7 Series HD SDI+IP
Dual Output PTZ Camera

USER MANUAL

VERSION: VCC-7HD-M-02202021

VCC-7HD20S-3SMN

VCC-7HD30S-3SMN

Contents

Operating Instructions

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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IMPORTANT INFORMATION

Legal Notice

Attention:

To ensure account security, please change the password after your first login. You are recommended to set a strong password (no less than eight characters). Password login does not apply to some 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. We will readily improve or update the products or procedures described in the manual.

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 formal guarantee of any kind, expressed or implied. We shall not be held responsible for any technical or typographical errors in this manual.

The product appearance shown in this manual is for reference only and may be different from the actual appearance of your 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 displayed interface, parameters displayed, drawings and value ranges may vary with models. Please see the actual product for details.

Due to uncertainties such as physical environment, discrepancy 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.

Symbols

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

Warnings:

- 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 device, 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.

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

Note: The camera color may be in white or black per the item that is purchased.

	Camera X 1
	IR Remote Controller X 1
	Camera Power Adaptor and Power cord X 1
	Bag of Mounting Screws X 1
	RJ45 to RS232 Extension Cable X 1
	RJ45 to RS422 Extension Cable X 1
	User Manual X 1

Accessories (Optional)

	RS232 8 Pin Mini Din to Phoenix Terminal Block
	Wall Mount
	Ceiling Mount

Overview

This user guide is suitable for the following models:
VCC-7HD30S-3SMN

Features

- Resolution: Up to 1080P60, 1080i59.94
- IP Resolution: Up to 1080P60, 1080P30
- Zoom: Optical 30X
- Image stabilizer(20X) and true WDR 130dB
- Video Output: HDMI, 3G-SDI, IP, CVBS simultaneously
- ±350-degree continuous pan, ±120-degree continuous tilt
- 128 presets, Speed up to 150 degrees/sec
- Standard mounting and ceiling mounting with E-Flip function
- Control supports RS-232 control, RS-422/485 control, VISCA-over-IP, IP-Onvif*, CGI*, IP control software*, IR Remote Controller
- Presets store camera directions and image parameters. (Up to 6 presets on remote controller or 128 presets via protocol programming.)
- Image parameter setting restore with presets and quick access operation
- IP Protocol RTSP, RTMP for online video streaming.
- Local storage Micro SD card up to 32GB supported.
- Supports Audio input, Audio output with IP streaming.
- Power: DC 12V, PoE+(IEEE802.3at)
- Firmware upgrade via USB2.0 or IP
- *Features to be supported on future firmware release.

Camera Diagrams

FRONT   BACK   BOTTOM

1   2   3   4   2   5   18   19   20   19 21   19

12   13   14   15   16   17

USB2.0 FW Upgrade Only   Video Format   IR Select   SD Card   Audio OUT IN   CVBS

1 2 3

DC 12V   RS232   RS422   IP Video / POE   HDMI   3G-SDI
Control   Video Output

6   7   8   9   10   11
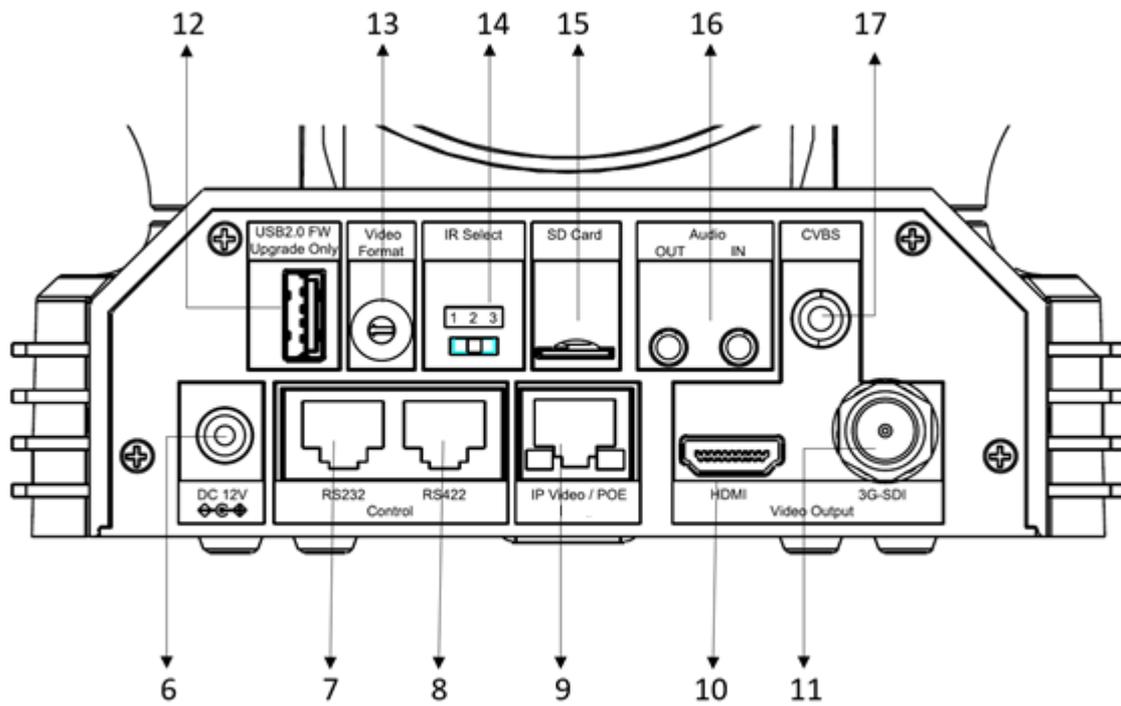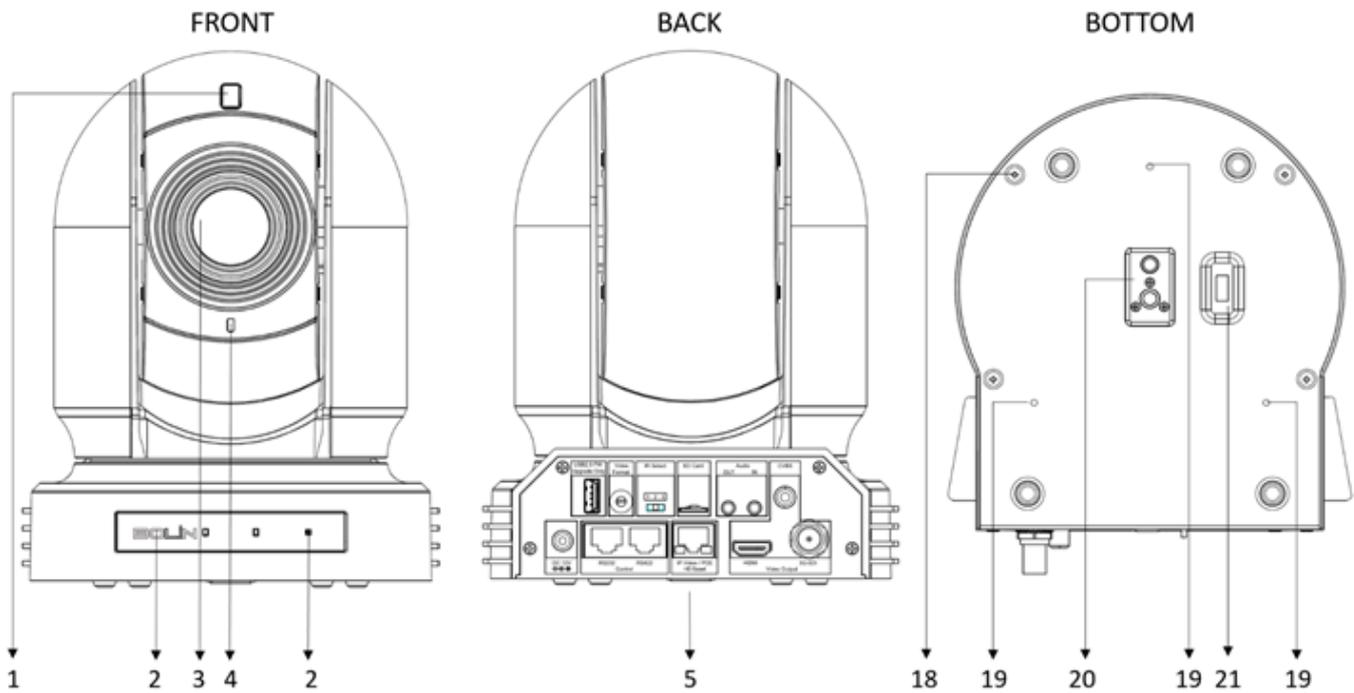
1. **Front Tally Light**
2. **IR Remote Controller Sensors**
   These are sensors to receive commands from infrared remote controller.
3. **Lens**
   This is a 30X magnification optical zoom lens
4. **Power LED Indicator**
   Turns green when the camera is connected to power outlet. When the power is turned on, it takes about 15 to 30 seconds to display the image after LED turns on.
5. **Back Panel**
6. **12V DC Power Port**
   Connect the supplied DC power adaptor and cord.
7. **RS232 Control Port (RJ45)**
   RJ45 to RS232 convertor cable is provided.
8. **RS-422 Control Port (RJ45)**
   RJ45 to RS422 convertor cable is provided
9. **RJ45 Port for IP Network Video Streaming or PoE power supply**
   For VISCA over IP control and IP video streaming with POE (IEEE802.3bt) power input when it is used as IP Network Port;
10. **HDMI Port** (HDMI 1.4)
11. **3G-SDI Video Output**
12. **USB2.0 Port**
    For firmware upgrade only
13. **Video Format Selector**
    For video format selection
14. **IR Remote ID Selector**
    Camera ID for IR remote controller
15. **Micro SD Card Port**
16. **Audio Output/Input (Line-in/out)**
17. **CVBS Video Output**
18. **Bottom piece screws (**Open them without authorization will violate warranty regulation**)**
19. **Fix Mounting Holes**
    For original wall/ceiling mount bracket
20. **Tripod mounting holes**
21. **Bottom DIP Switch**

Remote Controller

1. MENU, on screen menu display ON/OFF
2. Camera IR ID Selector for Remote Control.
3. AI Features, available when AI button (13#) is pressed. (Not activated, for future use).
4. Positioning Function and Number Buttons
   - Preset Position Calling and Setting
5. Value adjusting + for Feature Item NO.11.
6. Preset button, to set preset position.
7. Zoom. Telescope and Wide with slow speed.
8. Auto Framing. (Not activated).
9. Direction Control
   - PAN-TILT direction control
   - OSD menu navigator
   - HOME: Home position, confirm button, Enter button.
10. FOCUS
    - Manual Focus, Far, Near
    - Auto Focus
11. Features Direct Control, work with Value Adjust key + and – to make the feature adjustments.
    - Gain, Image gain adjustments
    - Color, Image color saturation adjustments
    - Black L, Image Black Level adjustments
    - WB.R, Image White Balance Red adjustments
    - PT S, Pan/Tilt Speed adjustments
    - Zoom S, Zoom Speed adjustments
    - Preset S, Preset Speed adjustments
    - WB.B, Image White Balance Blue adjustments
    - WDR, Wide Dynamic Range adjustments
    - Freeze, To get a frozen image.
    - B Light, Back Light compensation
    - OPW, One Push White Balance
12. Video Format Switching, Works with pressing and holding Fn button.
    - You can change the video format by keep pressing the button. (When video format is changed, the camera would restart and the screen turns black for few seconds.)
13. AI Mode key (Not activated, for future use)
    - Press AI button once, then press one of the AI features (Printed in color blue).
14. Power (Press and hold for 3 second)
    - Power ON the camera to turn the camera in operation status.
    - Power OFF the camera to turn the camera in standby status.
    - When the camera is powered OFF, the camera turns to the back and would be on standby mode.
    - When the camera is powered ON, the camera turns to the front.
    - Powering the camera ON/OFF would not restart the camera.
15. Fn Function Mode key
    - Press and hold the Fn key, and press one of the function buttons that printed in color brown.
16. Reset button, to cancel preset that has been set.
17. Zoom. Telescope and Wide with fast speed.
18. One Push AF
    - Press once to focus.
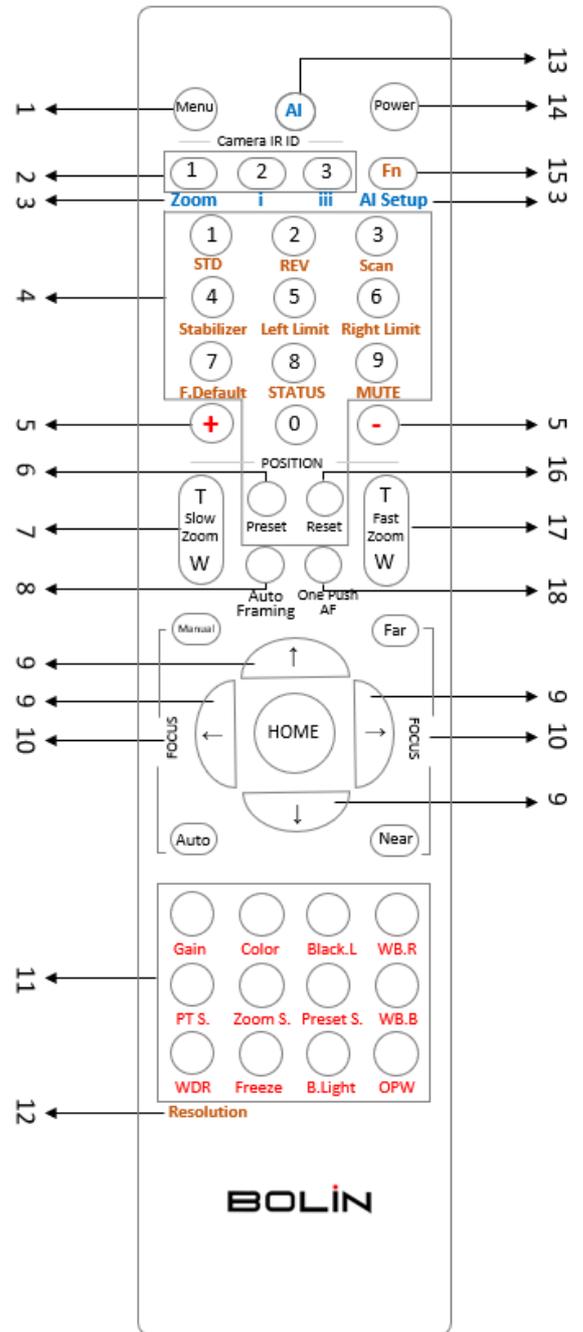
Notes
- AAA Battery is not included with the remote controller.

System Configuration

Connection

When the camera is connected to a computer and joystick keyboard with a VISCA cable (cross type, RS-232), you can operate the camera with the computer and the joystick keyboard.

When the camera is connected to a joystick keyboard a control cable (cross type, RS-422/485), you can operate the camera's pan, tilt, zoom with the joystick keyboard.

In this connection configuration, HDMI cable, SDI video cable, data cable, Network cable is required. To obtain these third-party components or accessories, consult the dealer where you bought your camera.
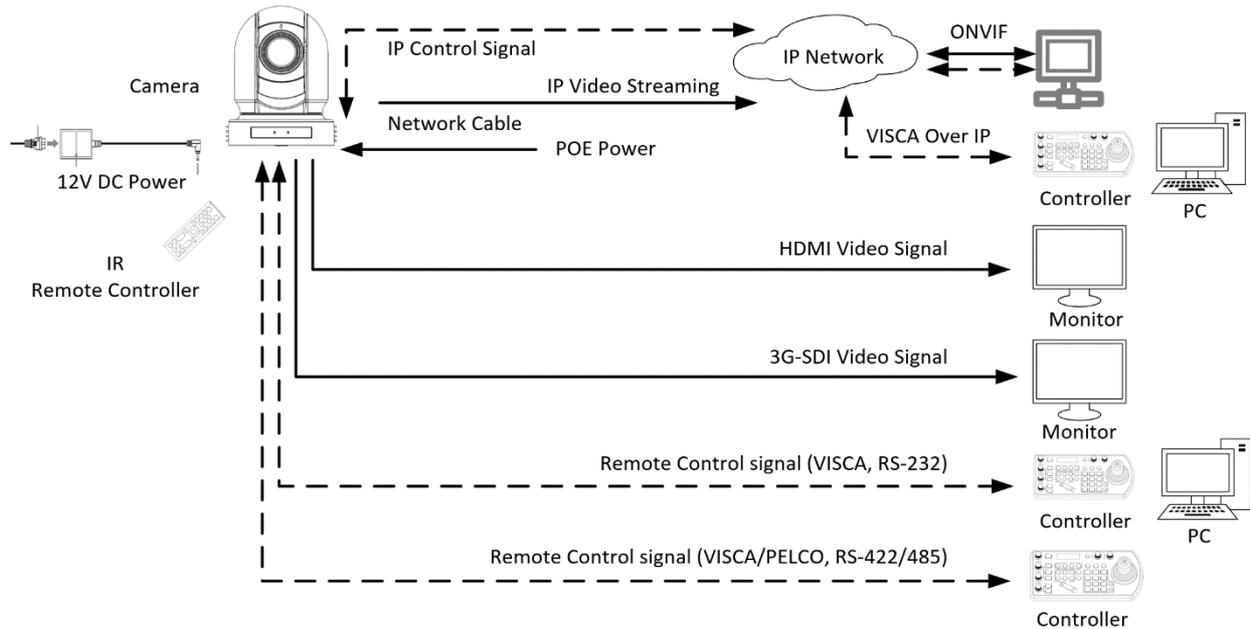
Power

- Use only the DC power adaptor (JEITA type4) supplied with the unit. Do not use any other DC power adaptor.
- If using POE to power the camera, PoE+(IEEE802.3at) is supported
- Ensure that the POE power source has sufficient power budget to power the camera, or some features may not function properly.

Cable Requirements

- Network Cable: 10/100 Mbps Ethernet CAT 5/5E/6 UTP cables are applicable to the ANSI/EIA/TIA-568A/B and ISO/D. Eight wires in the network cable need to be inserted in parallel into the top of the cable connector. The cable connector needs to be crimped in position. When the cable connector is in position, ensure that the metal pieces of the cable connector are parallel to each other and the clamp of the cable connector is intact.
- SDI Cable: For broadcast use, Belden1694A/5CFB is a suitable cable to transmit broadcast-quality video:

Conductor:

AWG	Stranding	Material	Nominal Diameter
18	Solid	Bare Copper	0.04 in.

Shield Material

Type	Layer	Material	Coverage
Tape	1	Aluminum / Polyester / Aluminum	100%
Braid	2	Tinned Copper	95%

Nom. Capacitance Conductor to shield	Nom. Inductance	Nom. Char. Impedance
16.2 pF/ft	0.106 µH/ft	75 Ohm

Obtain Video Signal

The camera can simultaneously have SDI video output and HDMI video output and IP video output.

HDMI HD Video signal
1. Connect the camera to a HD monitor/TV using HDMI cable.
2. Turn on the camera, video will display on the monitor after running initializing.
3. Information of the camera initial setting status will display for 5 seconds.
4. You can set the video format of the camera to the one you want to display.

SDI Video Signal
The camera can simultaneously stream SDI video output with HDMI video output.
1. Connect SDI cable in between the camera your SDI Device/display.
2. You now have SDI video output.
3. SDI video only supports 1080P.

IP Video Signal
The camera can simultaneously stream IP video output and SDI video output and HDMI video output.
1. Connect the camera to the network using Cat5/Cat6 network cable.
2. You need to have a web browser or VMS client software ready for IP video streaming.
3. PELCO address and Baud Rate setting on the camera must be as same as the setting on camera IP WEB interface.
4. To obtain IP video and configure IP video, please refer to Network Camera User Manual Part Two.

CVBS Video Signal
1. Connect CVBS cable in between the camera and your CVBS Device/display.
2. You now have CVBS video output.

Camera Initial setting status Information
Information of the camera initial setting status will display for 5 seconds.
1. Camera PELCO ID for RS-485 control
2. Camera ID for IR Remote Controller
3. IR remote control signal receive current setting
4. Baud Rate current setting
5. Control COMM Port current setting
6. Video format current setting
7. HDMI current setting
8. Model number
9. Firmware version

Camera Status Info Display

```
PELCO ID        001
IR ID           01
IR-RECEIVE      ON
BAUD RATE       9600
COMM TYPE       232
FORMAT          1080P29.97
HDMI OUT        RGB
MODEL TYPE      ----
SV:       VOB220BI0040AA005
```

Audio IN / OUT

- 0n real panel, a microphone or audio source can be connected to the **Audio IN** port, which feeds audio into the camera
- A speaker can be connected to the **Audio OUT** port, which will output any audio that is captured on the **Audio In** port
- See Manual part 2 for more information about Audio capture
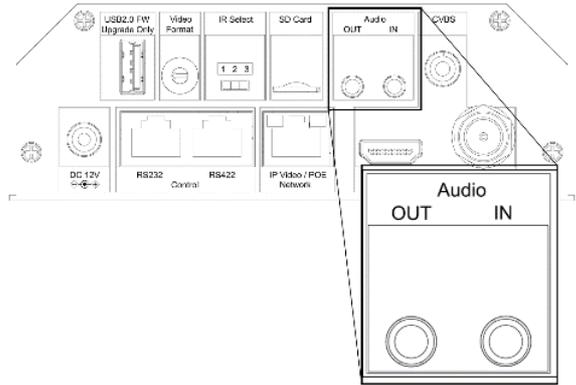
Table: Audio input & output relationship

| Audio Input	SDI Audio Embedded	HDMI Audio Embedded	IP Audio Output	*Audio Line- out
Mic Built-in	NO	NO	NO	YES, IP Audio
Audio Line-In	YES	YES	YES	YES, IP Audio

SD Card (Not Activate, for future supported by software upgrade)

Micro SD card can be inserted to the camera for local recording.

- Ensure that the Micro SD card's pins are faced downward (logo faced up)
- Slide the card into the slot, and click into place
- To remove the card, click inward, and it will pop outward and may be removed
- See Manual part 2 for more information regarding SD recording

Currently, the following Micro SD cards are supported:

Brand	Size	Format	Type	Class	Transfer Bus
Kingston	16GB	exFAT	SDHC	10	IU1
Kingston	32GB	FAT32	SDHC	10	IU1
Kingston	32GB	exFAT	SDHC	10	IU1
Kingston	64GB	exFAT	SDXC	10	IU1
Kingston	128GB	exFAT	SDXC	10	IU1
Samsung	32GB	FAT32	SDHC	10	UHS-I (1)
Samsung	32GB	exFAT	SDHC	10	UHS-I (1)
Samsung	32GB	FAT32	SDHC	10	UHS-I (1)
Samsung	32GB	exFAT	SDHC	10	UHS-I (1)
Samsung	64GB	exFAT	SDXC	10	UHS-I (3)
Toshiba	32GB	FAT32	NA	10	U1
Toshiba	32GB	exFAT	NA	10	U1
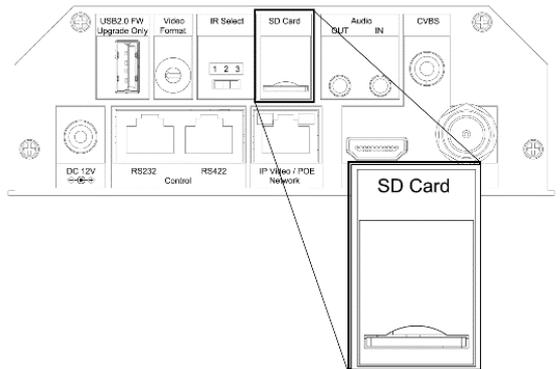
Camera Control Methods and System Configurations

This unit has multiple ways of controlling the camera and various system configuration capabilities using optional products. This section describes the ways of controlling and typical system examples with the required components and usage of each system.

1. Use the Infrared Remote Controller
2. Use RS-232 (VISCA)
3. Use RS-422/485 (VISCA/PELCO P/D)
4. IP Control (See Network Camera User Manual)

Use the Infrared Remote Controller

To operate the camera from a short distance.
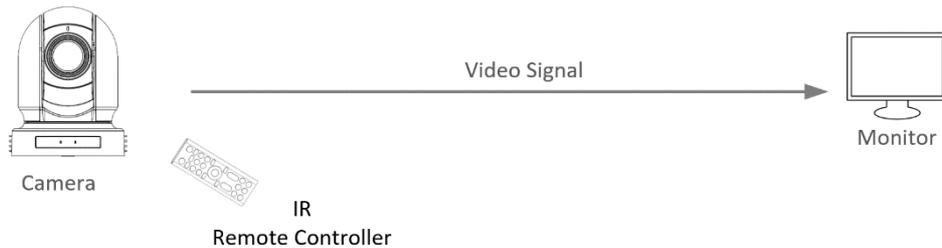
For IR remote control details, refer to Operation Using the Infrared Remote Controller.

Use RS-232 (VISCA)

You can use RS-232 port to connect to optional controllers, such as joystick control keyboard, control PC station, to operate the camera.
To perform pan/tilt and zoom operations using the joystick of the control keyboard, and to perform the Preset operation using the control buttons.
An application software that supports this unit is needed if you use PC station.
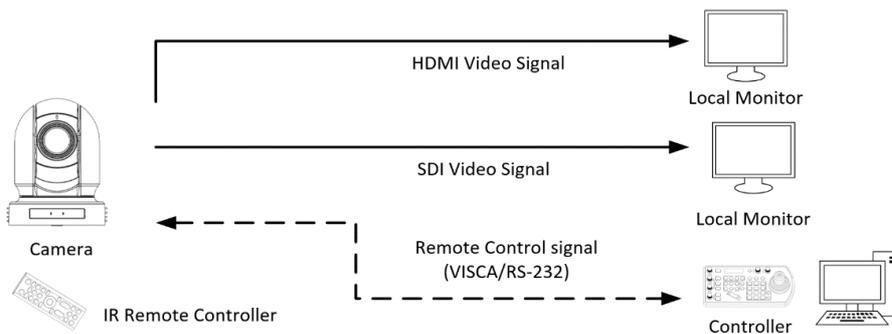
RS232 Connection

1. Set RS232 control method on Bottom Dip Switch.
2. Set Baud Rate on Bottom Dip Switch to the same as Baud Rate setting on the keyboard you are using.
3. Set specific camera address that you want to control the camera for on Bottom Dip Switch.
4. If you want to have the camera address to be automatically assigned by VISCA controller, set camera Dip Switch address to 0.
5. Reboot the camera by turning it Off/On after the Bottom Dip Switch has been set up correctly.
6. Camera supports Daisy Chain connection up to 7 cameras.
7. Use the RJ45 to RS232 (VISCA) control cable. The controller must be VISCA compatible.

8. You can make RS232 connection cable if you have the following applications:
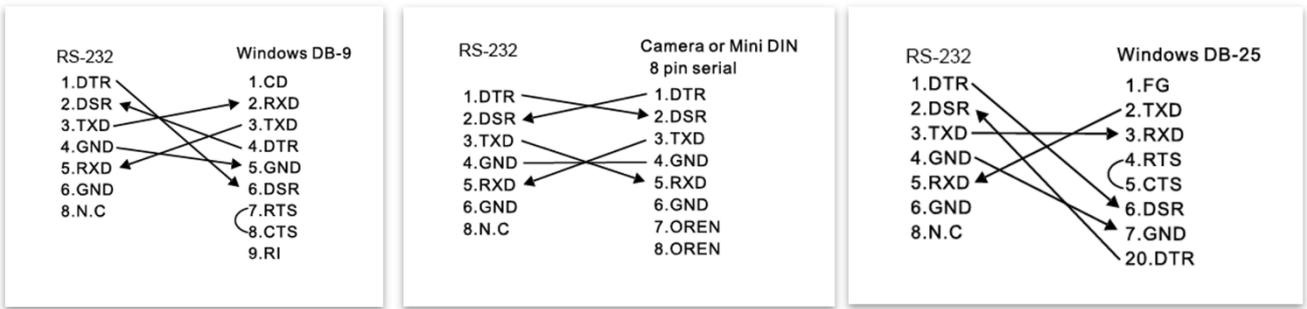
9. Use extension cables included RJ45 to RS232 8 pin Mini Din adaptor to make RS232 connection for your control device.
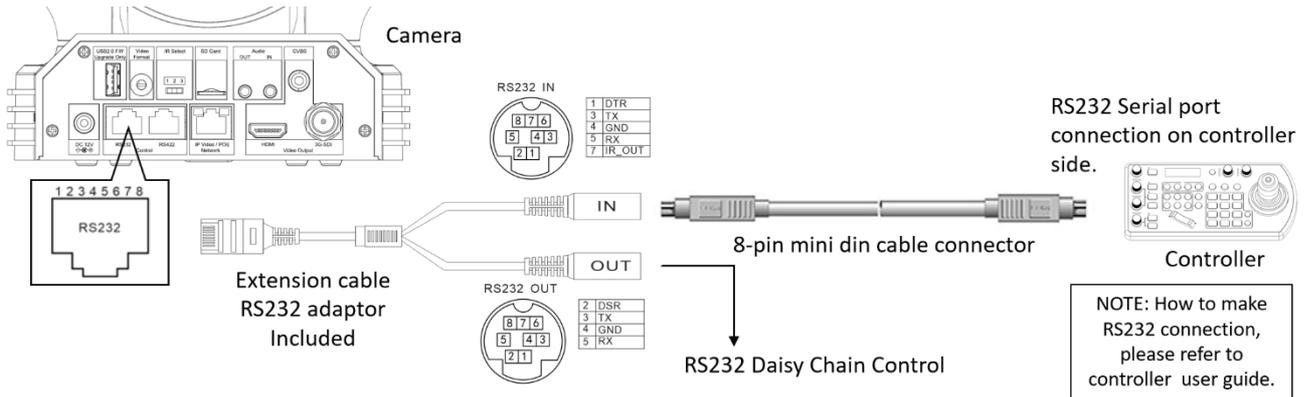
10. Use extension cables included RJ45 to RS422/232 Phoenix terminal contact adaptor to make RS232 connection for your control device.
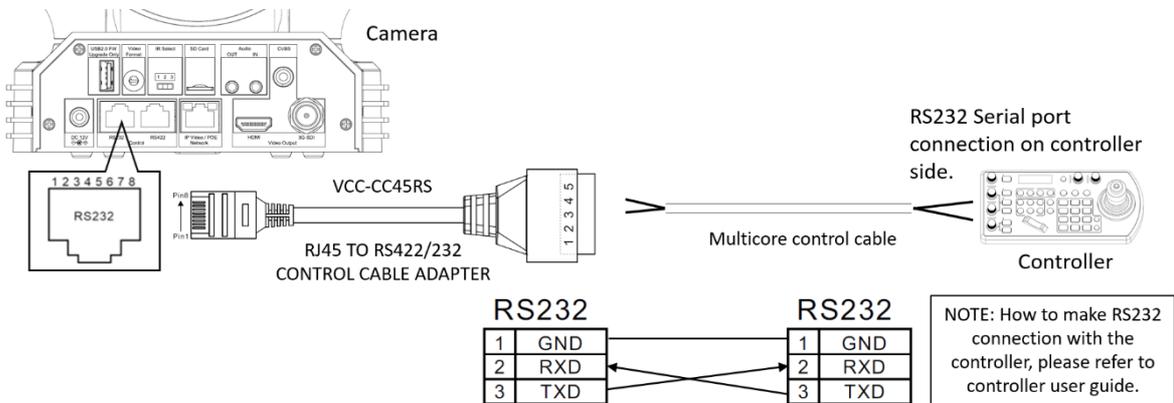
11. Or you can use CAT5/6 network cable **(T-568B standard pinout)** to make RS232 connection by following the pin definition below:
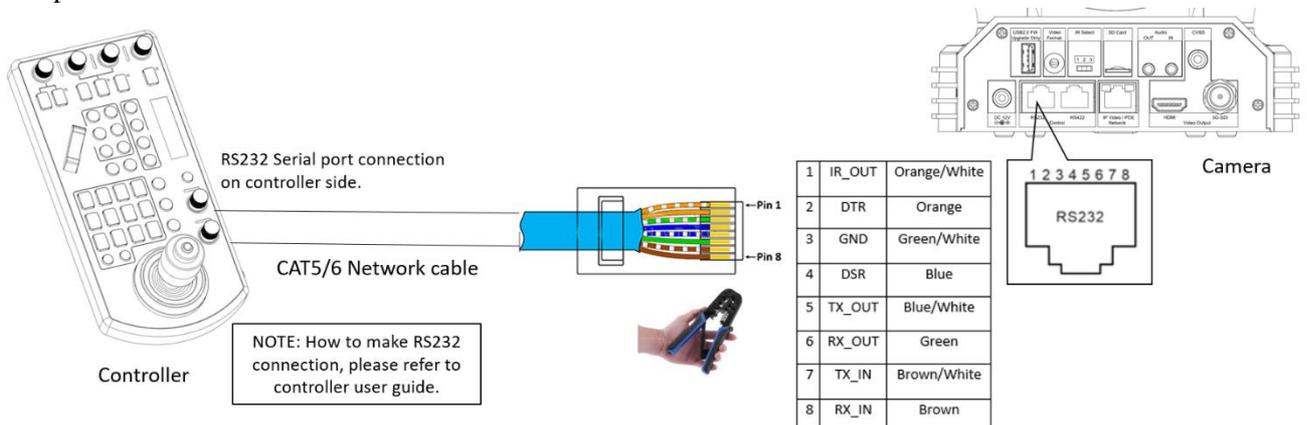
12. How to make RS232 Daisy Chain multiple camera connection with standard RS232 serial port controller as below:

RS232 Connection with standard RS232 Serial Port PTZ Keyboard Controller
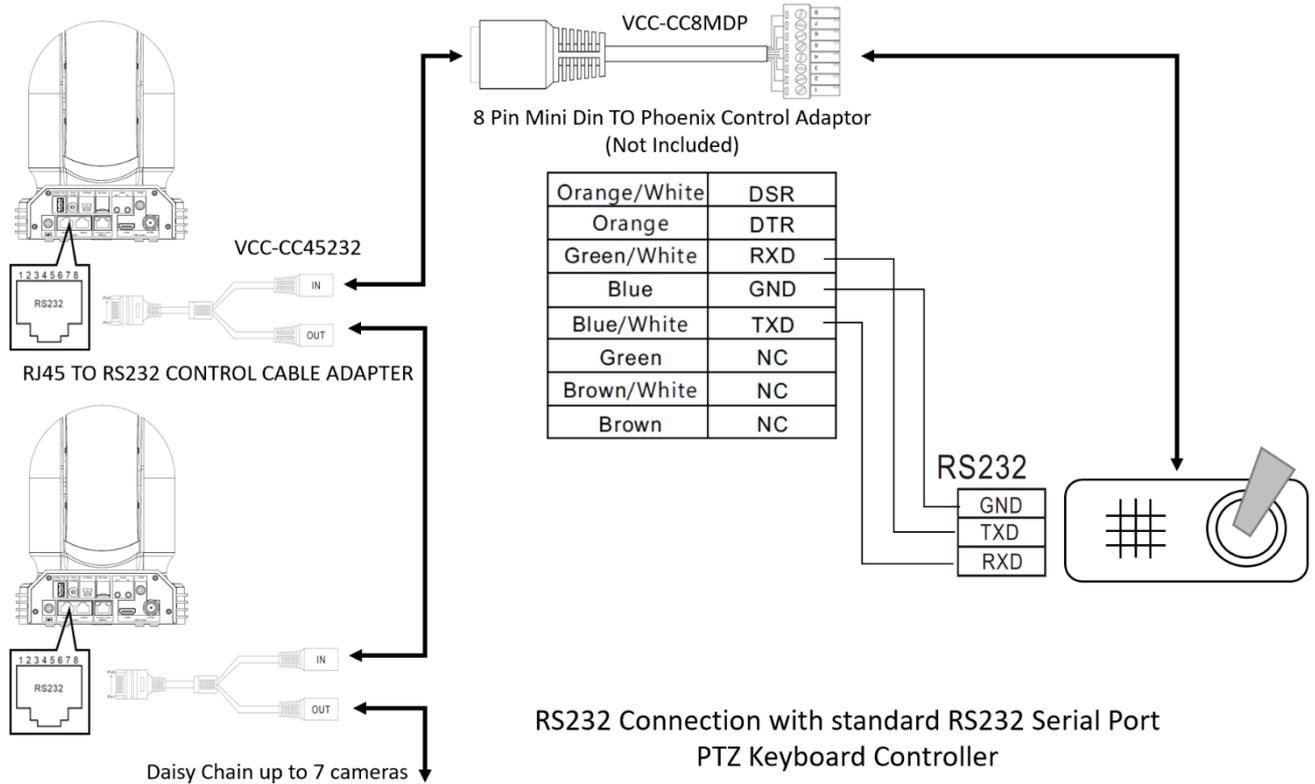
Use RS-422(VISCA) / RS485 (PELCO P/D)

You can use RS-422/485 port connect to optional controllers, such as joystick control keyboard, control PC station, to operate the camera.

To perform pan/tilt and zoom operations using the joystick of the control keyboard, and to perform the Preset operation using the control buttons.

An application software that supports this unit is needed if you use PC station.
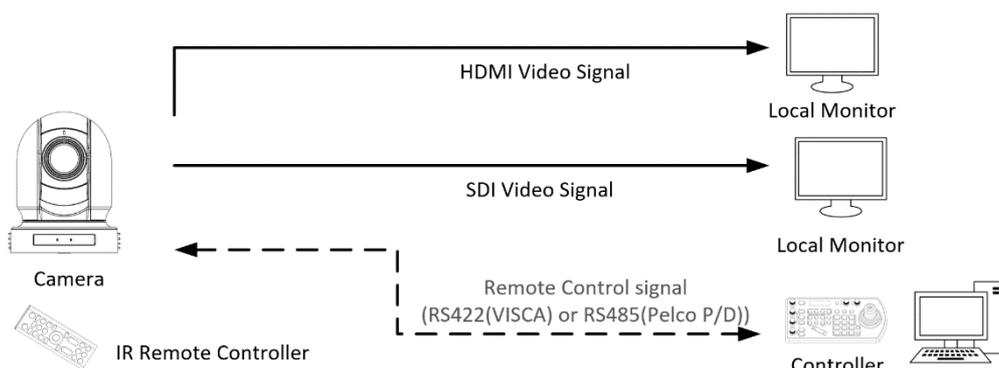
RS422 (VISCA) connection

1. Set RS422 control method on Bottom Dip Switch.
2. Set Baud Rate on Bottom Dip Switch to the same as Baud Rate setting on the keyboard you are using.
3. Set specific camera address that you want to control the camera for on Bottom Dip Switch.
4. If you want to have the camera address to be automatically assigned by VISCA controller, set camera Dip Switch address to 0.
5. Reboot the camera by turning it Off/On after the Bottom Dip Switch has been set up correctly.
6. Use the RJ45 to RS422 control cable. The controller must be VISCA compatible.
7. Camera supports Daisy Chain connection up to 7 cameras.
8. The connection of SONY keyboard is different than other VISCA (Non-Sony) keyboard.

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9. How to make RS422 connection and RS422 Daisy Chain multiple cameras connection with SONY controller as below

SONY Keyboard RS422 Connection

Sony Keyboard Connection

RS422 (VISCA) Daisy Chain Multiple Cameras Connection (Sony Keyboard)
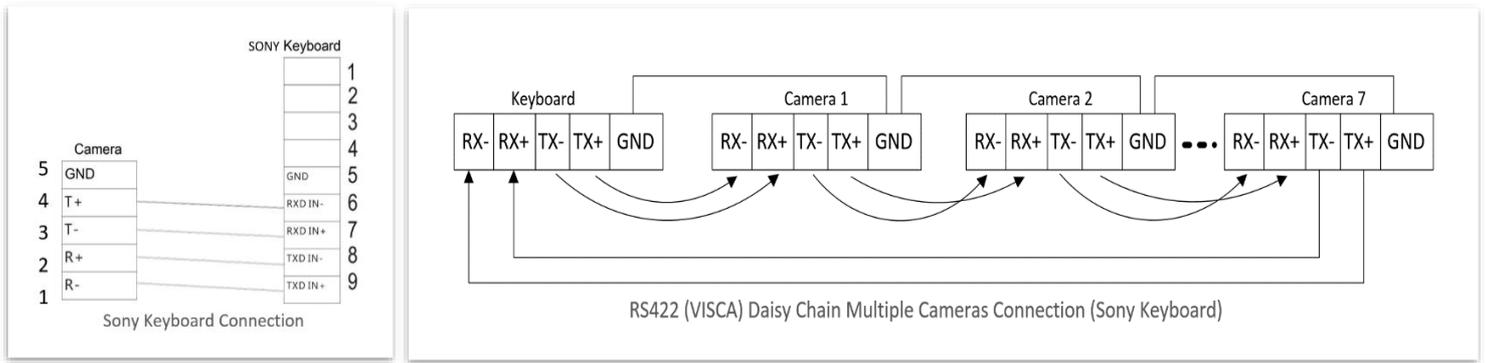
10. How to make RS422 connection and RS422 Daisy Chain multiple cameras connection with Non-Sony controller as below:

VISCA (Non-Sony) Keyboard RS422 Connection

VISCA Keyboard Connection

RS422 (VISCA) Daisy Chain Multiple Cameras Connection
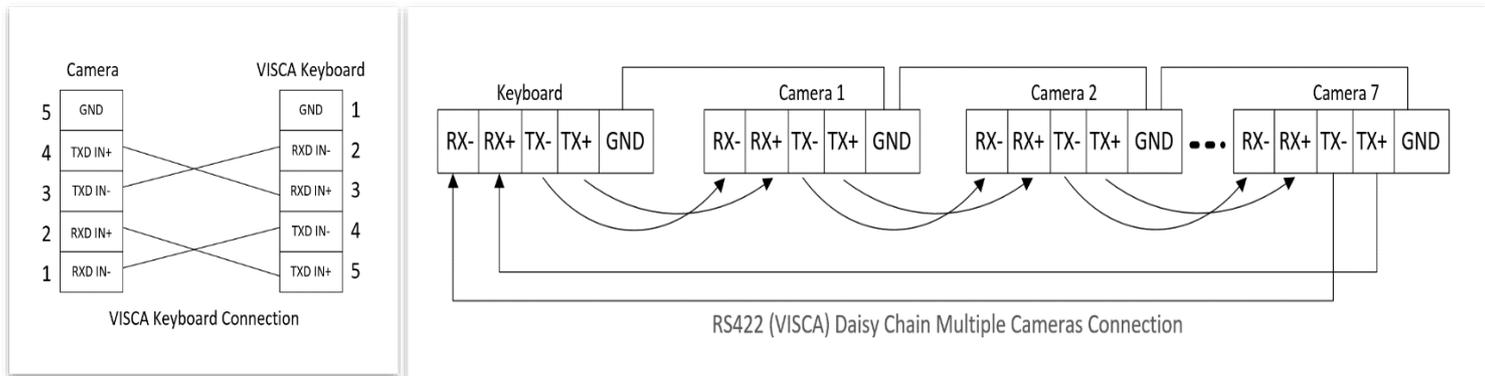
11. Use extension cables RJ45 to RS422 Phoenix connecter adaptor included to make RS422 connection for your control device.

NOTE: How to make RS422 connection with the controller, please refer to controller user guide.

RS422 Serial port connection on controller side.

Multicore control cable

Controller

Camera

VCC-CC45RS

Extension cable RS422 adaptor Included
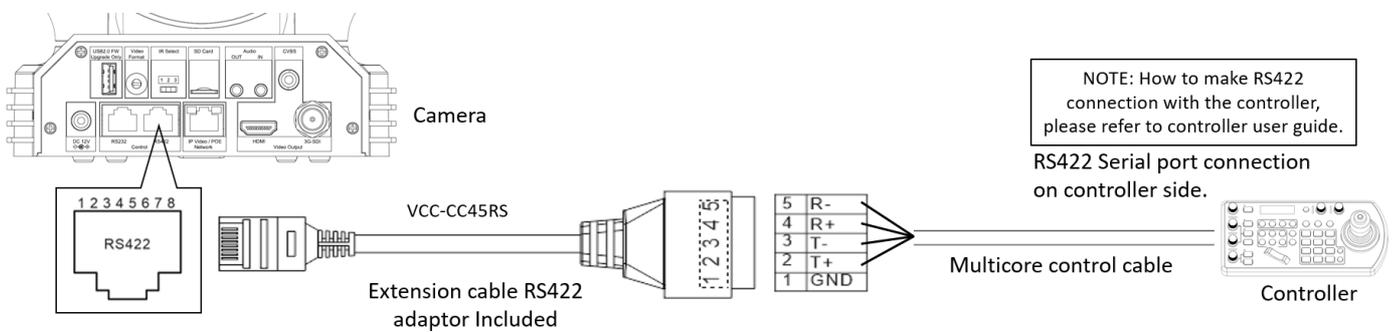
12. Or you can use CAT5/6 T-568B Standard Ethernet cable direct connect between the camera and the controller to make RS422 connection by following the pin definition below:

NOTE: How to make RS422 connection with the controller, please refer to controller user guide.

CAT5/6 Network cable

RS422 Serial port connection on controller side.

Controller

Camera

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

18
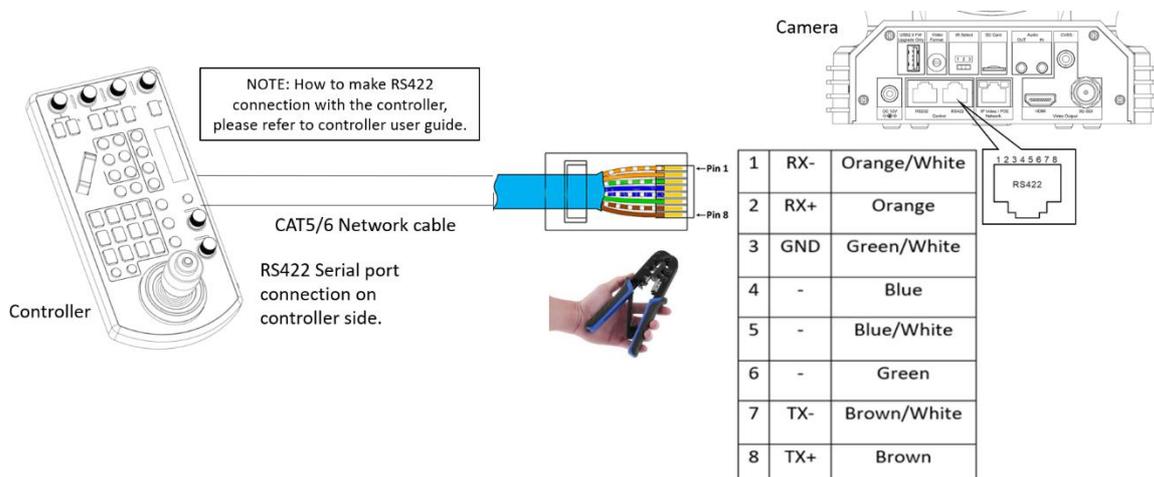
13. How to make RS422 Daisy Chain multiple camera connection with RS422 standard serial port controller:
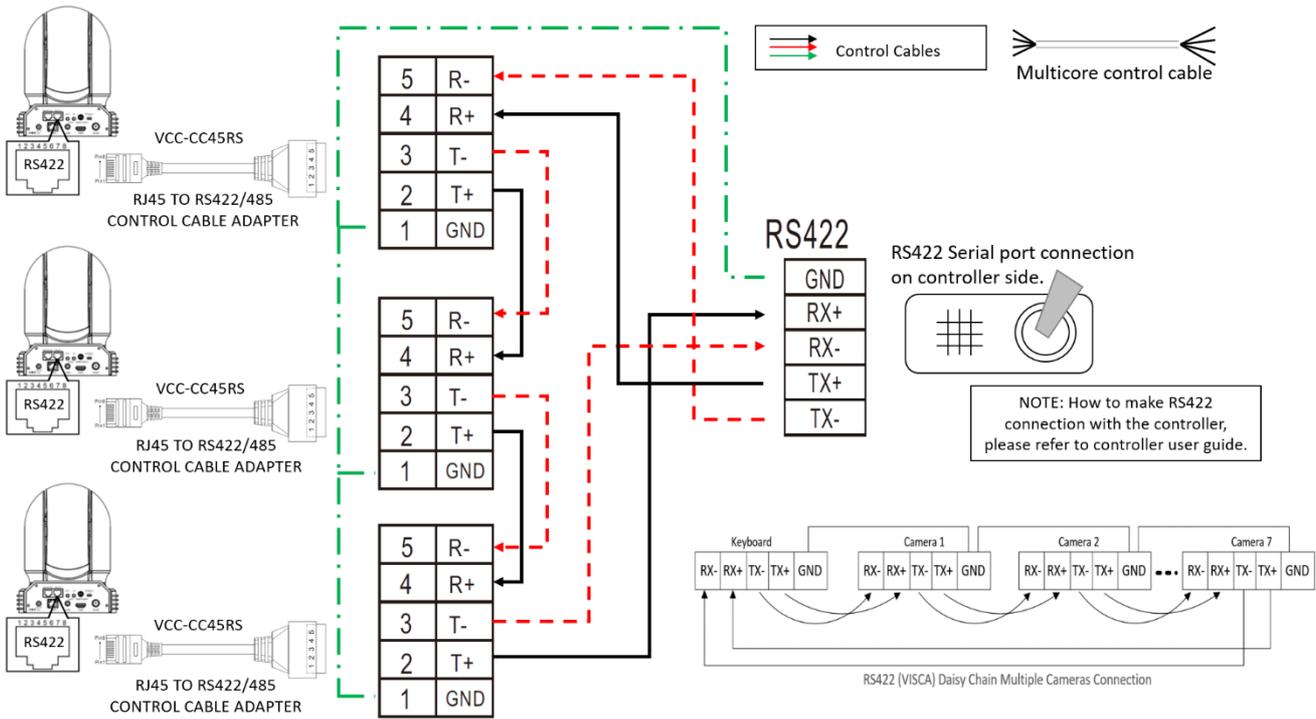
PELCO P/D Keyboard RS485 Connection

NOTE: Use RS422 ports for RS485 connection. Only use TX+ and TX- for RS485 connection.

- Set RS422 control method on Bottom Dip Switch.
- Set Baud Rate on Bottom Dip Switch to the same as Baud Rate setting on the keyboard you are using.
- Set the camera ID on OSD menu by remote controller
- Reboot the camera by turning it Off/On after the Bottom Dip Switch has been set up correctly.
- Use PELCO P/D compatible keyboard.
- Use preset 95# on the keyboard to bring up/exit camera OSD menu.
- Use joystick and Button "OPEN" or "CLOSE" to navigate OSD menu.
- To operate keyboard, please refer to the user manual of the keyboard you are using.

PELCO RS485 Connection
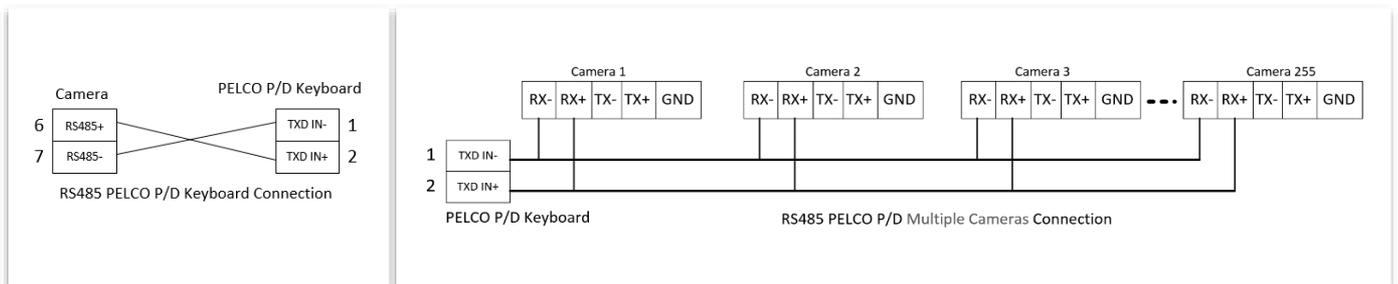
- Use extension cables included RJ45 to RS422 Phoenix connecter adaptor to make RS485 connection for your control device.
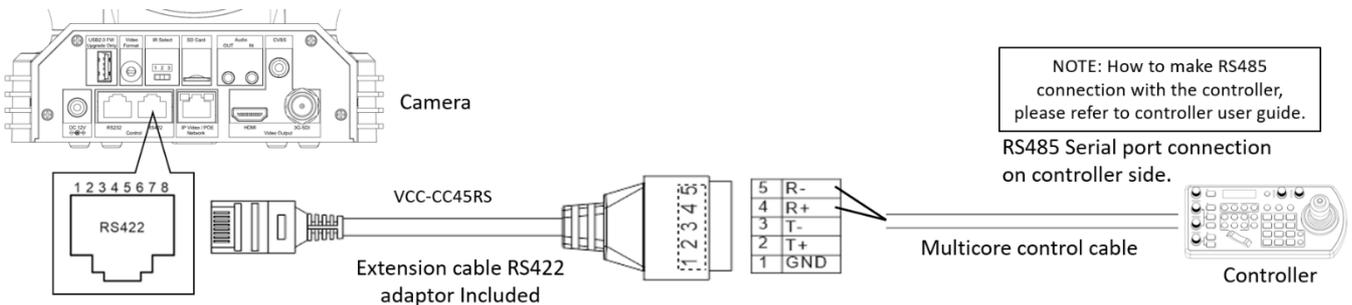
- Or you can use CAT5/6 T-568B Standard Ethernet cable direct connect between the camera and the controller to make RS485 connection by following the pin definition below:

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
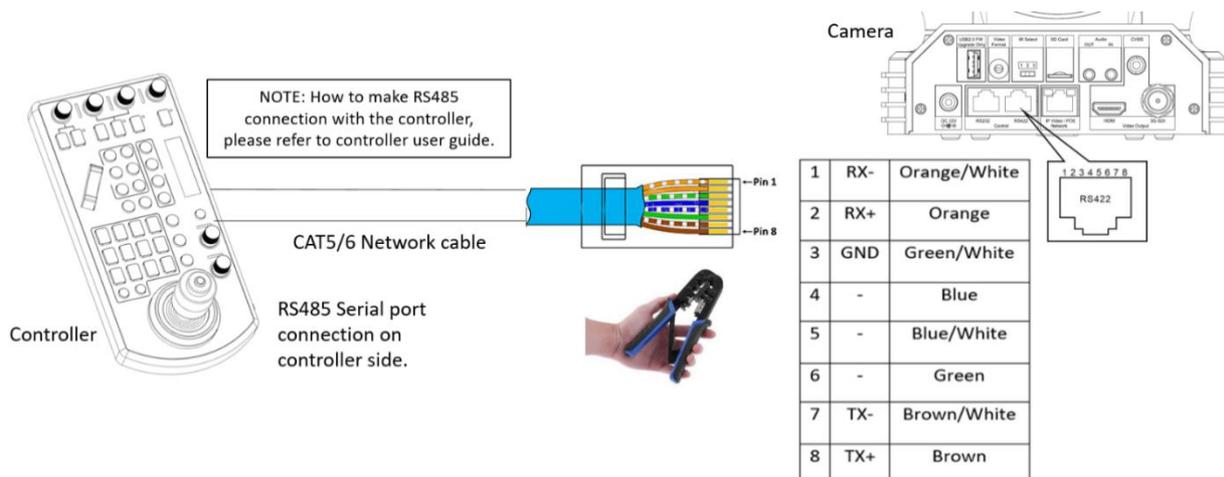
- How to make RS485 multiple cameras connection with RS485 standard serial port controller:
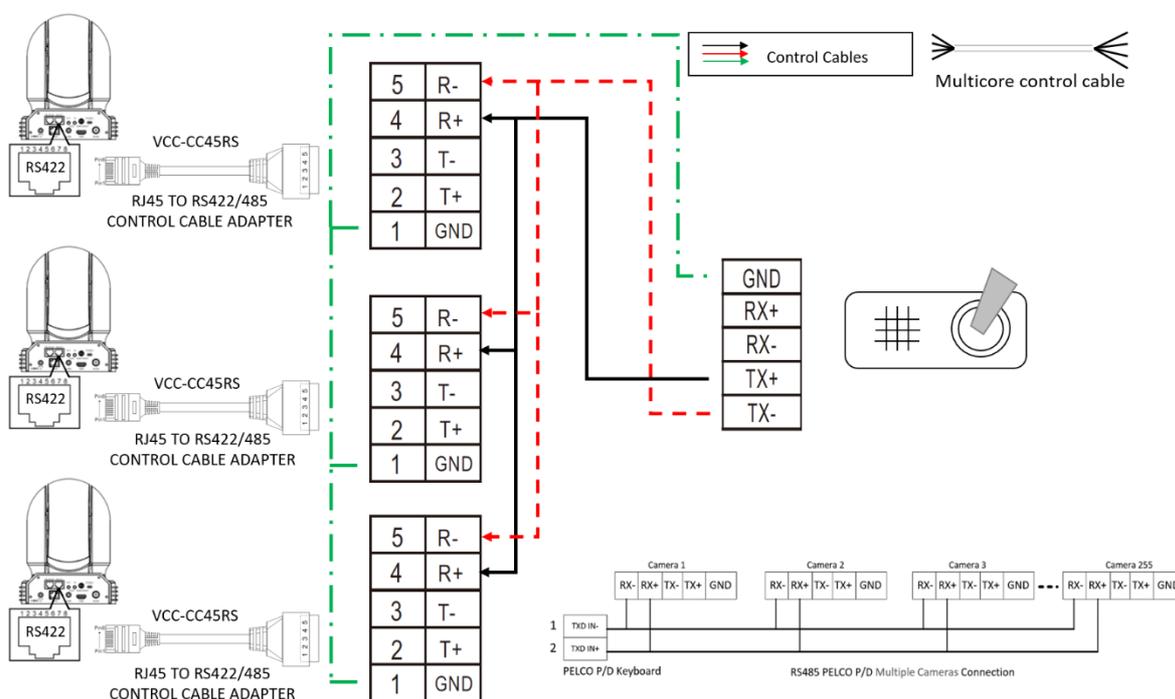

Note

For RS-232 VISCA control, this unit supports daisy chain connection for using multiple cameras.
For control details, refer to Operating Instructions of control keyboard/station software.
- You need to match the communication speed (Baud Rate) between the camera and the joystick controller.
- You cannot use the RS-232 connections while you are using the RS422/485 connection.

Operating Multiple Cameras Using RS-232,422/485
- Using RS-232 (VISCA), you can connect to 7 cameras.
- Using RS-422 (VISCA), you can connect to 7 cameras.
- Using RS-485 (PELCO), you can connect to 255 cameras.
- Using RS-485 (PELCO), all camera addresses must be set up before the connection. You can set the camera address by operating OSD menu, or by setting the Dip Switch on the bottom of the camera. In this case, you can use multiple control keyboards.

How to make the connection with BOLIN products

Please see the User Guide "BOLIN Camera and Keyboard Controller Connection" that you can download it at www.bolintechnology.com product pages.

VISCA over IP Control

With VISCA over IP function, you can control the camera using VISCA protocol on a controller equipped with IP communication capabilities via LAN.
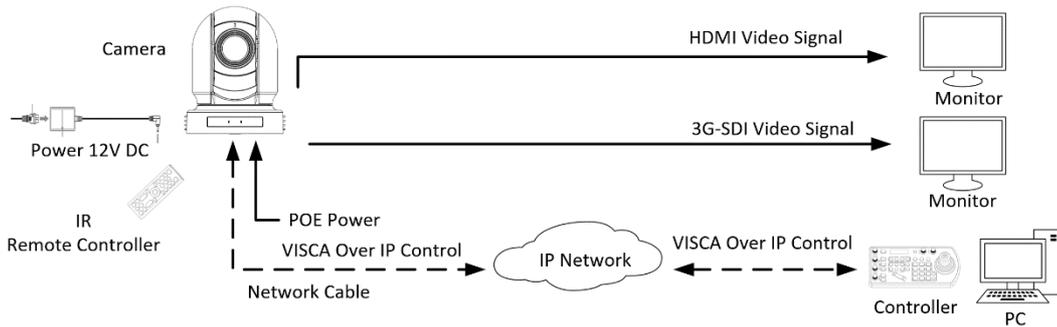
The communication specifications of VISCA over IP are followings:

- Interface: RJ-45 10/100M
- Interface protocol: IPv4
- Transport protocol: UDP
- IP address: 192.168.0.13 By default
- Port: 52381

VISCA over IP Network Configuration

Re-assign the camera

The default information of the IP camera is following:

- Static IP: 192.168.0.13
- Subnet mask: 255.255.255.0
- Gateway: 192.168.0.1
- VISCA over IP control port: **52381**.

The camera IP address needs to be assigned to the IP address that works with your local network.

Controlling via VISCA over IP

- Connect the network port on the camera to the network switch.
- Set the IP address and other network information appropriately to communicate on your network
- Connect the VISCA over IP-compatible controller to the network
- Configure the controller to access the camera's IP address and VISCA over IP port
- *The IP port within on your control must be set to 52381 to communicate with the camera.*
- Select VISCA protocol on your IP control device.

Recommended way to re-assign the IP address:

1. Create a local network within which the camera and your PC/Laptop are connected.
2. Install and run the IP-FINDER tool (You can contact Bolin Technical support team for tool requirements)
3. The IP-FINDER can find the camera IP address, which is the default :192.168.0.13
4. Click the search button, select the camera you want to Assign IP address, edit the IP address to the one that matches your local network credential.
5. Once the IP address has been changed successfully, you can access the IP camera via your local network.

Note

How to re-assign the IP address to the camera, please refer to user manual Part Two-IP Camera user guide.

Tally Light GPI I/O connection

The camera is equipped with a Tally lamp that quickly distinguishes when the camera is in use. In order to use camera Tally Light function, you need a video switch and a keyboard (not included).

GPI connection with RS422 VISCA control connection

Cable Preparation
1. Build standard multiple cameras RS-422 daisy chain control connection between the keyboard controller and the cameras. (For more RS422 control information details please refer to Keyboard Controller user guide)
2. Built Tally/Contact Function cable connection between the Keyboard Controller and Video Switcher (Sony)
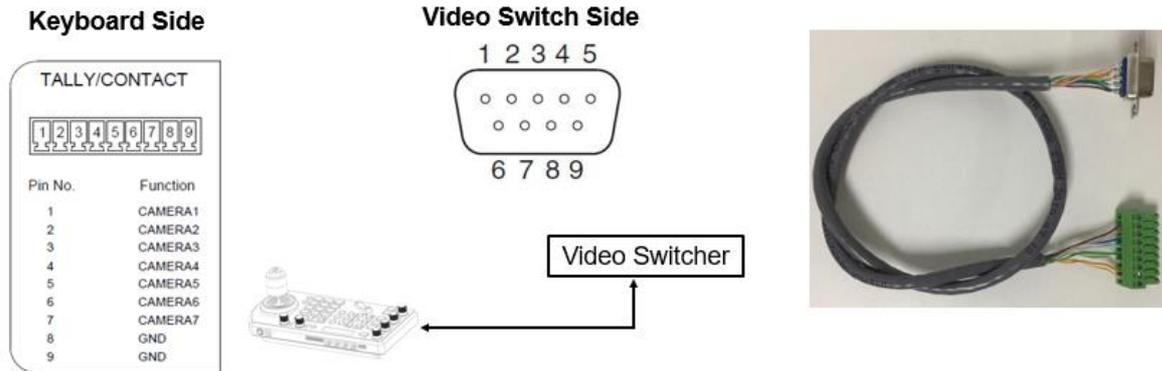
1. Keyboard side we use pin 1 to pin 8, Video Switch side we use pin 1 to pin 9 except pin 8;
2. Keyboard pin 8 connected with Video Switch pin 9;
3. Keyboard pin 1 connected with Video Switch pin 1, pin 2 connected with pin 2, the rest

    may be deduced by analogy, ...pin 7 connected with pin 7

Set UP

1. GPI I/O Input mode - Tally signal is sent by Video Switch
   a. Connect camera with keyboard by standard RS-422 control cable;
   b. Connect keyboard with video switch by tally function cable;
   c. Access to KEYBOARD SETTING > GPI I/O > Setting, and change it to Input mode, then Exit to home directory;
   d. After done above operations, we can switch to different camera by video switch, for example, if we switch to camera 1 on video switch, it will send tally signal to keyboard via the tally function cable, and keyboard will transmit this tally signal to camera 1 via standard RS-422 control cable, so camera 1 tally light will turn on, and keyboard can control camera 1 pan and zoom;

e. If switch to camera 2 on video switch, then camera 2 tally light will on and camera 1 tally light will off;
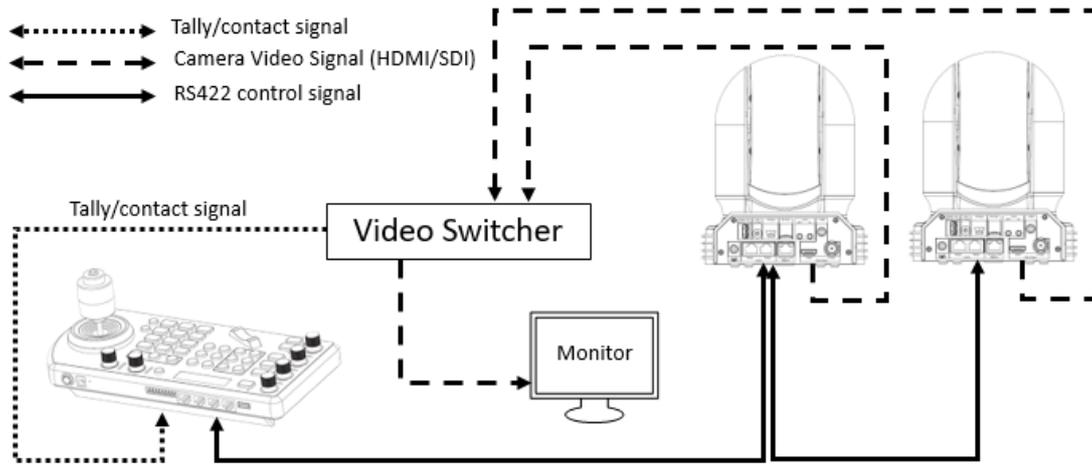
Tally Light GPI Connection – Using RS422 VISCA Control Protocol

Diagram when GPI is select "Input"

2. GPI I/O Output mode -Tally signal is sent by Keyboard Controller
    a. Connect camera with keyboard by standard RS-422 control cable;
    b. Access to KEYBOARD SETTING > GPI I/O > Setting, and change it to Output mode, then Exit to home directly;
    c. After done above operation, we can switch to different camera by keyboard, for example, if we switch to camera 1 on keyboard, it will send tally signal to camera 1 via standard RS-422 control cable, so camera 1 tally light will turn on, and keyboard can control camera 1 pan and zoom;
    d. If switch to camera 2 on keyboard, then camera 2 tally light will on and camera 1 tally light will off;
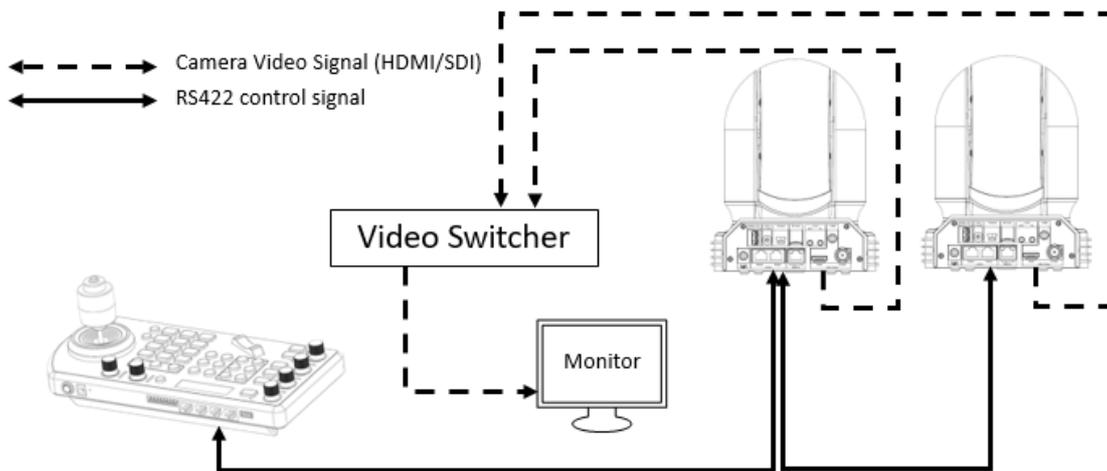
Tally Light GPI Connection – Using RS422 VISCA Control Protocol

Diagram when GPI is select "Output"

GPI connection with VISCA OVER IP control connection

Monitor

Video Switcher

IP Switching Hub

LAN

Tally/contact signal

············► Tally/contact signal

◄ — — — ► Camera Video Signal (HDMI/SDI)

◄————► Remote control signal, Network Cable
CAT5/6 with VISCA OVER IP Control

Tally Light GPI Connection – Using VISCA OVER IP Control Protocol
– With Visca Over IP ready Camera

DIP SWITCH SETTINGS

The Dip switches are for setting the camera configuration for following items:

1. Camera ID Address for RS-485 PELCO protocol
2. Video output / Video color space
3. RS-232 / RS-422/485 selection
4. RS-232 / RS-422/485 baud rate
5. Video resolutions selection
6. IR remote controller ID

Setting of the BOTTOM DIP Switches

Turn off power to the camera before changing the DIP switch settings.
Power on the camera to have the new Dip Switch setting activated.

From the above list, No.1 Camera ID address and NO.2 Video resolution settings can be set in camera OSD menu as well. The camera takes either the way of OSD menu setting or the way of bottom DIP switch setting. They override each other. After the camera is turned on, the camera takes the last setting before it is turned on, either set through the OSD or bottom DIP switch.

The Bottom DIP Switch Settings

Bit 1~3:   Camera Address setting for VISCA protocol
Bit 4:   Video Output/Video Color Space
Bit 5:   Reserve
Bit 6:   RS-232/RS-422
Bit 7~8:   RS-232/RS-422 Baud Rate

VISCA Address	1	2	3
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON
6	OFF	ON	ON
7	ON	ON	ON

Color Space Setting	4
YUV Output	OFF
RGB Output	ON

Mode	5
Operation	OFF
Firmware Upgrade	ON

Control Mode	6
RS-232	OFF
RS-422	ON

Baud Rate Setting	7	8
2400 bps	OFF	OFF
4800 bps	ON	OFF
9600 bps	OFF	ON
38400 bps	ON	ON
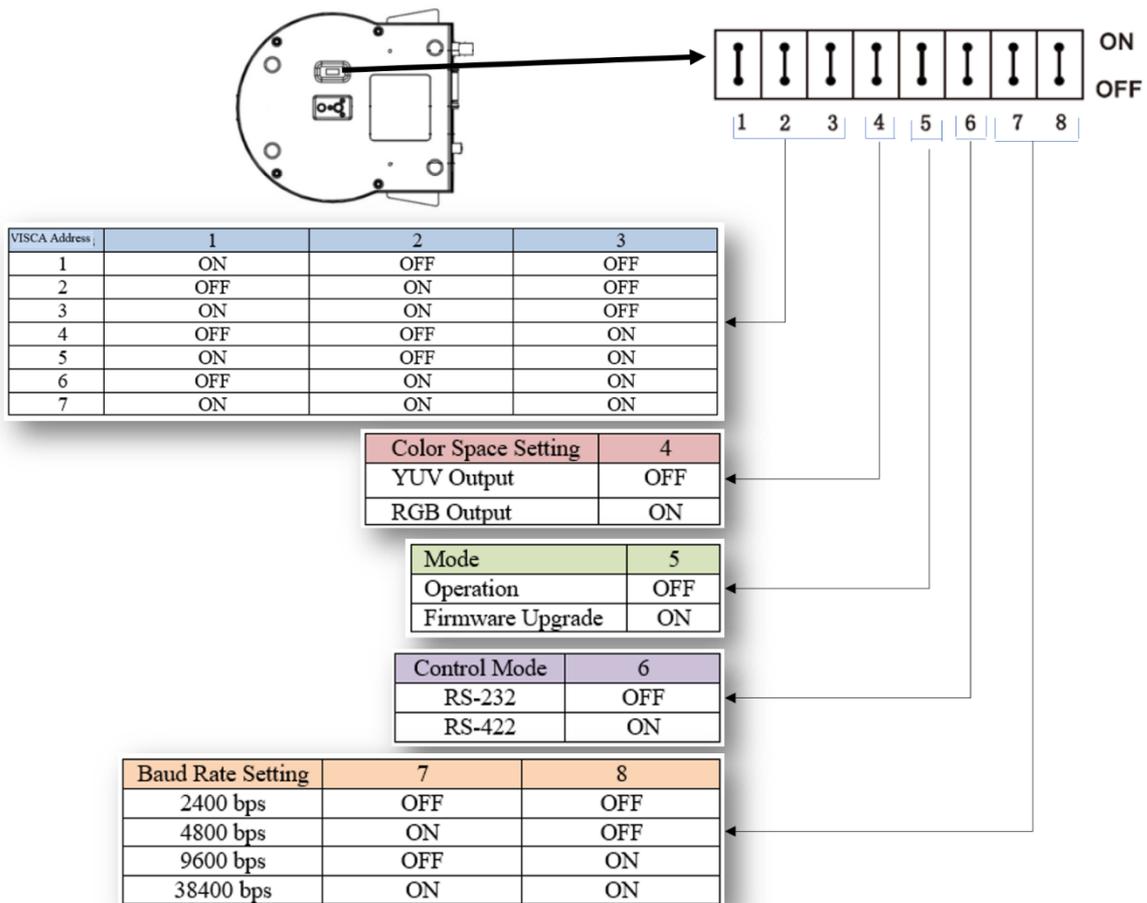
Setting of the back panel Rotate DIP Switches

The Rotate Dip Switch is for setting video format.
Use small screw driver to turn the switch, the arrow points to the Numbers or the Letters. The video format that the Number or Letter stands for refer to the video format as the chart following:
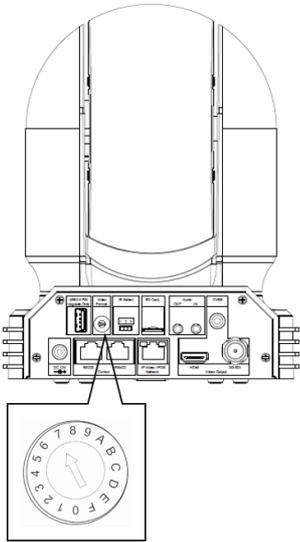
Numbers & Letters	Video Resolution
0	1080i59.94
1	1080P29.97
2	720P59.94
3	1080P59.94
4	1080P50
5	1080I60
6	1080P30
7	1080P60
8	1080I50
9	1080P25
A	720P50
B	1080P50
C	720P25
D	720P30
E	720P60
F	-

IR Remote Controller ID Setting

Set the IR SELECT switch on the back panel of the camera to 1, 2 or 3, which is the camera ID number that you want to operate on the Remote Controller.

For example, when the camera IR ID is selected 1, on the remote controller, press the Camera IR ID button 1, the camera will be controlled by remote controller.

When the camera IR ID is selected 3, on the remote controller, press the Camera IR ID button 3, the camera will be controlled by remote controller.

Always check the IR ID on both camera and remote sides if they match when the camera doesn't response to the remote control.
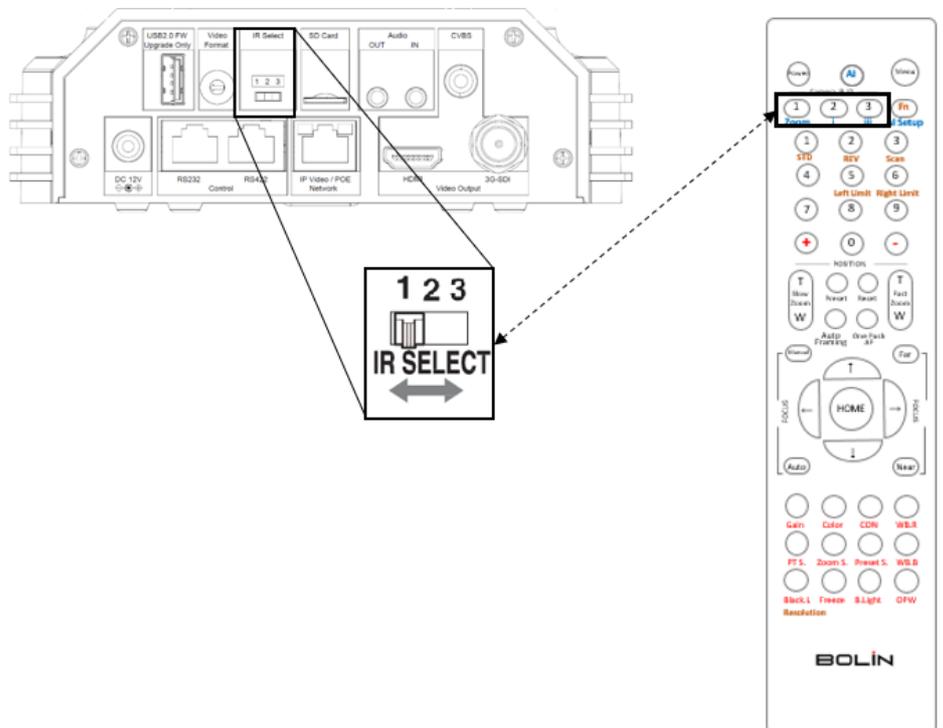
Adjusting and Setting with Menus

About On-Screen Menus

You can change various settings, such as shooting conditions and system setup of the camera, while observing menus displayed on a connected computer screen.

This section explains how to read the on-screen menus before starting menu operations.

The menu parameters may vary according to the different product model numbers.

For a complete configurations menu, see "Menu Configuration" (page 25).

Note

You cannot perform pan/tilt operations while the menu is displayed.

Main Menu

To display the main menu, press the DATA SCREEN button on the supplied infrared remote controller.

1. Selected Items

Selects a setting menu.

The selected item is shown by the cursor. The cursor moves up or down by pressing the "↑, ↓" button on the infrared remote controller.

2. Menu Items

To display a setting menu, select one using the "↑, ↓" button on the infrared remote controller and press the HOME button on the infrared remote controller.

```
           <MENU>
1 ←         EXPOSURE
            WHITE BALANCE
2 ←         PICTURE
            PAN TILT ZOOM
            SYSTEM
```
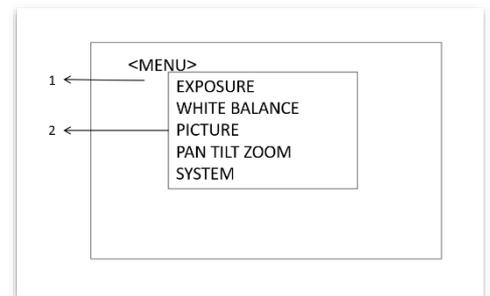
Setting Menus

The setting menu selected on the main menu is displayed.

1. Setting Menu

The name of the setting menu currently selected is displayed here.

2. Selected Item

Selects a setting item.

The selected item is shown by the cursor.

Move the cursor up or down by pressing the "↑, ↓" button on the infrared remote controller.

3. Setting Items

The setting items for this setting menu are displayed. Select the setting item using the "↑, ↓" button on the infrared remote controller.

4. Set Value

The currently set values are displayed.

To change a set value, use the "←, →" button on the infrared remote controller.

```
1 ←    <SYSTEM>
2 ←
3 ←        IR-RECEIVE        ON
           DISPLAY INFO      ON      → 4
```
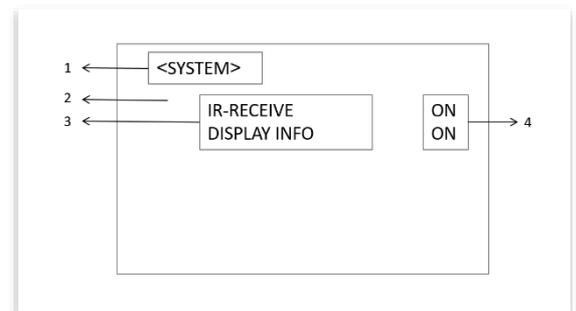
Note

In some product models, only use "←" button on the infrared remote controller to change the value. To confirm the value, you can use either "→" button or HOME button.

Control Button

You can select the item by pressing "↑, ↓, ←, →" and HOME button.

1. You can select a menu item by "↑, ↓" button on the infrared remote controller. The selected item is shown by the cursor (Color change). You can change the value of the item by pressing "←, →" button.

2. You can move to the next layer by pressing the HOME button.

3. You can return to the normal display by pressing the DATA SCREEN button.

Note

When you are operating the menu using the infrared remote controller, you cannot set IR- RECEIVE in the SYSTEM menu to OFF. To set IR- RECEIVE to OFF, use the appropriate VISCA command.

EXPOSURE Menu

The EXPOSURE menu is used to set the items related to exposure.

MODE (Exposure Mode)

FULL AUTO: The exposure is adjusted automatically using the values set for SLOW SHUTTER, S. SHUTTER LIMIT, AE RESPONSE, GAIN LIMIT, and EX-COMP.

MANUAL: Adjust the GAIN, GAIN LIMIT, electronic shutter speed (SPEED), iris (IRIS), and HIGH SENSITIVITY manually.

IRIS PRI: Iris Priority mode. The exposure is adjusted automatically using the values manually set for iris (IRIS), GAIN LIMIT, and EX-COMP

SHUTTER PRI: Shutter Priority mode. The exposure is adjusted automatically using the values manually set for electronic shutter speed (SPEED), GAIN LIMIT, and EX-COMP

BRIGHT: Bright mode, the exposure is adjusted automatically using the values manually set for LEVEL and HIGH SENSITIVITY

```
OSD                    EXPOSURE MENU: FULL AUTO

>EXPOSURE              MODE   FULL AUTO
 WHITE BALANCE           SLOW SHUTTER     OFF
 PICTURE1                S. SHUTTER LIMIT 1/4
 PICTURE2                AE RESPONSE      01
 NETWORK                 GAIN LIMIT       21.4dB
 PAN TILT ZOOM         EX COMP            OFF
 SYSTEM                   LEVEL           0
  STATUS
```

When you select one from various exposure modes, some of the following setting items that are required for the selected mode will appear.

```
MODE   MANUAL
   GAIN              12dB
   GAIN LIMIT        21.4dB
   SPEED             1/60
   IRIS              F1.6
 HIGH SENSITIVITY    OFF
```

GAIN: Select the gain from the following:
0dB, 3.6 dB, 7.1 dB, 10.7 dB, 14.3 dB, 17.8 dB, 21.4 dB, 25 dB, 28.6 dB, 32.1 dB, 35.7 dB, 39.3 dB, 42.8 dB, 46.4 dB, 50 dB

GAIN LIMIT:
The gain limit can be set at Full Auto, Shutter Priority, Iris Priority, Bright, Spot Exposure and Manual in AE mode. Use this setting when you want to obtain images with a focus on the signal-to-noise ratio

EXPOSURE MENU: IRIS PRI

```
MODE   IRIS PRI
   IRIS              F1.6
   GAIN LIMIT        21.4dB



EX-COMP    OFF
```

HIGH SENSITIVITY:
This function increases the max gain to allow bright output in darker environments. However, with a strong gain (up to 10×), the captured image will contain a lot of noise

EXPOSURE MENU: SHUTTER PRI

```
MODE   SHUTTER PRI
   SPEED             1/60
   GAIN LIMIT        21.4dB



EX-COMP    OFF
```

SPEED: Select the electronic shutter speed from the following:
When video format is set to 720P25, 1080P50, 1080i50, 1080P25, 720P50, Speed can be selected from the following:

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, 1/10K.

When video format is set to 720P30, 1080i59.94, 1080P29.97, 720P59.94, 1080P59.94, 1080I60, 1080P30, 1080P60, 720P60, Speed can be selected from the following:

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, 1/10K.

IRIS: Select the iris the following: CLOSE, F14, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.6

SLOW SHUTTER:
When set to "On," the slow shutter functions automatically when the light darkens. This setting is available only when the AE mode is set to "Full Auto." The initial setting is "Auto Slow Shutter Off."

S. SHUTTER LIMIT:
When the subject becomes dark, the shutter speed becomes slow and the gain is increased. This is a function to put a limit on the shutter speed. It prevents the camera shake when you shoot a moving subject in a dark place.

AE Response:
The slow AE Response function allows you to reduce the exposure response speed. Usually the camera is set up so that the optimum exposure can be obtained automatically within about 1 second. However, using the slow AE response function allows you to lengthen the auto exposure response speed from the initial setup speed

EX-COMP: (Exposure Compensation)
When MODE is set to one of FULL AUTO, SHUTTER PRI or IRIS PRI, set this item to ON to enable exposure compensation. When you set EX-COMP to ON, LEVEL appear and you can select the exposure compensation level from the following:
–10.5, –9, –7.5, –6, –4.5, –3, –1.5, 0, +1.5, +3, +4.5, +6, +7.5, +9, +10.5
If you set the level to 0, exposure compensation will be disabled. Level +10.5 is the brightest and –10.5 is the darkest compensation value.
When EX-COMP is set to OFF, exposure compensation does not function.

WHITE BALANCE Menu

The WHITE BALANCE menu is used to select the white balance mode.

MODE (white balance mode)
Select the white balance mode from the following:

AUTO: This mode computes the white balance value output using color information from the entire screen. It outputs the proper value using the color temperature radiating from a black subject based on a range of values from 2500K to 7500K. This mode is the initial setting.
INDOOR: 3200K Base Mode
OUTDOOR: 5800K Base Mode

OSD

| EXPOSURE |
| >WHITE BALANCE |
| PICTURE1 |
| PICTURE2 |
| NETWORK |
| PAN TILT ZOOM |
| SYSTEM |
| STATUS |

WHITE BALANCE MENU

| WB MODE | AUTO |
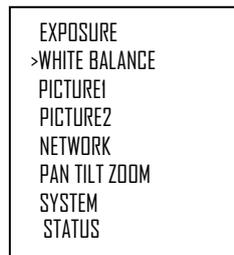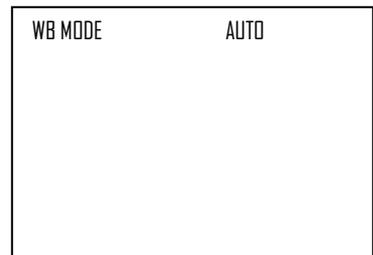
OPW (One Push White Balance): The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only at the request of the user (One Push Trigger), assuming that a white subject, in correct lighting conditions, and occupying more than 1/2 of the image, is submitted to the camera. One Push White Balance data is lost when the power is turned off. If the power is turned off, reset One Push White Balance.
NOTE: *When you select the OPW (One Push White Balance)*
Perform the following operations:
1. Place an image of white subject (For example: A piece of white paper) in the center of the screen.
2. Press the HOME button of the infrared remote controller.
The one-push white balance adjustment is activated.

WHITE BALANCE MENU

| WB MODE | INDOOR |

WHITE BALANCE MENU

| WB MODE | OUTDOOR |

WHITE BALANCE MENU

| WB MODE | OPW |

ATW (Auto Tracking White Balance): Auto Tracking White balance (2000K to 10000K), allows the camera to adjust the tone according to the temperature of the light source illuminating the subject

WHITE BALANCE MENU

| WB MODE | ATW |

USER: This is a mode that enables you to manually set the control of R and B gain up to 256 steps.

NOTE: *When you select USER, R. GAIN (red gain) and B. GAIN (blue gain) appear. You can select each item in the range from 0 to 255.*

```
WHITE BALANCE MENU
┌─────────────────────────────┐
│ WB MODE          USER        │
│  R GAIN          106         │
│  B GAIN          217         │
└─────────────────────────────┘
```

OUTDOOR AUTO: This is an auto white balance mode specifically for outdoors. It allows you to capture images with natural white balance in the morning and evening.

```
 WHITE BALANCE MENU
┌─────────────────────────────┐
│ WB MODE       OUTDOOR AUTO   │
└─────────────────────────────┘
```

SL AUTO: Sodium Vapor Lamp Auto: This is an auto white balance mode that is compatible with sodium vapor lamps.

```
WHITE BALANCE MENU
┌─────────────────────────────┐
│ WB MODE        SVL AUTO      │
└─────────────────────────────┘
```

SL: Sodium Vapor Lamp: This is a fixed white balance mode specifically for sodium vapor lamps.

```
WHITE BALANCE MENU
┌─────────────────────────────┐
│ WB MODE          SVL         │
└─────────────────────────────┘
```

SLO AUTO: Sodium Vapor Lamp Outdoor Auto: This is an auto white balance mode specifically for outdoors, which is compatible with sodium vapor lamps.

```
WHITE BALANCE MENU
┌─────────────────────────────┐
│ WB MODE        SVL OUTDOOR A.│
└─────────────────────────────┘
```

PICTURE1 Menu

```
OSD                    PICTURE MENU
┌──────────────┐  ┌──────────────────────┐
│ EXPOSURE     │  │ SHARPNESS       3     │
│ WHITE BALANCE│  │ EFFECT          OFF   │
│ >PICTURE1    │  │ NOISE REDUCTION 3     │
│  PICTURE2    │  │ FLIP            OFF   │
│  NETWORK     │  │ MIRROR          OFF   │
│  PAN TILT ZOOM│ │ DE-FLICKER      OFF   │
│  SYSTEM      │  │ WDR             OFF   │
│   STATUS     │  │ COLOR           5     │
│              │  │ HUE             6     │
│              │  │ CONTRAST        128   │
└──────────────┘  └──────────────────────┘
```

SHARPNESS:
Picture sharpness value ranges from 0 to 15. You can enjoy emphasized edge and high-resolution images.

EFFECT: (Picture Effect)
It consists of the following functions:
B&W: Monochrome Image
Image effect from Off, B&W

NOISE REDUCTION:
Noise reduction - you can enjoy clearer images by removing unnecessary noise. You can select 6 levels from OFF (MIN), 1 to 5 (MAX).

FLIP:
Image E-Flipper – Used when ceiling mounting or upright mounting. Set to OFF is upright mode, set to ON is for ceiling mount.

MIRROR:
You can have the image as seen in a mirror, with the right side as though it were the left.

DE-FLICKER:
You can turn it ON if the Video output format frame rate is difference from your country's electricity Frequency.

WDR: (Wide dynamic range mode): WDR feature is available on certain product models.
Wide Dynamic: ON, OFF. The camera distinguishes light and dark areas within the same scene, adjusts the brightness for dark areas, and also controls the blown-out highlights.
You can select the wide dynamic range mode between ON and OFF

COLOR
You can configure the color gain from 1-15. Use this setting when bright color is particularly important.

HUE
You can adjust color phase from 1-15.

CONTRAST
You can adjust the contrast level in the range from 0 (00h) to 255 (FFh). The initial setting is 128 (80h). The smaller the value is, the lower the contrast becomes, and the larger the value is, the higher the contrast becomes.

PICTURE2

IR CUT FILTER

An infrared (IR) Cut-Filter can be disengaged from the image path for increased sensitivity in low light environments. The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day/night environments. When the auto ICR mode is set to NIGHT, the image becomes black and white

OSD		PICTURE2	
EXPOSURE		IR CUT FILTER	OFF
WHITE BALANCE		CHROMA SUPPRESS	OFF
PICTURE1		HLC MODE	OFF
>PICTURE2		BACKLIGHT COM.	OFF
NETWORK		STABILIZER	OFF
PAN TILT ZOOM		GAMMA	0
SYSTEM		LOW LATENCY MODE	OFF
STATUS			

CHROMA:

You can set the brightness from OFF, LOW, MID, HIGH in each mode of the variable gamma mode.

HLC MODE:

HLC (Highlight Light Compensation) is a function to adjust AE and AF, and to perform the masking of light area as required when a high intensity spot light is detected.

BACKLIGHT COM.

When the background of the subject is too bright, or when the subject is too dark due to shooting in the AE mode, back light compensation will make the subject appear clearer.

STABILIZER (Available on 30X, not available on 20X)

When the image stabilizer function is set to ON, you can obtain the image with less screen blur caused by shaking. The correction effect can be achieved at the vibration frequency around 10 Hz. The image stabilizer function uses the digital zoom method. Although there are changes in the angle of view and resolution, the sensitivity is maintained.

Note: The image stabilizer function may not work under the environment of high frequency vibration components. When using the camera under such environment, set the image stabilizer function to Off.

GAMMA:

In this mode, the gamma can be set to value from 0 to 1.

LOW LATENCY MODE

The camera image performance can be set to Low Latency Mode to have the least image latency.

NOTE:

By setting the Low Latency Mode on, the Digital Zoom feature and Stabilizer feature will be disabled.

NETWORK

It may take a short while to display the network information after you select the NETWORK menu.

The network menu is for displaying IP configuration information of the IP encoder that is built-in with the camera.

OSD	NETWORK MENU	
EXPOSURE	IPv4	192.168.002.234
WHITE BALANCE	SUBNET MASK	255.255.255.0
PICTURE1	GATEWAY	192.168.002.001
PICTURE2	MAC ADDRESS	00:26:C2:01:02:EE
>NETWORK		
PAN TILT ZOOM		
SYSTEM		
STATUS		

The IP configuration is currently not available to be modified via OSD menu. You need to use your PC internet browser to configure the IP network setting of the camera.

PAN TILT ZOOM Menu

The PAN TILT ZOOM menu is used to select the pan/tilt/zoom mode.

OSD   PAN TILT ZOOM MENU

OSD		PAN TILT ZOOM MENU	
EXPOSURE		DIGITAL ZOOM	OFF
WHITE BALANCE		ZOOM RATIO OSD	OFF
PICTURE1		AF SENSITIVITY	LOW
PICTURE2		MF SPEED	2
NETWORK		NEAR LIMIT	30cm
>PAN TILT ZOOM		ADAPTIVE PT	ON
SYSTEM		P/T SPEED	3
STATUS		PRESET SPEED	5
		PAN DIR	NORMAL
		TILT DIR	NORMAL
		TRACE MEMORY	

DIGITAL ZOOM:

Set to DIGITAL ZOOM ON, 12X digital zoom is activated. You can set digital zoom to ON or OFF. When set to OFF, digital zoom does not operate, and only optical zoom is available. When set to ON, digital zoom takes over after optical zoom reaches MAX (20X/30X). Up to 200X/300X can be zoomed digitally.

When digital zoom is available, the resolution decreases

ZOOM RATIO OSD (Zoom times display):

Set Ratio OSD to ON, the number of the zoom ratio that you are operating displays on screen.

AF SEN:

NORMAL: Reaches the highest focus speed quickly. Use this when shooting a subject that moves frequently.

LOW: Improves the stability of the focus. When the lighting level is low, the AF function does not take effect, even though the brightness varies, contributing to a stable image.

MF SPEED:

Manual Focus variable speed, that has eight speed levels.

NEAR LIMIT:

Can be set in a range from OVER, 1cm, 11cm, 30cm, 80cm, 1.2m, 1.4m, 1.6m, 2.0m, 2.5m, 3.1m, 4.2m, 6m, 10m, 20m.

ADAPTIVE P/T:

Set to ON, Pan Tilt speed would be adaptive with the zoom range.

Turn ON to automatically adjust the Pan and Tilt speed with various zoom ratios. For example, the higher zoom ratio you use, the slower the speed of P/T.

P/T SPEED:

Set P/T Speed value to from 0 to 5 (The speed from low to high), to change the speed of P/T on remote controller.

PRESET SPEED:

Set preset speed value from 0 to 5 to change the preset speed.

PAN DIR:

Camera horizontal Left and right orientation setting, option: Normal/Invert

TILT DIR:

Camera tilt up and down orientation setting, option: Normal/Invert

TRACE MEMORY

PTZ Trace is a function used to record pan/tile/zoom operations, controlled by remote commander or a remote controller, and then to play back the operations as required. UP to 100 pan/tilt/zoom commands can be recorded for up to 60 seconds.

Trace Memory

TRACE NO	1
PLAY TIMES	ONCE
RECORD	
MEMORY	PLAY

- TRACE NO: Select the TRACE number to record, play back or delete.
- PLAY TIMES: How to play back the recorded operations, can be set to Once or Unlimited.
    - Once: The recorded trace memory will be only running one time then stop.
    - Unlimited: The recorded trace memory will be only running unlimited times and never stop until quit the Trace Memory mode or the PTZ movement is triggered manually.
- RECORD: Record operations.
- MEMORY: Play back or delete the recorded operations.

Recording Trace Memory (pan/tile/zoom operations)

- Select the trace number you want to record in TRACE NO.
- Move the cursor to RECORD and press the HOME button (Or joystick right click).
  *Setting menu (enter to record) is display at the top left corner of the screen
- Move the camera position to the Start Position where you want the Trace to start from.
  *Recording status is display at the top of the screen
- Call preset 1 to start the trace recording
- Perform the pan/tilt/zoom operations you want to record, during recording, elapsed commands number at the top of the screen increases in increments of 1 when the camera received one command.

NOTE: *If using the remote commander, pan/tilt/zoom operations can't be performed simultaneously.*
If using the joystick controller, pan/tilt/zoom operations can't be performed simultaneously

- Call preset 1 to finish and stop the trace recording

NOTE: *The recording automatically stops after the maximum recording time has elapsed.*

Playing Trace Memory (pan/tilt/zoom operations)

- Select the recorded trace number you want to play in TRACE NO.
- Move the cursor to MEMORY, select PLAY and press HOME button to begin playback.

NOTE: *Playback stops if a pan/tilt/zoom operation is performed during playback by using the remote commander or a joystick controller.*

Deleting recorded Trace Memory (pan/tilt/zoom operations)

- Select the trace number you want to delete in TRACE NO.
- Move the cursor to MEMORY, select DELETE and press HOME button, it will display "DELETE TRACE YES", press HOME button again, this trace will be deleted.

SYSTEM Menu

PELCO ID

When using RS485 (PELCO P/D) control, Set Camera ID to the address that you want to control to. This value is from 001-255.

IR-RECEIVE (Infrared Signal Reception)

When this is set to OFF, the camera does not receive the signal from the infrared remote controller.
Be sure to keep it set to ON when you use the infrared remote controller.

Note

You cannot set IR-RECEIVE to OFF when you operate the menu using the infrared remote controller. To set it to OFF, use the appropriate VISCA controller.

```
OSD                      SYSTEM MENU

  EXPOSURE                 PELCO ID        001
  WHITE BALANCE            IR-RECEIVE      ON
  PICTURE1                 DISPLAY INFO    ON
  PICTURE2                 PRESET MEMORY   ON
  NETWORK                  FACTORY RESET
  PAN TILT ZOOM            AUDIO           OFF
 >SYSTEM                   TALLY MODE      OFF
  STATUS                   RELOAD PRESET 1 ON
                           VIDEO FMTT      1080P29.97
                           MCU FW:   V0B220BI0040AA005
```

DISPLAY INFO

When this item is set to ON, the message of the camera configuration appears for about 3 seconds on the screen, after the camera is powered on or rebooted.

PRESET MEMORY:

This feature allows you to save the image parameter to PRESET memory, turn it on to save most image parameters like as picture, white balance, exposure, focus mode, zoom positions when you call the preset.

FACTORY RESET

You can select this item to set camera back to Factory Default setting by pressing HOME button to confirm the action. All data of the camera that have been set will be deleted.

AUDIO

This item is set to OFF by default, user can set it to ON to enable camera AUDIO IN to capture audio signal.

TALLY MODE

When the tally mode is set to ON, the tally light on the camera will be turned on.
If you connect the camera with Bolin keyboard controller, you can set the GPI I/O to Output mode in Keyboard Setting, then you can do tally control via the keyboard directly.

RELOAD PRESET 1:

When this item is set to ON, preset 1 is set to Home position. The camera goes to Home position when it is powered on or reset.

VIDEO FORMAT:

You can change the video format by adjusting this item. Select the item, press "←" button to choose the video format you want to set to, then press "→" (Pressing "→" button changes value on some product models) or HOME button to confirm it. After you confirm your choice, press HOME button again to restore it. The camera will reboot by itself. The new video format is activated.
You can cancel it by pressing the DATA SCREEN button.

Depending on the video client software you are using, some video software may need to be restarted to obtain the new video format.

The video formats that you can select from are: 1080P:60/59.94/50/30/29.97/25, 1080I:60/59.94/50, 720P:60/59.94/50/30/25

SV:

Software Version Number that is currently running on the camera, you may need this information for technical support.

Note

The camera video format can be changed by setting bottom DIP switch as well.

Firmware Upgrade

There are 4 types of firmware with this camera can be upgradable. The latest camera firmware is available to be downloaded from Bolin website: www.bolintechnology.com.

1. MCU (Micro Control Unit) firmware upgrade via USB

2. IP encoder firmware upgrade via IP network

3. FPGA firmware upgrade via IP network

4. Resolution FHD to 4K firmware via IP network.

NOTE:

The firmware upgrade process is intended to be performed under the supervision of a BOLIN-Authorized repair technician. For assistance with this, please contact your authorized BOLIN Technology dealer, installer, or integrator. BOLIN Technology Technical Support can also be reached for assistance with this process

Upgrading MCU Firmware

MCU Firmware can be upgraded by following these steps:
1. Load the .bin file onto a flash drive (Formatted as FAT32), and name the file "HD20.bin"
2. With the camera powered off, insert the flash drive to the USB port on the back panel of the camera
3. Apply power to the camera

The green indicator light above the lens will turn red for a few seconds while the upgrade takes place. Once the upgrade is finished, the light will turn green, and the camera will proceed through a normal boot cycle. Check the data on the OSD boot screen
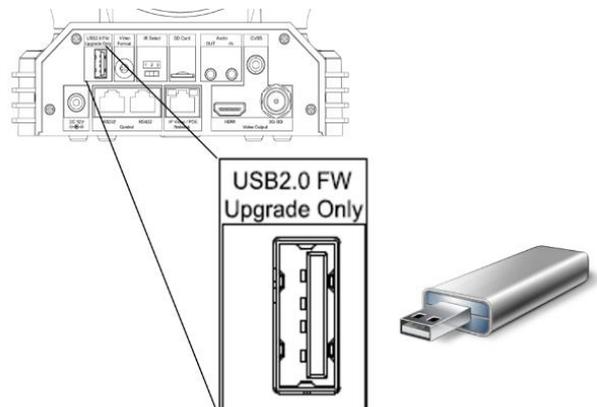
Upgrading IP encoder firmware

You can upgrade camera IP encoder module Firmware via IP network.

Connect and configure your camera with your local network successfully, log in the camera IP web interface, go to System, Maintenance section to upgrade the firmware.

How to make Firmware upgrade for IP Encoder, please refer to User Manual Part Two.

Operation Using the Infrared Remote Controller

Pan/Tilt and Zoom Operation

Panning and Tilting
1. Press the POWER switch.
The camera will turn on and perform the pan/tilt reset operation automatically.
2. Press the arrow button to pan or tilt the camera.
While checking the picture on the screen, press the desired arrow button.
To move the camera in short increments, press the button just for a moment.
To move the camera in long increments, press and hold the button.
To move the camera diagonally, press the "←, →" button while holding down the "↑, ↓" button.

Restore to starting position
Press the HOME button.

If the camera moves in a different direction from the one that you intended
The camera is preset so that the image output from the camera is rotated toward the right whenever you press the "←, →" button.

To face the camera toward the opposite direction
You might wish to face the camera toward the opposite direction from that of the button you pressed, for example, when you change the direction of the camera while checking the picture on the screen. In such a case, press and hold the Fn key, then press the 2 (REV) button.

| Arrow button	Movement of the camera	Setting
		L/R DIRECTION SET While holding down REV ② Press

To reset the setting
To reset the setting, press and hold the Fn key, then press the 1 (STD) button.

Arrow button	Movement of the camera	Setting
		L/R DIRECTION SET While holding down STD ① Press

Note

The above setting only changes the signal emitted from the infrared remote controller, and does not change the setting of the camera itself. Therefore, repeat the setting for each infrared remote controller if you are using more than one infrared remote controller.
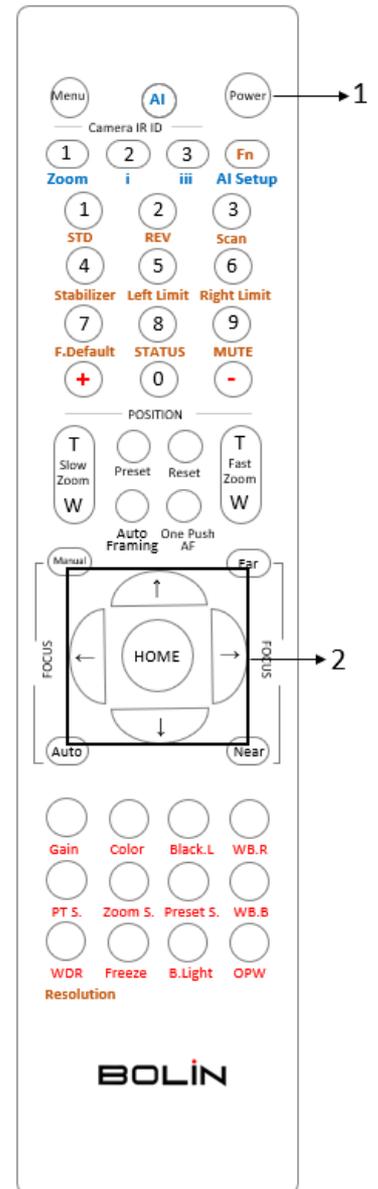
When the STANDBY lamp is blinking

If the camera is moved forcibly, or a finger or other object interferes with camera movement, the camera may fail to memorize the pan/tilt position.

Press the PAN-TILT RESET button to reset the pan/tilt position.

Zooming

Button (Slow Zoom) [T] - Zoom-IN and [W] - Zoom-OUT slowly
Button (Fast Zoom) [T] - Zoom-IN and [W] - Zoom-OUT quickly
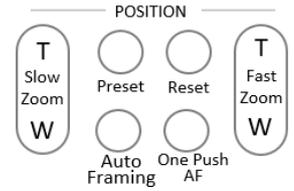
Operating Multiple Cameras with Infrared Remote Controller

1. Set the DIP Switch on the rear panel of the camera to the number of camera you want to operate to 1, 2 or 3.
   (See DIP Switch setting instruction)
2. Press one of the Camera IR ID button on the IR remote controller, the button will be illuminated, that means the camera that is set to IR ID Number will respond to the IR controller.
3. Always firstly check if the IR ID is set correctly same as the IR ID set on the camera when the camera is not responding to the IR controller.

Then, you can operate the camera(s) specified by number. Every time you operate the camera(s) using the IR remote controller, the Camera IR ID button pressed in step 2 fleshes.
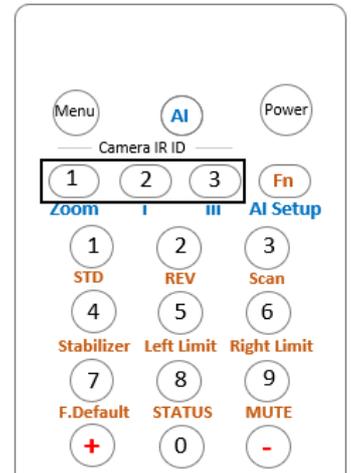
Adjusting the Camera Focus

Focusing on a Subject

Focusing the camera on a subject automatically

Press the AUTO button.
The camera focuses on the subject at the center of the screen automatically.

Focusing the camera on a subject manually

After pressing the MANUAL button, press either the FAR or the NEAR button to have the camera focus on the subject.

Shooting with Back Lighting

When you shoot a subject with a light source behind it, the subject becomes dark. In such a case, press the BACK LIGHT button.
To cancel the function, press the BACK LIGHT button again.

Note

The BACK LIGHT function is effective if MODE is set to FULL AUTO in the EXPOSURE menu of the camera.
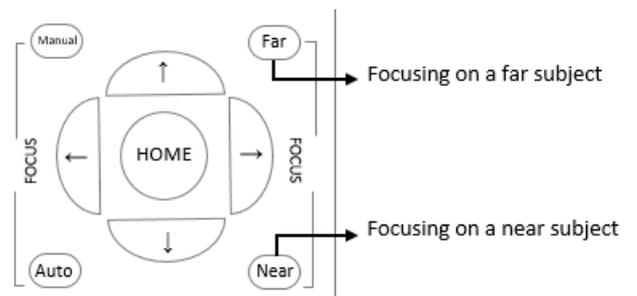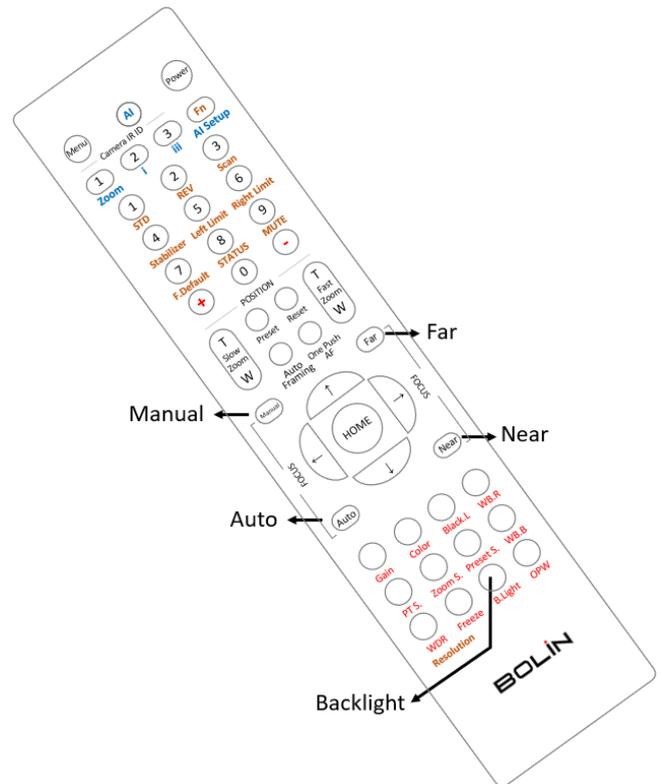
Storing the Camera Settings in Memory — the Presetting Feature

Memory (Preset)

Using the preset function, 9 sets of camera shooting conditions can be stored and recalled. 9 sets of camera shooting conditions can be stored and recalled by using remote controller. Up to 128 presets via protocol programming.

This function allows you to achieve the desired status instantly, even without adjusting the following items each time.

- Pan/Tilt Position
- Zoom Position
- Focus Auto/Manual
- Focus Position
- AE Mode
- Shutter control parameters
- Bright Control
- Iris control parameters
- Gain control parameters
- Exposure Compensation On/Off
- Exposure Level
- Backlight Compensation On/Off
- White Balance Mode
- R/B Gain
- Aperture Control
- WD Parameter

The settings stored using this function are recalled when the power is turned on.

1. Press the PAN-TILT RESET button to reset the pan/ tilt position.

2. Adjust the position, zooming, focusing and backlighting of the camera.

While holding down the PRESET button, press any of the POSITION buttons, 1 to 9, in which you want to store the settings.

Recalling the stored settings
Press any of the POSITION buttons, [1] to [9], in which you have stored the settings.

Cancelling the preset memory
While holding down the RESET button, press the POSITION button from which you want to cancel the settings.

Notes

- When the power is turned on, the camera starts with the settings stored in POSITION 1.
- If you want to retain the previous pan and tilt positions, etc. before the power is turned off and turned on again, store those positions in POSITION 1.
- When you are storing or cancelling the settings in one POSITION, you cannot call up, store or cancel the settings in another POSITION.
- When the menu is displayed on the screen, you cannot perform the operation for storing, recalling, or cancelling the setting. Be sure to return to the normal display before starting these operations.
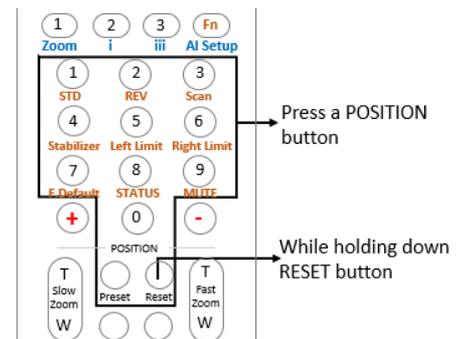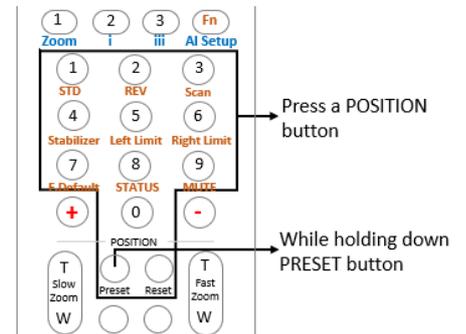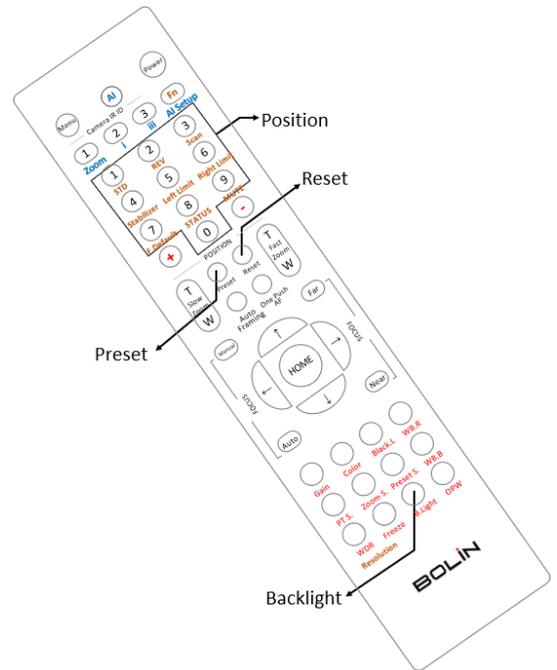
Adjusting the camera

Adjusting the camera, including camera image parameter (Gain, Color, Contrast, White Balance (Red & Blue), Black Level), camera speed (Pan/Tilt speed, zoom speed and preset speed), as well as Freeze, Back Light and One Push White Balance.

Gain-Adjust Gain
Press Gain button, the Gain button light will on, then press "+" or "-" button to adjust the Gain value.
After done, press other button in this area, the Gain button light will off.

Color-Adjust Color
Press Color button, the Color button light will on, then press "+" or "-" button to adjust the Gain value.
After done, press other button in this area, the Color button light will off

CON-Adjust Contrast
Press CON button, the CON button light will on, then press "+" or "-" button to adjust the Contrast value.
After done, press other button in this area, the CON button light will off.

WB.B-Adjust White Balance (Red)
Press WB.R button, the WB.R button light will on, then press "+" or "-" button to adjust the White Balance Red color value.
After done, press other button in this area, the WB.R button light will off.

WB.B-Adjust White Balance (Blue)
Press WB.B button, the WB.B button light will on, then press "+" or "-" button to adjust the White Balance Blue color value.
After done, press other button in this area, the WB.B button light will off.

PT S.-Adjust Pan/Tilt Speed
Press PT S button, PT S button light will on, then press "+" or "-" button to adjust Pan/Tilt speed value.
After done, press other button in this area, the PT S button light will off.

Zoom S.-Adjust Zoom Speed
Press Zoom S button, Zoom S button light will on, then press "+" or "-" button to adjust zoom speed value.
After done, press other button in this area, the Zoom S button light will off.

Preset S.-Adjust Preset Speed
Press Preset S button, Preset S button light will on, then press "+" or "-" button to adjust preset speed value.
After done, press other button in this area, the Preset S button light will off.

Black L.-Adjust Black Level
Press Black L button, Black L button light will on, then press "+" or "-" button to adjust black level value.
After done, press other button in this area, the Black L button light will off.

B.Light-Adjust Back Light
Press B Light button, B Light button light will on, then press "+" or "-" button to adjust back light value.
After done, press other button in this area, the B Light button light will off.

Freeze-Set Freeze
Press Freeze button, Freeze button light will on, the camera image will be frozen, press Freeze button again, Freeze button light will off, and camera image will back to normal

OPW-Set One Push Whit Balance
Press OPW button, OPW button light will on, camera will be automatically readjusted white balance.
NOTE:
When you select the OPW (One Push White Balance), please perform the following operations:
1. Place an image of white subject (For example: A piece of white paper) in the center of the screen.
2. Press the OPW button of the infrared remote controller. the one-push white balance adjustment is activated.

NOTE:
After done, press other function button which in different color, the red color button light will off.
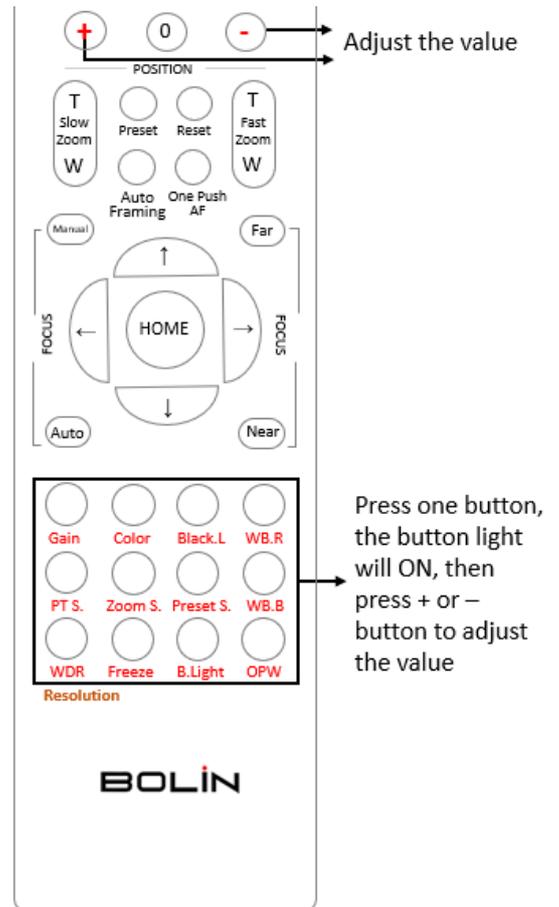
AI Feature Mode

This IR Remote Controller can be used for BOLIN AI (Auto Framing/Auto Tracking) camera, we can set this IR controller to AI mode, to set up AI feature quickly.
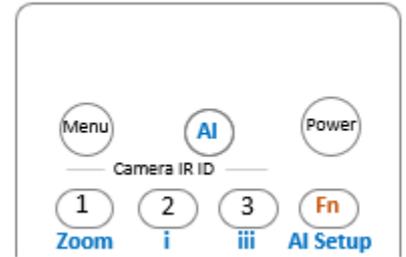
AI Button:
Press AI button, the IR controller will switch to AI mode.
Zoom:
AI Feature, it is available when AI button is pressed. Adjust the zoom position of the person within the image, for example Close Up, Half-Body, Full-Body.
i: AI feature
Single target mode, use this mode when there is only one person as a tracking target in the camera image.
iii: AI feature
Multi-target mode, use this mode when there are more than one person as a tracking target in the camera image.
AI Setup:
Press it to bring up AI setting menu.

Fn Mode Key
Press and hold the Fn key, then press one of the function buttons that printed in color brown to have extra feature settings.

REV:
To face the camera toward the opposite direction, press and hold the Fn key, then press 2 (REV) button.
STD:
To reset the setting that configured in REV step, press and hold the Fn key, then press 1 (STD) button.
Scan:
To set the camera in scan mode, press and hold the Fn key, then press 3 (Scan) button. Press one more time to stop the scanning.
NOTE: If set Left limit / Right Limit, auto scanning will run within the limit position range.
Left Limit:
To set the leftmost position that the camera can pan to.
Use the arrow keys to turn the camera to the leftmost position you want to set, press and hold the Fn key, then press 5 (Left Limit) button and hold for 1 second, the left limit position has been set. When the camera is turned to the left and reach the left limit position, the camera will stop.
Press and hold Fn key, then press 5 (Left Limit) and hold for 3 seconds, the left limit position will be deleted.
Right Limit:
To set the rightmost position that the camera can pan to.
Use the arrow keys to turn the camera to the rightmost position you want to set, press and hold the Fn key, then press 6 (Right Limit) button and hold for 1 second, the right limit position has been set. When the camera is turned to the right and reach the right limit position, the camera will stop.
Press and hold Fn key, then press 6 (Right Limit) and hold for 3 seconds, the right limit position will be deleted.
NOTE:
When the HOME position or the preset position set is not within the Left Limit / Right Limit range, the remote controller operate HOME position or preset call command is invalid.
F.Default:
To restore the camera to factory settings, press and hold Fn key, then press 7 (F.Default) button.
**STATUS**
To pull out the camera Status menu, press and hold Fn key, then press 8 (Status) button.
MUTE
To enable or disable the audio signal from the SDI/HDMI output, press and hold Fn key, then press 9 (Mute) button to enable, press one more time to disable the mute.
Resolution:
To change the video resolution, press and hold Fn key, then press the Resolution button to populate a menu where you can switch resolutions.
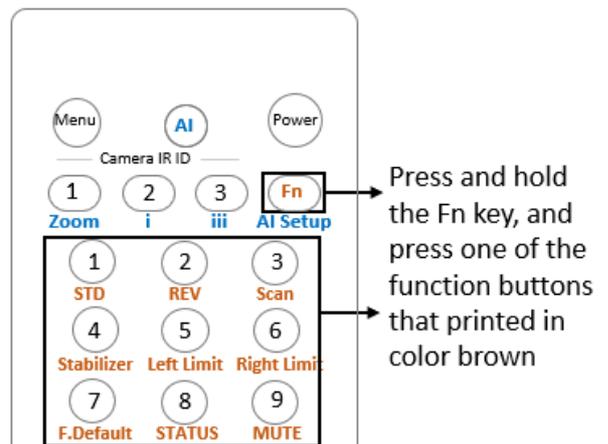
Changing Video Resolutions

- Press and hold Fn button, then press the Resolution button to populate a menu where you can switch resolutions
- Use the arrow keys to navigate
- Press Home to select
- Screen will show 'CHANGING…"
- Press Menu to exit

Gain   Color   Black.L   WB.R

PT S.   Zoom S.   Preset S.   WB.B

WDR   Freeze   B.Light   OPW
Resolution

BOLİN
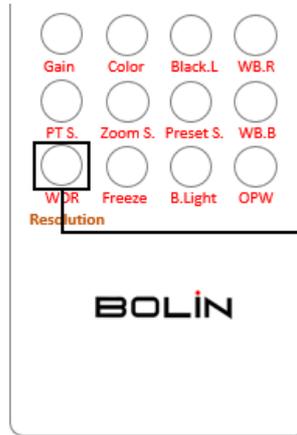
Press and hold Fn key, then press this button to switch between available resolution

Menu Configuration

The menus of the camera are configured as described below. The initial settings of each item are in bold.

OSD Menu Configuration

Menu	EXPOSURE	MODE	FULL AUTO	SLOW SHUTTER	OFF, ON
				S. SHUTTER LIMIT	1/1, 1/2, 1/3, 1/4, 1/8, 1/15, 1/30
				AE RESPONSE	1-48
				GAIN LIMIT	10.dB, 14.3dB, 17.8dB, 27dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				EX-COMP	ON, OFF (When set to ON, the LEVEL can be adjusted) LEVEL: -10.5, -9, -7.5, -6, -4.5, -3, -1.5, 0, 1.5, 3. 4.5, 6, 7.5, 9, 10.5
			MANUAL	GAIN	0dB, 3.6dB, 7.1dB, 10.7dB, 14.3dB, 17.8dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				GAIN LIMIT	10.7dB, 14.3dB, 17.8dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				SPEED	1/1, 1/2, 1/4, 1/6, 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, 1/10K
				IRIS	CLOSE, F14, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.6
				HIGH SENSITIVITY	OFF, ON
			IRIS PRI	IRIS	CLOSE, F14, F11, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.6
				GAIN LIMIT	10.7dB, 14.3dB, 17.8dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				EX-COMP	ON, OFF (When set to ON, the LEVEL can be adjusted) LEVEL: -10.5, -9, -7.5, -6, -4.5, -3, -1.5, 0, 1.5, 3. 4.5, 6, 7.5, 9, 10.5
			SHUTTER PRI	SPEED	1/1, 1/2, 1/4, 1/6, 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, 1/10K
				GAIN LIMIT	10.7dB, 14.3dB, 17.8dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				EX-COMP	ON, OFF (When set to ON, the LEVEL can be adjusted) LEVEL: -10.5, -9, -7.5, -6, -4.5, -3, -1.5, 0, 1.5, 3. 4.5, 6, 7.5, 9, 10.5
			BRIGHT	LEVEL	0, 5-31
				GAIN LIMIT	10.7dB, 14.3dB, 17.8dB, 21.4dB, 25dB, 28.6dB, 32.1dB, 35.7dB, 39.3dB, 42.8dB, 46.4dB, 50dB
				HIGH SENSITIVITY	OFF, ON
	WHITE BALANCE	MODE	AUTO		
			INDOOR		
			OUTDOOR		
			OPW		
			ATW		
			USER	R GAIN	0-255
				B GAIN	0-255
			OUTDOOR AUTO		
			SVL AUTO		
			SVL		
			SVL OUTDOOR A.		
	PICTURE 1	SHARPNESS			0-15
		EFFECT			OFF, NEG, B&W
		NOISE REDUCTION			OFF, 1-5
		FLIP			OFF, ON
		MIRROR			OFF, ON
		DE-FILCKER			OFF, ON
		WDR			OFF, ON
		COLOR			1-15
		HUE			1-15
	PICTURE 2	IR CUT FILTER			OFF, ON
		CHROMA SUPPRESS			OFF, LOW, MID, HIGH
		HLC MODE			OFF, ON
		BACKLIGHT COMP.			OFF, ON
		STABILIZER			OFF ON
		GAMMA			0-2
		LOW LATENCY MODE			ON, OFF

| NETWORK	IPv4 ADDRESS	192.168.0.13	
	SUBNET MASK	255.255.255.0	
	GATEWAY	192.168.0.1	
	MAC ADDRESS	xx-xx-xx-xx-xx-xx	
PAN TILT ZOOM	DIGITAL ZOOM	OFF, ON, SRZ	
	ZOOM RATIO OSD	OFF, ON	
	VIDEO PARAMETERS OSD	OFF, ON	
	AF SENSITIVITY	NORMAL, LOW	
	MF SPEED	0-7	
	NEAR LIMIT	OVER, 20m, 10m, 6m, 4.2m, 3.1m, 2.5m, 2.0m, 1.6m, 1.4m, 1.2m, 80cm, 30cm, 11cm, 1cm	
	ADAPTIVE PT	ON, OFF	
	P/Z SPEED	0-5	
	PRESET SPEED	0-5	
	PAN DIRECTION	NORMAL, INVERT	
	TILT DIRECTION	NORMAL, INVERT	
	TRACE MEMORY	TRACE NO	1~4
		PLAY TIMES	ONCE / UNLIMITED
		RECORD	
		MEMORY	PLAY / DELETE
SYSTEM	PELCO ID	1-255	
	IR-RECEIVE	ON, OFF	
	DISPLAY INFO	ON, OFF	
	PRESET MEMORY	ON, OFF	
	FACTORY RESET	YES?	
	AUDIO	OFF, ON	
	TALLY MODE	OFF, ON	
	RELOAD PRESET 1	ON, OFF	
	VIDEO FMT	1080p: 60/59.94/50/29.97/25 1080i: 60/59.94/50 720p: 60/59.94/50/30/25	
	MCU FW	V0B220B10040AA005	
STATUS	NEXT PAGE		
	PELCO ID	1	
	VISCA ID	1	
	IR ID	1	
	BAUD RATE	9600	
	COMM TYPE	422	
	FORMAT	1080P60	
	IP ADDR	xxx.xxx.xxx.xxx	
	MAC ADDR	44-03-77-E0-07-4E	
	MCU FW	V0B220B10040AA005	
	EXP MODE	AUTO_EXP	
	WB MODE	AUTO	
	COLOR	5	
	HUE	8	
	FLIP	OFF	
	MIRROR	OFF	
	HLC MODE	OFF	
	STABILIZER	OFF	
	P/T SPEED	3	
	PRESET SPEED	5	

Dimension

Unit: mm

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