BOLIN
TECHNOLOGY

R9-230H Indoor PTZ Camera

User Guide

Contents

Important Information

Thank you for purchasing our product. If there are any questions, please contact the authorized dealer. Before operating the unit, please read this manual thoroughly and retain it for future reference.

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Attention:

To ensure account security, the user should change the password after their first login. The user is recommended to set a strong password (no less than eight characters). Password login does not apply to certain models that do not need password login.
The contents of this document are subject to change without prior notice. Updates will be added to the new version of this manual. Improvements or updates to the products or procedures described in the manual will be made readily.
The best effort has been made to verify the integrity and correctness of the contents in this document, but no statement, information, or recommendation in this manual shall constitute a formal guarantee of any kind, expressed or implied. Responsibility for any technical or typographical errors in this manual will not be held.
The product appearance shown in this manual is for reference only and may be different from the actual

appearance of the user's device.

This manual is a guide for multiple product models and so it is not intended for any specific product.

In this manual, the illustrations of the displayed interface, parameters displayed, drawings, and value ranges may vary with models. The user should refer to the actual product for details.

Due to uncertainties such as the physical environment, discrepancies may exist between the actual values and reference values provided in this manual.

Use of this document and the subsequent results shall be entirely on the user's own responsibility.

Before operating the unit, the user should read this manual thoroughly and retain it for future reference.

Symbols

Symbol	Description
⚠️	**WARNING** Contains important safety instructions and indicates situations that may cause bodily injury.
ⓘ	**CAUTION** Users must be careful. Improper operations may cause damage or malfunction of product.
📝	**NOTE** Indicates useful or supplemental information about the use of the product.

Safety Information

⚠️ WARNING:

Installation and removal of the unit and its accessories must be carried out by qualified personnel. You must read all of the Safety Instructions supplied with your equipment before installation and operation.

• If the product does not work properly, please contact your dealer. Never attempt to disassemble the camera yourself. (We will not assume any responsibility for problems caused by unauthorized repair or maintenance.)

• This installation should be made by a qualified service person and should conform to all the local codes.

• When shipping, the camera should be packed in its original packaging.

• Make sure the power supply voltage is correct before using the camera.

• Do not drop the camera or subject it to physical shock.

• Do not touch sensor modules with fingers. If cleaning is necessary, use a clean cloth with a bit of ethanol and wipe it gently. If the camera will not be used for an extended period of time, put on the lens cap to protect the sensor from dirt.

• Do not aim the camera lens at the strong light such as sun or incandescent lamp. The strong light can cause fatal damage to the camera.

Maintenance Precautions:

• If there is dust on the front glass surface, remove the dust gently using an oil-free brush or a rubber dust blowing ball.

• If there is grease or a dust stain on the front glass surface, clean the glass surface gently from the center outward using anti-static gloves or an oil-free cloth. If the grease or the stain still cannot be removed, use anti-static gloves or an oil-free cloth dipped with detergent and clean the glass surface gently until it is removed.

• Do not use organic solvents, such as benzene or ethanol, when cleaning the front glass surface.

Regulatory Compliance

FCC Part 15

This equipment has been tested and found to comply with the limits for digital devices, pursuant to part 15 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 own expense.

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

CE	**LVD/EMC Directive** This product complies with the European Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC.
	WEEE Directive–2002/96/EC The product this manual refers to is covered by the Waste Electrical & Electronic Equipment (WEEE) Directive and must be disposed of in a responsible manner.

What's In the Box

	R9 Indoor PTZ Camera (R9-230H)
	12V, 4A Locking Power Supply with International Plugs (P12-4)
	IR Remote Controller (VCC-RC-2)
	RS422/232 RJ45 Adapter (VCC-CC45RS)
	Lens Cap
	Protective Dust Cover
	Safety Cable
	HDMI Cable Support with Screws
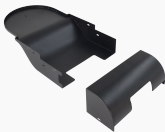
Optional Accessories

	Large PTZ Camera Wall Mount Bracket - Available in Black or White (C-WM3B or C-WM3W)
	Cover Set for Large PTZ Camera Wall Mount Bracket - Black or White (C-WM3B-CV or C-WM3W-CV)
	PTZ Camera Pendant Mount System for Drop Ceiling - Black or White (C-PMSB or C-PMSW)
	10-Pin LEMO to Balanced XLR Connector (AUD-10BC)

Recommended Peripherals

|	
	97W POE Injector (BL-PP97)
	Fast HEVC IP Decoder (EG40F) **Dante AV-H Decoder (EG40DH)**
	PTZ Controller (KBD-1010-RNV)

Overview

This user guide will provide users of the R9-230H indoor PTZ cameras with in-depth knowledge of the various features and functions of the camera and how it can be utilized. Functions limited to a specific camera model will be noted as such in the various sections.

Features

- Two high quality image options to choose from- 4K30 with 18X Zoom and 1" Image Sensor, 4K60 with 20X Zoom

- True Tri-Output; Simultaneous and independent outputs via HDMI, SDI, and IP Stream

- Broadcast-standard SDI outputs

- Smooth, accurate, and quiet PTZ motors

- Super Image Stabilization

- Support for multiple PTZ control protocols and methods

- Firmware Upgrades via IP (Web Interface)

- Front and Rear Tally Lights

- Built-In Handle - Industry First

- On-Screen Character Generator

- Mic & Line-Level Balanced Audio Input via XLR

- Genlock Supported

Camera Diagrams and Dimensions
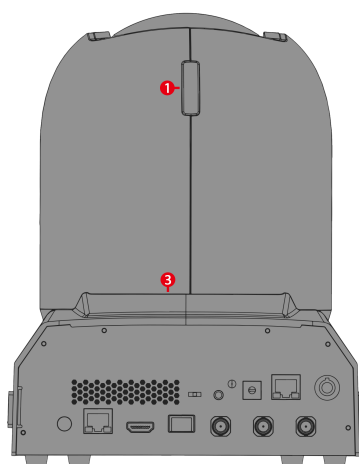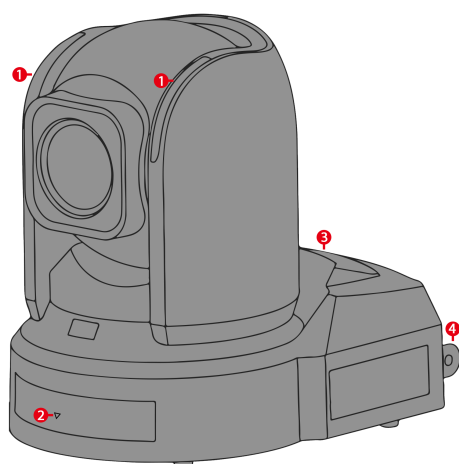

1. Tally Lights
2. Activity Indicator Light
3. Handle
4. Security Slot
5. 1/4" Tripod Mount
6. Product Info & Serial Number
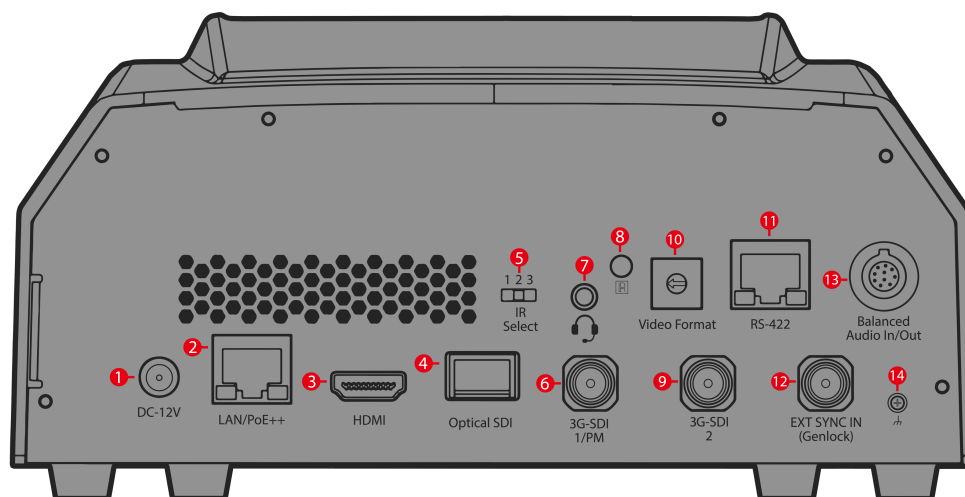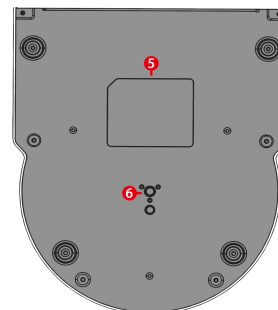
1. DC 12V Power Input
2. 10/100/1000 LAN Port/ PoE++ Power In
3. HDMI 14/2.0 Output
4. Optical SDI SFP Slot
5. IR Channel Selector
6. 3G-SDI Program Output
7. 3.5mm Audio
8. IR Receiver
9. 3-G SDI Output
10. Video Format
11. RS422 Serial Port (RJ45)
12. Genlock Input
13. Balanced Audio Input & Output (10-Pin LEMO Connector)
14. GND

📋NOTE: All dimensions listed below are in millimeters.

249.00

6.80

200.38

3-M3

1/4-20UNC

110.00

110.00

234.67

252.67

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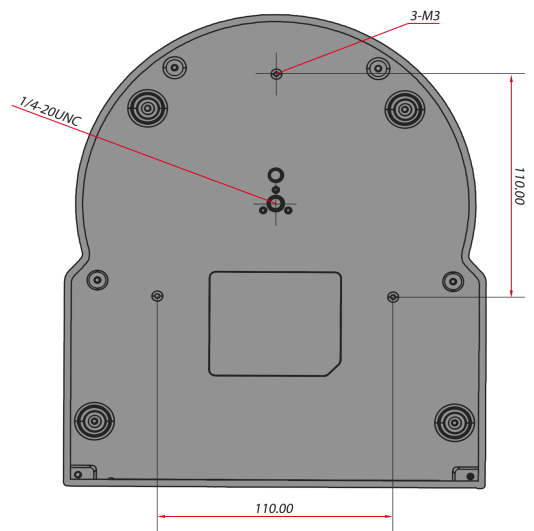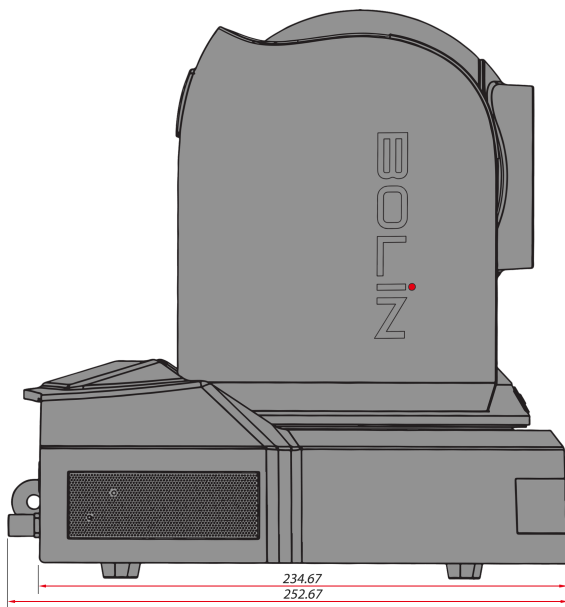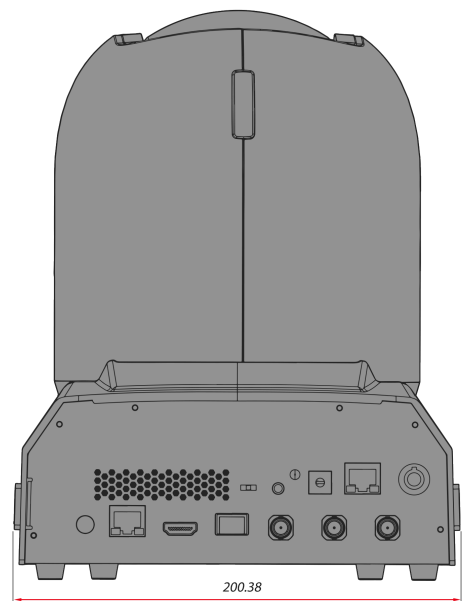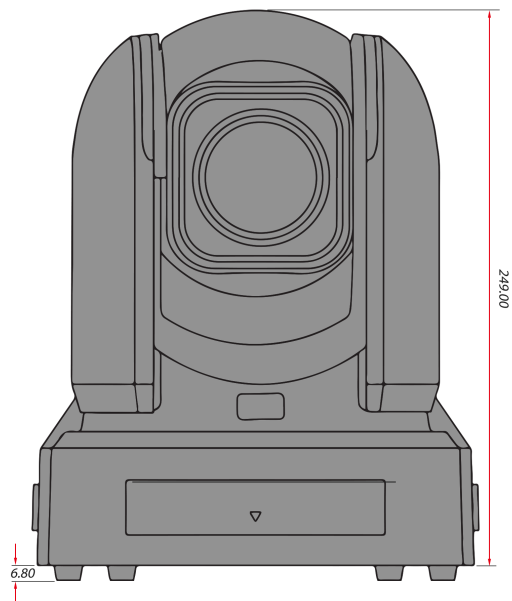
Quick Start Guide

The R9 Series Indoor PTZ Camera has multiple connection options for video output, power input, control input, audio input and output, and synchronization. You can choose the appropriate connection points based on your requirements.

Power

Power Options

1. PoE++ via Network Switch

2. PoE++ with Injector

3. 12V DC Power Adapter
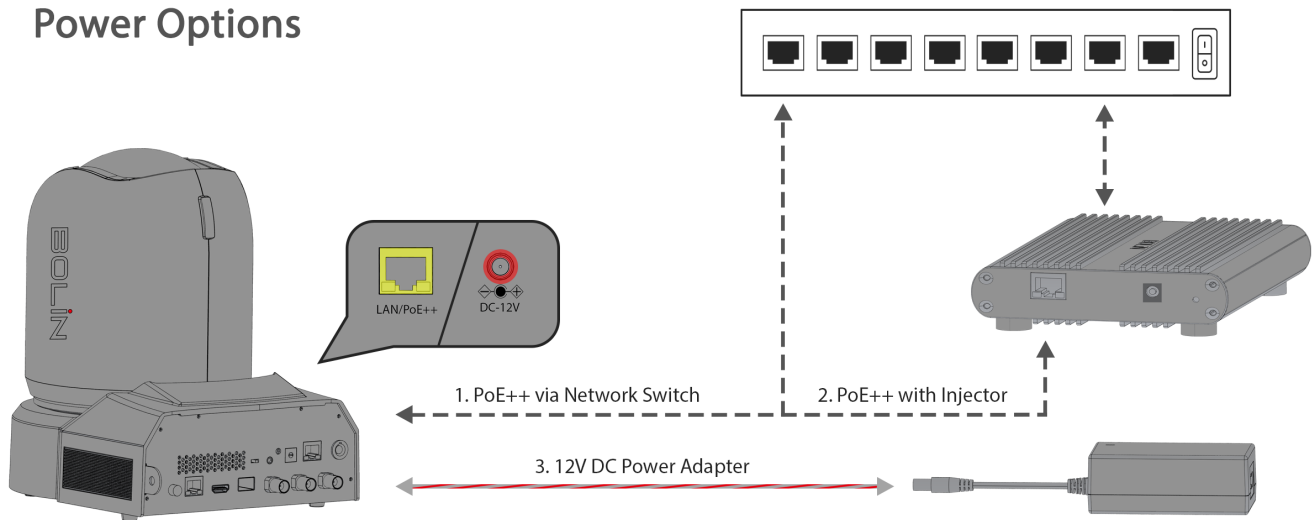
The camera can be powered two ways:

- 12VDC 4A Power Adapter (P12-4), which is included in the box, plugged into the DC 12V Power Input

- PoE++(IEEE802.3bt, Type 4 Class8) through a Category 6 (CAT6) cable with RJ45 connector plugged into the 10/100/1000 LAN port. The other end of that CAT6 cable can be plugged in to a network switch that supports POE++ (90 Watts of Power Output per Port)

> 📒**NOTE:** If the network switch doesn't provide POE++ power, the Bolin's POE++ power injector can be used. (See below).
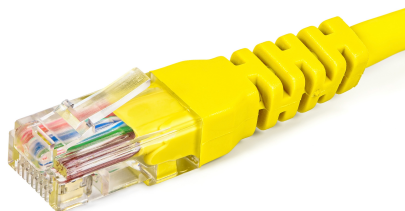
12V DC 4A Power Adapter (P12-4)	Category 6 (CAT6) Cable with RJ45 Connector	97W PoE Injector (BL-PP97)

> ⓘ**CAUTION:** Only use the DC power adapter supplied with the camera. Do not use any other DC power adapter.

ⓘ**CAUTION:** If using POE++ power, ensure that the POE power source has a sufficient power budget for the camera, or some features may not function properly. CAT6 cable runs from the camera to the POE power source have a limit of 90 meters before signal and power loss occurs.

Network

This camera offers a variety of functionalities via a network connection. Besides being powered over Ethernet, a network connection enables the user to adjust camera settings remotely, stream video from the camera to a distant location, and control the PTZ camera functions via the Web Interface. To connect the camera to the network, the user should adhere to the following steps:

1. Acquire a standard Category (CAT) 6 cable and insert one end of the cable into the camera. Connect the other end into a network switch.

2. Power on the camera.

3. To retrieve the IP address of the camera, the user should open the OSD Menu and navigate to the Status section. Alternatively, the user can download Bolin's IPC search tool from the website (www.bolintechnology.com) onto a Windows computer and execute the tool to locate the camera on the network.

4. The user should ensure that their camera and computer are on the same subnet of the network to gain access to the Web Interface.

📋 **NOTE:** Factory-Default Camera Network Settings
Static IP Address: 192.168.0.13
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.1

To change these settings, refer to the Web Interface Configuration section of this guide.

Video Output

The R9 has multiple video outputs, which can be used simultaneously, and the resolutions can be configured independently. The outputs vary based on the camera model and are as follows:

HDMI Out (HDMI 1.4 in R9-230H)

The user should follow these steps to connect the camera:

1. Connect one end of an HDMI cable that supports the required resolution to the HDMI Output of the camera. Connect the other end of the HDMI cable to the desired destination (Switcher, Converter, Display, etc.).

2. Power on the camera and wait for it to initialize. Once initialized, video will appear on the screen. For the first five seconds, the camera's initial settings will be displayed.

3. The user can utilize the OSD (On-Screen Display) Menu or Web Interface to set the desired output resolution and frame rate. For more information on how to configure these settings, please refer to the Web Interface Configuration and System Menu section of this guide.

📋 **NOTE:** It is recommended for the user to utilize a certified "Premium High Speed HDMI" cable to guarantee the attainment of the maximum signal quality from their camera.

HDMI Standard Classifications

HDMI Standard	Bandwidth	Max Resolution Supported
HDMI 1.4	10.2 Gigabit/Second	1080p, 120 Hz 4K, 30 Hz
HDMI 2.0	18.0 Gigabit/Second	4K, 60 Hz
HDMI 2.1	48.0 Gigabit/Second	8K, 120 Hz

Dual SDI Out (3G-SDI in R9-230H)

1. Connect one end of an appropriately rated SDI cable to one of the two SDI outputs on the camera. Ensure to secure the BNC connector in place to prevent the cable from becoming loose during use. Connect the other end of the SDI cable to the desired destination (Switcher, Video Router, Converter, Display, etc.).

2. Power on the camera and wait for it to initialize. Once initialized, video will appear on the screen. For the first five seconds, the camera's initial settings will be displayed.

3. The user can utilize the OSD (On-Screen Display) Menu or Web Interface to set the desired output resolution and frame rate. For more information on how to configure these settings, please refer to the Web Interface Configuration and System Menu section of this guide.

> 📒NOTE: The SDI Output labeled as "Program Out" or "P/G Out" will only display the video and not any OSD Menu's or overlays.

SDI Standard Classifications

SDI Standard	Bandwidth	Resolution Supported
SD-SDI	270 Megabits/Second	480i
HD-SDI	1.485 Gigabit/Second	720p / 1080i
3G-SDI	2.970 Gigabit/Second	1080P, 60FPS
6G-SDI	6 Gigabit/Second	4K, 30FPS
12-SDI	12 Gigabit/Second	4K, 60FPS

Optical Fiber

Obtain (2x) single-mode 1310 nm SFP+ 12G optical modules (transceivers) with LC duplex fiber connectors to plug into each end of the signal chain. Additionally, acquire a single-mode duplex fiber cable with LC connectors that is the appropriate length for the user's requirements.

1. Insert one SFP+ module into the camera. Once the module is fully inserted, connect the fiber cable to the LC connectors of the module. Repeat these steps at the receiving end of the signal chain (Fiber Converter, Monitor, Recorder, etc.).

2. Power on the camera and wait for it to initialize. Once initialized, video will appear on the screen. For the first five seconds, the camera's initial settings will be displayed.

3. You can use the OSD (On-Screen Display) Menu or Web Interface to set the desired output resolution and frame rate. Please see the Web Interface Configuration and System Menu section of this guide for more

information on how to configure these settings.

4. The user can utilize the OSD (On-Screen Display) Menu or Web Interface to set the desired output resolution and frame rate. For more information on how to configure these settings, please refer to the Web Interface Configuration and System Menu section of this guide.

After conducting thorough testing, we recommend the brands FS and LR-TECH for your needs. In particular, the 'LR-8910D-SDI-LR' model (Serial Number: BS190909052) was found to perform exceptionally well.

📋NOTE: The resolution of the Optical Fiber is the same as the resolution set for the SDI outputs. These video outputs are not independent.

ⓘCAUTION: Make sure you keep the LC connectors on the fiber cable and SFP modules covered when not in use. Leaving connectors uncovered could lead to damage and signal degradation.

SFP+ 12G Optical Modules	LC Duplex Fiber Connector
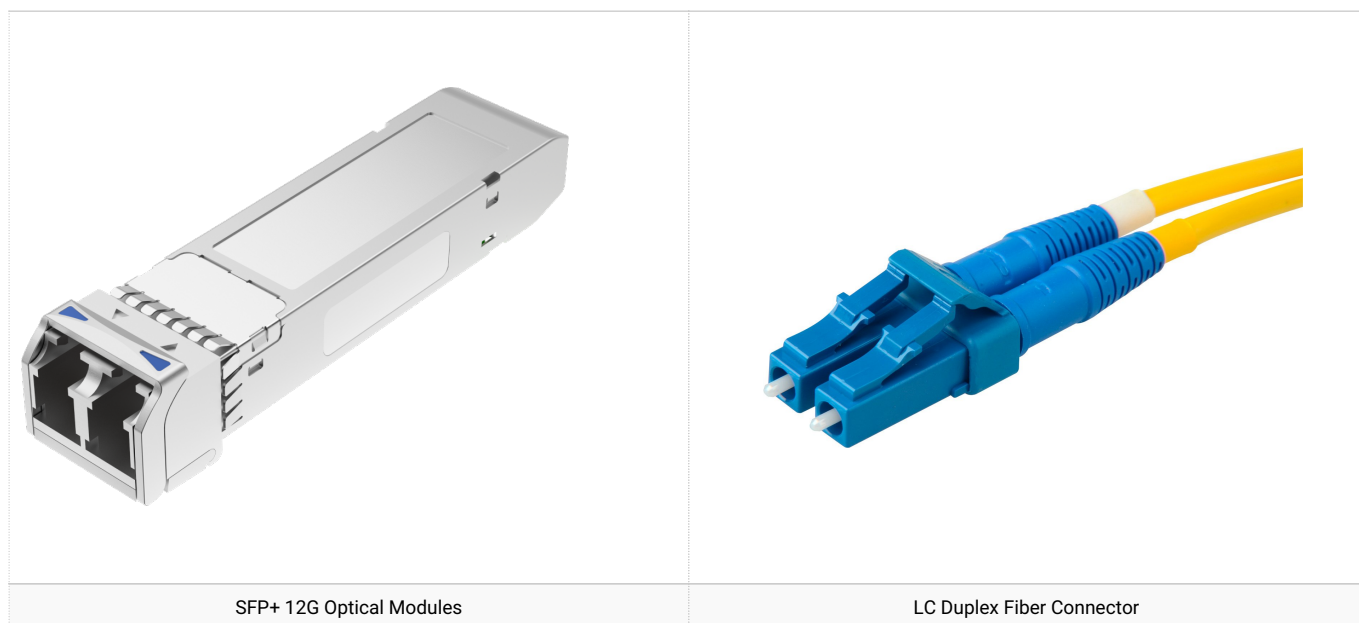
IP Stream Out

The IP stream(s) can be enabled and configured from the Web Interface of the camera. The camera must be connected to a Local Area Network (LAN) using a CAT6 cable through either a switch or direct connection to a computer in order to access the web interface. Streaming from the camera requires internet (WAN) access. The following steps should be followed:

1. Connect the camera to the network by inserting one end of a CAT6 cable into the 10/100/1000 LAN port of the camera and the other end either into a switch or directly into a computer.

2. Open an HTML5-enabled web browser on a computer and enter the IP address of the camera. By default, the camera is set to 192.168.0.13. The IP address can also be located under the "Status" menu of the camera's On-Screen Display (OSD) or by using Bolin Technology's IPC Search Tool in the Download Center.

3. Select "AV Setup" from the menu on the left-side of the Web Interface. From here, enable and configure

the IP streams as needed. For more details, refer to the "Web Interface Configuration" section of this user guide.

Control Input

The R9 PTZ cameras have multiple ways of being controlled that can be used simultaneously to provide the user with the flexibility they need for their setup. The control methods are as follows :

Infrared (IR) Remote Controller

The IR remote included with the device is capable of controlling up to 3 unique IR channels. IR channels can be set with the toggle switch on the back of the camera or through the Web Interface.

The remote is designed to function optimally from short distances and requires a line-of-sight with the camera. The I/O panel of the camera incorporates an IR receiver to accept commands from the remote. To use the IR Controller, the following steps are recommended:

1. Before powering on the camera, the desired IR channel should be selected using the IR Channel Selector located on the back of the camera. Channels 1-3 are available for selection. If multiple cameras are in use, it is advisable to assign different IR channels to cameras that are in close proximity to each other to prevent unintended changes.

2. Once the channel has been selected, the camera should be powered on.

3. On the IR remote, the "Camera IR ID" that corresponds with the selected channel on the camera should be chosen. The remote is now ready to be used to configure or control the camera.

> 📒**NOTE**: When you're using the IR Remote, make sure to either power off any nearby cameras or set them to a different IR ID. If there are cameras within range that are set to the same IR ID, their settings might be altered.

Functions of the IR Controller:
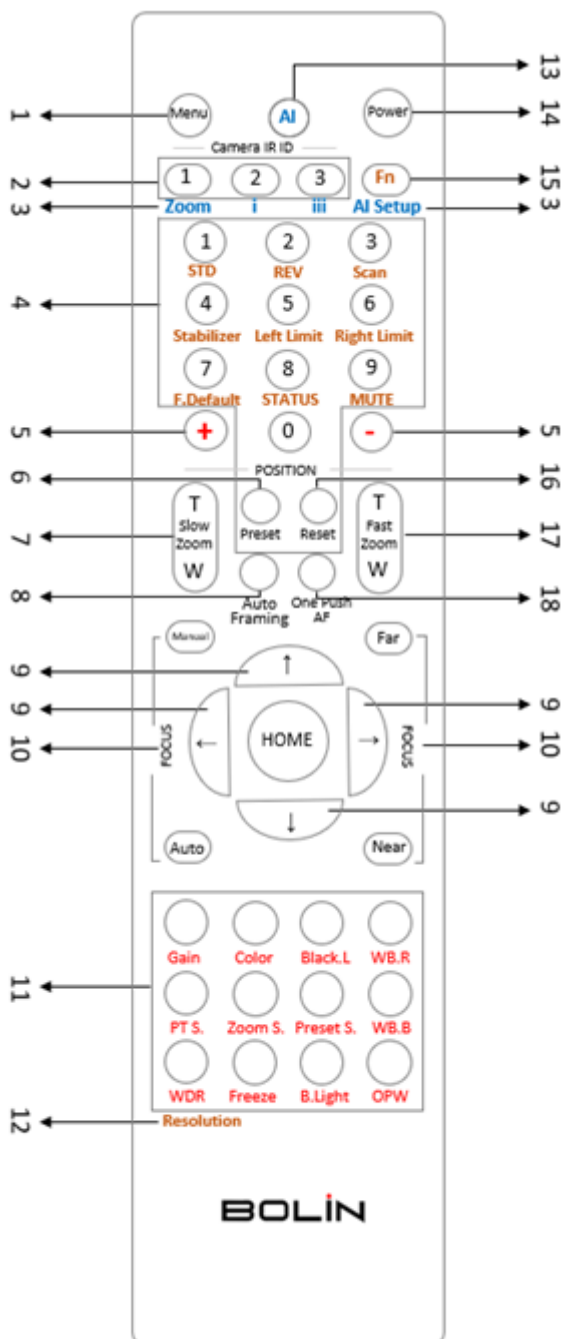
1. **Menu** - On-Screen Display (OSD) Toggle

2. **IR ID Selector** - Select which IR Channel (Camera) to be controlled

3. **AI Function Buttons** - Disabled

4. **Buttons 1-9** - Used to set & recall corresponding presets. (See #6 to set a preset and #16 to erase a preset)

5. **+ & - Buttons** - Used in conjunction with image adjustment buttons (11) to increase or decrease parameters.

6. **Preset** - To save a preset, hold down the "Preset" button and the preset number you would like to assign it to.

7. **Slow Zoom** - Zoom's the camera in or out in a slow speed.

8. **Auto Framing** - Disabled

9. **Direction Arrows** - Pan and Tilt the camera in the corresponding direction. Navigate the OSD Menu when open.

10. **Focus Adjustments** - Use the "Auto" button to enable autofocus. To make manual focus adjustments, press the "Manual" button first, followed by the "Far" or "Near" buttons to adjust.

11. **Image Adjustments** - Select the property you would like to adjust, followed by the + and - buttons (5) to make the appropriate adjustment, unless otherwise noted below. The selected function and corresponding options will glow when selected.

    - *Gain* - Image gain settings

    - *Color* - Color saturation settings

    - *Black.L* - Image black level settings

    - *WB.R* - White Balance, Red settings

    - *PT.S* - Pan/Tilt speed settings

    - *Zoom.S* - Zoom speed settings

    - *Preset.S* - Preset speed settings

    - *WB.B* - White Balance, Blue settings

    - *WDR* - Wide Dynamic Range Settings

    - *Freeze* - Freeze the video on the current frame. (Doesn't use + and - buttons)

    - *B.Light* - Back light compensation

    - *OPW* - One Push White Balance (Hold the button down while pointing the camera at a gray card to set white balance.)

12. **Resolution** - Used to change the video format/resolution. Press and hold the Fn button (15) and Resolution button to select the desired format. The image block will restart after the format is changed, and the screen will go black for a few seconds.

13. **AI Button** - Disabled

14. **Power** - Press and hold for three seconds to turn the camera on/off.

15. **Fn Button** - Press and hold in conjunction with other buttons in dark brown text (Stabilizer, Mute, Scan, etc...) to adjust parameters.

RS-422 Serial Commands (VISCA)

The camera is equipped with an RS-422 port, which facilitates VISCA control over serial commands. This RS-422 port is also compatible with RS-485. The camera can be connected via a serial connection to a PTZ controller or a computer. This allows for the execution of pan, tilt, and zoom operations, as well as the performance of preset recalls.

> ⓘ **CAUTION:** When one connects the camera via serial to a Sony PTZ controller, it differs from the process with a non-Sony PTZ controller. It is crucial to verify the pin settings for the specific controller in use.

1. The camera should be powered on, and the OSD menu should be opened or the Web Interface should be logged into using any web browser. Proceed to the system settings and adjust the baud rate to match

that of the controller. The VISCA ID should be set to a number between 1 and 7.

2. A standard terminated CAT5 or CAT6 cable can be used to directly connect the camera to the controller. Alternatively, the included RJ45 to RS422 Control Cable Adapter can be used to connect unterminated CAT5/CAT6 cables between the camera and controller. The pin connection diagrams provided below should be followed, taking into account the specific controller in use and the desired connection.
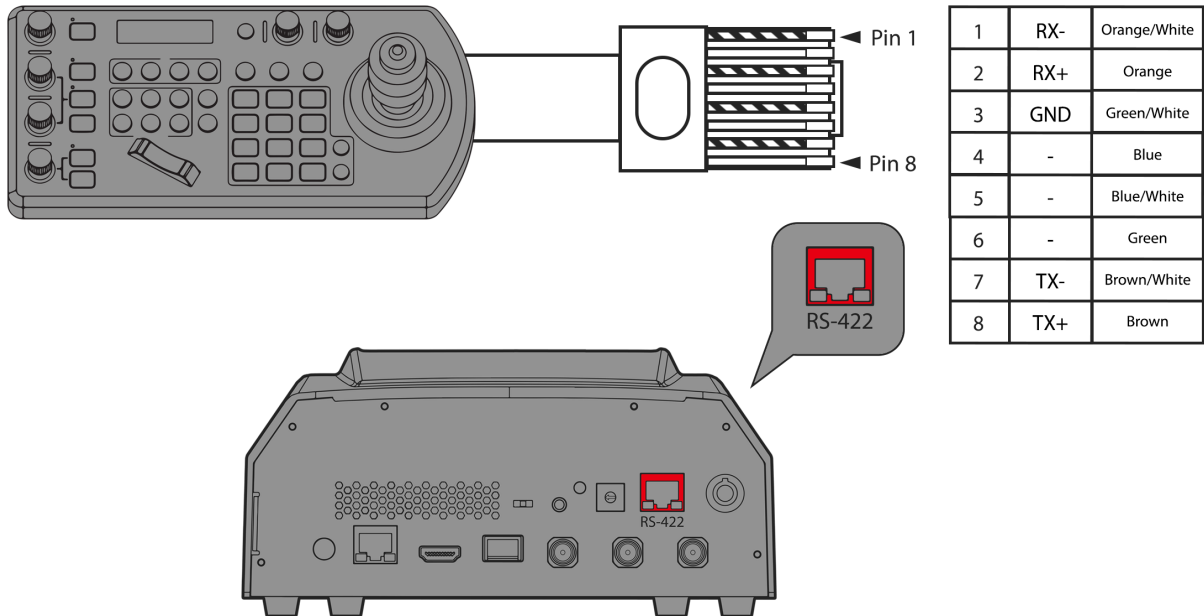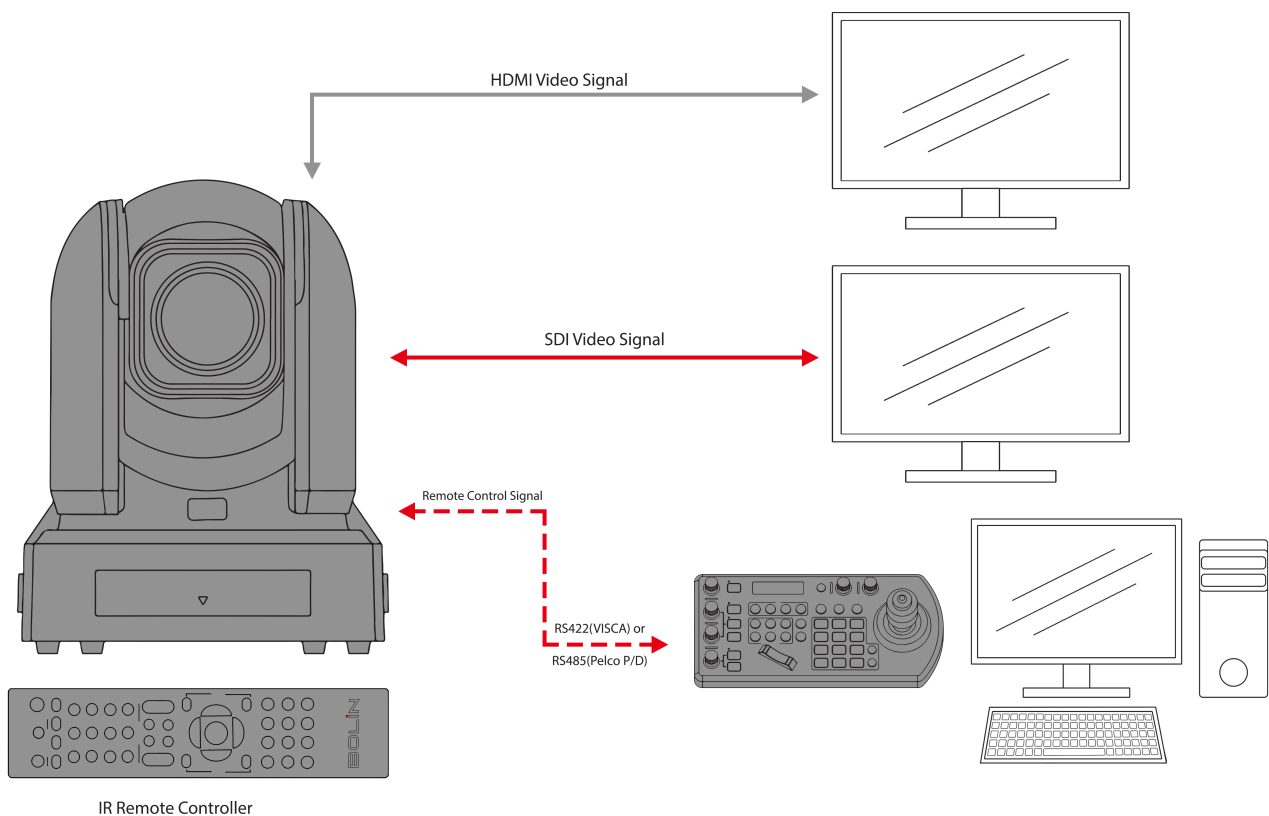

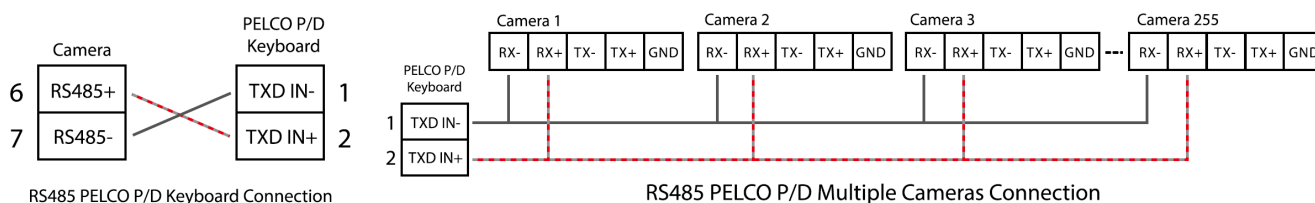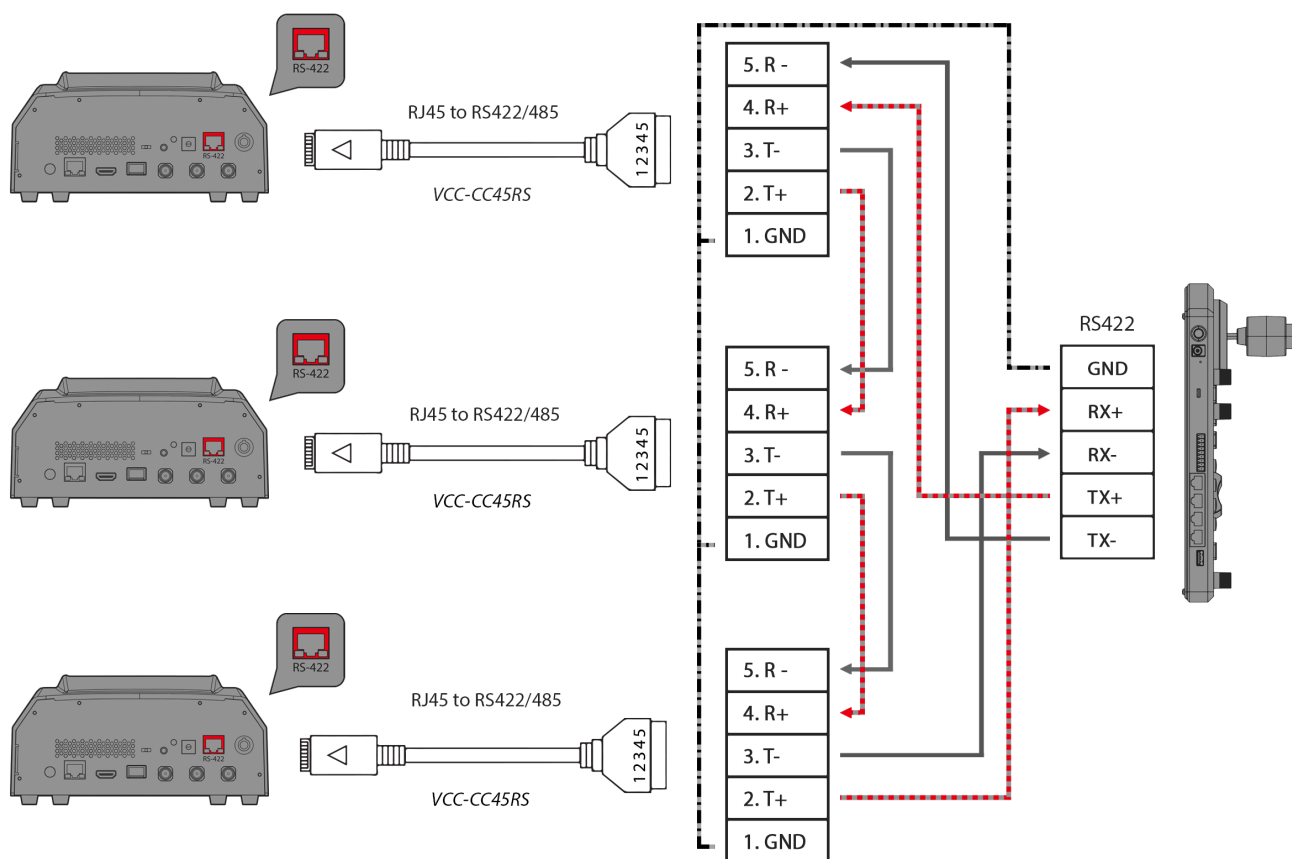| 1	RX-	Orange/White
2	RX+	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	-	Green
7	TX-	Brown/White
8	TX+	Brown

NOTE: Please refer to the KBD-1010-RNV user guide for instructions on how to establish an RS422 connection with the controller.

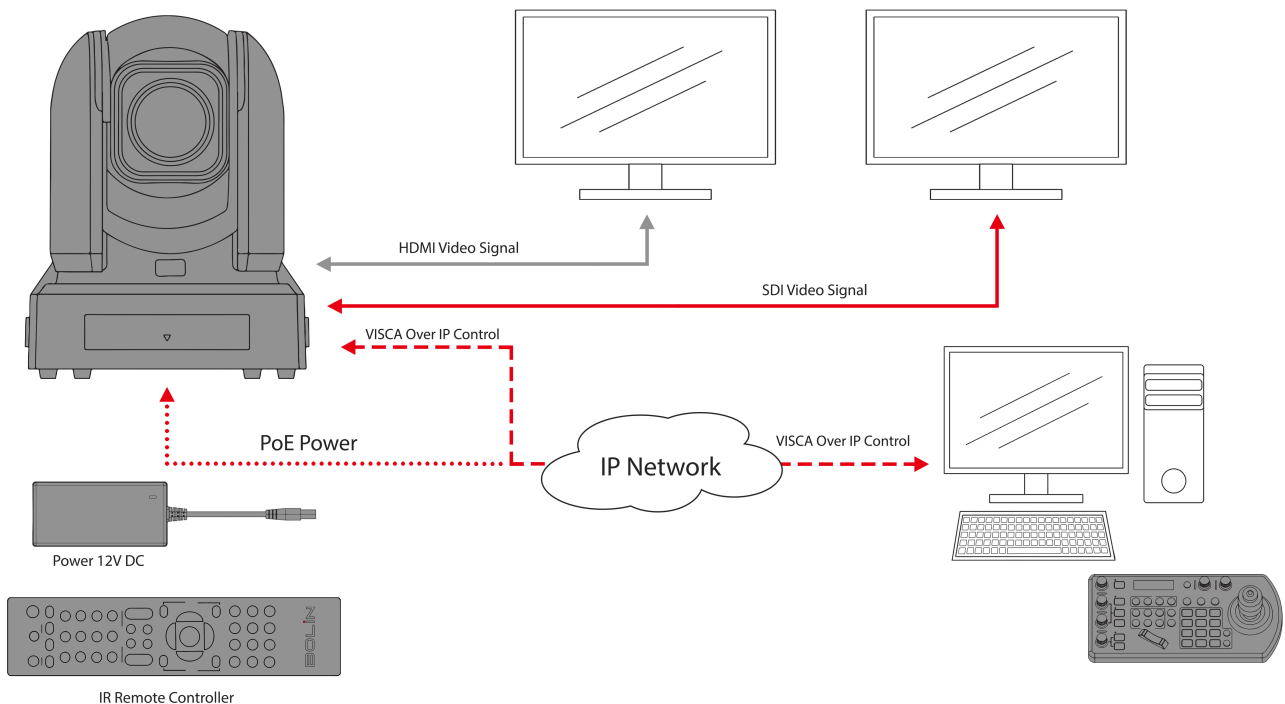## Use RS-422 (VISCA) / RS485 (PELCO P/D)

For camera operations, the RS-422/485 port can be utilized to connect controllers, such as a joystick keyboard or a PC station. This allows for the effortless management of pan, tilt, and zoom functions, as well as access to all preset functions using the controller's buttons.

To operate a PC station, it is essential to have a software application that is compatible with this unit.

HDMI Video Signal

SDI Video Signal

Remote Control Signal

RS422(VISCA) or
RS485(Pelco P/D)

IR Remote Controller

SONY Keyboard RS422 Connection

Guide for Establishing RS422 Connection and Daisy Chain Configuration for Multiple Cameras with a SONY Controller.

Sony Keyboard

Camera

5	GND
4	T+
3	T-
2	R+
1	R-

1	
2	
3	
4	
5	GND
6	RXD IN-
7	RXD IN+
8	TXD IN-
9	TXD IN+

Sony Keyboard Connection

Keyboard

| RX- | RX+ | TX- | TX+ | GND |

Camera 1

| RX- | RX+ | TX- | TX+ | GND |

Camera 2

| RX- | RX+ | TX- | TX+ | GND |

Camera 7

| RX- | RX+ | TX- | TX+ | GND |

RS422 (VISCA) Daisy Chain Multiple Cameras Connection (Sony Keyboard)
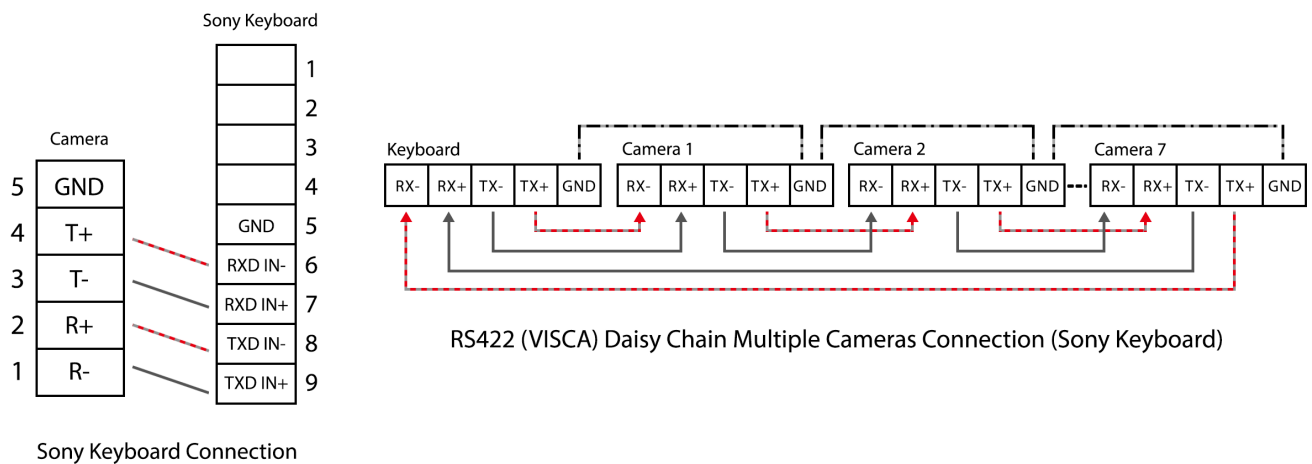
VISCA (Non-Sony) Keyboard RS422 Connection

Guide for Establishing RS422 Connection and Daisy Chain Configuration for Multiple Cameras with a Non-Sony Controller:

Camera / **VISCA Keyboard**

Camera		VISCA Keyboard	
5	GND	GND	1
4	TXD IN+	RXD IN-	2
3	TXD IN-	RXD IN+	3
2	RXD IN+	TXD IN-	4
1	RXD IN-	TXD IN+	5

VISCA Keyboard Connection

Keyboard					Camera 1					Camera 2					Camera 7				
RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND

RS422 (VISCA) Daisy Chain Multiple Cameras Connection
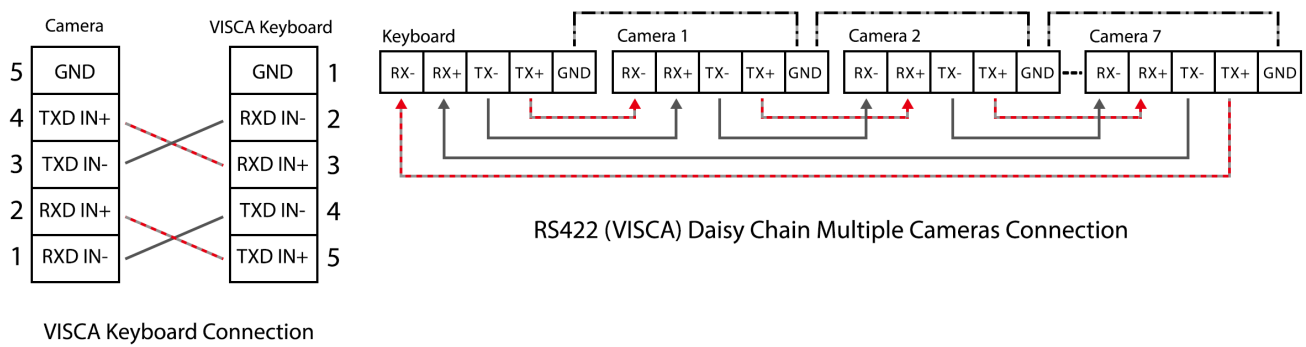
The included extension cables, along with the RJ45 to RS422 Phoenix connector adapter, should be utilized to establish an RS422 connection for the control device.

RS-422

VCC-CC45RS   1 2 3 4 5

| 5 R- |
| 4 R+ |
| 3 T- |
| 2 T+ |
| 1 GND |
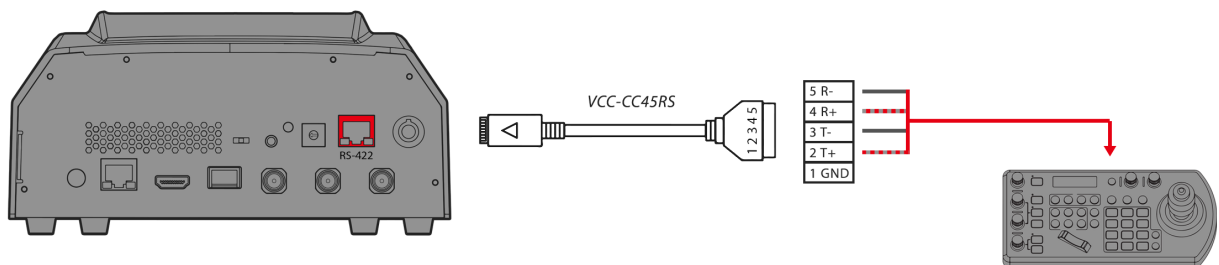
NOTE: Please refer to the KBD-1010-RNV user guide for instructions on how to establish an RS422 connection with the controller.

Guide to creating an RS422 Daisy Chain Connection for Multiple Cameras with an RS422 Standard Serial Port Controller.
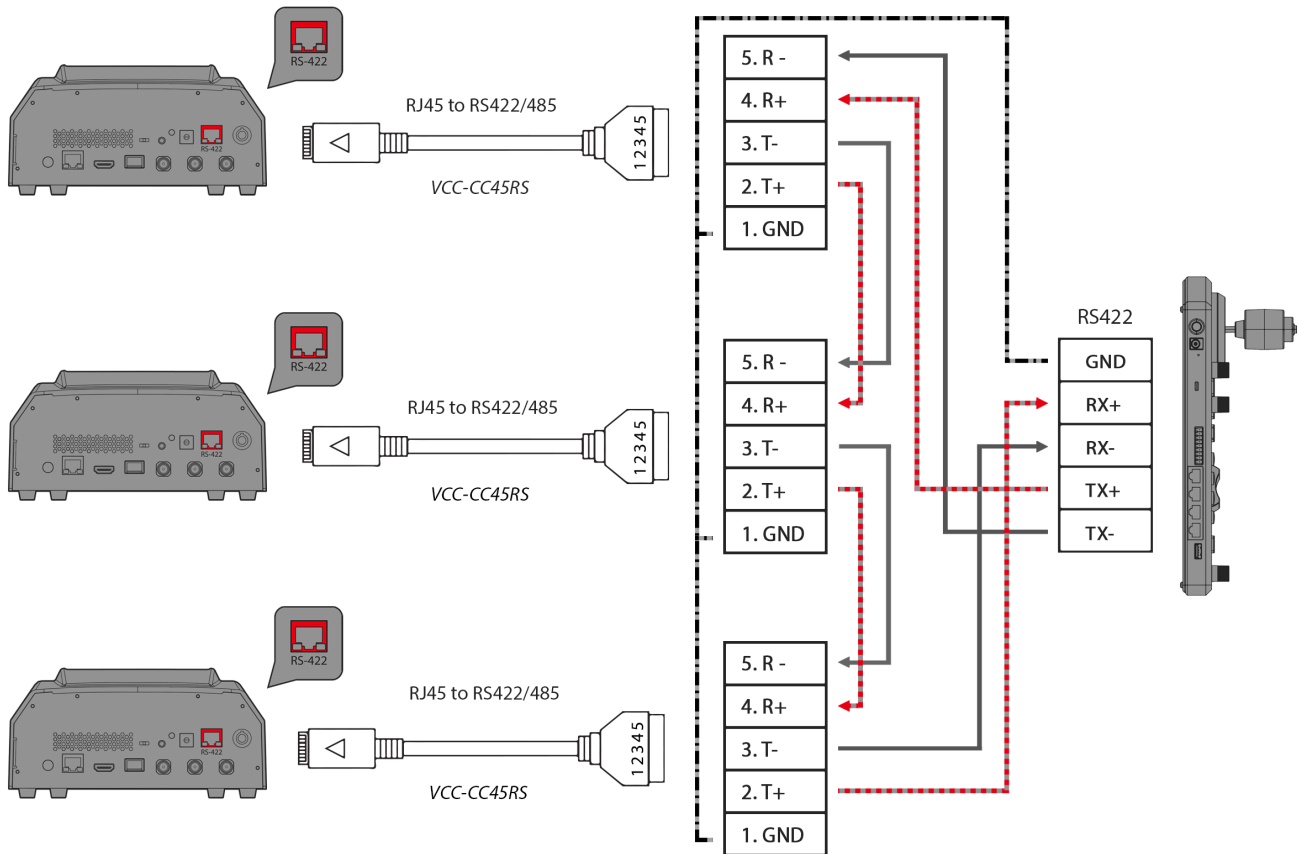
PELCO P/D Keyboard RS485 Connection

Important: Utilize RS422 ports when establishing an RS485 connection. Only employ TX+ and TX- for RS485 connections.

• Set the RS422 control method using the OSD menu or Web interface.

• Set the camera ID on the OSD menu using the remote controller.

• To ensure the settings have been applied, restart the camera by switching it off and then back on.

• Use a PELCO P/D compatible keyboard for seamless integration.

• Utilize preset # 95 on the keyboard to access/exit the camera OSD menu.

• Navigate the OSD menu using the joystick and buttons "OPEN" or "CLOSE."

• For the keyboard operation details, refer to the user manual of the specific keyboard in use.

PELCO RS485 Connection

RS485 PELCO P/D Keyboard Connection

RS485 PELCO P/D Multiple Cameras Connection
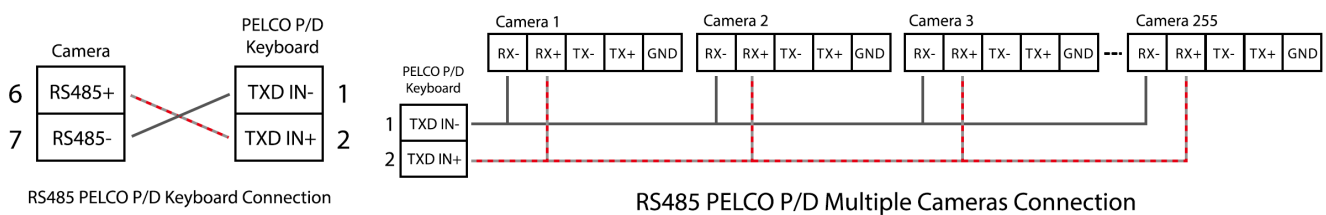
Utilize extension cables that come with an RJ45 to RS422 Phoenix connector adapter to establish an RS485 connection for your control device.
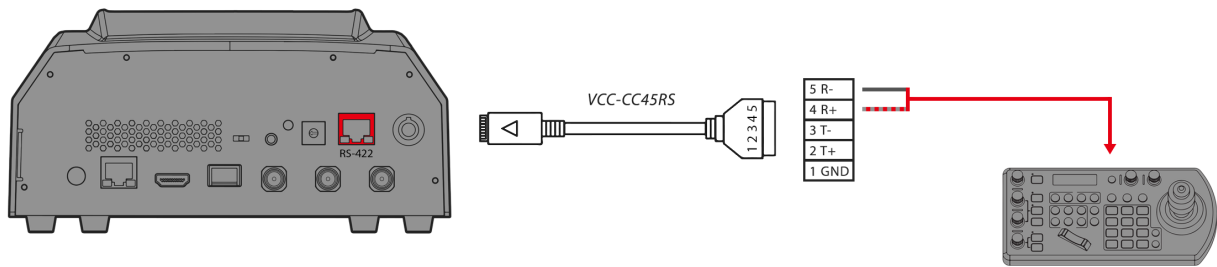
The extension cables that are provided, along with the RJ45 to RS422 Phoenix connector adapter, should be utilized to establish an RS422 connection for the control device.

1	RX-	Orange/White
2	RX+	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	-	Green
7	TX-	Brown/White
8	TX+	Brown
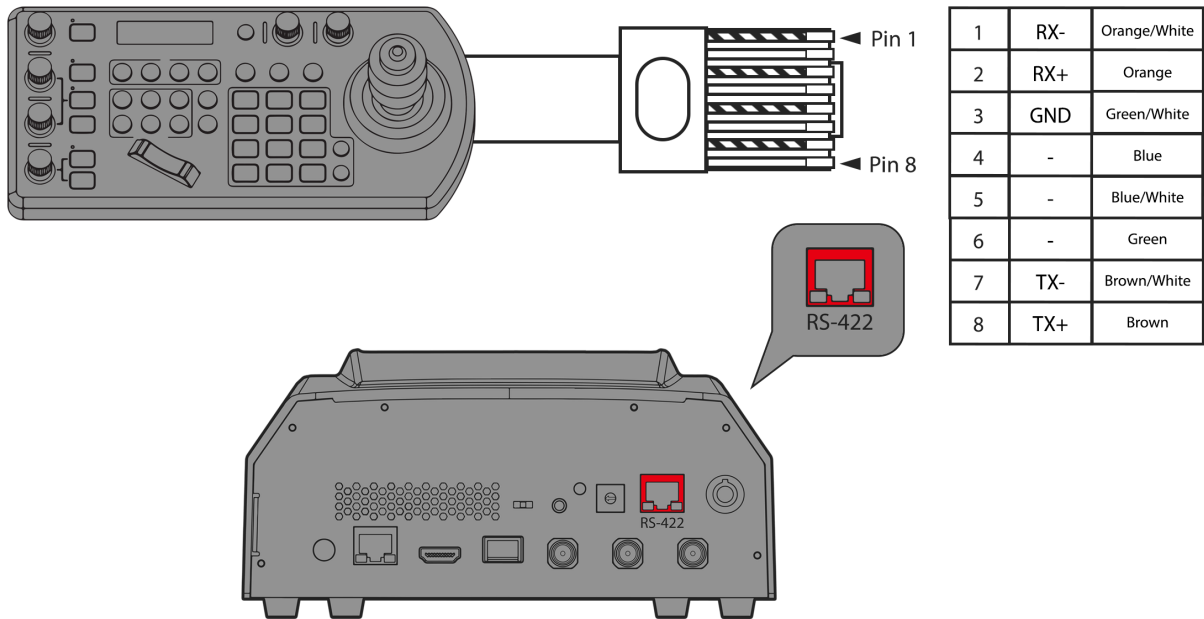
Alternatively, you can establish an RS485 connection by directly connecting the camera and the controller using a CAT5/6 T-568B Standard Ethernet cable.

RS-422

RJ45 to RS422/485

VCC-CC45RS

1 2 3 4 5

RJ45 to RS422/485

VCC-CC45RS

1 2 3 4 5

RJ45 to RS422/485

VCC-CC45RS

1 2 3 4 5

| 5. R - |
| 4. R+ |
| 3. T- |
| 2. T+ |
| 1. GND |

| 5. R - |
| 4. R+ |
| 3. T- |
| 2. T+ |
| 1. GND |

| 5. R - |
| 4. R+ |
| 3. T- |
| 2. T+ |
| 1. GND |

RS422

| GND |
| RX+ |
| RX- |
| TX+ |
| TX- |

Camera

| 6 | RS485+ |
| 7 | RS485- |

PELCO P/D Keyboard

| TXD IN- | 1 |
| TXD IN+ | 2 |

RS485 PELCO P/D Keyboard Connection

PELCO P/D Keyboard

| 1 | TXD IN- |
| 2 | TXD IN+ |

Camera 1					Camera 2					Camera 3					Camera 255				
RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND	RX-	RX+	TX-	TX+	GND

RS485 PELCO P/D Multiple Cameras Connection

VISCA over IP

Using VISCA over IP allows users to control the camera from anywhere that is on the same LAN as the camera. It involves connecting the PTZ camera to a network switch. The steps are as follows:

1. Connect the camera to the network by inserting one end of a CAT6 cable into the 10/100/1000 LAN port of the camera and the other end into a network switch.

2. Configure the camera's IP address and related network settings to properly communicate with your network and PTZ Controller.

3. Connect a PTZ Controller that supports VISCA over IP to the network with a CAT6 cable.

4. Configure the controller's IP address and related network settings to properly communicate with your network and PTZ camera. Then enter the camera's IP address and VISCA over IP port settings into the controller to access the camera.

HDMI Video Signal

SDI Video Signal

VISCA Over IP Control

PoE Power

IP Network

VISCA Over IP Control

Power 12V DC

IR Remote Controller

> 📒**NOTE:** **Factory-Default Camera Settings for control of VISCA over IP**
> Static IP Address: 192.168.0.13
> Subnet Mask: 255.255.255.0
> Gateway: 192.168.0.1
> VISCA over IP Control Port: 52381
> To change these settings, refer to the Web Interface Configuration section of this guide.

> 📒**NOTE:** The VISCA over IP port of the controller MUST be set to 52381 to communicate with and control the camera.

ONVIF Protocol

Bolin PTZ cameras support **ONVIF 2.4 (Profile S/G/T)**, ensuring compatibility with a wide range of third-party applications, including PTZ controllers and streaming software. These cameras use the **standard ONVIF port 2000** for communication.

ONVIF compliance enables **device discovery, video streaming, and PTZ control**, making these cameras ideal for **live production, broadcasting, and professional AV workflows**.

Integrating with ONVIF-Supported Software:

1. Ensure the camera is connected to the network and properly configured.

2. Use an ONVIF-compliant application to detect the camera.

3. Enter the camera's **IP address, ONVIF credentials (web login credentials), and port 2000** during setup.

4. Configure video and PTZ settings as needed for the application.

ONVIF 2.4 (Profile S/G/T)
ONVIF Port: 2000
<u>Audio Input</u>

The camera features an industry-standard 10-pin LEMO connector to embed balanced audio. Users can choose to use a third-party breakout cable or purchase Bolin's 10-Pin LEMO to XLR breakout cable (BLA-10). Once connected and activated from the Web Interface or OSD Menu, the audio will be embedded into the camera's HDMI, SDI, and IP streams. To connect an audio source to the camera, follow these steps:

1. Obtain a 10-pin LEMO to XLR breakout cable. Plug the male LEMO connector of the breakout cable into the female LEMO connector that is labeled as "Balanced Audio In/Out" on the back of the camera.

2. Using XLR cables, connect the output of the audio source (microphone, audio mixer, speaker, etc...) into the two female XLR connectors of the breakout cable.

3. To enable the audio and configure the audio levels, log into the camera's web interface or open the OSD menu.

> ⓘ**CAUTION:** Be sure to enable the audio input through the Web Interface or OSD Menu. Otherwise, your video streams will not have audio.

> 📒**NOTE:** Disregard the two male XLR connectors on the breakout cable. The audio output through XLR is not active.

> 📒**NOTE:** The 3.5mm audio jack on the back of the device is for intercom (comms) use and is currently inactive. This feature will be enabled later.

Synchronization (Genlock)

Genlock (Generator Locking) is an external synchronization signal input, which supports BBS (Black Burst Sync) and tri-level synchronization. External synchronization (genlock) can be applied to achieve precise frequency-locked video signals where every device (audio and video) knows when a frame starts and ends. Genlock is an industry standard and conforms to SMPTE standards.
To connect a genlock signal to your camera, follow these steps:

1. Connect one end of a 75-ohm SDI cable with BNC connectors into the "Genlock" port of the camera.

2. Connect the other end of the 75-ohm SDI cable with BNC connectors to a device that is outputting the Genlock signal or providing timing reference (Sync Generator, Video Switcher, Audio Mixer, etc...)

3. Open the camera's OSD menu and turn on External Synchronization. Other Genlock settings can be configured in this menu as well.

> ⓘ**CAUTION:** Once the Genlock cable is connected, make sure to enable Genlock in the camera's menu. Otherwise, the camera may not be synchronized with the rest of the system.

> 📒**NOTE:** External synchronization is performed using SDI only. Synchronization is not possible using the HDMI video signal or the IP video signal.

Tally Light

Tally Light GPI I/O connection
The camera is equipped with two Tally lights, serving as visual indicators. When illuminated, these lights signal that the camera is actively operational. One front Tally light improves visibility, and an additional Tally

light positioned behind the camera block improves rear visibility. To activate the camera's Tally Light function, you need a video switch and a keyboard (not included).

GPI connection with RS422 VISCA control connection

Cable Configuration:

1. Set up a standardized RS-422 daisy chain control connection to seamlessly control multiple cameras from the keyboard controller. (For detailed RS422 control information, refer to the Keyboard Controller user guide.)
2. Established a Tally/Contact Function cable connection between the Keyboard Controller and the Video Switcher (Sony).

Keyboard Side   Video Switch Side

TALLY/ CONTACT

Pin No.	Function
1	CAMERA 1
2	CAMERA 2
3	CAMERA 3
4	CAMERA 4
5	CAMERA 5
6	CAMERA 6
7	CAMERA 7
8	GND
9	GND
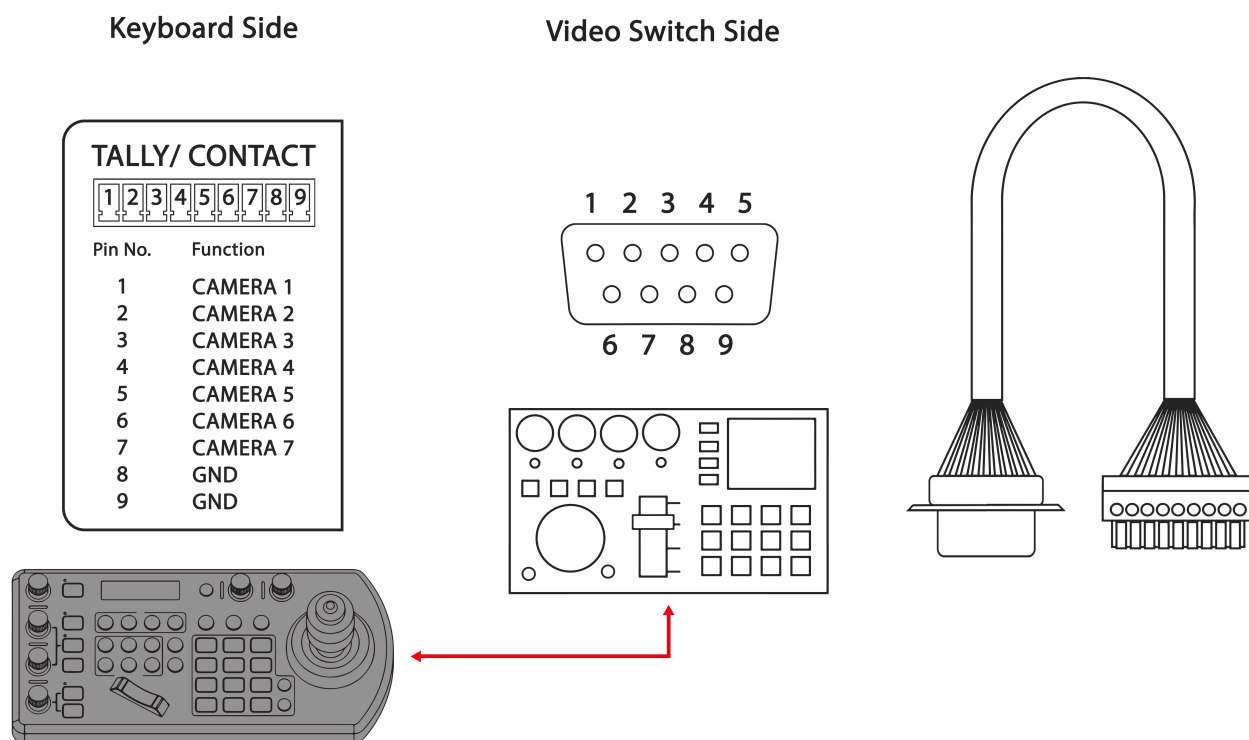
1. On the keyboard side, connect pins 1-8. On the Video Switch side, connect pins 1-9, excluding pin 8.
2. Link keyboard pin 8 with video switch pin 9.
3. Connect keyboard pin 1 to video, switch pin 1, pin 2 to pin 2, and continue similarly (you can decide the rest based on the pattern), ensuring pin 7 is connected to pin 7.

Set Up

1. GPI I/O Input Mode for Tally Signal from Video Switch:
   a. Connect the camera to the keyboard using a standard RS-422 control cable.
   b. Establish a connection between the keyboard and the video switch using a tally function cable.
   c. Navigate to KEYBOARD SETTING > GPI I/O > Setting, and switch it to Input mode. Exit to the home directory.
   d. After completing the above steps, you can switch between cameras using the video switch. For instance, selecting camera 1 on the video switch sends a tally signal to the keyboard via the tally function cable. The keyboard then transmits this tally signal to camera 1 through the standard RS-422 control cable, activating camera 1's tally light. The keyboard can now control camera 1's pan and zoom.
   e. If you switch to camera 2 on the video switch, the tally light for camera 2 will turn on, and the tally light for camera 1 will turn off.

RS-422 Control Signal

Camera Video Signal (HDMI/SDI)

Tally/Contact signal

Tally/ Contact signal
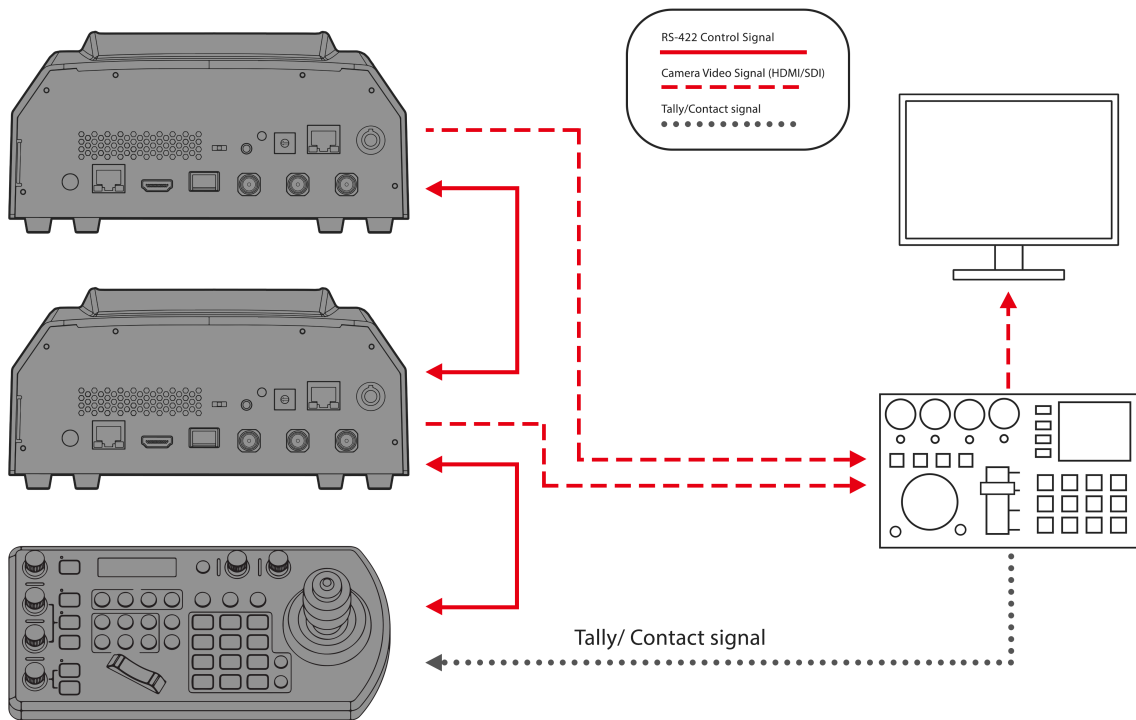
2. GPI I/O Output Mode for Tally Signal Sent by Keyboard Controller:

    a. Connect the camera to the keyboard using a standard RS-422 control cable.
    b. Navigate to KEYBOARD SETTING > GPI I/O > Setting, and switch it to Output mode. Exit directly to the home menu.
    c. After completing the above operation, you can switch between different cameras using the keyboard. For instance, selecting camera 1 on the keyboard sends a tally signal to camera 1 via the standard RS-422 control cable. As a result, camera 1's tally light turns on, and the keyboard gains control over camera 1's pan and zoom.
    d. If you switch to camera 2 on the keyboard, the tally light for camera 2 will turn on, and the tally light for camera 1 will turn off.

RS-422 Control Signal

Camera Video Signal (HDMI/SDI)
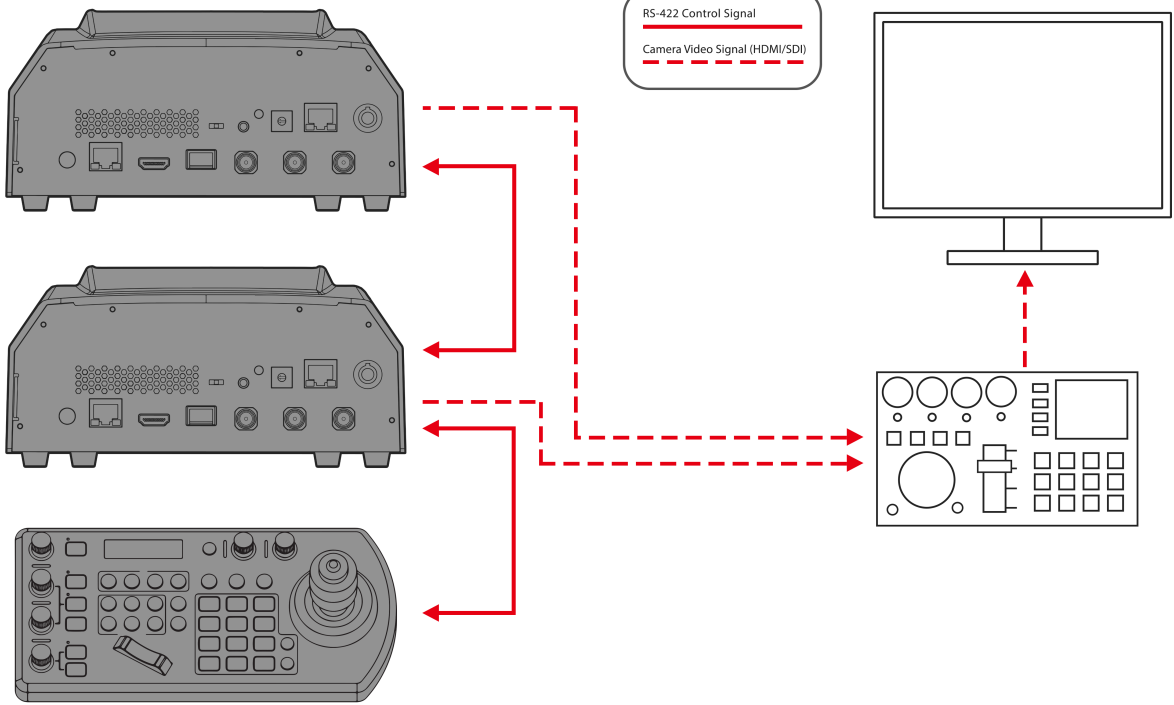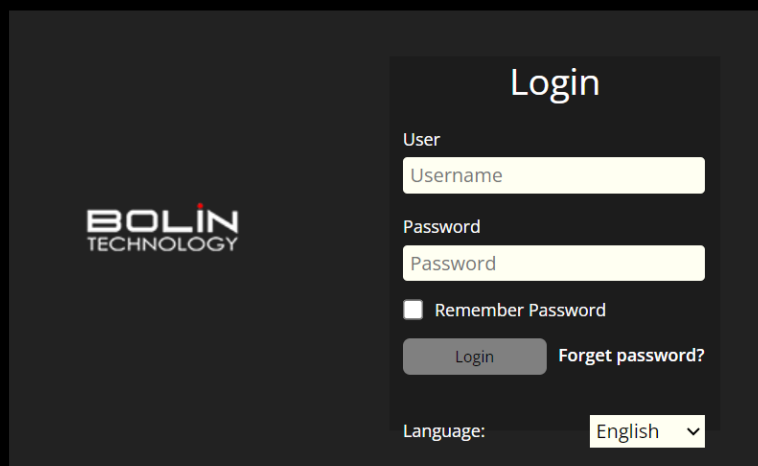
Web Interface Configuration

Once connected to the network, the camera can be configured and controlled through the web interface on any web browser that supports HTML5. This next section will explain the various sections of the web interface and what they can do.

Web Interface Login

To log in to the web interface, first, make sure that the camera is connected to the network and the computer is on the same subnet as the camera.

Factory-Default Camera Network Settings:

Static IP Address: **192.168.0.13**
Subnet Mask: **255.255.255.0**
Gateway: **192.168.0.1**

> 📋**NOTE:** To obtain the IP address of the camera, open the OSD Menu and scroll down to the Status section. Alternatively, download Bolin's IPC search tool from the website (www.bolintechnology.com) onto a Windows computer and run the tool to discover the camera on the network.

1. Once the camera's IP address has been obtained, the user should enter it into the web browser on their computer.

2. The user will be prompted to enter a username and password. By default, the credentials are:
   Username: admin
   Password: admin

3. Once the user enters the credentials, they should press the login button.

Live View

Once the user logs in to the camera, they will be taken to the Live View page. From the "Live View" page, the user will be able to:

- See a preview of the video output (NOTE: This feed will be delayed by 1–2 seconds.)

- Adjust and control PTZ functions

- Set and recall camera presets
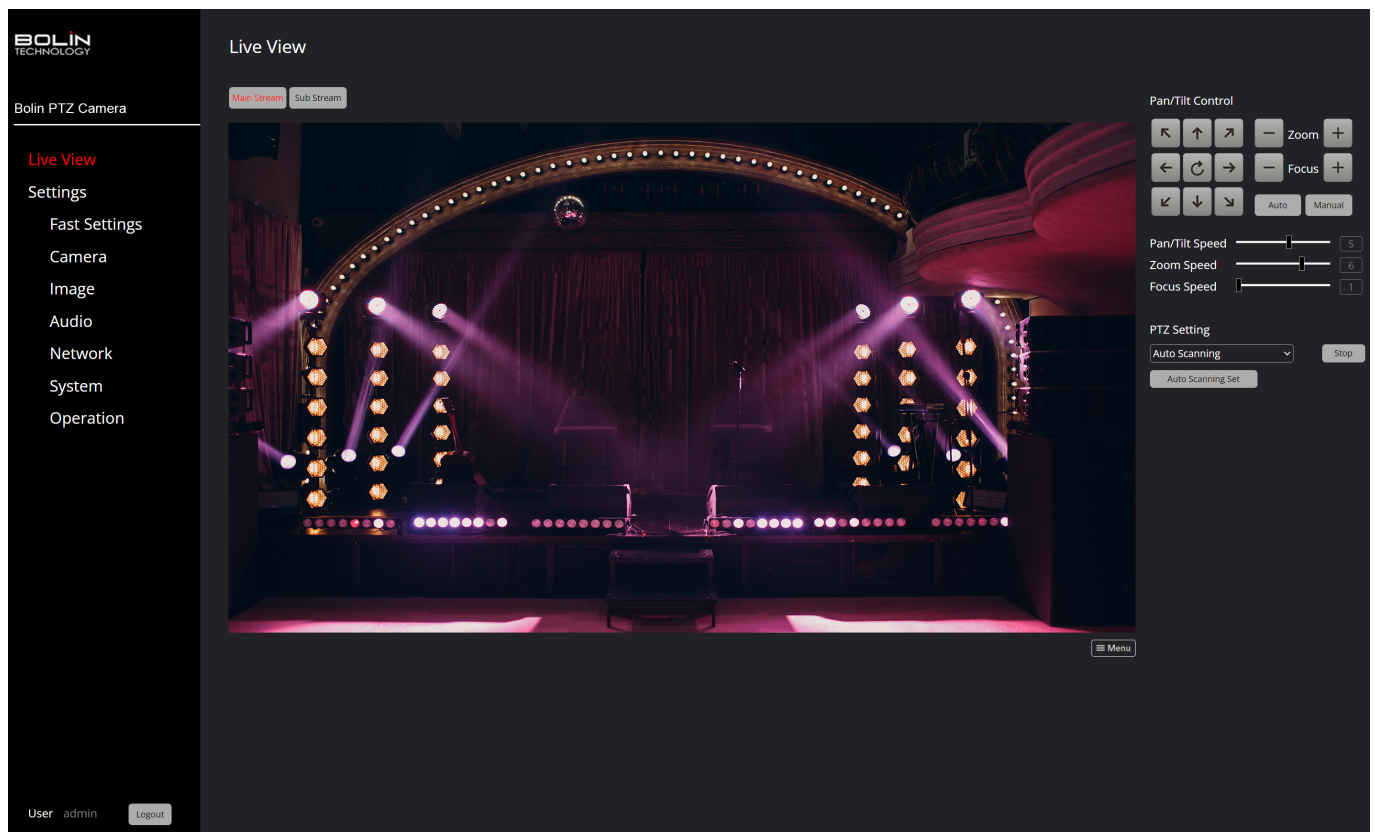
Adjusting and Controlling PTZ Functions

On the "Live View" page, the user will observe a "Menu" icon situated at the bottom right of the live view image. Additionally, on the right side of the page, there are "Pan/Tilt Controls". This section comprises a set of arrows and sliders, specifically designed to control the camera.

The arrows are utilized to pan (move side to side) and tilt (move up and down) the camera. The focus and zoom buttons are provided for the user to adjust the view. The user can zoom in (+) or out (-), and manually adjust the focus to be closer (+) or further (-).

Furthermore, there are speed-setting sliders that permit the user to alter the speed of the camera's movements, including pan, tilt, focus, and zoom. This allows the user to customize the camera's operations to suit their needs.

Within the **PTZ Setting** drop-down menu, the user will discover the following options:

1. **Auto-Scanning**: The camera image pans automatically from left to right or right to left at a speed defined by the user (Speeds 1-8).

2. **Preset**: The user can set and recall up to 64 camera presets (The camera supports saving a total of 255 presets). These presets can be recalled through the web interface, IR Remote, or PTZ Controller.

3. **Tracking**: The camera will record a series of presets that are recalled in a specified order.

4. **Scanning**: The camera image pans from left to right or right to left between up to 12 points defined by the user at a speed also defined by the user (Speeds 1-8).

5. **Power On Action**: Users can define a set of actions that a camera performs (preset recall, scan, trace, or cruise) once powered on.

6. **Cruise**: The camera will record a series of movements that an operator makes, which can then be recalled whenever a user prefers.

Creating and Recalling Presets

To save presets, the user should adhere to the following steps:

1. Utilize the PTZ controls of the web interface, IR controller, or a PTZ controller to adjust the camera to the

position(s) they wish to save as a preset.

2. After positioning the camera, click on the 'Create' button. Subsequently, select the preset number under which they want to save this setting. Label the preset in the 'Name' field and click 'Save'.

3. To recall a preset, select the preset number on the Web Interface and click the "Go" button.

4. A saved preset can also be deleted by selecting it and clicking on the Delete button.

Adjusting OSD Menu Settings from the Web Interface

The OSD Menu settings can be accessed and adjusted from the Web Interface. On the "Live View" page, locate and click the "Menu" icon situated at the bottom right of the live view image to display the OSD menu. The user can navigate through these settings using the arrows under "Pan/Tilt Control". The middle button is used to select, and the right arrow button is used to modify the setting. To exit this menu, simply click on the "Menu" icon again. The settings available in this menu encompass:

- Adjust Exposure, White Balance, Picture (Noise Reduction, E-Flip, ND Filter, IR Filter), Gamma, Lens (Focus, Stabilization), Pan & Tilt, Genlock, System (Pelco, Visca, IR, Baud Rate, Tally, Audio, Video Format) settings, and view System Status.

SETTINGS

Fast Settings:

This section provides quick access to frequently used settings. The Fast Settings page has four tabs: Device, Network, Codec, and User. For more information about these settings, please refer to the corresponding section in this user guide.

Camera - Camera Setting

The Camera Setting page consists of 3 tabs: Codec, Output, and Overlay.

Codec

From the Codec tab, users can configure the video streams to meet their requirements. The various settings and their functions are described below.

Output

On the "Output" tab, users can define what resolution/frame rates, color space, bit depth, and color format they would like the camera's physical ports to output. Users can click the parameter they would like to modify and select from the drop-down menu. Once the desired settings have been chosen, click on the 'Save' button. At the bottom of this tab, there is a section for "Output Status" where users can see the settings of what is being output from the device.

NOTE: The "System Format" will set the highest resolution and frame rate for the camera. While the frame rates are the same, output resolutions are simultaneous and independent of each other. The HDMI, SDI/Optical Fiber, and IP outputs can be set to different resolutions without impacting

Overlay

The Overlay function is a feature that displays characters on your screen, enabling users to incorporate crucial information (either text or image) into their IP video feed.
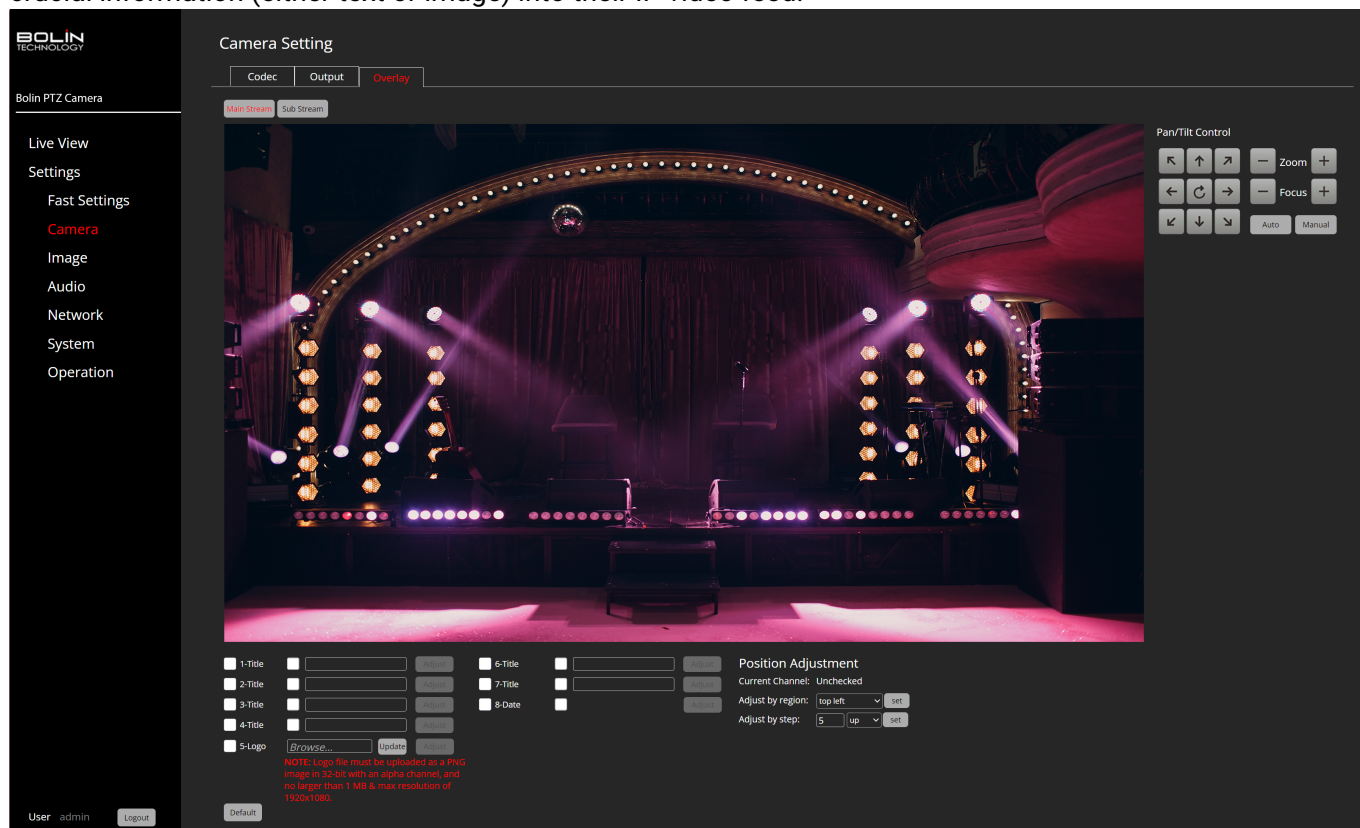
Steps to implement an on-screen overlay:

1. Begin by adding text to the title bar, such as in '1-Title', then click on the checkbox located furthest to the left (which will turn red with a white check mark) to display it on the live feed image.

2. The box closest to the text bar is initially set in white. To alter the text color, click on this box. The user can select from white, black, yellow, red, and blue.

3. To reposition the text within the live feed image, make use of the 'position adjustment' section situated on the left of the page.

4. The '5-logo' option allows the user to upload an image. The image must be in PNG format and have dimensions less than 1920x1080 pixels. Please note that this image will only be displayed on the user's main stream.

Image - Image Settings

The image settings page consists of 9 tabs. Exposure, White Balance, Picture, Color Matrix, Gamma, Lens, Pan Tilt, Genlock, and System.

Exposure

The Exposure menu is utilized for configuring settings associated with exposure.
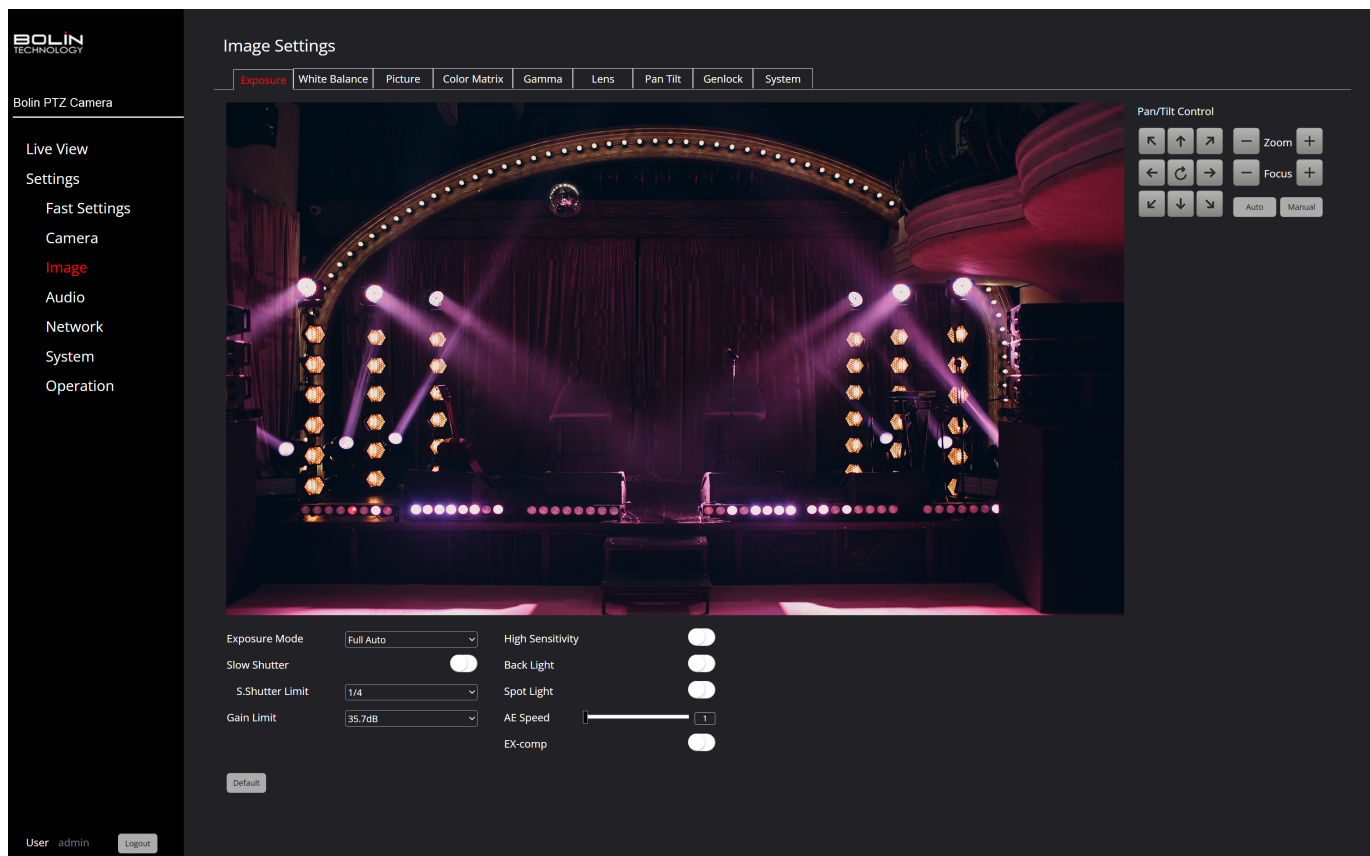
Exposure Mode:

- **Full Auto** mode, the Slow Shutter, S. Shutter Limit, Gain Limit, High Sensitivity, Backlight, Spotlight, AE Speed, and EX-Comp are all set automatically.

- **Manual mode**, to adjust Iris, Shutter Speed, Gain, and High Sensitivity settings manually.

- **Shutter pri**, the user has the ability to set the shutter speed. The iris and gain adjust automatically based on the subject's brightness. The exposure is also automatically adjusted using the values that the user manually sets for the electronics.

- **Iris pri**, In Iris Priority mode, the user has the flexibility to set the iris. The gain and shutter speed adjust automatically based on the brightness of the subject. The exposure is also automatically adjusted using the manually set values for the iris (IRIS), GAIN LIMIT, AE SPEED, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT, and EX-COMP.

White Balance

The white Balance menu is utilized for choosing the mode of white balance.

Image Settings

| Exposure | White Balance | Picture | Color Matrix | Gamma | Lens | Pan Tilt | Genlock | System |

Pan/Tilt Control

WB Mode   [Auto]

- Auto
- Indoor
- Outdoor
- OPW
- ATW
- User
- Outdoor Auto
- SVL Auto
- SVL
- SVL Outdoor Auto

[Default]
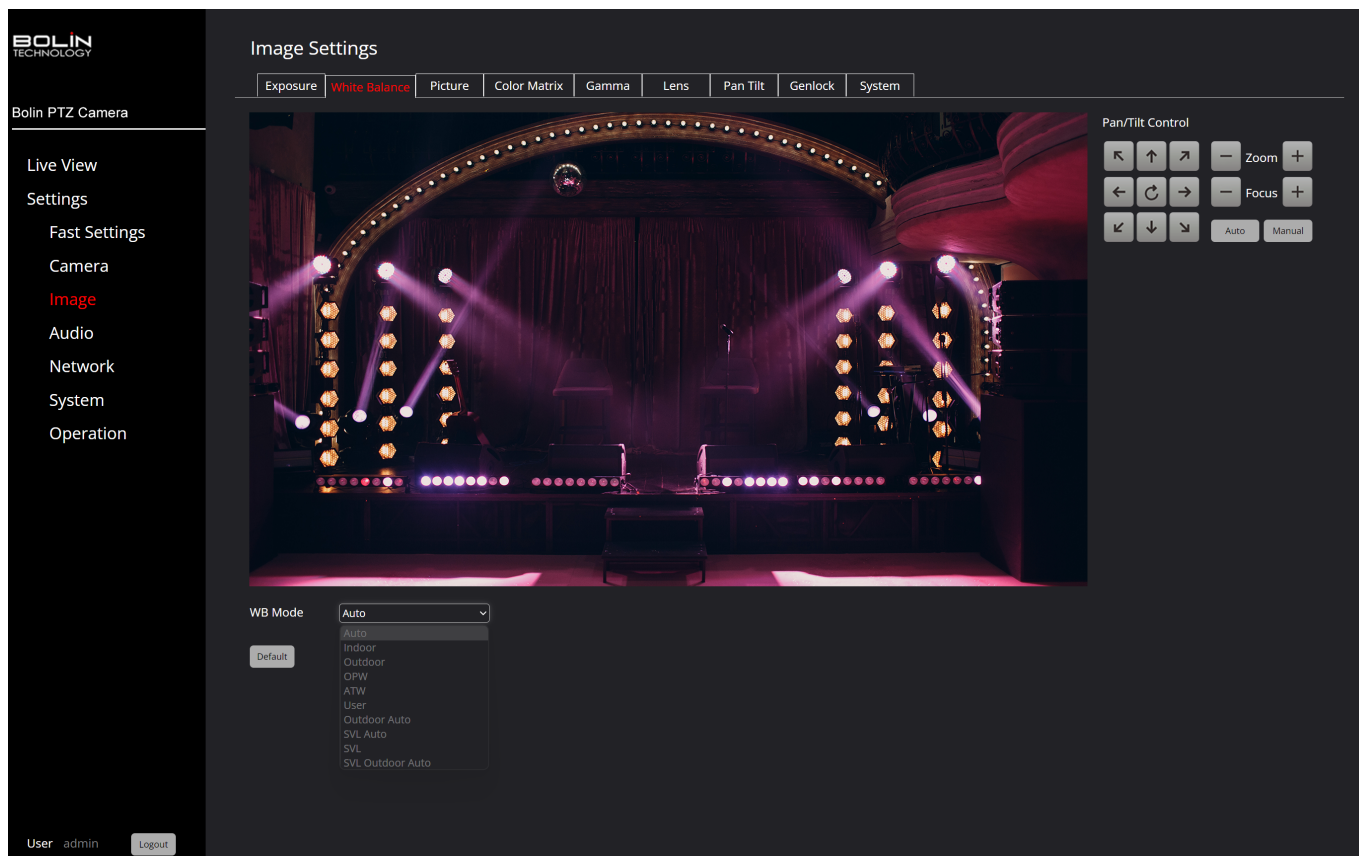
The white Balance menu is utilized for choosing the mode of white balance.

WB Modes include: Auto, Indoor, Outdoor, OPW, ATW, User, Outdoor Auto, SVL Auto, SVL, SVLOutdoor Auto.

Picture

The Picture page is to configure the various image parameters of the camera.

Image Settings

| Exposure | White Balance | Picture | Color Matrix | Gamma | Lens | Pan Tilt | Genlock | System |

Pan/Tilt Control

Sharpness	5	Color gain	153	Flip
2D NR	2	Hue phase	112	Mirror
3D NR	2	Chroma Suppress	Off	Flicker
Contrast	98	Scenes	Bright	HLC Mode
IR CUT Filter	Day			
Auto ICR	Off			

[Default]
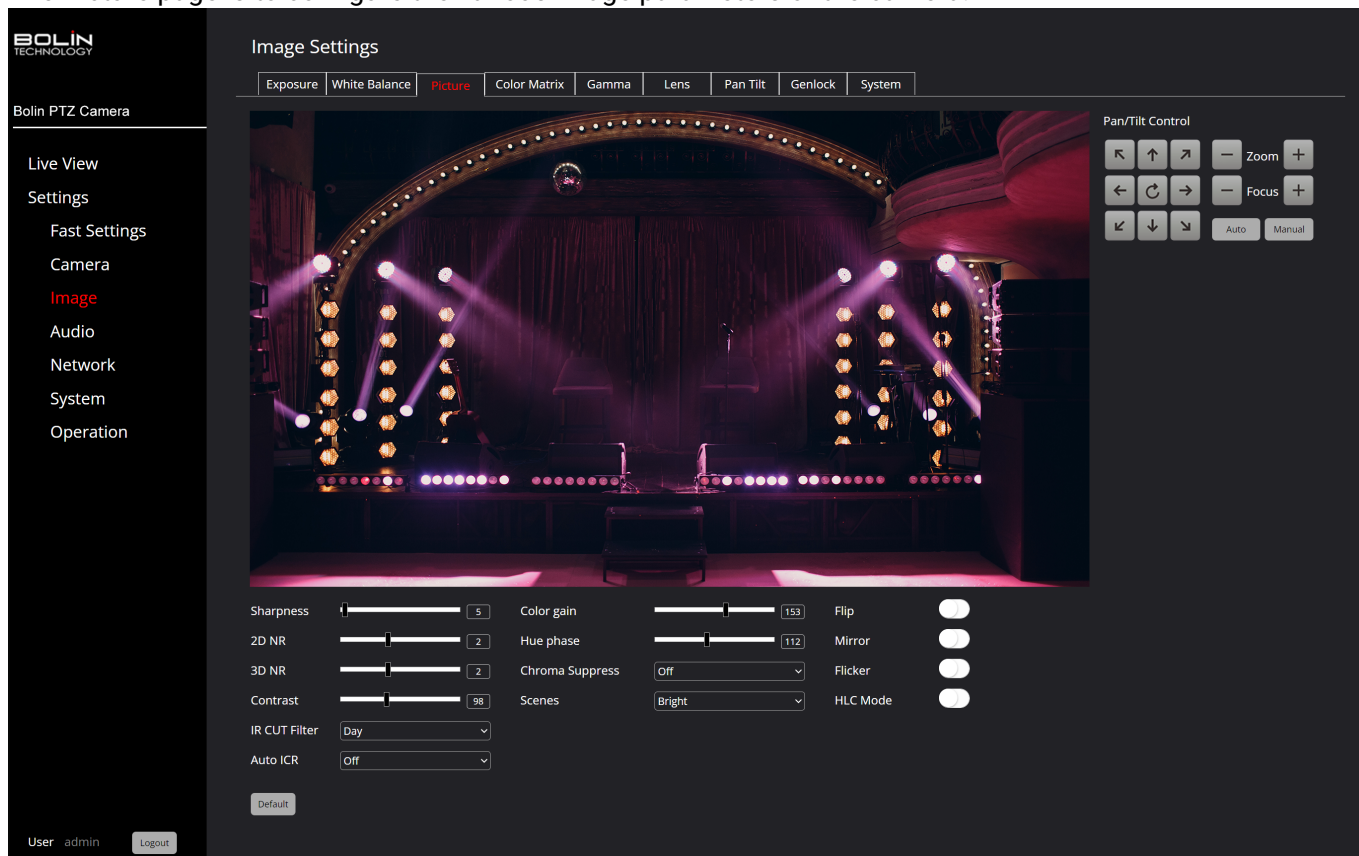
- **Sharpness**: This setting enhances the clarity of the detail in an image.

- **2D NR (2D Noise Reduction)**: This technique reduces noise in an image by comparing it frame by frame and eliminating variations that do not consistently appear in each frame.

- **3D NR (3D Noise Reduction)**: This technique diminishes noise by analyzing differences within a single frame and between consecutive frames. This method effectively reduces noise without creating trails behind moving objects.

- **Contrast**: This setting adjusts the difference between the lightest and darkest elements in an image.

- **IR CUT Filter (Infrared (IR) Cut-Filter)**: This filter can be removed from the image path to enhance sensitivity in low-light conditions. The IR Cut-Filter will automatically activate based on the surrounding light, enabling the camera to function effectively in both day and night settings. When the automatic IR Cut-Filter mode is set to NIGHT, the image will appear in black and white.

- **Auto ICR (Infrared Cut-Filter Removal)**: This feature in cameras enhances image quality in varying lighting conditions.

- **Color Gain**: This setting allows the user to adjust the amplification of the individual color components - Red, Green, and Blue. By adjusting the gain of these individual components, the user can achieve better contrast between close shades of the same color.

- **Hue Phase**: This setting is related to the color aspect of the video signal. The hue phase controls the tint of the color in the image.

- **Chroma Suppress**: This feature reduces color noise in the image, improving the image quality.

- **Scenes**: These refer to preset configurations that optimize the camera settings for specific shooting conditions.

- **Flip**: This setting allows the user to invert the image vertically.

- **Mirror Flicker**: This refers to the flickering effect in the live feed related to the frequency of artificial lighting and the camera's shutter speed.

- **HLC Mode (Highlight Compensation)**: This mode is used to prevent overexposure in the areas of the frame that are very bright.

Color Matrix
You can emphasize or weaken a specific color region while keeping the white convergence point unchanged.
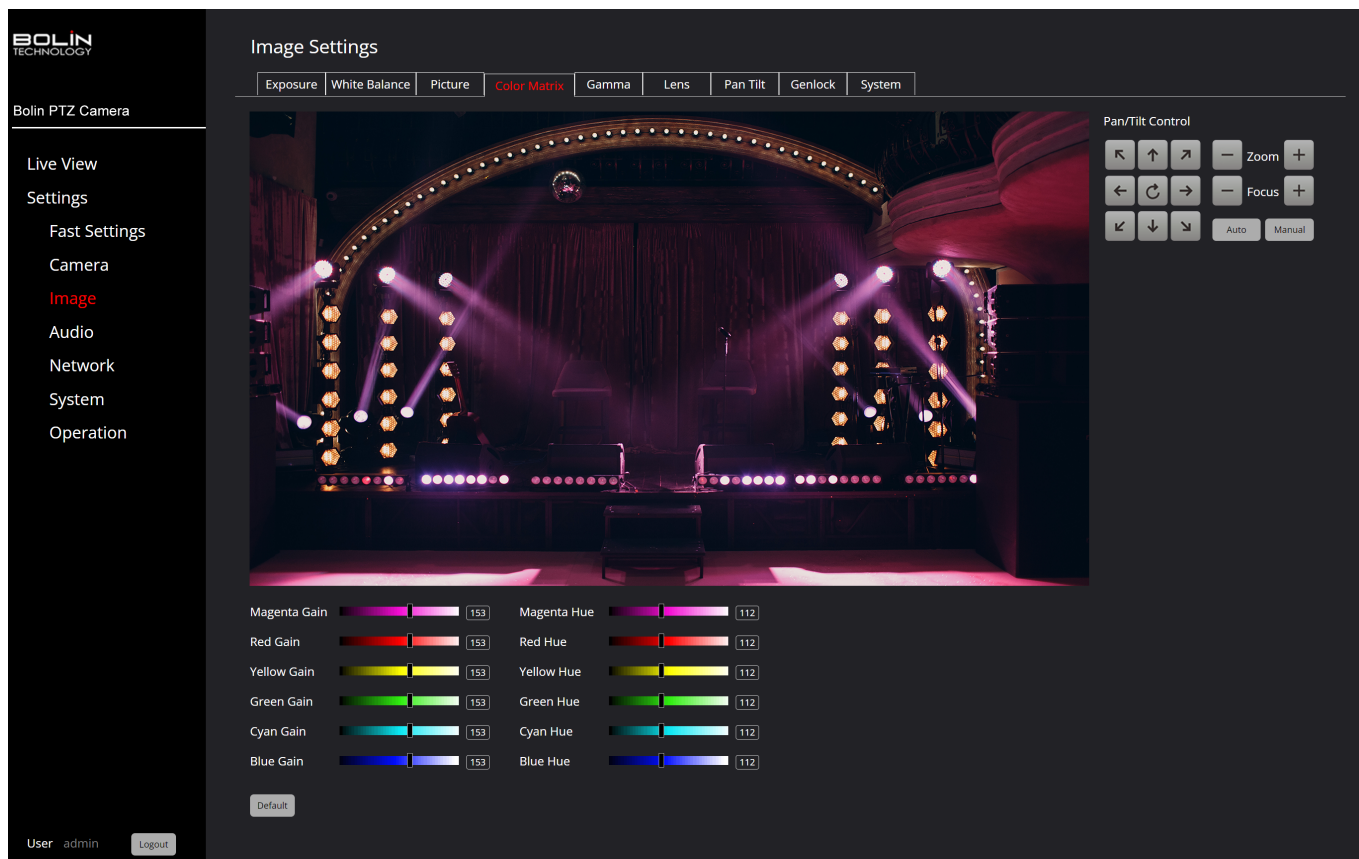
Gamma

The user is provided with the option to select the basic curve type for gamma correction.
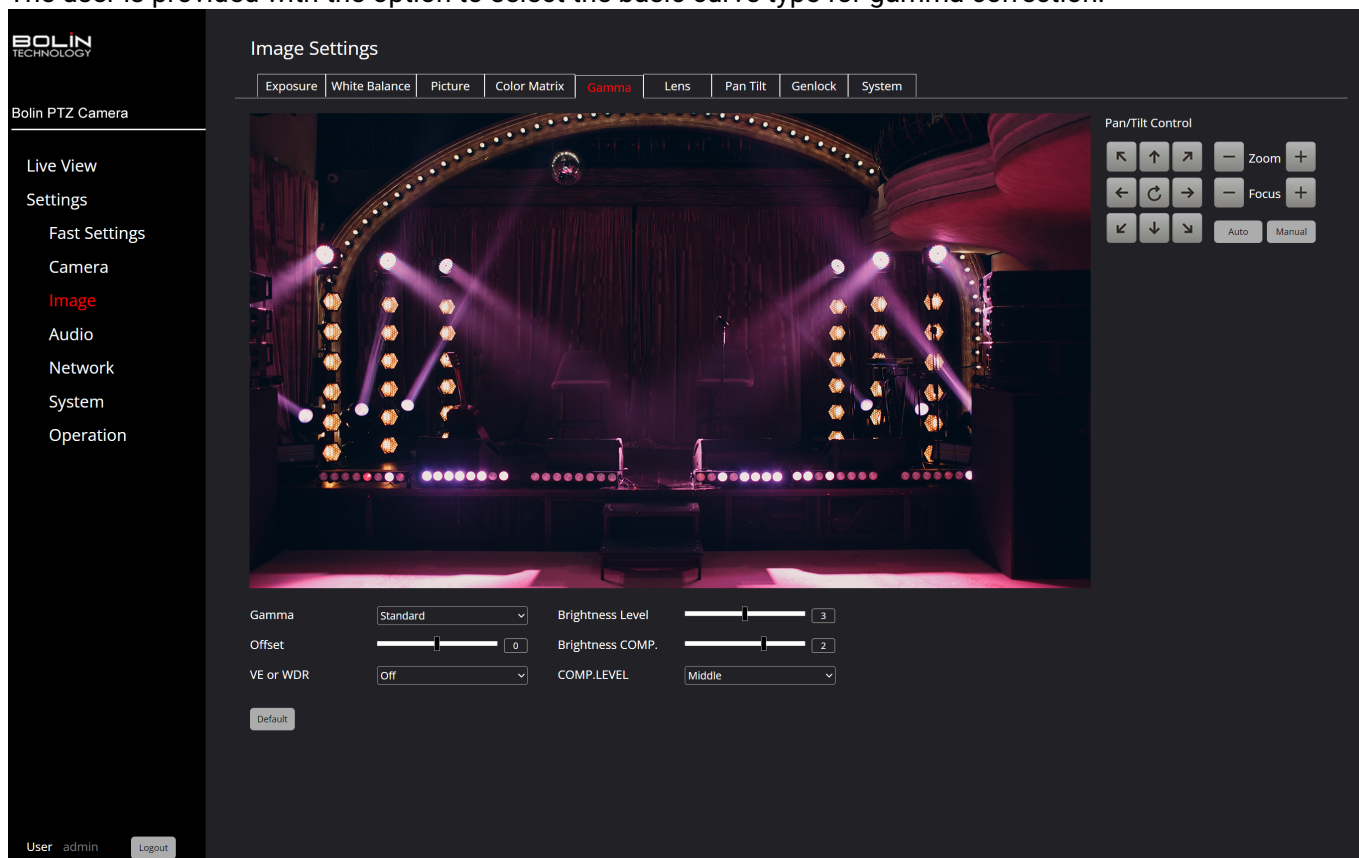
- **Gamma**: Setting Gamma in standard mode is equivalent to setting it in movie mode.

- **Straight**: This option permits the user to select a straight GAMMA curve.

- **Pattern**: This option allows the user to select a gamma curve from 512 patterns stored in the camera. The pattern can be specified using the PATTERN and PATTERN FINE settings. The PATTERN setting defines the first two digits of the pattern number, while PATTERN FINE defines the last digit.

- **Offset**: The user can select the offset of the output level of gamma curves. They can choose a value from −64 to 0 to +64.

- **VE or WDR (Visibility Enhancer or Wide Dynamic Range)**: This function in the camera adjusts according to the imaging scene. It brightens the darker areas of an image and automatically corrects brightness and contrast to display the brighter parts.

- **Brightness Level**: This feature allows the user to adjust the brightness of the camera's display.

- **Brightness COMP. (Brightness Compensation)**: This feature allows users to override exposure settings picked by the camera's light meter to darken or brighten images before they are captured.

- **COMP. Level (Compensation Level)**: This setting allows the user to adjust the camera's exposure settings to either brighten or darken the image.

Lens

The Lens page is to configure the various lens parameters of the camera.
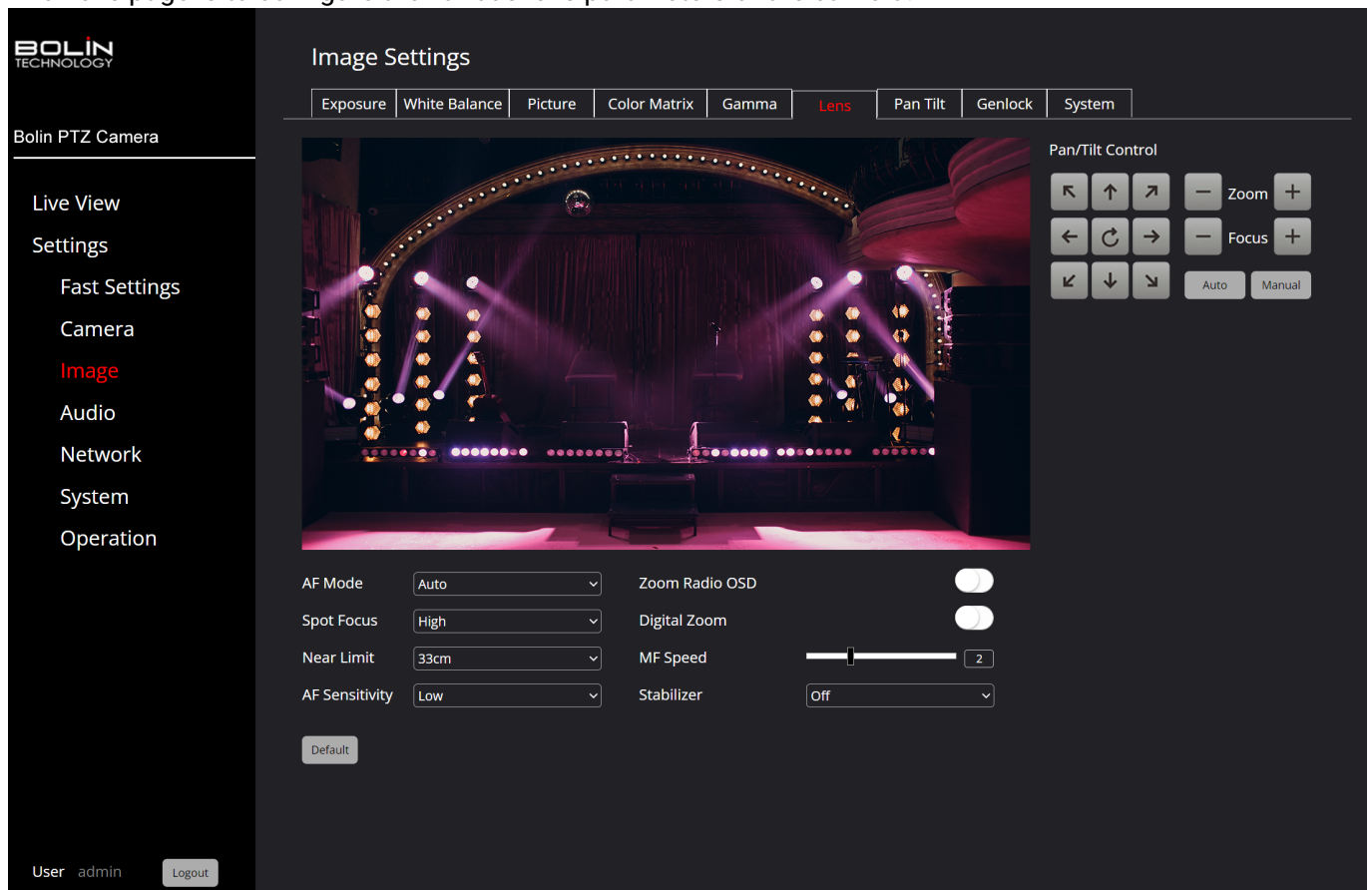
- **AF Mode**: Allows selection of the autofocus mode based on shooting conditions.

- **Spot Focus**: Enables selection of a specific area in the frame for autofocus priority.

- **Near Limit**: Sets the minimum distance for the camera's focus.

- **AF Sensitivity**: Adjusts the speed of autofocus response to scene changes.

- **Zoom Ratio OSD**: Displays the zoom ratio on the screen.

- **Digital Zoom**: Offers digital magnification of the image.

- **MF Speed**: Controls the speed of manual focus adjustments.

- **Stabilizer**: Designed to minimize camera shake and ensure smooth, clear images. This feature can be activated by selecting either the Super or Super+ options. The stabilizer is set to Super it provides an elevated level of steadiness, ensuring superior video quality even in challenging conditions. When the Stabilizer is set to Super+, it offers an even more enhanced level of stabilization, which is particularly useful in situations where there is significant camera movement, such as when shooting in a moving car or in high-wind conditions.

Pan Tilt

The Pan Tilt page is utilized to designate the desired mode for pan, tilt, and zoom operations.
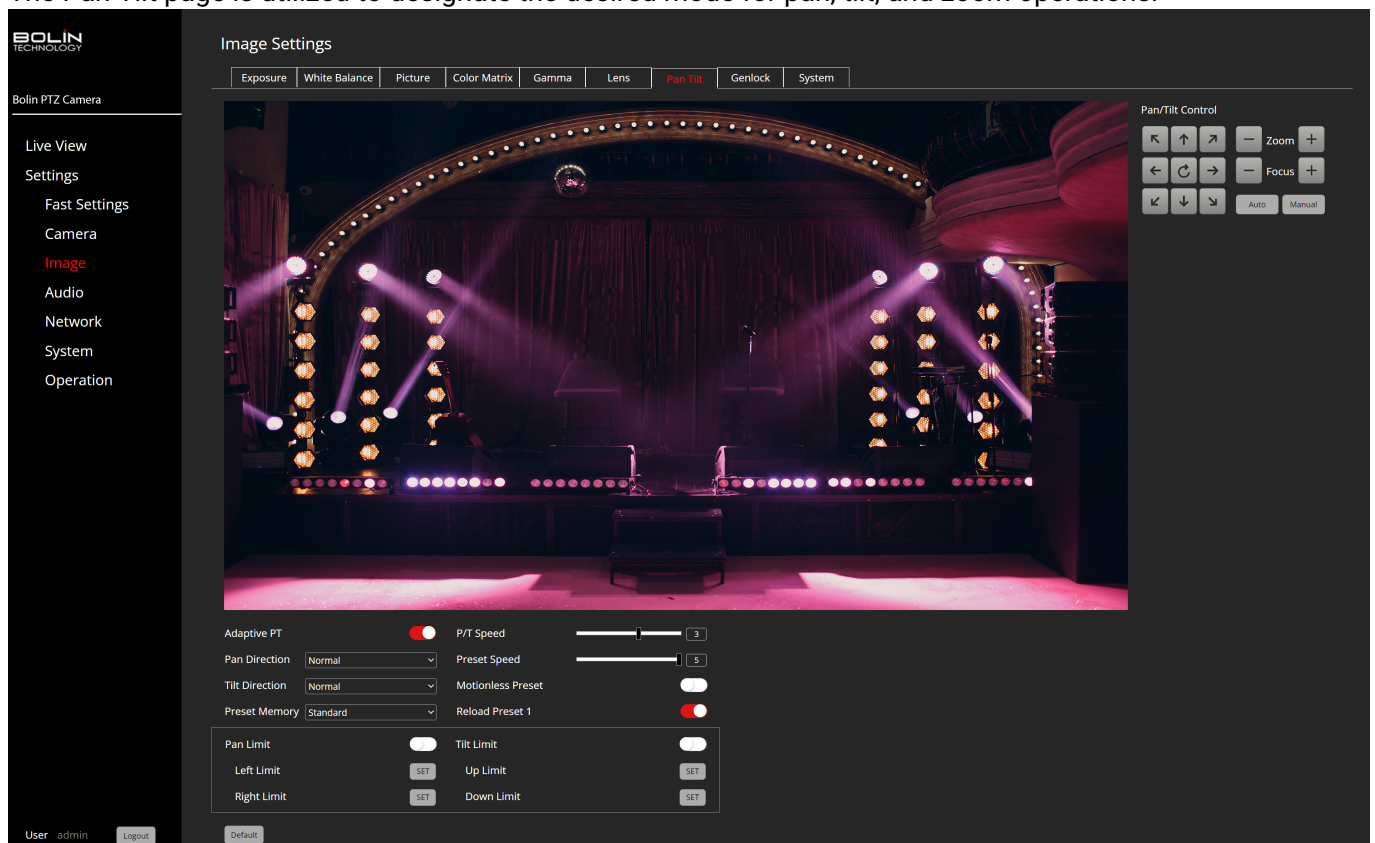
- **Adaptive PT:** When enabled, the Pan Tilt speed will adapt according to the zoom range. Activating this feature allows the Pan and Tilt speed to adjust automatically to different zoom ratios. For instance, as the zoom ratio increases, the Pan/Tilt speed decreases correspondingly.

- **Pan Direction:** This setting adjusts the camera's horizontal orientation, with options for either normal or inverted left and right directions.

- **Tilt Direction:** This setting controls the camera's vertical orientation, with options to choose between normal or inverted for upward and downward movements.

- **Preset Memory:** This feature allows the PTZ camera to save specific pan, tilt, and zoom coordinates.

- **P/T Speed:** Adjust the P/T Speed value between 0 and 5 to modify the Pan/Tilt speed on the remote controller. The speed increases as the value goes from low (0) to high (5).

- **Preset Speed:** Adjust the Preset Speed value within a range of 0 to 5 to modify the speed of the preset movements. The speed increases as the value goes from low (0) to high (5).

- **Motionless Preset:** When the motionless preset is ON, the video image will not be shown during the transition to the designated preset location.

- **Reload Preset 1:** Enable this option to automatically switch to the default preset when powering on the camera.

Genlock

Genlock (generator locking) is a technique used to maintain synchronization.
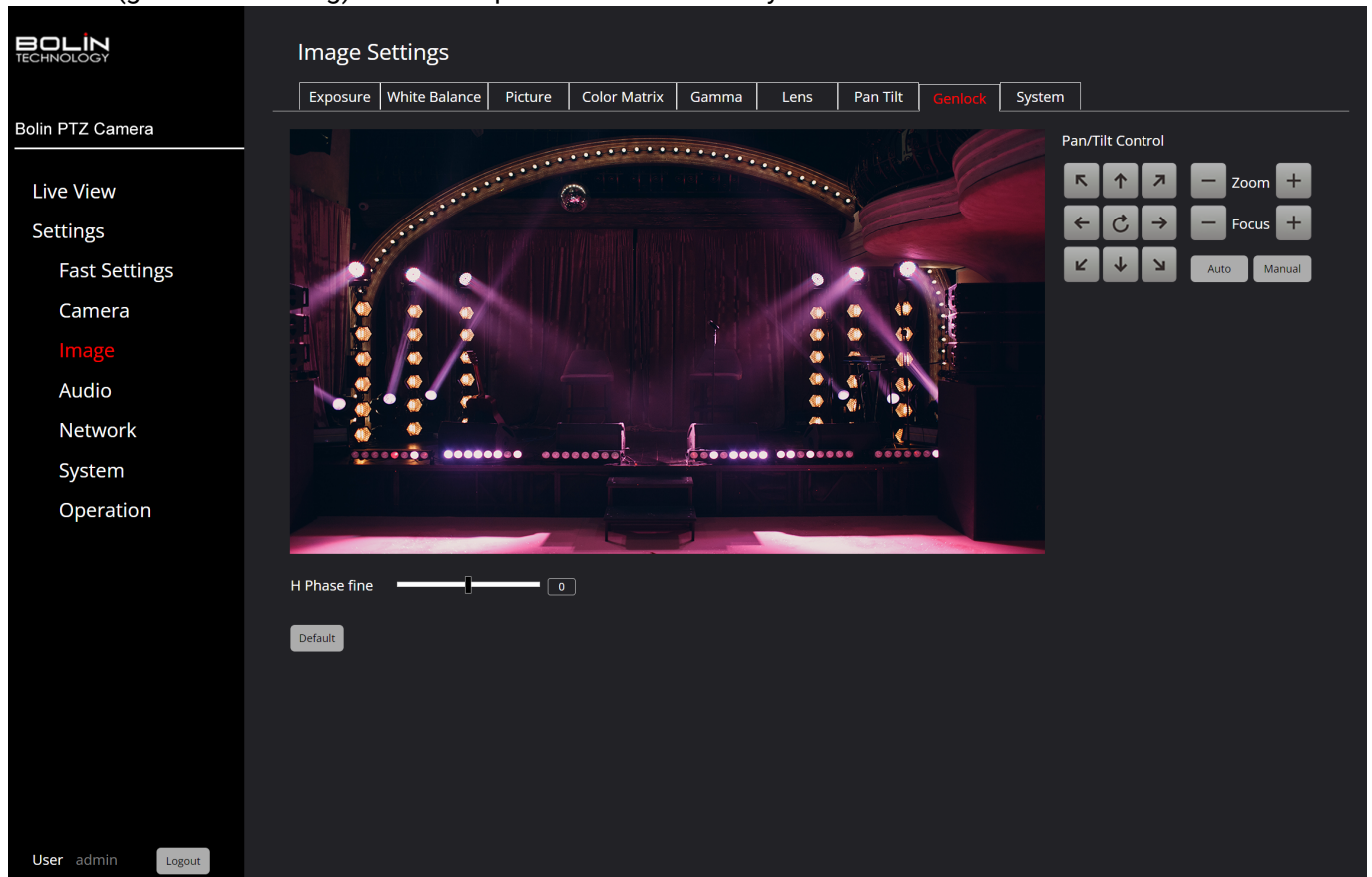
H Phase fine: is used for finely adjusting the horizontal phase during Genlock.

> ⓘ CAUTION: A sync generator must be connected before the use of Genlock.

System

The System page is to configure the various communications parameters of the camera.

Image Settings

Exposure | White Balance | Picture | Color Matrix | Gamma | Lens | Pan Tilt | Genlock | **System**
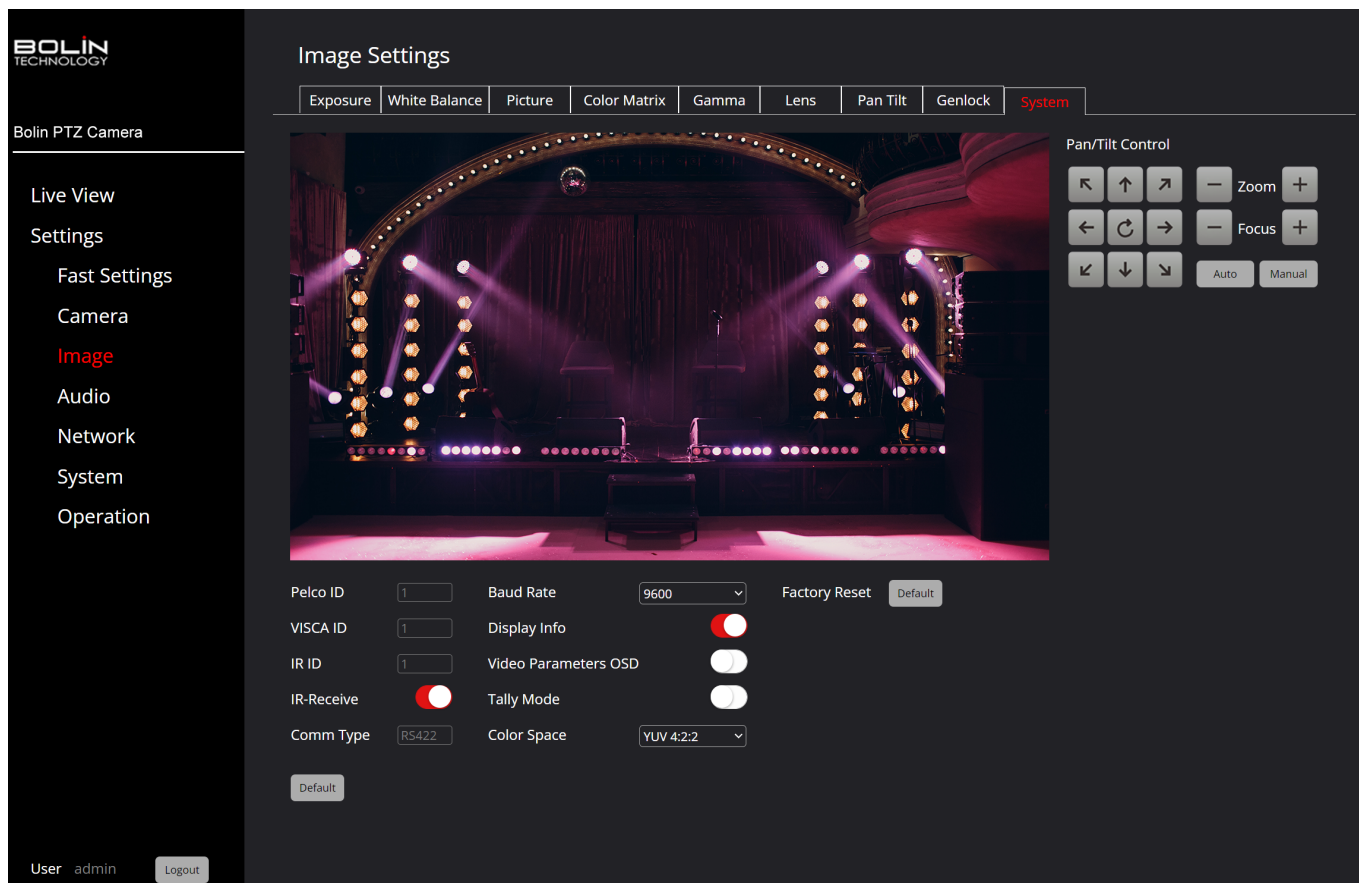
- **Pelco ID:** When utilizing RS485 (PELCO P/D) control, assign the Camera ID to the specific address you wish to control. The value for this setting can range from 1 to 255.

- **VISCA ID:** When utilizing RS422 (VISCA) control, assign the Camera ID to the specific address you wish to control. The value for the setting can range from 1 to 7.

- **IR ID:** Set the IR ID between 1 and 3, which corresponds to the camera ID number you wish to control via the remote controller.

- **IR-Receive:** When this setting is turned OFF, the camera will not receive signals from the infrared remote controller. Ensure this setting is turned ON for the camera to communicate with the infrared remote controller.

- **Comm Type:** Describes communication type.

- **Baud Rate:** The rate of data transfer, measured in bits per second.

- **Display Info:** When this setting is enabled, a message displaying the camera's configuration will appear on the screen for approximately 10 seconds each time the camera is powered on or restarted.

- **Video Parameters OSD:** Video parameters on screen display.

- **Tally Mode:** When you enable the tally mode, the camera's tally light will activate. If you've connected the camera to a Bolin keyboard controller, you can adjust the GPI I/O to Output mode in the Keyboard Settings. This allows you to control the tally directly from the keyboard.

- **Color Space:** Option to change color space from YUV 4:2:2 to RGB.

- **Factory Reset:** Resetting all the above settings to factory default.

Audio - Audio Setting

In the Audio tab, users can configure the audio settings on the camera to meet their requirements. The various settings and their functions are described below.

- **Audio Input:** Option to Mute audio.

- **Audio Input Type:** Supports Line in voltage only.

- **Audio Compression:** Supports AAC, G.711a and G.711u.

- **Bit Rate(bps):** Supports 32K, 40K, 48K, 64K, 96K, and 128K.

- **Sampling Rate(sps):** Supports 16KHz, 32KHz, 44.1KHz, and 48KHz.

- **Input Volume:** Supports -60db to 18dB.

- **Phantom Power:** Phantom power is a method that provides DC electric power at 48 volts, to sensitive microphones through an XLR cable, eliminating the need for an external power supply or battery.

> ⓘ **CAUTION:** Please verify that the microphone in use specifically requires 48v of power.

Network

- **Pattern:** Static and DHCP
  - DHCP - The IP Address of the device will be determined and dynamically assigned from the network gateway (router). This is recommended when the device is being installed on a network where the available IPs are unknown and a quick setup is required.
  - Static IP- The user will define and enter the IP address of the device. It is recommended to put the device on a known, constant IP address and guarantee the device will retain its IP address after a reboot or power failure. If not sure what IP addresses are available on a network, a user can set the camera to DHCP and use the assigned address as a static IP.

    > 📒NOTE: Static IP is recommended.

- **IP Protocol Version:** This shows the version of the Internet Protocol (IP).

- **IP Address:** This shows the camera's IP address, which can also be modified in this location.

  > 📒NOTE: By default, the camera is set to a Static IP Address of 192.168.0.13.

- **Subnet Mask:** A subnet mask is a filter for IP addresses, helping to organize and divide a large network into smaller groups, so devices within each group can communicate more efficiently.

  > 📒NOTE: By default, the camera is set to a subnet mask of 255.255.255.0.

- **Default Gateway:** When configuring the device, the default gateway IP address should be set to the IP address of the router that serves as the gateway for the local network. This address allows the device to

communicate with destinations outside its immediate network.

> 📒NOTE: By default, the gateway is set to 192.168.0.1.

- **Preferred DNS Server:** DNS (Domain Name System) servers are the addresses specified on a device for translating domain names into IP addresses. The preferred DNS server is the primary server used for this translation, and the alternate DNS server serves as a backup in case the preferred server is unavailable or experiences issues, ensuring access to the internet and other network resources.
    - On a network that is not connected to the Internet, this can be left blank.

- **Alternate DNS Server:** allows the user to specify a secondary DNS (Domain Name System) server. This server is used for resolving domain names to IP addresses in case the primary DNS server is unavailable or cannot be reached.

- **MAC Address:** This is a fixed address, used as a unique identifier of the device on a network. This cannot be changed.

Port

- **TCP Port:** TCP (Transmission Control Protocol) is a reliable, connection-oriented protocol used to ensure the secure and ordered delivery of data. TCP guarantees that transmitted video frames are received without loss and in the correct order, making it suitable for applications where data integrity is crucial, even though it may introduce slightly higher latency.

- **UDP Port:** UDP (User Datagram Protocol) is a connectionless protocol that provides low-latency transmission but without guaranteed delivery or order of data, which may lead to occasional data loss in exchange for faster performance. In IP camera applications, this can result in brief interruptions or quality degradation during live monitoring.

- **RTSP Port:** RTSP (Real-Time Streaming Protocol) is a network control protocol used for the delivery of real-time streaming media. The RTSP port is the network port designated for RTSP communication, allowing devices like IP cameras to send and receive streaming commands and data for effective real-time video transmission and control.

- **VISCA Over IP:** VISCA over IP is the implementation of the VISCA (Video System Control Architecture) protocol, commonly used for camera control, over an IP network. The VISCA over IP port is the specific network port through which devices communicate using the VISCA protocol, allowing for remote control and coordination of functionalities in compatible cameras.

- **ONVIF Port:** ONVIF (Open Network Video Interface Forum) is a standard that facilitates interoperability between different IP-based video devices, including cameras and video management systems. The ONVIF port is the network port designated for communication using the ONVIF protocol, enabling devices to exchange information and ensure compatibility within a networked video surveillance system.

- **HTTP Port:** HTTP (Hypertext Transfer Protocol) is the protocol for data communication on the network, used for the transfer of text, images, sound, video, and other files between web browsers and servers. The HTTP port is the specific network port through which devices establish connections for communication, facilitating the exchange of information between clients (such as web browsers) and servers on a local network or the Internet.

RTSP

On this page, you will find the RTSP Address URL information for Main Stream and Sub Stream.

- **Main Stream RTSP address: rtsp://192.168.3.230:554/media/video1** (based off IP above)

- **Sub Stream RTSP address: rtsp://192.168.3.230:554/media/video2** (based off IP above)

Connection String: rtsp://<IP address>:<RTSP port>/media/video<1/2>
By default, IP address is 192.168.0.13, RTSP port is 554

RTMP

This camera supports RTMP protocol, can push RTMP streaming to others video streaming platform, e.g. YouTube etc.

RTMP Connection String: *RTMPstreamURL/Key*

RTMP Port is **1935**

Note: To stream video, the user must first log in to their video streaming platform. After logging in, they need to obtain the RTMP stream URL and key. Once they have these details, they can enter them into the RTMP settings page on the camera's IP web interface. This will configure the camera for streaming.

FTP

File Transfer Protocol

1. Enable the FTP server.

2. Enter the IP address of the FTP server into the 'Server IP' field.

3. Enter the FTP server's port number into the 'Server Port' field. This should match the port configured on the FTP server, typically port 21.

4. Enter the FTP server's username and password into the 'Server Username' and 'Server Password' fields, respectively. These credentials should match those configured on the FTP server.

5. Choose the 'Path Type' and 'Path' where you want the snapshot to be saved on the FTP server.

Multicast

On this page, users can configure multicast for both the Main and Sub streams. This is particularly useful for conserving bandwidth in live-streaming applications.

1. Follow the specified Multicast address range to configure a multicast IP address for the Main Stream.

2. Follow the specified Multicast Port range to configure a multicast port for the Main Stream.

3. Click the 'Apply' button and restart the camera to ensure the settings take effect.

4. After the camera completes its power cycle, click the 'Copy' button to copy the multicast URL address. This URL can be used for accessing the Main Stream.

SRT
Secure Reliable Transport

Network Setting

| Network | Port | RTSP | RTMP | FTP | Multicast | SRT |

Stream Type   Main Stream   Sub Stream

SRT Streaming   ⬤ Enable   Caller ▾

Stream Status   No Stream

Destination IP(Hostname) [   ]

Latency   [50   ] ms (20-5000)

Port   [8001   ] (1-65535)

Stream ID   [live/channel/0   ]

Encryption   [OFF   ▾]

[Apply]

User admin   [Logout]

System - System Settings
Device

This refers to a consolidated page where the user can view various pieces of information about their device. This includes the Device Name, Model Number, Product Serial Number, IP Encoder Version, FPGA Version, and AF Version.

Time

On this page, users can configure the date and time settings of the camera.

- **Date Format:** Users have the option to set the date format as either Y-M-D or D-M-Y.

- **Time Format:** Users have the option to set the time as either a 12- or 24-hour clock and whether it is displayed with or without milliseconds. (4 Options - 24H: H-M-S; 24H: H-M-S-MS; 12H: H-M-S; 12H H-M-S-MS)

- **Time Zone:** Allows you to set the camera to the time zone in which you are currently located.

- **PC Time Sync:** Allows your camera to synchronize its internal clock with the clock on your computer.

- **Network Time Sync:** Check this box to have the camera synced with an NTP (Network Time Protocol) Server. If using this option, enter the URL of an NTP server in the highlighted field.

- **Time Sync Server:** Input the time sync server address.

- **Port:** Server address, port number.

- **Refresh:** Select refresh time option is 10 Min, 30 Min, 1 Hour, 1 Day.0

Maintenance

On the Maintenance page, it consists of firmware update, Device Restart, and Default Settings.

Firmware Update:

To update the firmware, follow these steps:

1. Visit Bolin Technology's official website at www.BolinTechnology.com.

2. Navigate to the "Support Center" and select the "Download Center" option.

3. Input the model number of the device and select the corresponding device from the list.

4. Download the firmware file and save it to a location on the computer.

5. Access the web interface of the device. The downloaded firmware file can be dragged and dropped into the designated box or the box can be clicked to manually select the file for upload.

6. After the device has verified the validity of the file, initiate the update process by clicking on the red "Update" button. During the update process, refrain from navigating away from the current tab, page, or

window, and avoid clicking elsewhere on the page to prevent the update from failing.

7. Upon successful installation of the update, a prompt will appear instructing to restart the device. Follow this prompt to complete the update process.

> 📒**NOTE:** It is crucial to maintain the current page active during the update process to ensure a successful update. Any navigation away from the page could result in a failed update.

Device Restart: Restarting/ Rebooting the camera.
Default Setting: Restoring the camera to original factory settings.
User
The User tab, located under the System section, is where you can manage operators who have access to the camera. Note that operators do not have the same level of access to system settings as administrators.
User Management:

1. Click on the 'Add users' button.

2. Enter a username for the new user.

3. Choose a role for the user. You can select either 'Operator', who will not have access to system settings, or 'Administrator', who will have access to all settings.

4. Create a password for the user. We strongly recommend using a strong password that includes at least one uppercase letter, one lowercase letter, one number, and one special character.

5. Set the user's permissions. Select 'Software Upgrade' and/ or 'PTZ Control'.

6. Finally, click on 'Save' to add the user.

Operation
Log
Under the "Logs" tab, users can see the actions that are performed by the device. The log can be filtered by 'All', Information, Warnings, and Errors.

System Menus
R9-230H OSD Menu Structure

Exposure	Mode: Full Auto	High Sensitivity	**Off**, On
		Slow Shutter	**Off**, On
		S. Shutter Limit	1/1, 1/2, 1/4, 1/8,1/15, 1/30
		Gain Limit	If High Sensitivity is Off: 10.7dB, 14.3dB, 17.9dB, 21.4dB, 25.0dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.9dB, 46.4dB, 50.0dB If High Sensitivity is On: 15.0dB, 20.0dB, 25.0dB, 30.0dB, 35.0dB, 40.0dB, 45.0dB, 50.0dB, 55.0dB, 60.0dB, 65.0dB, 70.0dB
		Backlight	**Off**, On
		Spotlight	**Off**, On
		AE Speed	1-48
		Ex. Comp	**Off**, On
		Ex. Comp Level	-10.5, -9, -7.5, -6, -4.5, -3, -1.5, 0, +1.5, +3, +4.5, +6, +7.5, +9, +10.5
	Mode: Manual	High Sensitivity	**Off**, On
		Gain	If High Sensitivity is Off: 0dB, 3.6dB, 7.1dB, 10.7dB, 14.3dB, 17.9dB, 21.4dB, 25.0dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.9dB, 46.4dB, 50.0dB If High Sensitivity is On: 0dB, 5.0dB, 10.0dB, 15.0dB, 20.0dB, 25.0dB, 30.0dB, 35.0dB, 40.0dB, 45.0dB, 50.0dB, 55.0dB, 60.0dB, 65.0dB, 70.0dB
		Speed	59.94/29.97 mode: 1/1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 50/25 mode: 1/1, 1/2, 1/3, 1/6, 1/12, 1/25, 1/50, 1/75, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
		Iris	F1.6, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14
	Mode: Iris Priority	Iris	F1.6, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14
		Gain Limit	If High Sensitivity is Off: 10.7dB, 14.3dB, 17.9dB, 21.4dB, 25.0dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.9dB, 46.4dB, 50.0dB If High Sensitivity is On: 15.0dB, 20.0dB, 25.0dB, 30.0dB, 35.0dB, 40.0dB, 45.0dB, 50.0dB, 55.0dB, 60.0dB, 65.0dB, 70.0dB
		Backlight	**Off**, On
		Spotlight	**Off**, On
		AE Speed	01-48
		Ex-Comp	**Off**, On
		Ex-Comp Level	-10.5 -9 -7.5 -6 -4.5 -3 -1.5 0 +1.5 +3 +4.5 +6 +7.5 +9 +10.5
	Mode: Shutter Priority	Speed	59.94/29.97 mode: 1/1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 50/25 mode: 1/1, 1/2, 1/3, 1/6, 1/12, 1/25, 1/50, 1/75, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000
		Gain Limit	If High Sensitivity is Off: 10.7dB, 14.3dB, 17.9dB, 21.4dB, 25.0dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.9dB, 46.4dB, 50.0dB If High Sensitivity is On: 15.0dB, 20.0dB, 25.0dB, 30.0dB, 35.0dB, 40.0dB, 45.0dB, 50.0dB, 55.0dB, 60.0dB, 65.0dB, 70.0dB
		Backlight	**Off**, On
		Spotlight	**Off**, On
		AE Speed	01-48
		Ex-Comp	**Off**, On
		Ex-Comp Level	-10.5 -9 -7.5 -6 -4.5 -3 -1.5 0 +1.5 +3 +4.5 +6 +7.5 +9 +10.5
White Balance	Mode: Auto	Speed	01 - 05
		Offset	-7 - +7
		Matrix	Off, On

		Select	Standard, Fl. Light, High Saturation
		Level	0 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: Indoor	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: Outdoor	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: OPW	Offset	-7 - +7
		Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: ATW	Speed	01 - 05
		Offset	-7 - +7
		Matrix	Off, On

		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: User	R Gain	000 - 255
		B Gain	000 - 255
		Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: Outdoor Auto	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: SVL Auto	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: SVL	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation

		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
	Mode: SVL Outdoor A	Matrix	Off, On
		Select	Standard, Fl. Light, High Saturation
		Level	00 - 14
		Phase	-7 - +7
		R-G	-99 - 0 - +99
		R-B	-99 - 0 - +99
		G-R	-99 - 0 - +99
		G-B	-99 - 0 - +99
		B-R	-99 - 0 - +99
		B-G	-99 - 0 - +99
Picture	Sharpness		000 - 255
	2D NR		Off, 01 - 05 **(Default set to 2)**
	3D NR		Off, 01 - 05 **(Default set to 2)**
	Flip		**Off**, On
	Mirror		**Off**, On
	Effect		**Day**, Night
	Color Gain		0 - 255
	Hue Phase		0 -255
	Flicker		**Off,** On
	Contrast		0 - 255
	Chroma Suppress		**Off**, Low, Middle, High
	HLC Mode		**Off**, On
	Next Page		
	Color Matrix	Magenta Gain	0 - 255
		Red Gain	0 - 255
		Yellow Gain	0 - 255
		Green Gain	0 - 255
		Cyan Gain	0 - 255
		Blue Gain	0 - 255
		Magenta Hue	0 - 255
		Red Hue	0 - 255
		Yellow Hue	0 - 255
		Green Hue	0 - 255
		Cyan Hue	0 - 255
		Blue Hue	0 - 255

	Scenes		**Standard**, Bright, Clarity, Soft
Gamma	Standard	Offset	-64 - +64
		VE / WDR	**Off**, On
		Brightness Level	0 - 6 (**Default Level 2**)
		Brightness Comp.	0 - 3
		Comp. Level	Low, **Middle,** High
	Straight	Offset	-64 - +64
		Level	-7 - +7
		Black Gamma	-7 - +7
		Black Gamma Range	Low, Middle, High
		Black Level	-48 - +48
		Visibility Enhancer	Off, On
		VE Effect	-3 - +3
	Pattern	Pattern	00 - 51
		Pattern Fine	00 - 09
		Offset	-64 - +64
		Level	-7 - +7
		Black Gamma	-7 - +7
		Black Gamma Range	Low, Middle, High
		Black Level	-48 - +48
		Visibility Enahncer	Off, On
		VE Effect	-3 - +3
Lens	Zoom Ration OSD		Off, On
	AF Mode		Auto, Manual
	AF Sensitivity		Normal, Low
	MF Speed		00 - 07
	Near Limit		Over 8CM 10CM 14CM* 18CM 25CM 35CM 55CM 80CM 1.0M 1.2M 1.5M 2M 3M 5M
	Stabilizer		Off, On
Pan Tilt	Adaptive P/T		Off, On
	P/T Speed		00 - 05
	Pan Direction		Normal, Invert
	Tilt Direction		Normal, Invert
	Preset	Preset Memory	Standard, Extended
		Preset Speed	00 - 05
		Motionless Preset	Off, On
		Reload Preset 1	Off, On
Genlock	H Phase		-127 - 0 - +127
System	Pelco ID		001 - 255
	VISCA ID		001 - 007
	IR ID		01 - 03
	IR Receive		Off, On
	Comm Type		RS422

	Baud Rate		2400,4800,9600,38400
	Display Info		Off, On
	Video Parameters OSD		Off, On
	Tally Mode		Off, On
	Audio		Off, On
		Input Type	Line
		Volume Level	-60dB - +18dB (Increments of 2 dB)
		Phantom Power	Off, On
	Color Space	SDI	YUV422
		HDMI	RGB, YUV422
	System Format	2160P30	HDMI: 2160P30 1080P30 SDI: 2160P30 1080P30
		2160P29.97	HDMI: 2160P29.97 1080P29.97 SDI: 2160P29.97 1080P29.97
		2160P25	HDMI: 2160P25 1080P25 SDI: 2160P25 1080P25
		2160P24	HDMI: 2160P24 1080P24 SDI: 2160P24 1080P24
		2160P23.98	HDMI: 2160P23.98 1080P23.98 SDI: 2160P23.98 1080P23.98
		1080P60	HDMI: 1080P60 1080P30 1080i60 720P60 SDI: 1080P60 1080P30 1080i60 720P60
		1080P59.94	HDMI: 1080P59.94 1080P29.97 1080i59.94 720P59.94 SDI: 1080P59.94 1080P29.97 1080i59.94 720P59.94
		1080P50	HDMI: 1080P50 1080P25 1080i50 720P50 SDI: 1080P50 1080P25 1080i50 720P50
	Factory Reset		Yes, No
Status	Pelco ID		
	VISCA ID		
	IR ID		
	Baud Rate		
	Comm Type		
	HDMI Format		
	SDI Format		
	FPGA FW		
	MCU FW		
	EXP Mode		
	WB Mode		
	Visibility Enhancer		
	Black Level		
	Matrix		
	Next Page		
	Adaptive P/T		
	Flip		
	Mirror		
	ND Filter		
	Stabilizer		

	P/T Speed		
	Preset Speed		
	IP Address		
	MAC Address		
	Previous Page		

Technical Specifications