triggered by calling the associated preset.

These presets cannot be overwritten.

Preset Number	Function
80	Start tracking
81	Stop tracking
93	Cruise through presets 0 to 29 in. 10 second intervals
95	Open OSD Menu
96	Clear ALL User Presets
99	Reboot Camera
121	Output Left PTZ Camera
122	Output Right PTZ Camera
123	Output Side-by-Side of both PTZ cameras

VISCA Commands

1 Beyond PTZ cameras can be controlled using the VISCA protocol through either a serial (RS-232 / RS-485) or IP connection. By default, the port for IP control is set to 5500. For serial communication, make sure the baud rate of the controller is set to 9600 bps. Below is a comprehensive list of VISCA commands that can be used to control the cameras.

Start/Stop Tracking

To start or stop tracking on the 1 Beyond Hawk camera, call the following commands:

Command	Command Packet	Comments
Start tracking (Recall CAM_Memory 80)	8x 01 04 3F 02 50 FF	Call Preset 80, camera addr x
Stop tracking (Recall CAM_Memory 81)	8x 01 04 3F 02 51 FF	Call Preset 81, camera addr x

NOTE: These commands can only be used with AutoTracker, AutoFramer, Falcon, and Hawk cameras. Under no circumstances should presets 80 and 81 be overwritten on these cameras. Once configured, presets 0 and 1 must not be overwritten since these are used as references to adjust framing while tracking is active.

Privacy

The PTZ cameras can be tilted backwards for privacy when the camera is not in use. To tilt the PTZ cameras backwards, call the following commands:

NOTE: Speaker tracking must be disabled to tilt the PTZ cameras backwards.

Command	Command Packet	Comments
Tilt PTZ 1	81 01 06 01 12 0E 03 01 FF	Tilt PTZ 1 backwards
Tilt PTZ 2	82 01 06 01 12 0E 03 01 FF	Tilt PTZ 2 backwards

ACK / Completion Messages

	Command Message	Comments
ACK	z0 4y FF (y:Socket No.)	Returned when the command is accepted.
Completion	z0 5y FF (y:Socket No.)	Returned when the command has been executed.

Error Messages

	Command Message	Comments
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.
Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
Command Canceled	z0 6y 04 FF (y:Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.
No Socket	z0 6y 05 FF (y:Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.
Command Not Executable	z0 6y 41 FF (y:Execution command Socket No. Inquiry command:0)	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

z = Device address + 8

Commands

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
Command Cancel		8x 2p FF	p: Socket No. (=1or2)
CAM_Power	On	8x 01 04 00 02 FF	Power On/Off
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	p: 0(Low)to 7 (High)
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	
			p,q,r,s: Zoom Position

Command Set	Command	Command Packet	Comments
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	p: 0(Low)to 7 (High)
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	p,q,r,s: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF On/Off
	Manul Focus	8x 01 04 38 03 FF	
	Auto/Manul	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	p,q,r,s: Zoom Position t,u,v,w: Focus Position
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
	Manual	8x 01 04 35 05 FF	Manual Control Mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger
CAM_RGain	Rest	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	p,q: R Gain
CAM_BGain	Rest	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	p,q: B Gain
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	8x 01 04 39 0D FF	Bright Mode (Manual control)

Command Set	Command	Command Packet	Comments
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright Setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 4D 00 00 0p 0q FF	
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation On/Off
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	
CAM_Backlight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF
	Off	8x 01 04 33 03 FF	
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	Neg.Art	8x 01 04 63 02 FF	
	B&W	8x 01 04 63 04 FF	

Command Set	Command	Command Packet	Comments
CAM_Memory	Reset	8x 01 04 3F 00 pp FF	pp: Memory Number (=0 to 255) Corresponds to 0 to 255 on the Remote.
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	
SYS_Menu	Off	8x 01 06 06 03 FF	Turns off the menu screen.
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	p,q,r,s: Camera ID (=0000 to FFFF)
IR_Receive	On	8x 01 06 08 02 FF	IR receiver On/Off
	Off	8x 01 06 08 03 FF	
Information Display	On	8x 01 7E 01 18 02 FF	Operation status display On/Off
	Off	8x 01 7E 01 18 03 FF	
Pan-tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0 x01 (low speed) to 0 x18 (high speed)
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	WW: Tilt Speed 0 x 01 (low speed) to 0 x14 (high speed)
	UpLeft	8x 01 06 01 VV WW 01 01 FF	
	UpRight	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	YYYY: Pan Position
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	ZZZZ: Tilt Position
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position ZZZZ: Tilt Position

Inquiry Commands

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
		y0 50 04 FF	Internal power circuit error

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	p,q,r,s: Zoom Position
CAM_FocusModelInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	p,q,r,s: Focus Position
CAM_WBModelInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	In Door
		y0 50 02 FF	Out Door
		y0 50 03 FF	One Push WB
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	p,q: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	p,q: B Gain
CAM_AEModelInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter Priority
		y0 50 0B FF	Iris Priority
		y0 50 0D FF	Bright
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	p,q: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	p,q: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	p,q: Gain Position
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	p,q: Bright Position
CAM_ExpCompModelInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	p,q: ExpComp Position
CAM_BacklightModelInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	p,q: Aperture Gain

Inquiry Command	Command Packet	Inquiry Packet	Comments	
CAM_PictureEffectMode Inq	8x 09 04 63 FF	y0 50 00 FF	Off	
		y0 50 02 FF	Neg.Art	
		y0 50 04 FF	B&W	
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.	
SYS_MenuModelInq	8x 09 06 06 FF	y0 50 02 FF	On	
		y0 50 03 FF	Off	
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	p,q,r,s: Camera ID	
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 01	m,n,p,q: Model Code (0504)	
		mn pq rs tu vw FF	r,s,t,u: ROM version	
			v,w: Socket Number (=02)	
Information Display	8x 09 7E 01 18 FF	y0 50 02 FF	On	
		y0 50 03 FF	Off	
VideoSystemInq	8x 09 06 23 FF	y0 50 00 FF	1920 x1080i/60	60 Hz system
		y0 50 01 FF	1920 x1080p/30	60 Hz system
		y0 50 02 FF	1280 x720p/60	60 Hz system
		y0 50 03 FF	1280 x720p/30	60 Hz system
		y0 50 07 FF	1920 x1080p/60	60 Hz system
		y0 50 08 FF	1920 x1080i/50	50 Hz system
		y0 50 09 FF	1920 x1080p/25	50 Hz system
		y0 50 0A FF	1280 x720p/50	50 Hz system
		y0 50 0B FF	1280 x 720p/25	50 Hz system
		y0 50 0F FF	1920 x1080p/50	50 Hz system
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On	
		y0 50 03 FF	Off	
Pan-tiltMaxSpeedI	8x 09 06 11 FF	y0 50 ww zz FF	ww = Pan Max Speed zz = Tilt Max Speed	
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w	www = Pan Position zzzz = Tilt Position	
		0z 0z 0z 0z FF		
Pan-tiltModelInq	8x 09 06 10 FF	y0 50 pq rs FF	p,q,r,s: Pan/Tilt Status	

Zoom Ratio / Position (CAM_Zoom)

(CAM_Zoom Direct – p,q,r,s Zoom Position)

Optical Zoom Ratio	Optical Zoom Ratio
1x	0000
2x	1851
3x	22BE
4x	28F6
5x	2D45
6x	3086
7x	3320
8x	3549
9x	371E
10x	38B3
11x	3A12
12x	3B42
13x	3C47
14x	3D25
15x	3DDF
16x	3E7B
17x	3EFB
18x	3F64
19x	3FBA
20x	4000

Exposure Comp (CAM_ExpComp)

(CAM_ExpComp Direct – p,q ExpComp Position)

0E	+7	0000
0D	+6	1851
0C	+5	22BE
0B	+4	28F6
0A	+3	2D45
09	+2	3086
08	+1	3320
07	0	3549
06	-1	371E
05	-2	38B3
04	-3	3A12
03	-4	3B42
02	-5	3C47
02	-6	3D25
00	-7	4000

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTIONS
No movement or video signal when powered on	Power supply failure	Check power supply output using a multimeter.
	Power adapter damaged	Replace faulty power adapter.
	Power not connected	Plug the provided 12V power supply into a wall outlet and connect the other end to the input on the camera.
Camera not showing in 1 Beyond Camera Manager	Incorrect IP settings	Check to confirm the camera's IP is set to match the IP settings of your connected computer. Default IP: 192.168.18.77.
Video feed not showing in 1 Beyond Camera Manager	Subnet setting of camera does not match your computer's.	Set the IP, gateway, and subnet mask of your camera to match your network scheme.
	RTSP Stream configured incorrectly	Enter the camera configuration menu from the Main View of 1 Beyond Camera Manager and adjust the resolution and bitrate of the Close Up.
Camera is not controllable when powered on	Wrong address / protocol / baud rate settings or a faulty serial cable	Open OSD to verify your settings are correct or check serial wiring.

Resources

The following resources are provided for the IV-CAMHK-12-SLVR-1B.

NOTE: You may need to provide your Crestron.com web account credentials when prompted to access some of the following resources.

Crestron Support and Training

- [Crestron True Blue Support](#)
- [Crestron Resource Library](#)
- [Crestron Online Help \(OLH\)](#)
 - support.crestron.com/app/answers/detail/a_id/1001561
- [Crestron Training Institute \(CTI\) Portal](#)

Product Certificates

To search for product certificates, refer to support.crestron.com/app/certificates.

