



WORLD'S FIRST NDI® PTZ CONTROLLER.



USER GUIDE

August 2022

NDI®

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Important Information

Legal Notice

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).

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.

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.

Warnings

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 device 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 device should be packed in its original packaging.
- Make sure the power supply voltage is correct before using the camera.
- Do not drop the device or subject it to physical shock.



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.



Welcome to BirdDog

Thank you for purchasing your BirdDog PTZ Keyboard. If you have any questions regarding the camera, please contact your authorized dealer or view our [PTZ Keyboard Knowledge Base](#).

Our website also has a [User Stories](#) page to help inspire you to get the most out of your camera.

Using This Manual

Your PTZ Keyboard is a powerful and sophisticated device, so please read this manual before use and retain for future reference.

If you are new to the world of NDI® or the PTZ Keyboard, begin with [Getting Started With Your PTZ Keyboard](#). This will give you a good introduction to the setup of your device.

Tip

You can use controls in your browser or PDF reader to increase the page size when viewing the diagrams to reveal much more detail.

First Step

Firmware Upgrade

Before you use your new PTZ Keyboard, it's a good idea to upgrade to the latest firmware. We are always adding new features and improving the performance of our products, so installing the latest firmware will provide you with the best user experience.

To upgrade the firmware, please follow the **Firmware Upgrade Instructions** located in your firmware download folder and perform upgrade process.

The latest firmware files are available for download here:

[Firmware Updates](#)

We're Invested in Your Success

We pride ourselves on being approachable and easily contactable. We'd love to hear from you.

Dan Miall

Co-Founder and CEO
dan@birddog.tv

Eamon Drew

Co-Founder and CMO
eamon@birddog.tv



Overview of the PTZ Keyboard

The BirdDog PTZ Keyboard is a full featured and versatile PTZ Keyboard that supports NDI®, NDI®|HX, Visca over IP, RS422, and RS232. By harnessing BirdDog's next generation NDI® and IP technology, it's never been easier to discover, connect, and control your PTZ cameras.

Key Features

- Wide protocol support: NDI®, VISCA, PELCO D/P, VISCA over IP.
- Cross protocol mix-control with RS232/RS422 and IP.
- Quick access of key camera functions.
- High quality 6-way joystick control.
- Independent wide-range dual power input: 12V DC, PoE.

Features

- Easy, ergonomic PTZ control of multiple remote cameras for live event production and content creation. Typical applications include: Education, Broadcast, Video Conferencing, House of Worship etc.
- This compact remote controller features a high-quality joystick that allows effortless one-handed pan, tilt and zoom adjustments. Zoom can also be controlled via the joystick or a supplementary seesaw lever; dedicated knobs and control buttons simplify direct access to frequently-needed camera functions without needing to use the camera menus.
- Quick Access features include the control of Exposure, Shutter Speed, Iris, Compensation, White Balance, Focus, PT Speed, Zoom Speed.
- The controller supports serial RS232/RS422 and IP mix-control. It allows you to use RS232/RS422/IP control on one controller to control cameras in a single system.
- With IP control, automatically search available IP cameras in the network and assign IP addresses easily. IP control supports CGI and VISCA Over IP.
- Up to 256 camera presets with memory of image parameters and 8 patterns to recall camera moves (requires camera support).
- Tally Indicator: Includes Normal Tally/On-Air Tally/Contact Modes.
- Supports 2 groups (7 cameras per group) via VISCA RS422 daisy chain control. Unlimited number of controllers can operate on a single network to control up to 255 IP cameras. Controls up to total 255 cameras (Combine using PELCO/VISCA/VISCA-Over-IP Protocol).
- Up to 6 selectable ASSIGN function keys, allowing quick control of key camera functions.
- Multi-color Key/Button illumination indicator.
- Full compatibility is provided with all BirdDog PTZ cameras and Sony BRC, SRG series PTZ cameras and most PTZ cameras in the market that support IP/RS232/RS422/RS485 control.
- Regular MCU firmware upgrades via USB add new features to the PTZ Keyboard.



Welcome to the Future

What is NDI®?

Your new PTZ Keyboard has been designed to support the cutting edge NDI® video transmission standard.

NDI® (Network Device Interface) is a high-quality, low-latency, frame-accurate standard that enables compatible devices to communicate, and deliver and receive high definition video over your existing Gigabit Ethernet network.

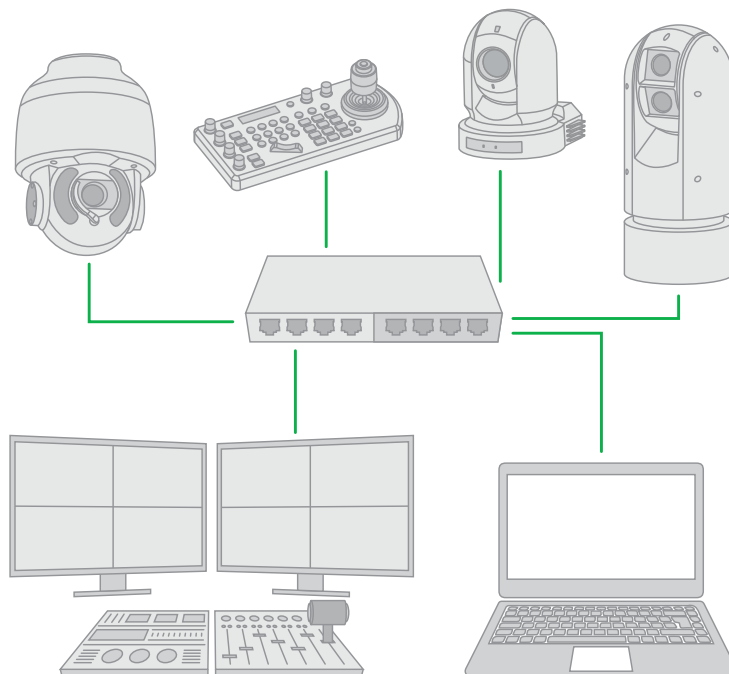
Operating bi-directionally, NDI® devices can be auto-detected, powered and controlled over the same Ethernet cable used to send the video and audio. If you have a Gigabit network, you have the potential for a streamlined, interconnected, video production environment.

With the introduction of NDI® 5, you can now securely share network sources between remote sites anywhere in the world – on a single network port. Even a smartphone can be a NDI® source.

Transitioning to NDI® can also occur gradually. Existing SDI or HDMI signals can easily be converted to an NDI® stream and piped where required on your network and converted back only at the necessary endpoints.

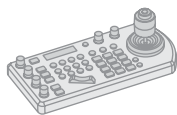
BirdDog has been on the NDI® journey since the very beginning, and your PTZ Keyboard is just one of our products designed to take advantage of the features and potential of NDI®.

For more information on NDI®, please refer to this [page](#) on our website.





What's in the Box?



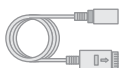
1x BirdDog PTZ Keyboard



1x Power Adaptor & Power Cord



1x Junction box

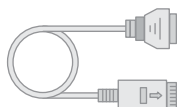


1x RJ45 Control Cable



1x Tally light Terminal Contact

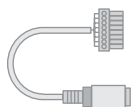
Optional Accessories



1x RJ45 to Phoenix Breakout



1x RJ45 Coupler



1x RS232 8 Pin Mini Din to Phoenix Terminal Block

Depending on your requirements, you may need to purchase these optional accessories:

- When RS422, RS485 and RS232 cameras are being controlled simultaneously.
- When more than one group of RS422/RS485 cameras is being controlled simultaneously.
- When a 8 Pin Mini Din RS232 connector camera needs to be connected to and controlled.

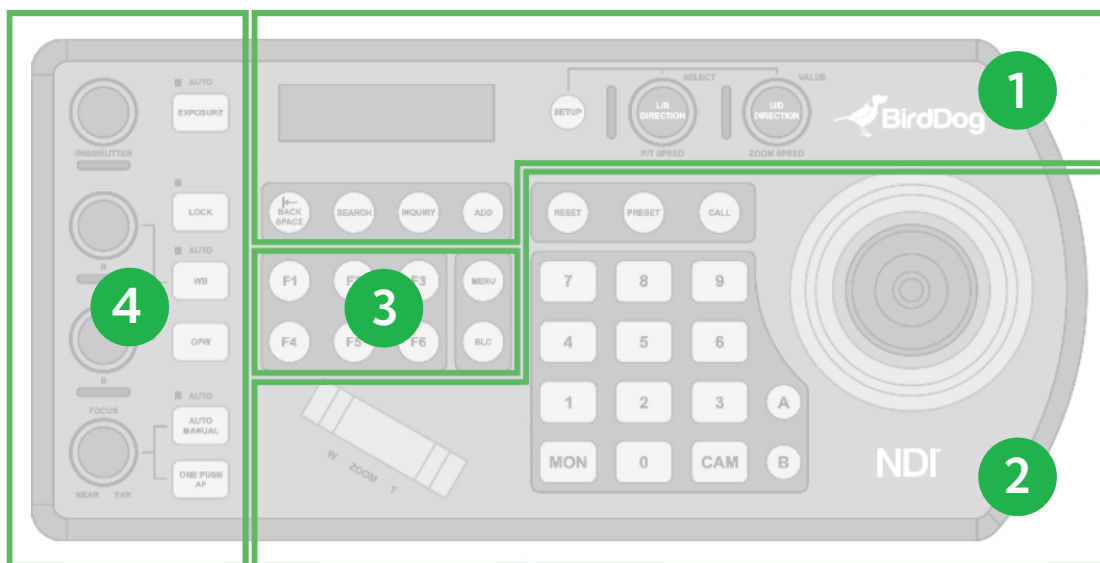
Please browse to this [page](#) on our website for all your accessory needs.



Getting Started With Your PTZ Keyboard

If you are new to the world of NDI® or BirdDog cameras, please follow this quick start guide to become familiar with the basic setup of your new camera.

Your PTZ Keyboard at a Glance



If you are new to the PTZ Keyboard, it may be helpful to visualize the layout as follows.

1. LCD Screen and Navigation

- For navigating and adjusting the Keyboard settings. Interacting with IP cameras.

2. Camera Control

- PTZ Joystick
 - For panning / tilting the camera in any direction and to zoom in / out.
- Alphanumeric Keypad
 - For camera call, preset call, entering menu data.
- Separate zoom seesaw control.

3. Assign Keys

- To assign quick access to device commands.

4. Camera Image Adjustment

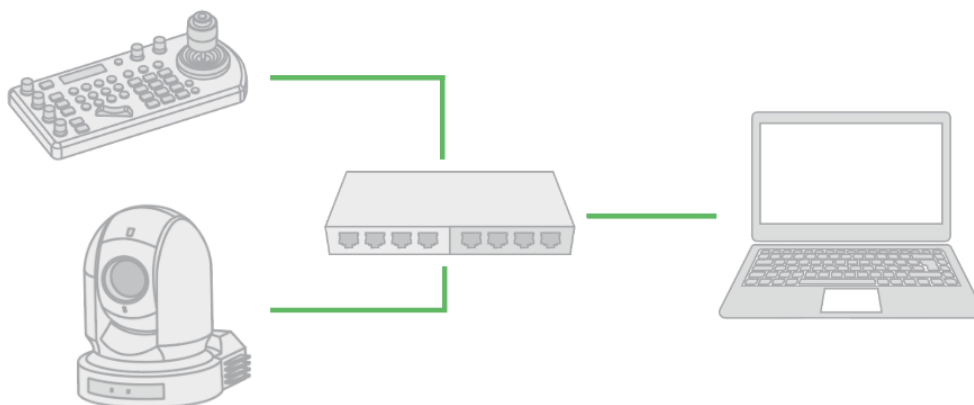
- Exposure, white balance and focus.



Connections

BirdDog products default to DHCP, so for the purposes of this quick start guide, we'll assume:

- You are also using a managed DHCP IP configuration on your network.
- You have connected NDI® cameras, such as the BirdDog P200.



Power

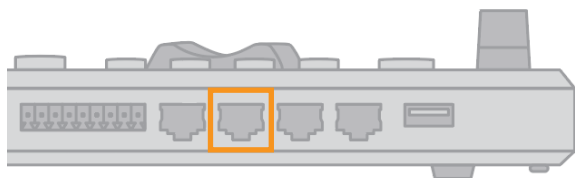
You'll have to decide how you are going to power your Keyboard. You have two choices. You can use PoE (power over Ethernet) or, if your network doesn't support PoE, you can use the included 12V DC power adaptor. If available, PoE is the easier choice, since you can use the same Ethernet cable to power and control the camera, as well as send video.

Joystick Calibration

After booting up your Keyboard, please follow the instructions on the Keyboard screen to calibrate the Keyboard joystick control.

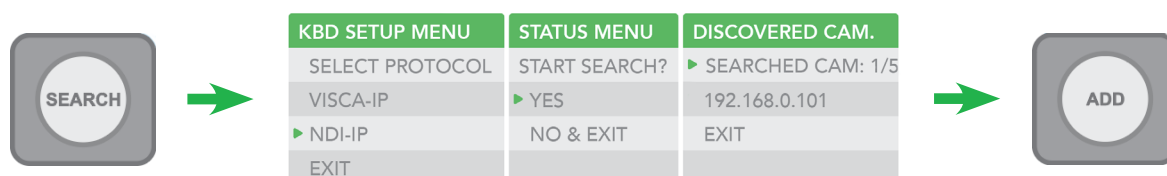
Network

Plug an Ethernet cable from the switch to your Keyboard. Ensure that the cable is plugged into the NDI®/PoE capable port on the Keyboard, as shown below.



Camera Search

Two control knobs on the Keyboard are used to navigate the menus. Please refer to [Navigating the Menus](#) for more information.





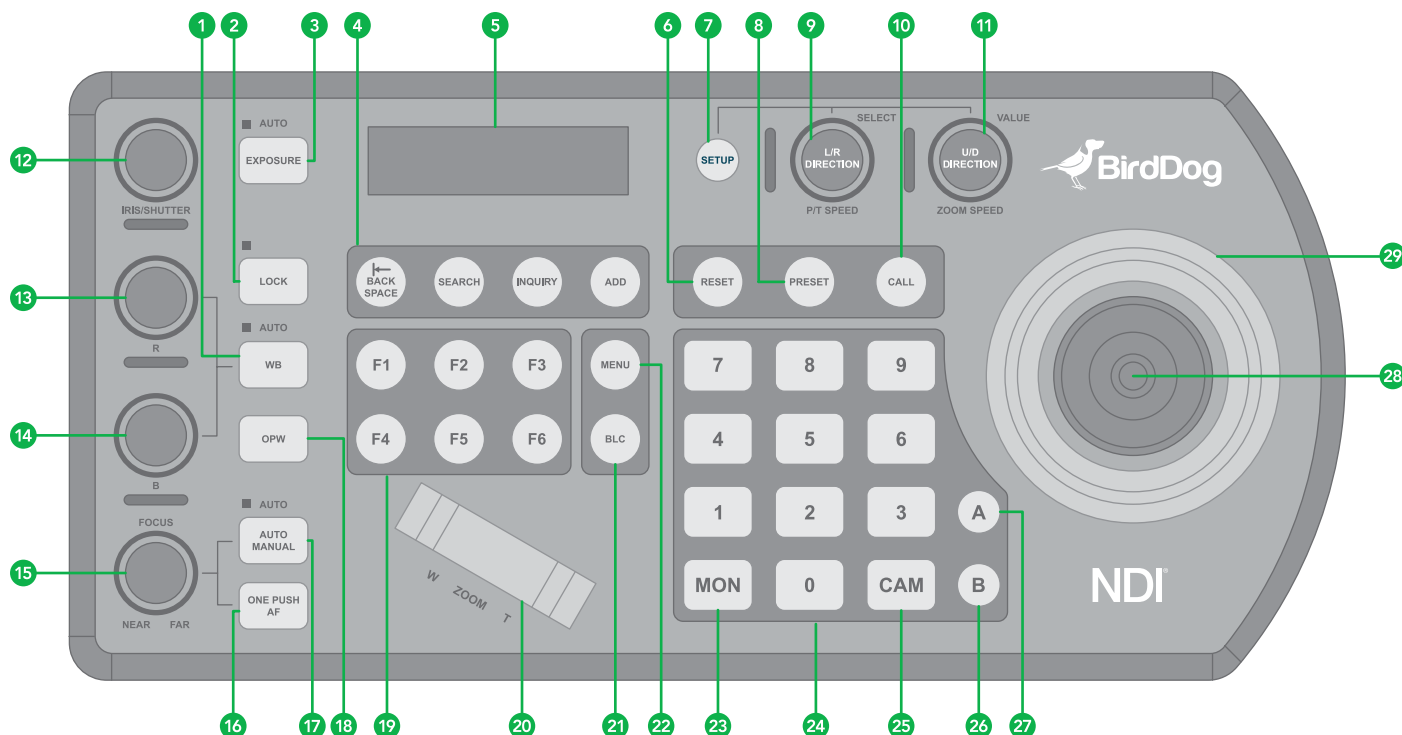
1. Press the SEARCH button to display the SEARCH menu.
2. Select NDI-IP as the Protocol. Click the P/T Speed dial.
3. Select YES to start the search by once again clicking the P/T Speed dial.
4. A list of discovered cameras will be displayed. Scroll through the cameras using the Zoom Speed dial.
5. Press the ADD button to add the selected camera.
6. With the cursor on CAM ID, assign the camera a number by rotating the Zoom Speed dial.
7. Move the cursor to TITLE, click the P/T Speed dial to enter edit mode and use the alphanumeric keypad to give the camera a title suitable for your production.
8. Exit this menu.
9. Repeat this process for each discovered camera that you wish to add to the Keyboard.
10. Test that you can call the camera by entering the CAM ID on the keypad (that you assigned) followed by the CAM button.

You're Done!

You should now have basic PTZ control of your camera. Please work your way through the rest of this manual so that you can familiarize yourself with the many features of the Keyboard.



Keyboard Main Panel



1. White Balance, (Auto, Manual)

- Press once for Auto.
- Press again to activate manual adjustments.

2. Lock

Locks all image adjustment buttons and dials.

3. Exposure (Auto, Iris PRI, Shutter PRI)

4. IP Interface Buttons

For interacting with IP cameras.

5. LCD Screen

For navigating the Keyboard settings.

6. Reset

For clearing presets.

7. Setup

For Keyboard menu setting.

8. Preset

For saving camera presets.



9. Pan Tilt Speed knob

- Rotate: Speed adjustment / Navigate (in menu).
- Press: Select (in menu).
- Long press (3 sec): Invert L/R direction.

10. Call

For calling camera presets.

11. Zoom Speed knob

- Rotate: Zoom speed adjustment / adjust value (in menu).
- Press: Save (in menu).
- Long press (3 sec): Invert U/D Direction.

12. IRIS / Shutter Adjustment for Exposure

13. Manual Red Adjustment for White Balance

14. Manual Blue Adjustment for White Balance

15. Manual Focus

16. One-Push Focus

17. Focus Auto/ Manual Toggle

18. OPW (One Push WB) For White Balance

19. Assign Keys

To assign quick access to commands.

20. Zoom Seesaw

21. BLC (Back Light Compensation)

Toggles Back Light Compensation setting in camera.

22. OSD Menu Button

23. MON

For calling monitor number (* Not activated for current versions).

24. Alphanumeric Keypad

For camera call, preset call, entering data (in menu).

25. CAM

For calling camera number.

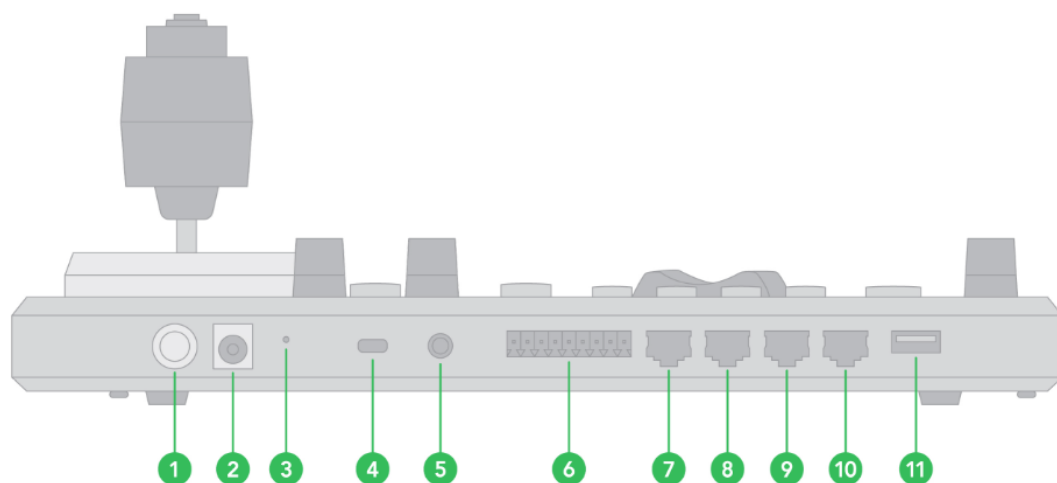
26. RS422 Group B Selection

27. RS422 Group A Selection

28. Joystick Button



Keyboard Rear Panel



1. Power Button

Power on / Power off the Keyboard.

2. 12V DC Power Port (range input tolerance: 5V–48V DC)

Connect the supplied DC power adaptor and cord.

3. Factory Reset/Network Reset

Performs factory reset including network settings.

4. Kensington Security Slot

Use a lock to physically secure the Keyboard in place.

5. Audio Port

For headset use when the Keyboard is added to a BirdDog Comms group.

6. Tally / Contact (GPI I/O Connector)

Tally control interface.

7. RS232 Interface / RJ-45 Port

Connect RS232 adapter.

8. IP Interface / RJ-45 Port

Connect the Keyboard to a network.

9. RS422 / RS485 (B) Interface / RJ-45 Port

Connect an RS422 adapter to control up to 7 daisy-chained RS422 cameras (Group A).

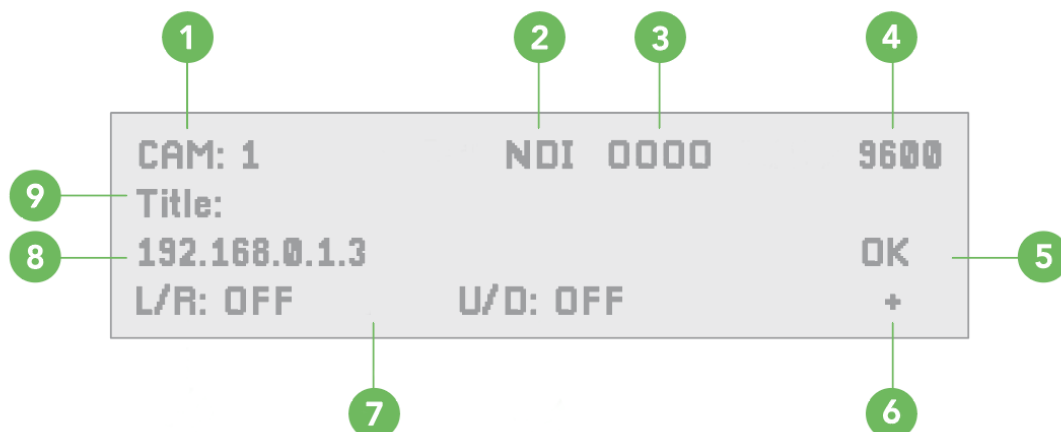
10. RS422 / RS485 (A) Interface / RJ-45 Port

Connect an RS422 adapter to control up to 7 daisy-chained RS422 cameras (Group B).

11. Firmware Upgrade USB port



Keyboard Screen



1. Camera identifier

Identifies the camera being controlled.

2. Protocol

3. TCP/UDP Port

4. Baud Rate

5. Communication Status Indicator (for the current device)

6. Network connectivity Indicator

- a. "+" displayed means that the network is successfully connected.
- b. "+" not displayed means that the network is not connected.

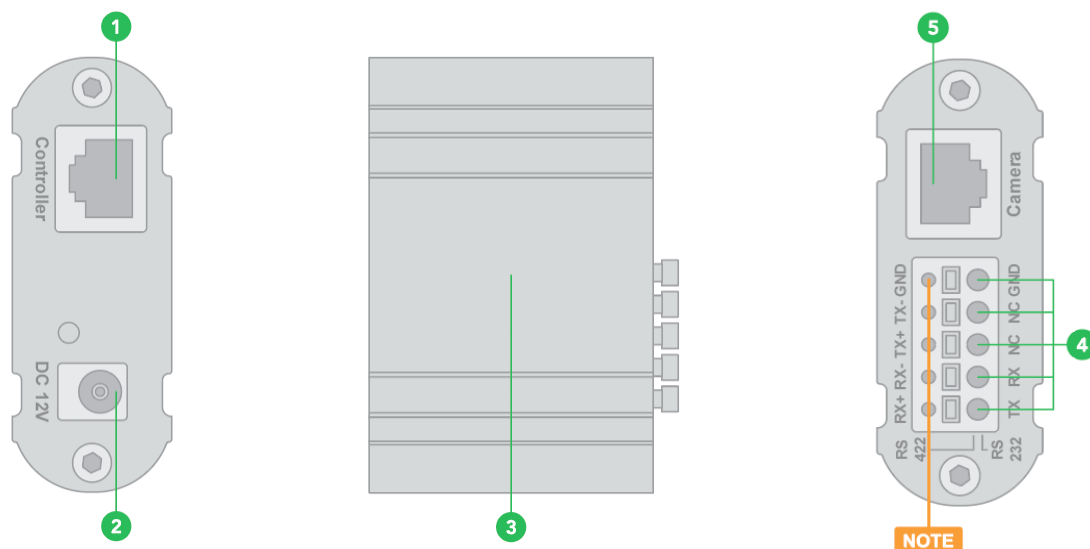
7. Tilt Reversal / Pan Reversal Indicator

8. IP Address (of the currently controlled camera)

9. Camera Title



Junction Box



1. RJ45 Port

For connection between Junction Box and The Keyboard Controller

2. 12V DC Power Port

Connect the supplied DC power adaptor and cord.

3. Junction Box body

4. Terminal Contact Connection

For RS422 or RS232 use.

5. RJ45 Port

For connection between Junction Box and the camera. Use a network cable to connect directly.

NOTE: Do not use the top row of holes, as these are not contact ports. All labels apply to the bottom row (Item #4 in the chart).

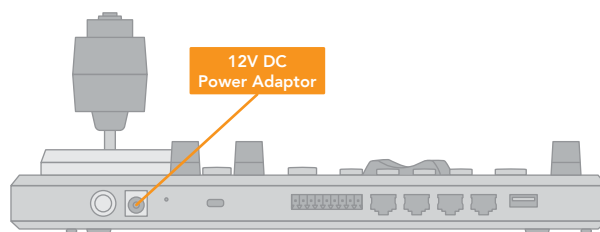


Powering the PTZ Keyboard

Power the Keyboard using one of the following options.

Power Supply (included)

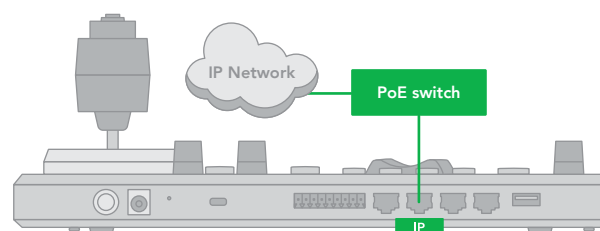
- Power voltage tolerance = 5V – 48V.
- The Keyboard can be powered with at least 5V DC. This allows for longer power runs between the power source and the Keyboard.
- The Keyboard can also tolerate 48V DC power, which makes the Keyboard suitable for vehicle use (broadcast vans, commercial vehicles, etc.).



PoE

PoE is a convenient way to power the Keyboard as it allows both data and power to be sent through the same standard Ethernet cable. To take advantage of PoE, the network switch that the Keyboard is directly plugged into must support 15.4W PoE (802.3af).

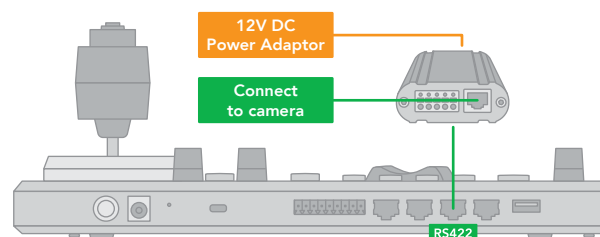
- Connect the Ethernet IP port to PoE switch.
- Maximum distance of cable is 80m using CAT6 Plus cable.



Junction Box (included)

- Connect the Junction Box to the power supply.
- Connect an Ethernet cable from the controller port on the Junction Box to the RS422 or RS232 port on the Keyboard.

Power supply is required at EITHER the Keyboard OR the Junction Box.



If the Junction Box is powered, no additional power supply is needed for the Keyboard, as the Junction Box will provide power to the Keyboard via the controller port.



Connecting the PTZ Keyboard to Your network

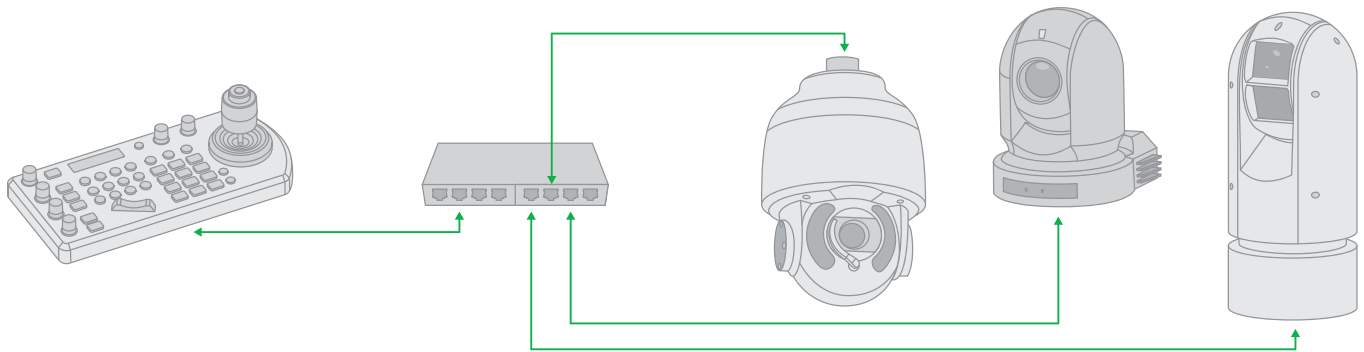
The Keyboard is the world's first PTZ controller with NDI® and NDI®|HX support. Along with NDI® there is support for Visca over IP, RS422, and RS232. You can mix and match cameras from any of the supported protocols and control them all from a single Keyboard.

NDI® Connection

Connect an Ethernet cable from the Keyboard's IP port to the Ethernet switch port. This connection allows you to use NDI® for camera control as well as using the WebUI for set up of the Keyboard. If supported by your switch, this same Ethernet cable connection enables you to power your Keyboard via PoE+.

With IP control, you can automatically search for available IP cameras in the network and easily assign IP addresses.

For more information on configuring Network and NDI® settings, please refer to [Web User Interface Configuration Panel](#).



Other Control Protocols

Please refer to [here](#) for information on using the Keyboard with other control protocols.

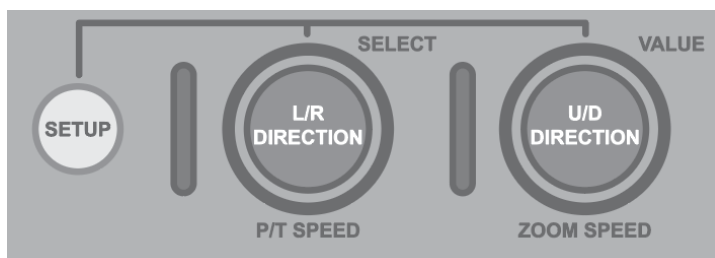


Navigating the Menus

Press the SETUP button to display the SETUP menu on the LCD screen (Default Password: 0000).

The password can be changed at: SETUP > KEYBOARD SETTING > PASSWORD SETTING.

The following controls are used to navigate the menus and select/save parameter values. Use the P/T Speed dial to navigate the menus and the Zoom Speed dial to change and save your settings.



P/T Speed Dial

- Rotate: Moves the cursor.
- Click: Selects the menu item.

Zoom Speed Dial

- Rotate: Change the value.
- Click: Save your value change.

Keyboard Configuration

Keyboard Setting Menu

Navigate to KEYBOARD SETTING in the MAIN SETUP MENU. IP Configuration

The IP address can be set to either STATIC or DHCP (default).

DHCP

1. Move the cursor to the TYPE field, and rotate the Zoom Speed dial to change the value to DHCP. Click the Zoom Speed dial to save.

Static

1. If setting the IP address to a STATIC address, ensure that the Type field displays STATIC, and then rotate the P/T Speed dial to move the cursor between the IP address octets. Move the cursor to each octet and use the alphanumeric keypad to enter its value. Rotate the P/T Speed dial to move to the next octet and repeat until all IP address octets are set to the desired values.
2. Click the Zoom Speed dial to save.



3. Ensure that you enter the **required** SUBNET MASK and GATEWAY details.
4. Click the Zoom Speed dial to save.
5. Exit this menu.

Button Light

The BUTTON LIGHT value affects the brightness of the button backlight.

1. Rotate the Zoom Speed dial to adjust the value.
2. Click the Zoom Speed dial to save.
3. Exit this menu.

Function Key Assignment

Keys can be configured as shortcuts to activate camera functions.



1. From the Keyboard Setup menu, move the cursor to the ASSIGNED KEY field.
2. Rotate the Zoom Speed dial to select the key to configure.
3. Click the P/T Speed dial to apply the function to the assigned key.
Keys can be assigned to the following camera features:

• Home:	Command the selected camera to activate its 'Home' preset.
• P/T Reset:	Reset the selected camera.
• Power:	Power off the selected camera.
• Mute:	Mute the audio from the selected camera.
• Picture Freeze:	Freeze the image of the selected camera.
• Picture Flip:	Flip the image of the selected camera.
• Picture LR Reverse:	Invert the L/R (pan direction) of the selected camera.
• None:	No function will be assigned to the key.
4. Exit.



Factory Default

To clear all Keyboard settings, and restore factory default:

1. From the KEYBOARD SETUP MENU, select FACTORY DEFAULT
2. Select YES.

NOTE: DO NOT move the joystick nor the Zooming control while the DEFAULT setting is processing.

Tally – GPI I/O

To configure the Tally settings.

Command Select

STANDARD: Sets the input/output method to Standard method. The camera numbers and input/output pin numbers have a 1:1 correspondence.

- If the unit and cameras are connected by serial connection, cameras 1 to 7 correspond to input/outputs 1 to 7.
- If the unit and cameras are connected by LAN connection, cameras 1 to 10 in group 1 correspond to input/outputs 1 to 10.

EXPAND: Handles camera numbers as binary numbers.

- Tally input numbers 8 and higher in a serial connection are ignored. In this case, the response is equivalent to no input.
- Numbers in a LAN connection, corresponding to cameras 1 to 10 in groups 1 to 10, are handled as the numbers 1 to 100. Tally input numbers 101 and higher are ignored. In this case, the response is equivalent to no input.

Password Setting

To change the password:

1. OLD PASSWORD: Enter the current password.
2. NEW PASSWORD: Enter the password you would like to set.
3. CONFIRM: Enter the new password again to confirm.
4. SAVE: Select this to apply the password. "OK" will display, confirming that the new password has been applied.



Joystick Zoom Setting

Change this setting to ON if you wish to use the joystick to control the camera's zoom. This setting can be changed by rotating the Zoom Speed knob while the setting is selected.

- Click the Zoom Speed knob to save this setting if changed.
- If this setting is set to "OFF", the Zoom Seesaw will remain active and can be used to control zoom.

Model Info

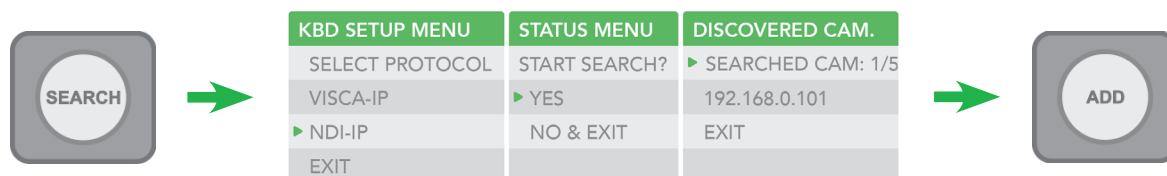
The Model info screen displays the current IP address, firmware version and MAC Address of the unit.



Adding an NDI® Camera to the Keyboard

Searching a Local Area Network (LAN)

Detect cameras on the network and add for Keyboard control.



1. Press the *SEARCH* button to display the Search menu.
2. Move the cursor to NDI-IP.
3. Select *YES* to start the search.
4. A list of discovered cameras will be displayed. Scroll through the cameras using the Zoom Speed dial.
5. To add a selected camera to be controlled by the Keyboard, press the *ADD* button.
6. With the cursor on CAM ID, Assign the camera to a number by rotating the Zoom Speed dial.
7. Move the cursor to the Title, and use the alphanumeric keypad to give the camera a title.
8. Exit this menu.
9. Repeat this process for each discovered camera that you wish to add to the Keyboard.

Adding Cameras Manually

1. Navigate to the Protocol setting and select NDI.
2. Click the P/T Speed dial to display the NDI Camera Setup menu.
3. Enter the the IP address of the camera. The IP address of the camera needs to be within the same subnet as the Keyboard.
4. Rotate the P/T Speed dial to move the cursor between the IP address octets.
5. Move the cursor to each address octet and use the alphanumeric keypad to enter its value. Rotate the P/T Speed dial to move to the next octet and repeat until all address octets are set to the desired values.
6. Click the Zoom Speed dial to save. Exit this menu.

Adding non-NDI® Cameras to the Keyboard

Manually adding cameras

The Keyboard can store settings to control up to:

- 255 cameras by RS485 PELCO protocol separately.
- 7 cameras by VISCA via RS422 group A separately.
- 7 cameras by VISCA via RS422 group B separately.
- 255 cameras by VISCA-Over-IP protocol separately.
- Total 255 cameras by cross protocol mix-controlling.



Use the Zoom Speed dial to select which camera slot to assign a camera. Each camera can be configured to be controlled using any of the following protocols: VISCA, PELCO-D, PELCO-P, VISCAIP (VISCA over IP), CGI.

If VISCA, PELCO-D, or PELCO-P are selected as the protocol, the Baud Rate Setting screen will be displayed. Use the Zoom Speed dial to set the baud rate. Click the Zoom Speed dial to save, and then exit this menu.

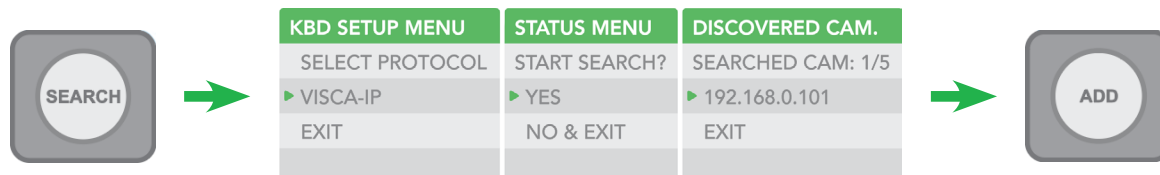
Adding a VISCA over IP Camera to the PTZ Keyboard

Adding a camera manually from Local Area Network (LAN)

Select VISCAIP (VISCA over IP) as the protocol and click the P/T Speed dial to display the VISCAIP configuration menu.

1. Rotate the P/T Speed dial to move the cursor between the IP address octets. Move the cursor to each octet and use the alphanumeric keypad to enter its value. Rotate the P/T Speed dial to move to the next octet and repeat until all IP address octets are set to the desired values.
2. Click the Zoom Speed dial to save.
3. Exit this menu.
4. Repeat this process for each camera that you wish to control with the Keyboard.

Scanning the Local Network for Available VISCA over IP Cameras



1. Press the SEARCH button to display the SEARCH menu.
2. Move the cursor to VISCA-IP.
3. Select YES to start the search.
4. A list of discovered cameras will display. Scroll through the list using the Zoom Speed dial.
5. To add a camera to be controlled by the Keyboard, press the ADD button.
6. With the cursor on CAM ID, assign the camera to a CAM ID by rotating the Zoom Speed dial.
7. Click the Zoom Speed dial to save.
8. Move the cursor to the TITLE, and use the alphanumeric keypad to give the camera a title.
9. Click the Zoom Speed dial to save.
10. Repeat this process for each discovered camera that you wish to add to Keyboard.



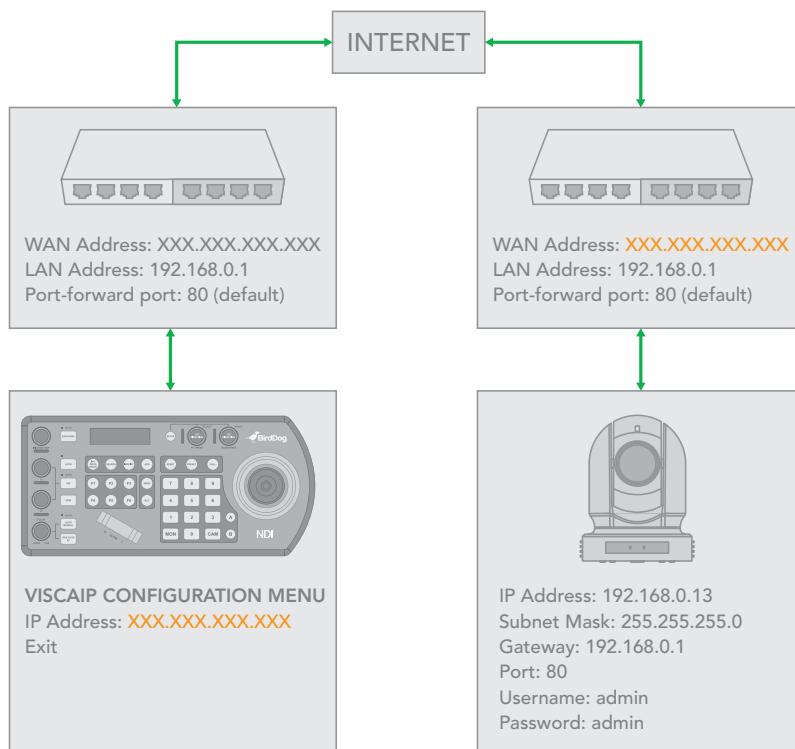
Adding VISCA over IP Cameras Under WAN Control

Make the following changes at the camera and Keyboard.

At the Camera Location

1. For commands to flow from outside the network in to a camera, ports must be opened. Contact the network administrator at the camera location to create a port-forwarding rule in the router allowing commands to flow through the necessary ports using these values:

- Source/ external port: 52381
- Destination / internal port: 52381
- IP Address: IP Address of the camera
- Protocol: Both (TCP and UDP)



At the Keyboard Location

1. Set the Keyboard to DHCP.
2. Contact the network administrator at the Keyboard location to create a port-forwarding rule in the router allowing commands to flow through the necessary ports using these values:
 - Source/ external port: 52381.
 - Destination / internal port: 52381.
 - IP Address: IP Address of the Keyboard.
 - Protocol: Both (TCP and UDP).
3. In the Setup menu of the Keyboard:
 - a. Add the VISCA over IP camera using the WAN IP of the camera location as the IP Address.
 - b. Click the P/T Speed dial to save.



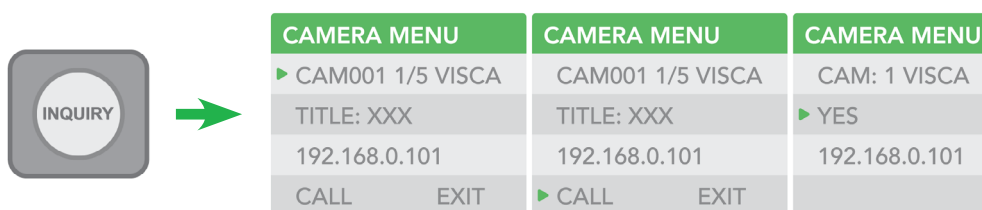
Interacting With Cameras

Options for Calling a Camera

1. Use the keypad to call the camera by CAM ID.
 - a. Enter the CAM ID on the keypad.
 - b. Press CAM.

OR

2. Call the IP cameras by selecting from a list of available devices.
 - a. Press the INQUIRY button.
 - b. Select a protocol.
 - c. Scroll through the list using the Zoom Speed dial.
 - d. Move the cursor to CALL, and click the P/T Speed dial.



Controlling Cameras

Engaging the Camera OSD Menu for non-IP Cameras

1. Press the MENU button on the Keyboard to to display the OSD menu.
2. Navigate the menu by using the joystick.
 - Move up / down to navigate through menu options.
 - Move the joystick to the right to send an "Enter" command.
 - Move up / down to adjust values.
 - Move the joystick to the left to send an "Exit" command.

Engaging the Camera OSD Menu for PELCO-D Cameras

On the alphanumeric keypad, call preset 95 to engage the menu (type 95, and then press the CALL button).





Using the Joystick to Control Cameras

Joystick Calibration

Move the joystick up/down and left/right on bootup to calibrate the joystick. During this period, control movements will not be sent to the camera.

Joystick Movements

- Pan, Tilt, and Zoom movements can be executed simultaneously.
- The joystick can be used to pan / tilt the camera in any direction and rotated to zoom in / zoom out.



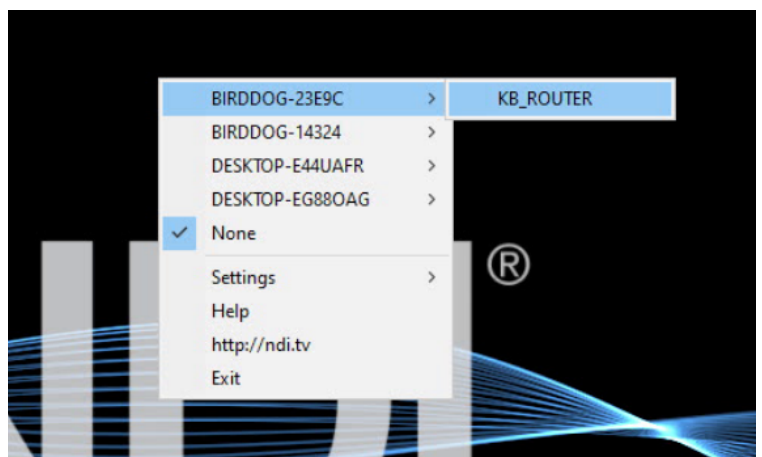
- When you are not in a menu, the P/T Speed and Zoom Speed dials control how fast the camera Pans, Tilts, and Zooms.
- Response to commands from the Keyboard.
- The Zoom Seesaw can be engaged to zoom in / Zoom out.



NDI® Keyboard Router

To allow for more efficient monitoring of cameras, the Keyboard outputs a video stream that follows the active controlled camera. To do this, select KB_ROUTER as the output channel of the desired NDI® sources.

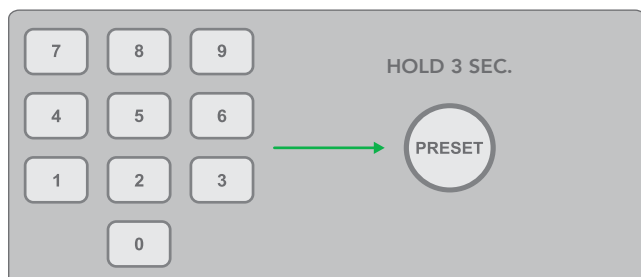
Selecting Cam 1 on the Keyboard will display the Cam 1 NDI® stream, and then selecting Cam 2 on the Keyboard will display the Cam 2 NDI® stream. Importantly, this output is a ROUTER output therefore the media is not passing through the Keyboard and any device controls published by the camera source are accessible on the viewer (i.e. Tally, Web Configuration URL and PTZ Control).





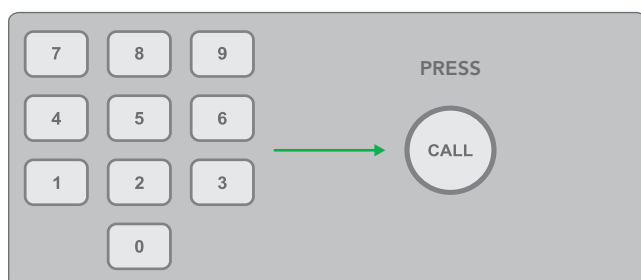
Setting and Calling Presets

Creating Presets



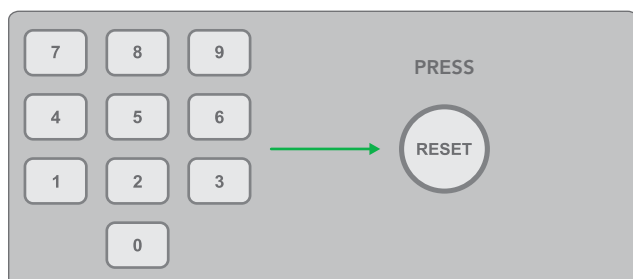
1. Move the camera to the desired position.
2. Enter the desired preset number on the alphanumeric Keyboard, and then hold the PRESET button for 3 seconds to save.

Calling Presets



1. Enter the preset number on the alphanumeric keypad.
2. Press the CALL button.

Resetting / Deleting Presets

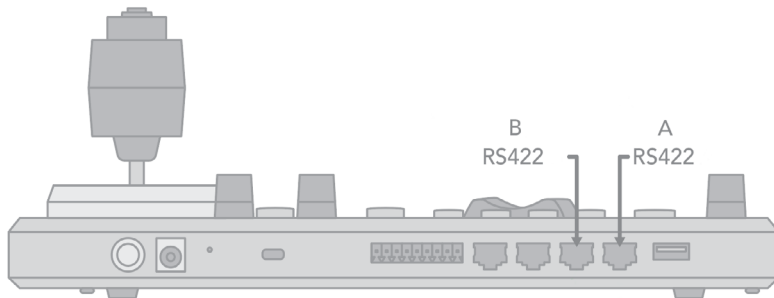


1. Enter the number of the preset you wish to delete.
2. Press the RESET button.



Dual RS422 Button A/B

There are 2 RS422 ports on the back panel of the Keyboard. Up to 7 cameras can be daisy chained from each RS422 port. You can toggle between these by using the A and B buttons.



Adjusting Image Parameters

The following image parameters can be set/adjusted by using the Image Adjustment Panel. The knobs are velocity sensitive and responding naturally for incremental, as well as large adjustments.

Iris/Shutter

- Adjust manually by rotating the IRIS/SHUTTER knob.
- Auto-adjust by engaging the EXPOSURE button.
- Toggle the exposure between Iris priority and Shutter priority by pressing the EXPOSURE button.

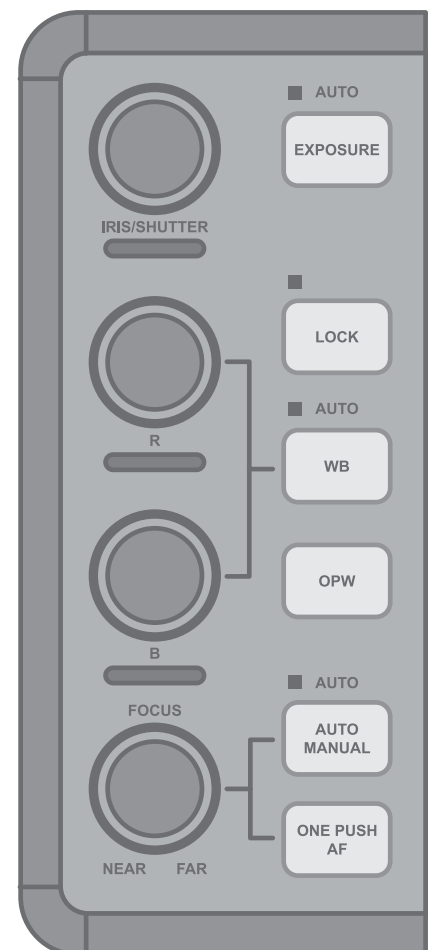
Red/Blue/White Balance

- Adjust Red or Blue values manually by rotating the R or B knob.
- Auto-adjust by engaging the WB button.
- Engage One Push White Balance by pressing the ONE PUSH WB button.

Focus Near/Far

- Adjust manually by rotating the FOCUS knob (NEAR/FAR).
- Auto-adjust by engaging the ONE PUSH AF (Auto Focus) button.

Lock the image adjustment panel buttons by engaging the LOCK button.





Web User Interface Configuration Panel

The WebUI Configuration Panel (WebUI) allows you to remotely alter key settings of the Keyboard, and apply firmware updates.

To access the WebUI, point your computer web browser to the IP address of the device which can be found in the Keyboard *IP Configuration* menu.

NOTE: The web address is case sensitive and is all lower case. Your computer will need to have 'Bonjour' services loaded in order to access the unit via it's user given name. Apple devices come pre-installed with Bonjour, while Windows devices require a small plugin available [here](#).

Dashboard

BirdDog | PTZ KEYBOARD DASHBOARD NETWORK SYSTEM LOGOUT

BirdDog Name: birddog-23e9c	Camera Info: IP-192.168.0.131:NDI:Connected
Network configuration method: dhcp	Status: active
Address: 192.168.0.26	Serial number: 68b9d3023e9c
Mask: 255.255.255.0	Firmware version: BirdDog PTZ KEYBOARD 1.97

REBOOT DEVICE **RESTART VIDEO**

The Dashboard displays important Keyboard settings in one convenient window.

You can also:

- **Reboot the Keyboard**
Allows you to remotely soft reboot the device, for example, after installing new firmware.
- **Restart the video processing engine**
Useful for ensuring that the NDI® video engine will process as per any manual settings you may have made.



Network

BirdDog | PTZ KEYBOARD DASHBOARD NETWORK SYSTEM LOGOUT

Configuration method: STATIC **DHCP**

Address: 192.168.0.26

Mask: 255.255.255.0

Gateway: 192.168.0.1

DHCP timeout: 20

Static fallback address: 192.168.100.100

Static fallback mask: 255.255.255.0

BirdDog Name: birddog-23e9c .local

APPLY

IP Address Configuration

You can configure the Keyboard to operate on the network with a dynamic (DHCP) IP address, or a fixed address. Most corporate, education and home networks have a DHCP server present on the network to allow this to occur. Usually your Internet Router provides this. For smaller networks DHCP networking is generally suitable, however larger networks with managed operations will often determine each device needs to have a dedicated and static IP address.

DHCP

DHCP is set as the network configuration by default for the Keyboard.

Static

To enable a static IP address, change the configuration method to Static and enter the **required** details in the Address, Mask and Gateway fields.

NOTE: The Address and Mask fields must be correct or the Keyboard will not be visible on the network and a factory reset will be required in order to recover the unit.

Static Fallback Address / Static Fallback Mask

Some standalone or private networks may not have a DHCP server. After 30 seconds of searching for an automatically assigned IP address, the Keyboard will fall back to a default address: 192.168.100.100

In order to access the web configuration panel on a network which is configured to a different subnet, change your computers IP address to match the BirdDog unit. Once you gain access to the BirdDog Dashboard panel, choose your IP address to match the rest of the devices on your network.

For instructions on setting your computers IP address please consult your computer operating system manual or IT support resources.

IP Address Recovery

In the event that the Keyboard is not visible on the network, the network has changed, or the static IP address details have been lost, reset the BirdDog back to its default settings by following the factory reset procedure.



BirdDog Name

When the Keyboard is first booted, it defaults to the naming convention:
`http://birddog-xxxxx.local/`.

You can name each Keyboard with a name that makes sense for each production. This name will appear on any NDI® receiver over the network. This name will appear on any NDI® receiver over the network.

Click in the BirdDog Name field to edit the name. The name must not include any special characters and can be any combination of a-z, 0-9, and –.

System

The screenshot shows the BirdDog PTZ Keyboard web interface. At the top, there's a header with the BirdDog logo and 'PTZ KEYBOARD' on the left, and navigation links 'DASHBOARD', 'NETWORK', 'SYSTEM', and 'LOGOUT' on the right. Below the header, there's a tabbed interface with four tabs: 'PASSWORD SETTINGS', 'SYSTEM UPDATE', 'NDI NETWORK SETTINGS', and 'FUNCTION MODE'. The 'PASSWORD SETTINGS' tab is currently selected. Under this tab, there are two sub-sections: 'API SETTINGS' and 'CONFIG. UPDATE'. The 'API SETTINGS' section contains three input fields labeled 'Current password:', 'New password:', and 'Confirm new password:'. To the right of these fields are three corresponding input boxes. At the bottom right of the 'API SETTINGS' section is a green 'APPLY' button.

Password Settings

The WebUI is secured by a user-selectable password. The default password is **birddog** (one word, lower case).

You can change the password in the PASSWORD SETTINGS tab.

1. Enter the current password.
2. Enter the new password. It is recommended to change this password in a network environment where the Keyboard is shared with other users (e.g. not private). By entering this password, the user is granted full access to the Keyboard configuration settings and could interrupt a live program.
3. Confirm the new password and click APPLY.



System Update

The screenshot shows the BirdDog PTZ Keyboard web interface. At the top, there is a header with the BirdDog logo and 'PTZ KEYBOARD' on the left, and navigation links 'DASHBOARD', 'NETWORK', 'SYSTEM', and 'LOGOUT' on the right. Below the header is a menu bar with four tabs: 'PASSWORD SETTINGS', 'SYSTEM UPDATE' (which is highlighted), 'NDI NETWORK SETTINGS', and 'FUNCTION MODE'. Under the 'SYSTEM UPDATE' tab, there are two sub-tabs: 'API SETTINGS' and 'CONFIG. UPDATE'. The main content area shows an 'Update file:' label followed by a 'CHOOSE FILE...' button and an 'UPDATE' button.

To perform a system update, download the firmware ZIP file from the link below and follow the included update instructions.

[Firmware Updates](#)

NDI Network Settings

The screenshot shows the BirdDog PTZ Keyboard web interface with the 'NDI NETWORK SETTINGS' tab selected. The header and navigation links are the same as in the previous screenshot. The menu bar shows 'PASSWORD SETTINGS', 'SYSTEM UPDATE', 'NDI NETWORK SETTINGS' (highlighted), and 'FUNCTION MODE'. Under the 'NDI NETWORK SETTINGS' tab, there are two sub-tabs: 'API SETTINGS' and 'CONFIG. UPDATE'. The main content area shows two settings: 'NDI discovery server' with an 'ON' button (highlighted) and an 'OFF' button, and 'NDI discovery server IP' with a text input field containing '192.168.2.155'. At the bottom right, there is an 'APPLY' button.

If you choose to use a NDI® Discovery Server, you can configure it in this tab. By default, NDI® utilizes mDNS (multicast Domain Name System) to create the zero configuration environment for discovery. The primary benefits of using mDNS is that it requires little or no administration to set up. Unless the network is specifically configured to not allow mDNS, NDI® sources will be discovered.

The NDI® Discovery Server is designed to allow you to replace the automatic discovery NDI® uses with a server that operates as an efficient centralized registry of NDI® sources that requires much less bandwidth. NDI® discovery server also helps with location of devices that reside on different subnets. The NDI® Discovery Server is available in the NDI 5.5 version of the free [NDI Tools](#) (C:\Program Files\NDI\NDI 5 Tools\Discovery\NDI Discovery Service.exe).

1. If you are using an NDI® Discovery Server, click the ON button.
2. Enter the IP address of your server.
3. Click the APPLY button to save your changes.



Function Mode

The screenshot shows the BirdDog PTZ Keyboard interface. At the top, there's a header with the BirdDog logo and 'PTZ KEYBOARD', and navigation links: DASHBOARD, NETWORK, SYSTEM, and LOGOUT. Below this is a sub-header with four tabs: PASSWORD SETTINGS, SYSTEM UPDATE, NDI NETWORK SETTINGS, and FUNCTION MODE. The FUNCTION MODE tab is selected. Under this tab, there are two sub-tabs: API SETTINGS and CONFIG. UPDATE. The main content area shows 'Function Mode:' with two buttons: 'API' (highlighted in green) and 'FUNCTION'. Below these is a green 'APPLY' button.

In this tab, choose whether the Keyboard Function Keys use the default function [commands](#) or operate in API mode. In API mode, you can program custom commands to control network devices.

API Settings

The screenshot shows the BirdDog PTZ Keyboard interface with the 'API SETTINGS' sub-tab selected under the 'FUNCTION MODE' tab. The main content area has a 'FUNCTION KEY:' dropdown menu set to 'F2'. Below this are input fields for 'IP ADDRESS' (placeholder: x.x.x.x), 'PORT' (placeholder: 8080), 'CALL' (placeholder: birddogpic2setup), 'CTYPE' (placeholder: json), and 'FILE' (placeholder: {"pic2_camstabilizer": "cstboff"}). A green 'APPLY' button is at the bottom right.

RESTful API commands are available to all BirdDog hardware devices, allowing users to remotely interact with devices.

In this tab, you can configure commands that can be saved to the Keyboard Function Keys when in API mode.

1. Select the desired Function Key from the FUNCTION KEY dropdown list.
2. Configure the command for the correct device.
3. Click the APPLY button to save.



Available parameters are:

IP ADDRESS: Target device IP address.

PORT: Target device listening port.

CALL: Called method (command). Please visit <https://birddog.tv/api> for more information on available commands.

CTYPE: Data Interchange Standard.

FILE: The parameter and value string.

Example 1

In the image above, the [F2] key is configured to deactivate the digital image stabiliser function for the camera identified by address 'x.x.x.x'. The OFF value "cstboff" is set for the camera stabilizer parameter "pic2_camstabilizer".

Target device and command: `http://x.x.x.x:8080/birddogpic2setup`

Parameter and value: `{"pic2_camstabilizer": "cstboff"}`

Example 2

In the example below, the [F3] key is configured to instruct a BirdDog device, identified by address 'x.x.x.x', to connect to a specific NDI® source "birddog (stream1)".

Target device and command: `http://x.x.x.x:8080/connectTo`

Parameter and value: `{"sourceName": "birddog (stream1)"}`

FUNCTION KEY:	F3
IP ADDRESS	x.x.x.x
PORT	8080
CALL	connectTo
CTYPE	json
FILE	{"sourceName": "birddog (stream1)"}
APPLY	



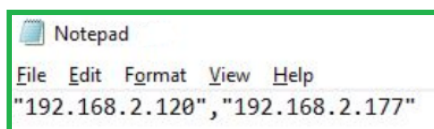
Configuration Update

Remote IP List

By default, NDI® devices are visible to each other only when they're on the same VLAN. If you want visibility or control of a device on a different VLAN, you can add it's address manually as a Remote IP. You can upload and download Remote IP Lists for sharing with other cameras.

To upload a list:

1. Click the CHOOSE FILE button to load your Remote IP List in UTF-8 encoded string format.
2. Click the UPDATE button. Do not upload a blank list.

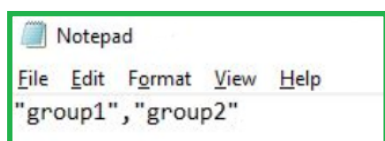


NDI Group List

Set the NDI® Group list. NDI® groups allow you to restrict communication to only devices that belong to the same NDI® Group. NDI® Groups can be very useful to control visibility and access in larger environments. You can upload and download Group lists for sharing with other cameras. Groups also need setting up in NDI Access Manager, available in [NDI Tools](#).

To upload a list:

1. Click the CHOOSE FILE button to load your NDI® Group List in UTF-8 encoded string format.
2. Click the UPDATE button. Do not upload a blank list.

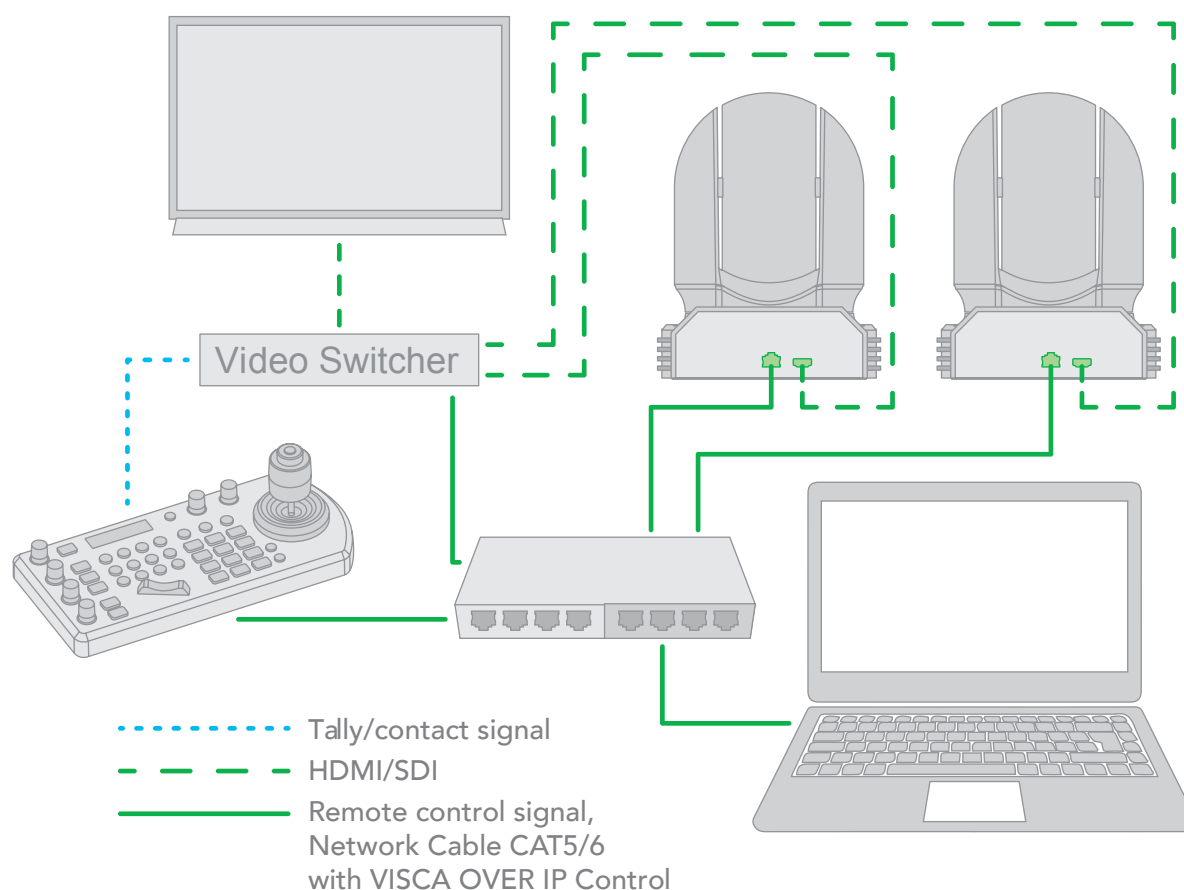




Using Other Control Protocols

Use VISCA OVER IP Control

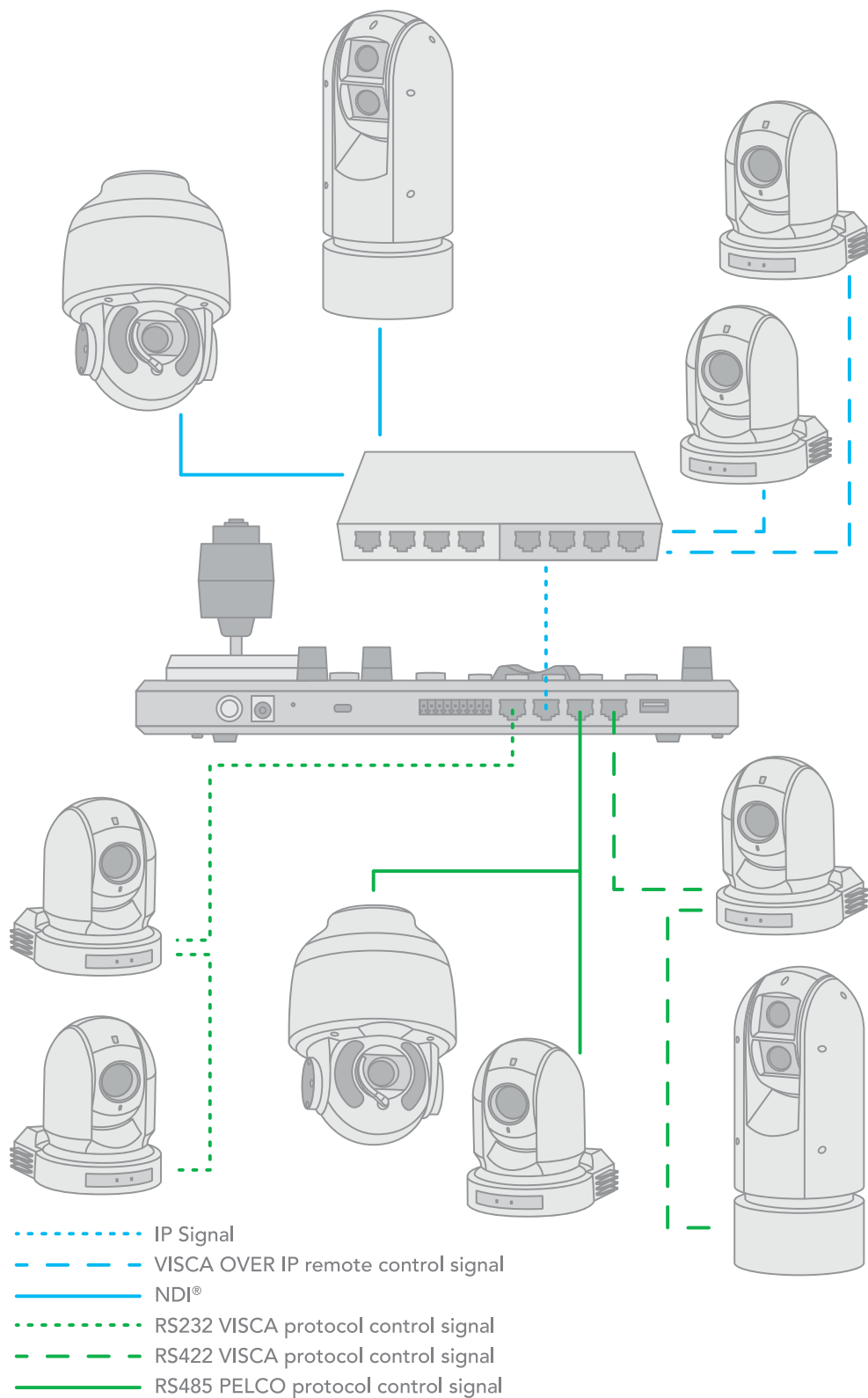
IP connection -> using VISCA OVER IP control protocol -> with a Visca Over IP ready camera.





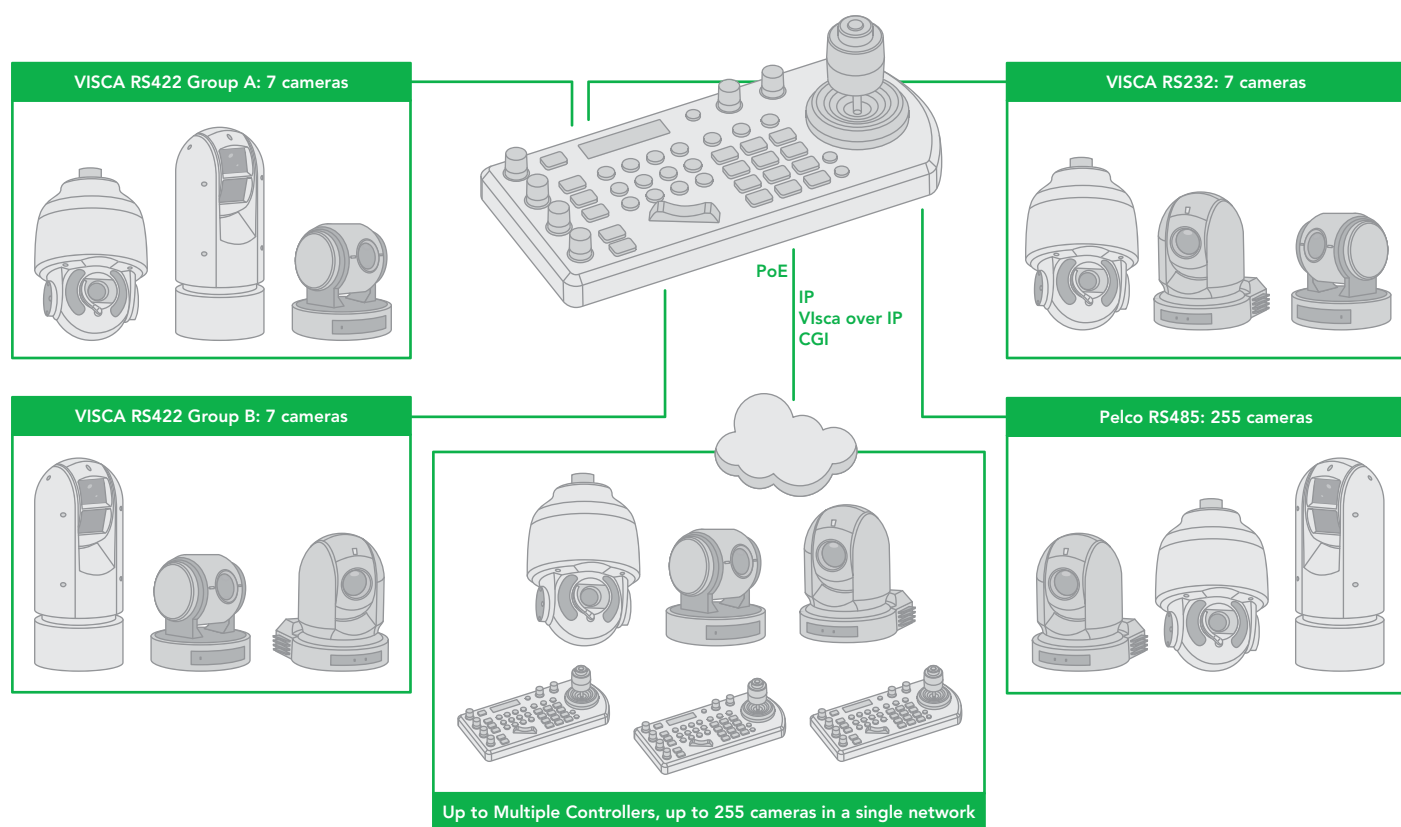
Cross-Protocol Mix Control

Using VISCA, PELCO, VISCA OVER IP, NDI® in a single system.



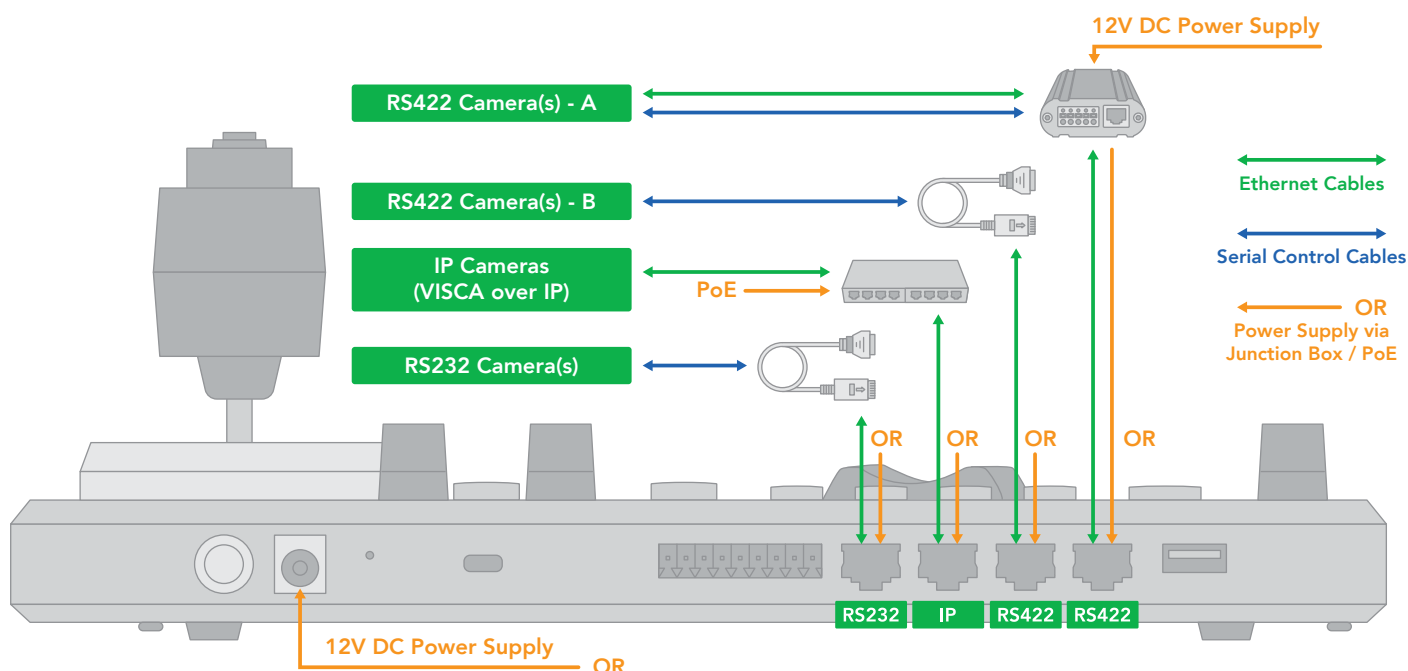


The Keyboard features cross protocol mix-control with RS232/RS422 and IP in one single system.





Cross Protocol Mix Control



When the junction box is powered, it will provide power to the Keyboard via any port that it is connected to i.e., RS232, IP, RS422(A), RS422(B).

Therefore, no additional power supply is required for the Keyboard if a powered junction box is used.

NOTE: Regarding Serial Control protocols (RS422/RS485 and RS232):

- When controlling only RS232 cameras, the Keyboard can control a total of 7 RS232 cameras.
- When controlling RS422 and RS232 cameras simultaneously, the Keyboard can control a total of 7 RS232 and RS422 cameras.
- When controlling only RS422 cameras, the Keyboard can control up to 14 RS422 cameras (2 daisy chains of 7).
- When controlling only RS485 cameras, the Keyboard can control up to 255 RS485 cameras.

The Keyboard is capable of simultaneously controlling up to 255 cameras, between mixed protocols (RS422, RS232, and IP).



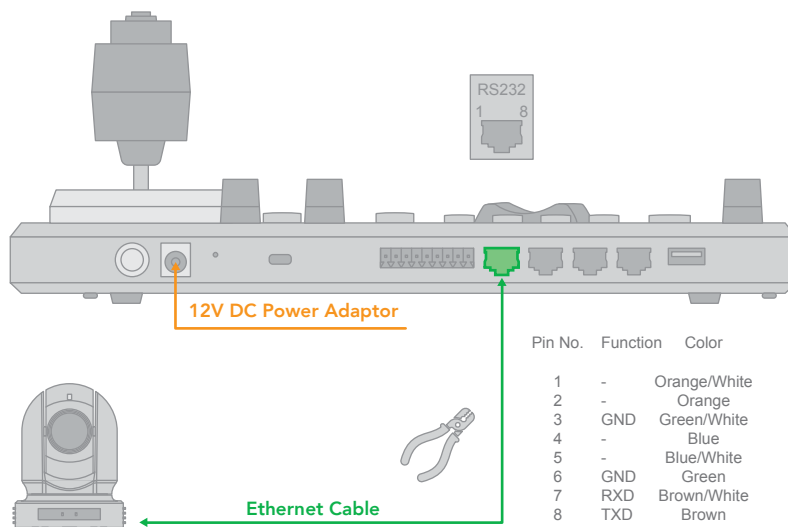
Serial Port Connection

The controller supports serial RS232/RS422 and IP Cross protocol mix-control. It allows you to use RS232/RS422/IP control on one controller to control cameras (Protocol support: VISCA, PELCO D/P, VISCA over IP, CGI*) in a single system.

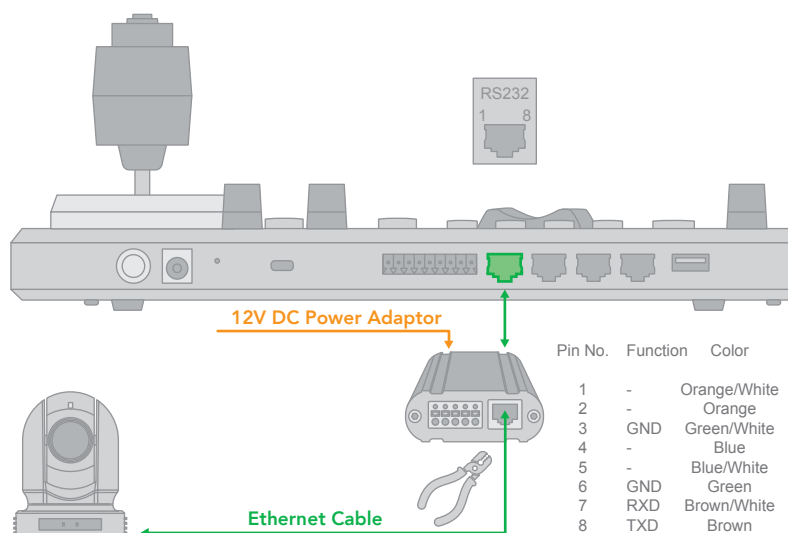
RS232 Connection

Use for the controller with a non-BirdDog camera connection.

1. RS232 connection using a network cable (follow the T-568B standard pinout at the Keyboard):
 - a. 1 to 1 connection – follow the pinout for the RS232 port on the Keyboard using CAT5/6 cable to make a suitable cable for controlling your camera.

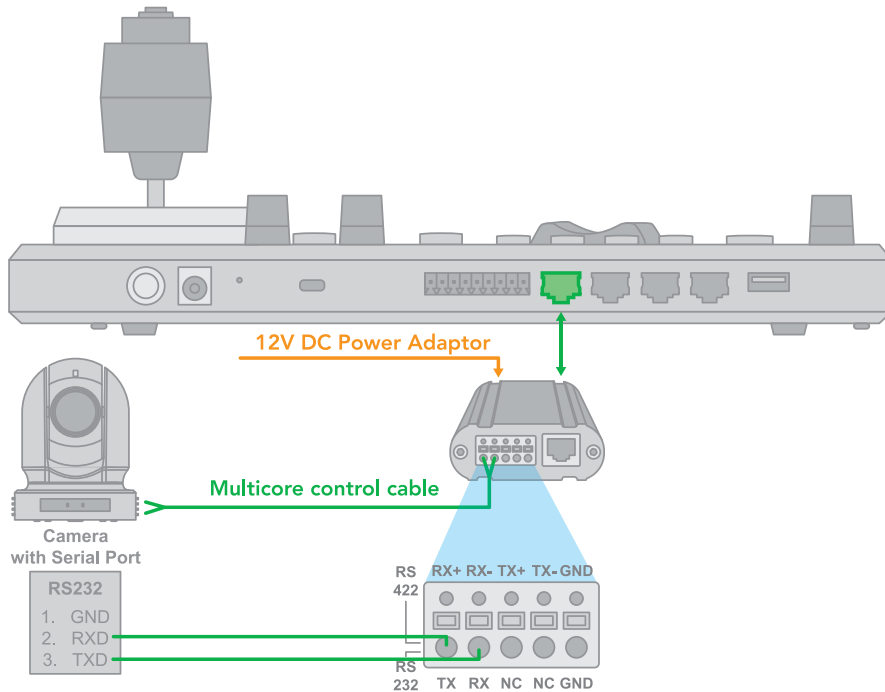


- b. Use the Junction Box for a 1 to 1 connection – follow the pinout for the RS232 port on the Keyboard and Junction Box using CAT5/6 cable (follow T-568B standard pinout between the Keyboard and Junction Box) to make a suitable cable for controlling your camera via the Junction Box.

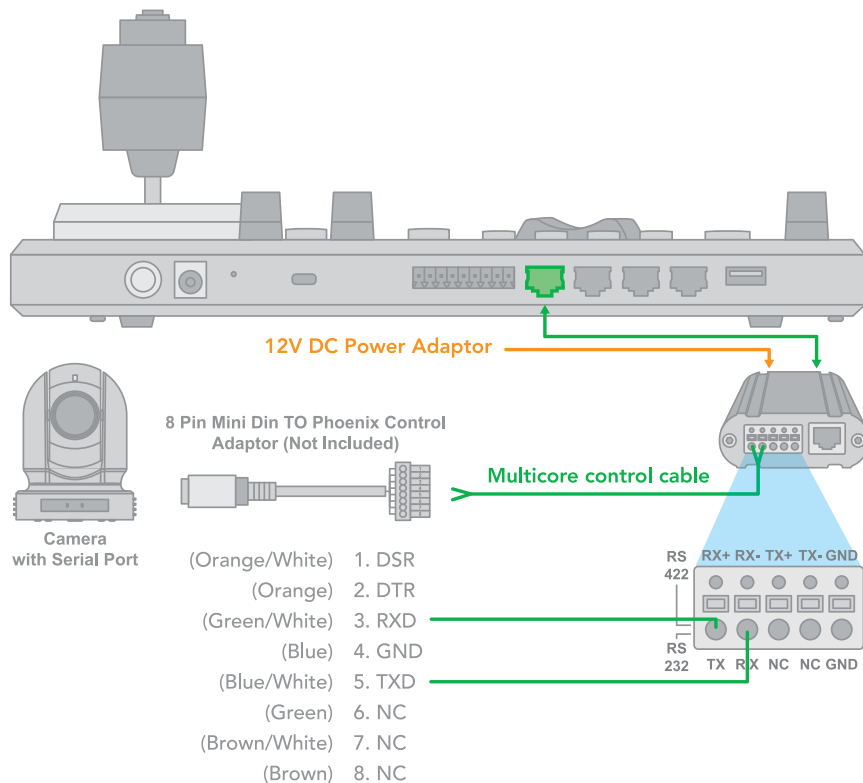




2. RS232 connection using a multicore control cable.
RS232 connection -> via the Junction Box -> camera with RS232 Serial connector.

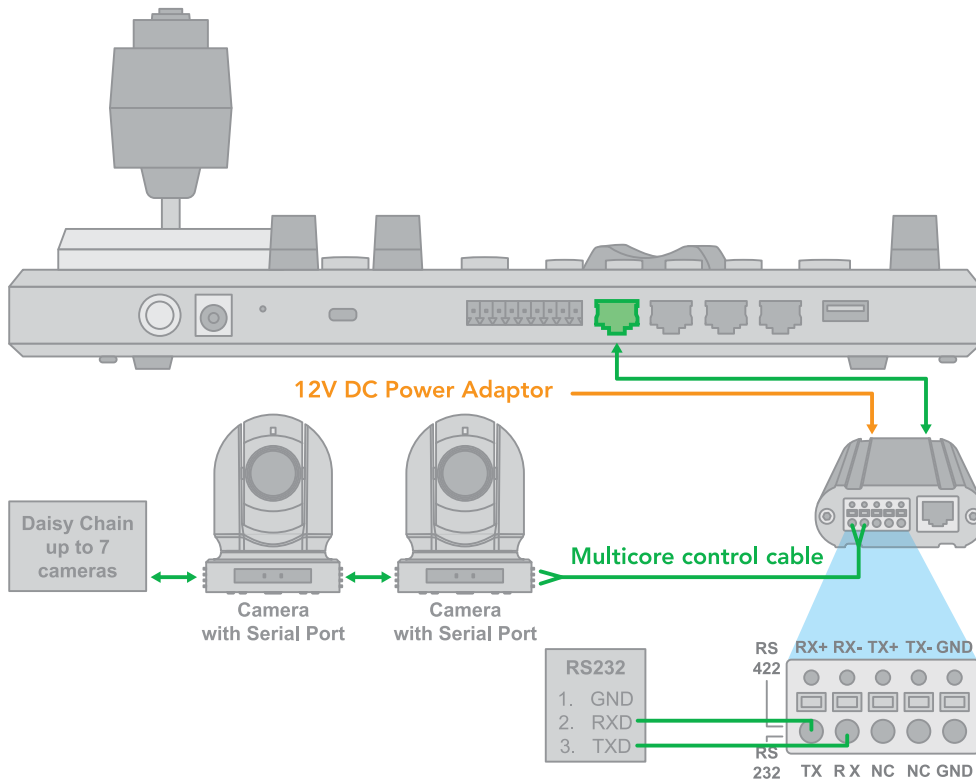


3. RS232 connection with the camera having an 8-Pin Mini Din RS232 connector.
RS232 connection -> via the Junction Box -> camera with an 8-Pin Mini Din RS232 serial connector.

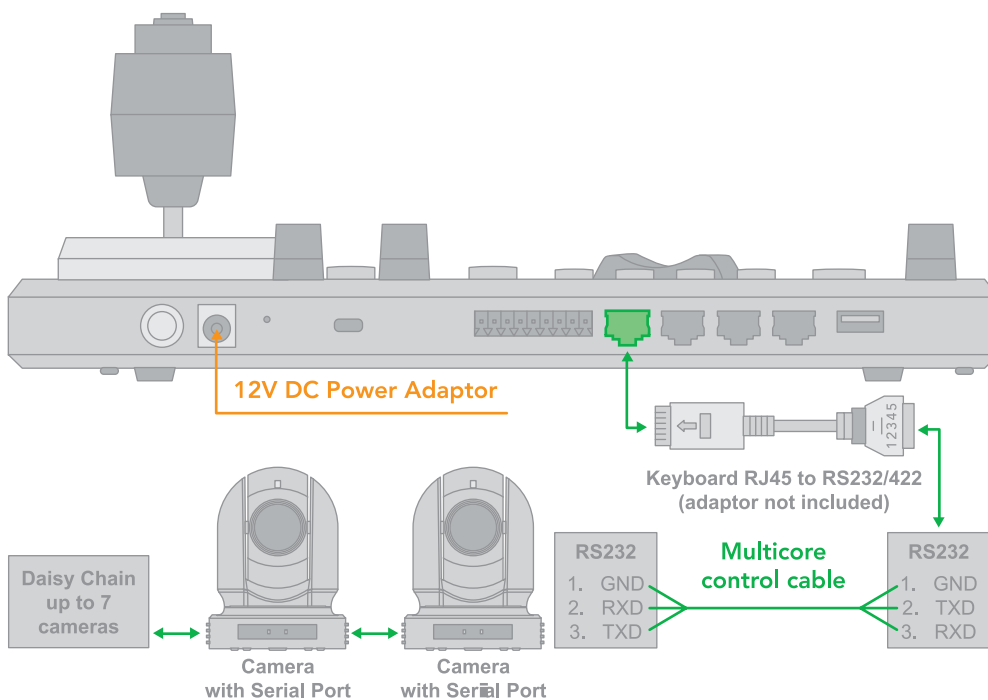




4. RS232 daisy chain multiple camera connection.
RS232 daisy chain connection -> via the Junction Box -> camera with RS232 serial connector.



5. RS232 connection using an RJ45 to Phoenix connector adaptor.
RS232 daisy chain connection -> using an RJ45 to Phoenix connector adaptor (not included).



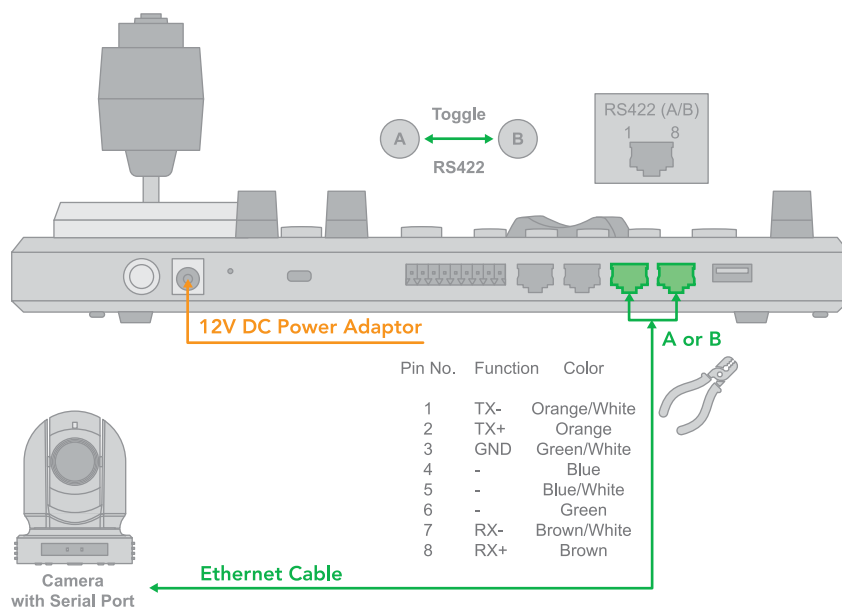


RS422 Connection

Use for the controller with non-BirdDog camera connection. For BirdDog camera connection see the separate section following.

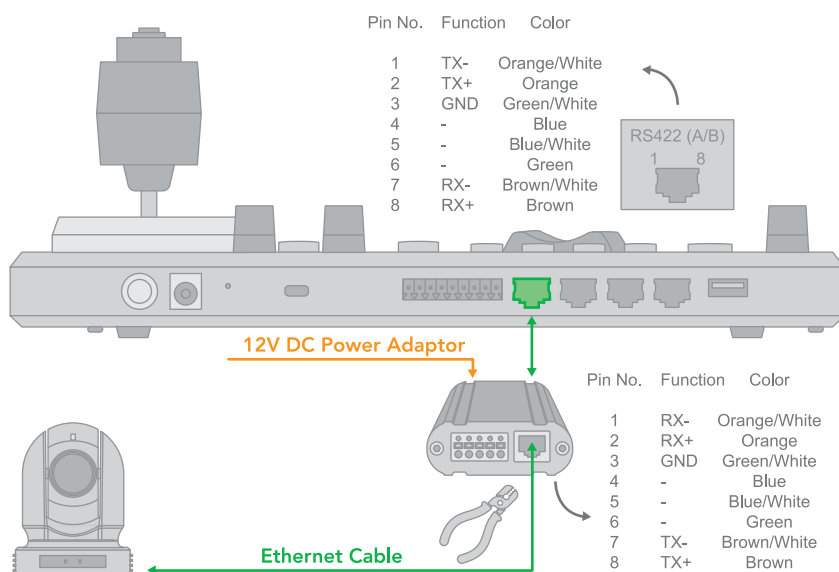
Follow the diagram below for the following options:

1. RS422 connection using a network cable (follow the T-568B standard pinout at the Keyboard):
 - a. 1 to 1 connection – follow the pinout for the RS422 port on the Keyboard to use CAT5/6 cable to make a suitable cable for controlling your camera.



- b. Use the Junction Box for a 1 to 1 connection – follow the pinout for the RS422 port on the Keyboard and Junction Box to use CAT5/6 cable (follow T-568B standar pinout between Keyboard and Junction Box) to make a suitable cable for controlling your camera via the Junction Box.

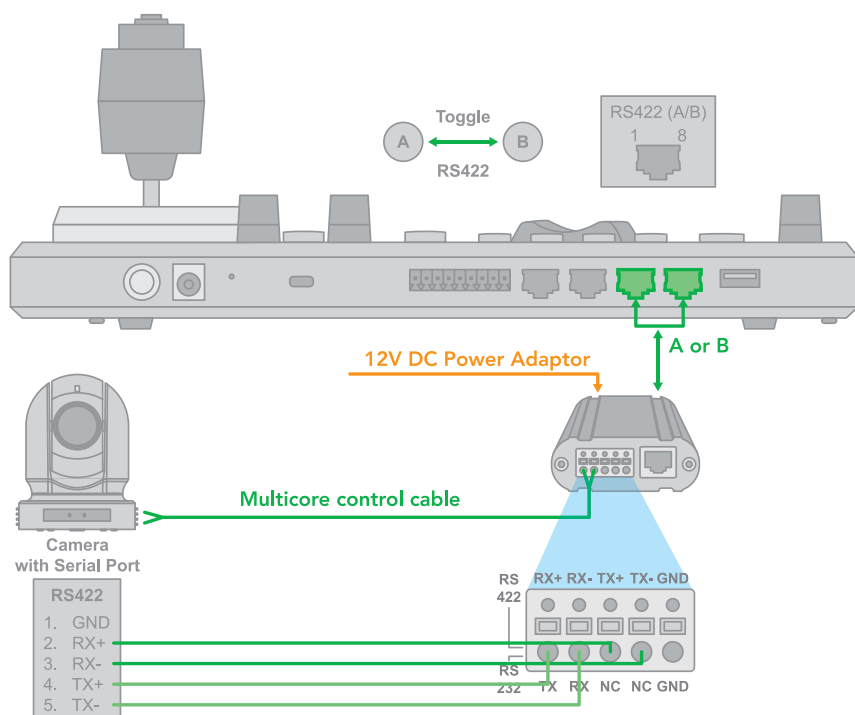
RS422 connection -> via the Junction Box to make a network cable -> camera with a R422 Serial connector.





2. RS422 connection using multicore control cable

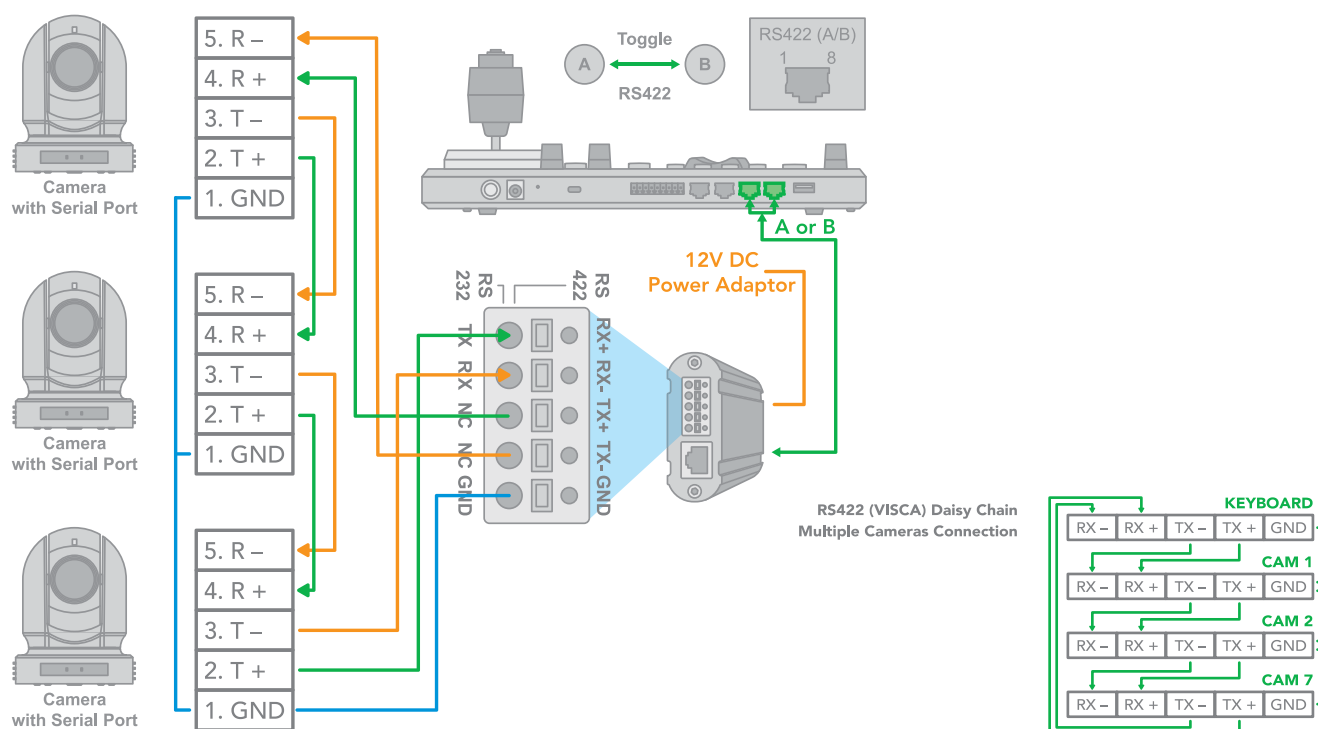
RS422 connection -> via the Junction Box -> camera with an RS422 serial connector.



3. RS422 daisy chain multiple camera connection

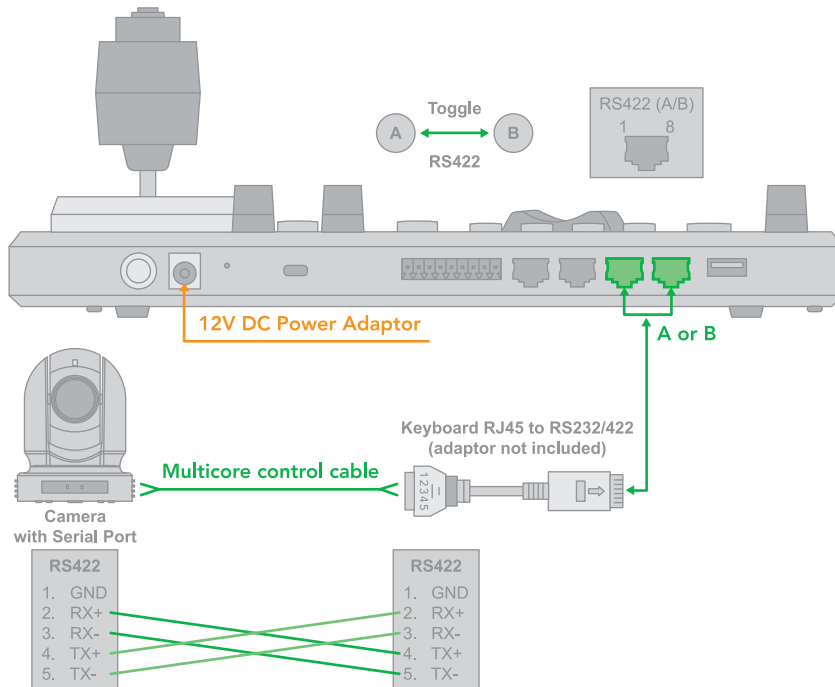
RS422 daisy chain connection -> via the Junction Box -> camera with a RS422 Serial Port.

Multicore control cable

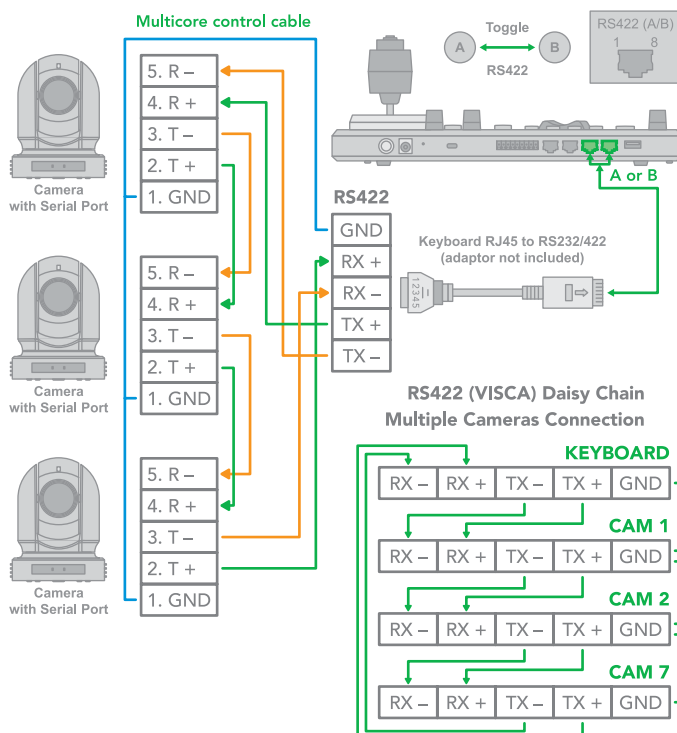




4. RS422 1 to 1 connection using an RJ45 to Phoenix connector adaptor (not included)
 RS422 connection -> use an RJ45-RS422 adaptor -> camera with an RS422 serial connector.



5. RS422 daisy chain connection using an RJ45 to Phoenix connector adaptor (not included).
 RS422 daisy chain connection -> via RJ45 to RS422/232 adaptor -> camera with an RS422 Serial Port.



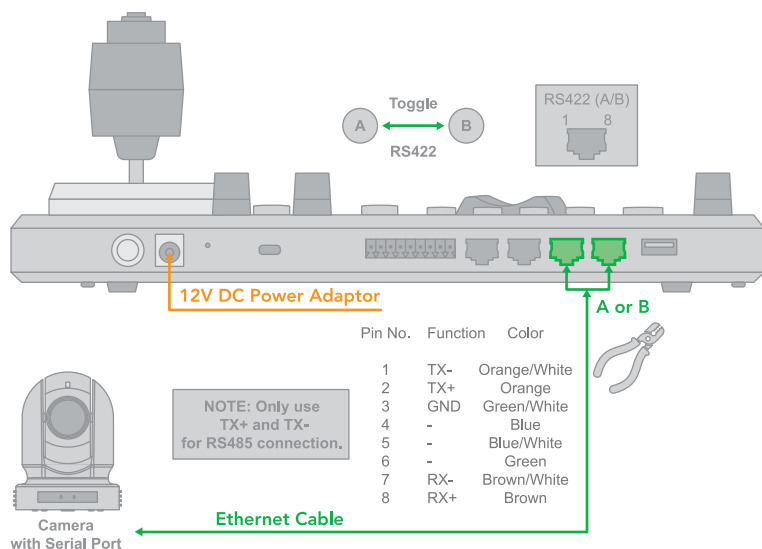


RS485 Connection

Use for the controller with a non-BirdDog camera. Follow the diagrams below for the following options:

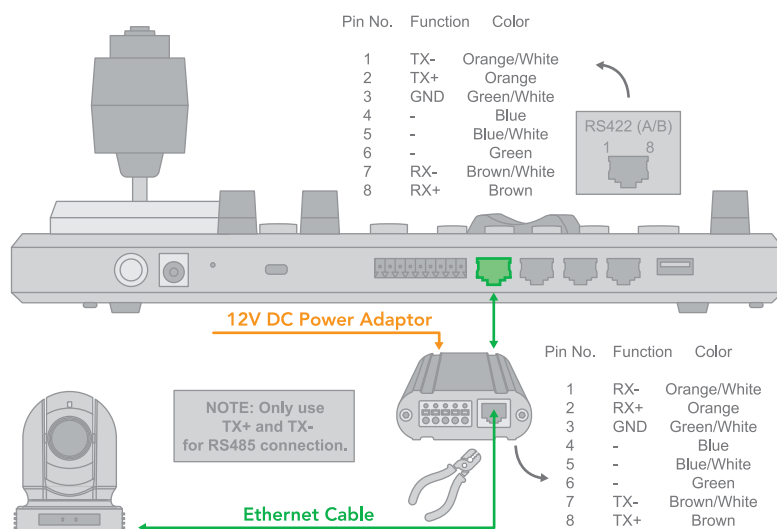
1. RS485 connection using a network cable (follow the T-568B standard pinout at the Keyboard end):
 - a. 1 to 1 connection – follow the pinout for the RS485 port on the Keyboard to use CAT5/6 cable to make a suitable cable for controlling your camera.

NOTE: Use the RS422 ports for RS485 connection.



- b. Use the Junction Box for a 1 to 1 connection – follow the pinout for the RS485 port on the Keyboard and the Junction Box to use CAT5/6 cable (follow the T-568B standard pinout between the Keyboard and Junction Box) to make a suitable cable for controlling your camera via the Junction Box.

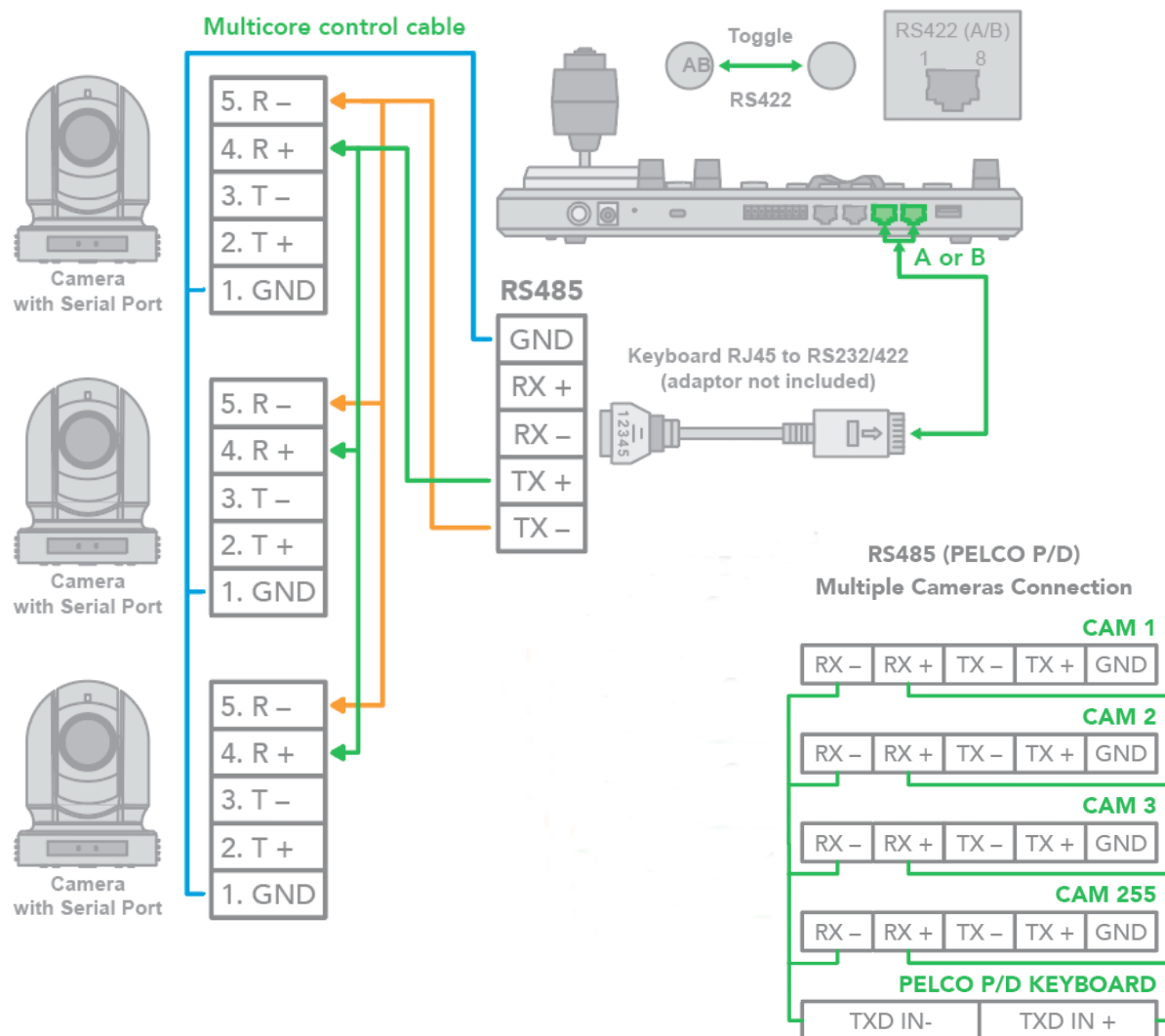
RS485 connection -> via Junction Box to make a network cable -> camera with a R485-Serial connector.







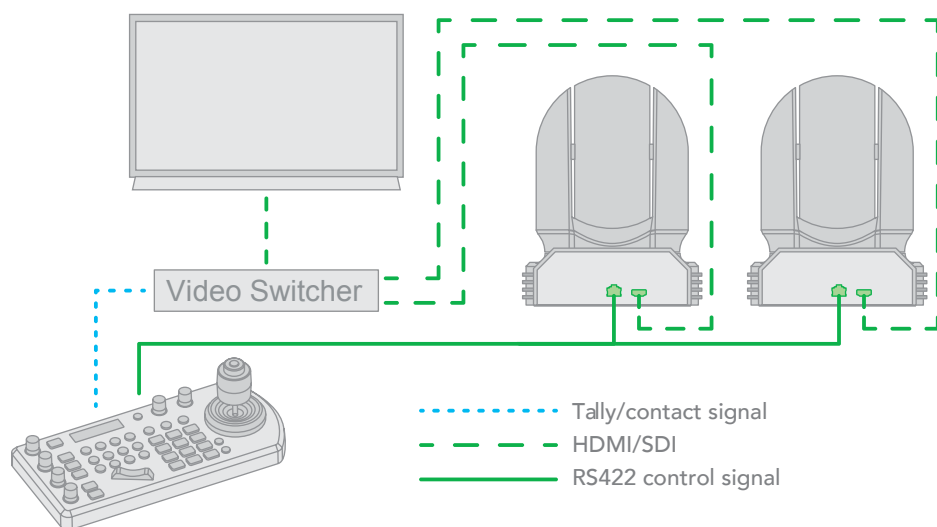
4. RS485 daisy chain connection using RJ45 to Phoenix connector adaptor (Not included).
RS485 daisy chain connection - Via RJ45 to RS422 Adaptor - Camera with RS485 Serial Port.



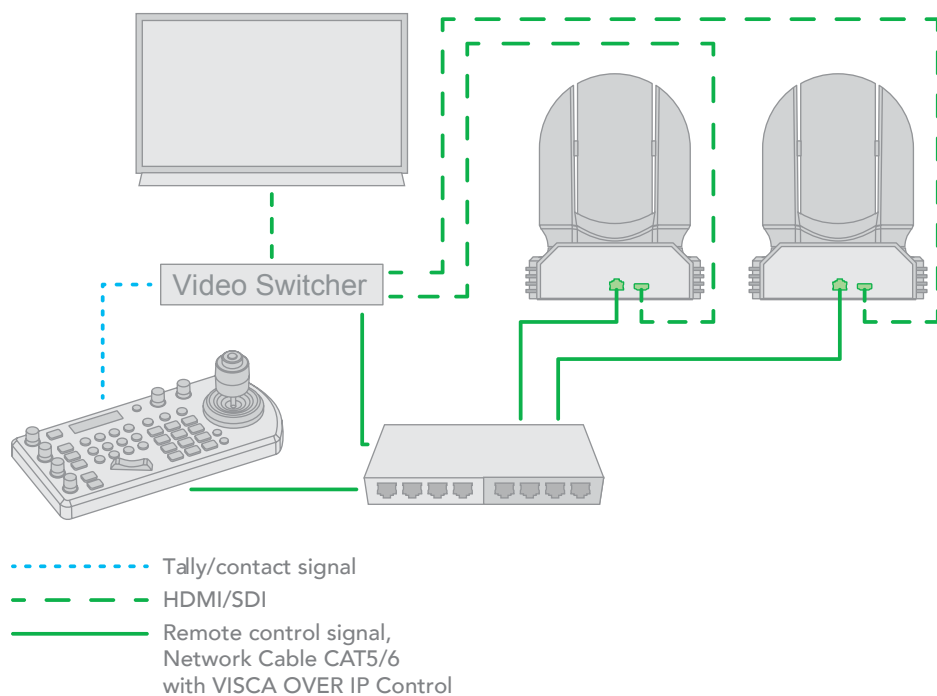


Tally Light GPI I/O Connection

GPI Connection with RS422 VISCA Control Connection



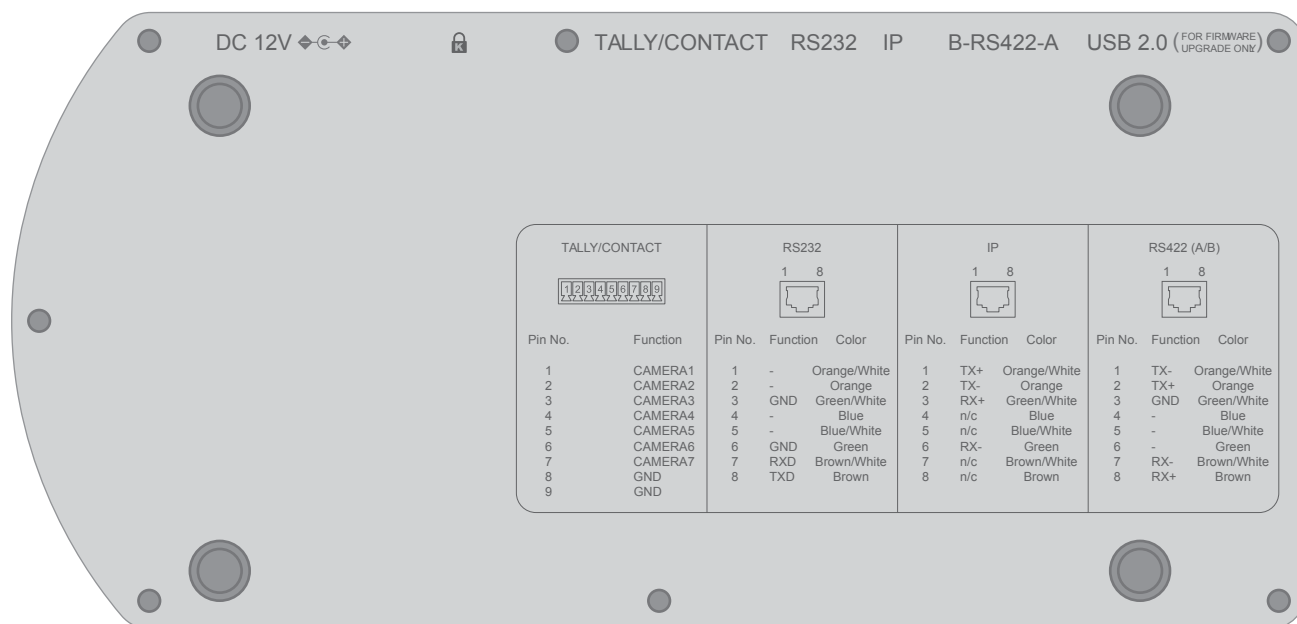
GPI Connection with VISCA OVER IP Control Connection





Appendix

PTZ Keyboard Pinout

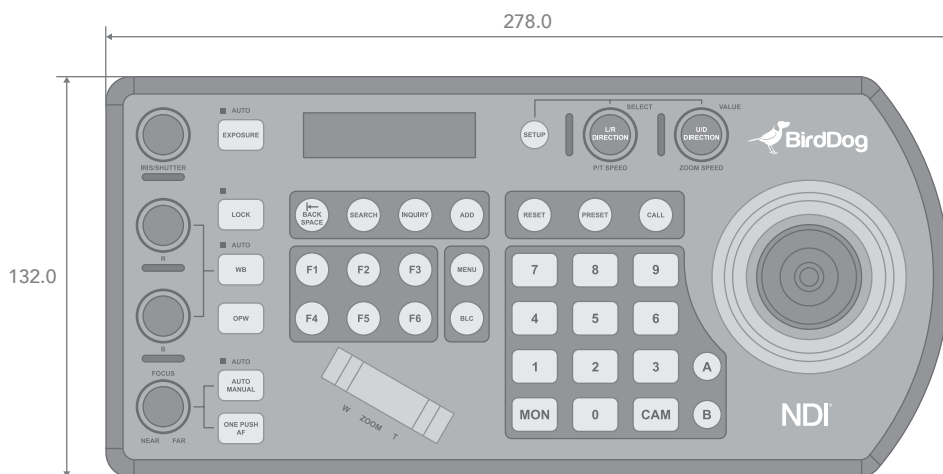
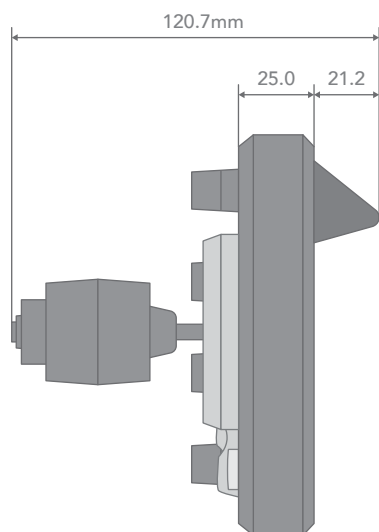


TALLY/CONTACT			RS232			IP			RS422 (A/B)		
Pin No.	Function		Pin No.	Function	Color	Pin No.	Function	Color	Pin No.	Function	Color
1	CAMERA1		1	-	Orange/White	1	TX+	Orange/White	1	TX-	Orange/White
2	CAMERA2		2	-	Orange	2	TX-	Orange	2	TX+	Orange
3	CAMERA3		3	GND	Green/White	3	RX+	Green/White	3	GND	Green/White
4	CAMERA4		4	-	Blue	4	n/c	Blue	4	-	Blue
5	CAMERA5		5	-	Blue/White	5	n/c	Blue/White	5	-	Blue/White
6	CAMERA6		6	GND	Green	6	RX-	Green	6	-	Green
7	CAMERA7		7	RXD	Brown/White	7	n/c	Brown/White	7	RX-	Brown/White
8	GND		8	TXD	Brown	8	n/c	Brown	8	RX+	Brown
9	GND										



PTZ Keyboard Dimensions

Unit: mm





Glossary

Domain

A domain contains a group of computers that can be accessed and administered with a common set of rules. Domain can also refer to the IP address of a website on the Internet.

DNS

DNS (Domain Name System) is a system used by the Internet and private networks to translate domain names into IP addresses.

mDNS

mDNS (Multicast DNS) refers to the use of IP multicast with DNS to translate domain names into IP addresses and provide service discovery in a network that does not have access to a DNS server.

Ethernet

Ethernet, standardized as IEEE 802.3, refers to a series of technologies used to connect computers and other devices to a LAN (Local Area Network) or wide area network (WAN).

Firmware

Firmware is a class of software held in non-volatile memory that provides the low-level control for a device's hardware.

Gigabit Ethernet (GigE)

An Ethernet capable of transmitting frames at a rate of a gigabit per second. A Gigabit capable Ethernet network is recommended for NDI® production workflows.

IP

IP (Internet Protocol) is the communications protocol for the Internet, many wide area networks (WANs), and most local area networks (LANs) that defines the rules, formats, and address scheme for exchanging datagrams or packets between a source computer or device and a destination computer or device.

LAN

LAN (Local Area Network) is a network that connects computers and devices in a room, building, or group of buildings. A system of LANs can also be connected to form a WAN (Wide Area Network).

Mbps

Mbps (Megabits per second) is a unit of measurement for data transfer speed, with one megabit equal to one million bits. Network transmissions are commonly measured in Mbps.

NDI®

NDI® (Network Device Interface) is a standard allowing for transmission of video using standard LAN networking. NDI® comes in two flavours, NDI® and NDI®|HX. NDI® is a variable bit rate, I-Frame codec that reaches rates of around 140Mbps at 1080p60 and is visually lossless. NDI®|HX is a compressed, long-GOP, H.264 variant that achieves rates around 12Mbps at 1080p60.

PELCO

PELCO is a camera control protocol used with PTZ cameras. See also VISCA.



PoE

Power over Ethernet.

Port

A port is a communications channel for data transmission to and from a computer on a network. Each port is identified by a 16-bit number between 0 and 65535, with each process, application, or service using a specific port (or multiple ports) for data transmission. Port can also refer to a hardware socket used to physically connect a device or device cable to your computer or network.

PTZ

Pan, tilt and zoom.

RJ45

A form of standard interface commonly used to connect computers onto Ethernet-based local area networks (LAN).

RS422, RS485, RS232

Physical layer, serial communication protocols.

Subnet

Subnet or subnetwork is a segmented piece of a larger network.

Tally

A system that indicates the on-air status of video signals usually by the use of a red illuminated lamp.

TCP

TCP (Transmission Control Protocol) is a network communications protocol.

UDP

UDP (User Datagram Protocol) is an alternative protocol to TCP that is used when reliable delivery of data packets is not required.

VISCA

VISCA is a camera control protocol used with PTZ cameras. See also PELCO.

WAN

WAN (Wide Area Network) is a network that spans a relatively broad geographical area, such as a state, region, or nation.

White Balance

White balance (WB) is the process of ensuring that white objects and by extension, all colour, in your video are rendered accurately. Without correct white balance, objects in your video display unrealistic color casts.



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