BirdDog | PTZ KEYBOARD

THE WORLD'S FIRST NDI® PTZ KEYBOARD.

USER GUIDE

NDI®

Table of Contents

Copyright

Trademark Acknowledgement

BirdDog and other BirdDog trademarks and logos are the property of BirdDog Australia. Other trademarks, company names and product names contained in this manual are the property of their respective owners.

- Trademarks and Registered Trademark Acknowledgement
- Microsoft, Windows, ActiveX, and Internet Explorer are registered trademarks of Microsoft Corporation in the U.S. and/or other countries.
- HDMI, the HDMI logo and High-Definition Multimedia Interface are the trademarks or registered trademarks of HDMI Licensing, LLC in the United States and other countries.
- Other trademarks, company names and product names contained in this manual are the property of their respective owners.

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 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 BirdDog 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 lastest 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

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

Dan Miall

Co-Founder and CEO
dan@bird-dog.tv

Eamon Drew

Co-Founder and CMO
eamon@bird-dog.tv

PTZ Keyboard Overview

BirdDog PTZ Keyboard is a full featured 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

- Protocol support: NDI®, VISCA, PELCO D/P, VISCA over IP.
- Cross protocol mix-control with RS232/RS422 and IP.
- Quick Access Control of key camera functions.
- High-quality sync-6-way joystick control which calibrates itself on every power up.
- Independent wide-range dual power input: 12VDC, 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 PTZ Keyboard.

Welcome to the Future

What is NDI?

Your new PTZ Keyboard has been designed from the ground up to support the cutting edge NDI™video transmission standard.

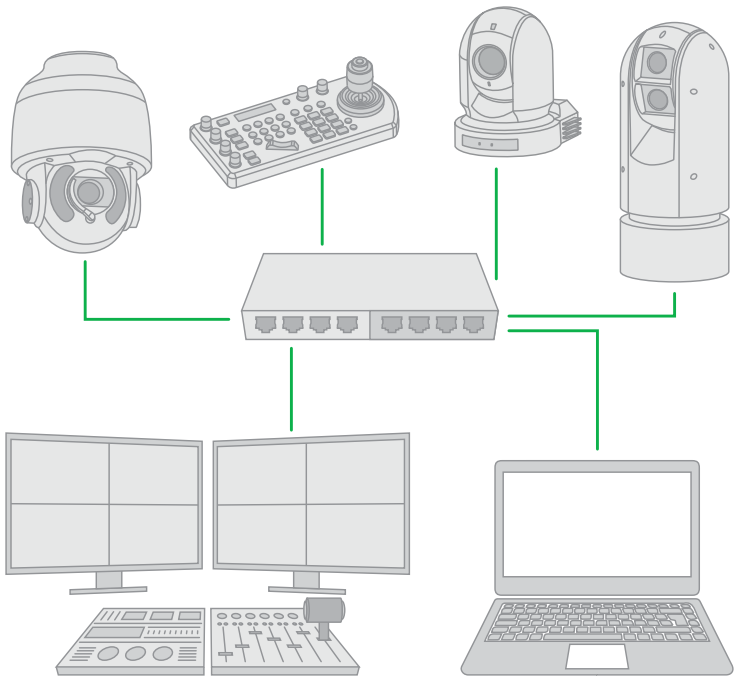
NDI (Network Device Interface) is a high-quality, low-latency, frame-accurate standard that enables compatible devices to communicate, deliver, and receive high definition video over your existing Giga-bit Ethernet network.

Operating bi-directionally, NDI devices can be auto-detected, powered and controlled over the same Ethernet cable used to send the video and audio to anywhere on a network. Even fill and key alpha channel information, as well as tally, can be sent over this same cable. If you have a Gigabit network, you have a now have the potential for a streamlined, interconnected, video production environment.

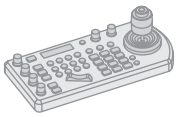
Transitioning to NDI can also occur gradually. Existing SDI or HDMI signals can easily be converted to an NDI stream and piped where required on your network and converted back only at the neccessary endpoints.

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.

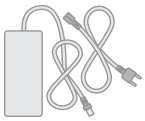
For more information on NDI, please refer to this page on our website.



What's in the box?

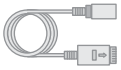


1x BirdDog PTZ Keyboard



1x Power Adaptor & Power Cord

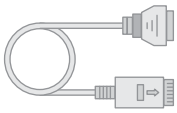
1x Junction box



1x RJ45 Control Cable

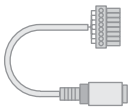
1x Tally light Terminal Contact

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:

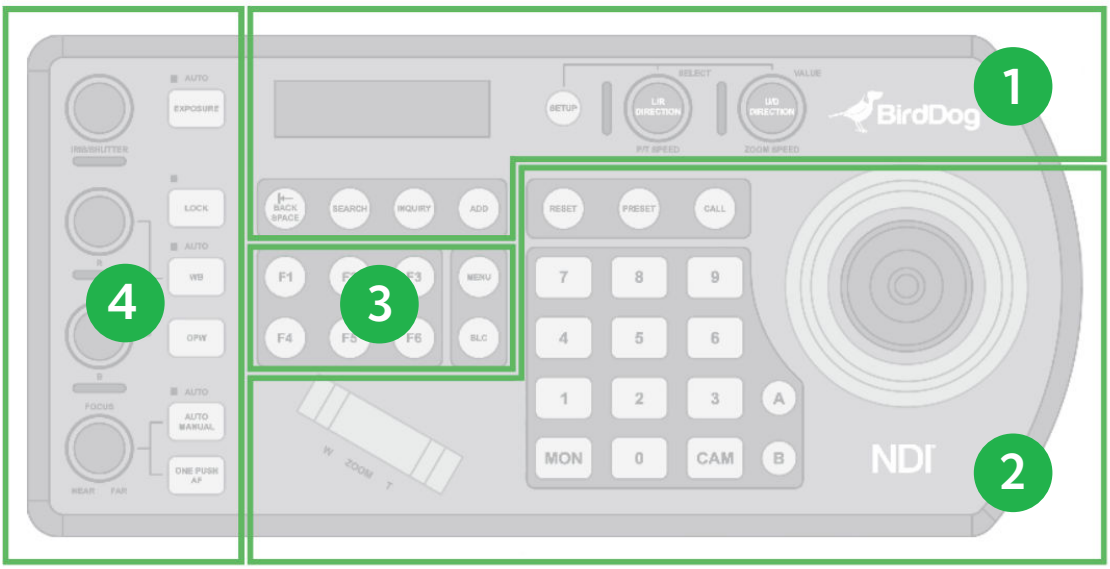
- When RS422, RS485 and RS232 cameras are being controlled simultaneously.
- When more than one group of RS422/RS485 cameras is being controlled simultaneously.
- When a 8 Pin Mini Din RS232 connector camera needs to be connected to and controlled.

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 familar with the basic setup of your new camera.

Your PTZ Keyboard at a Glance



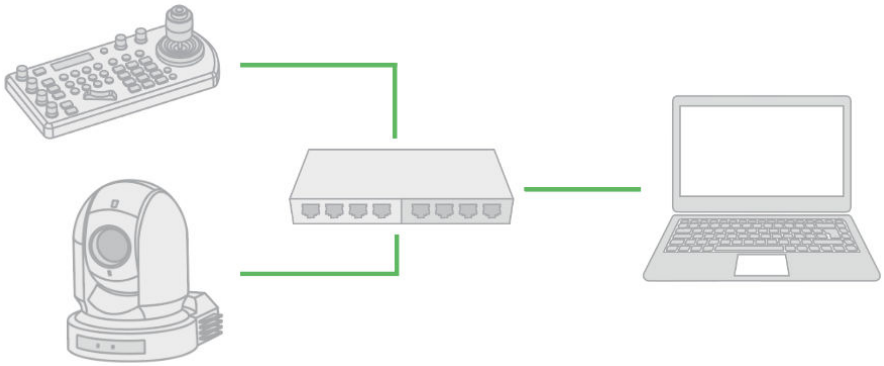
If you are new to PTZ Keyboard, it may be helpful to visualize the layout as follows.

1. **LCD Screen and Navigation**
    - For navigating and adjusting PTZ 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:

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

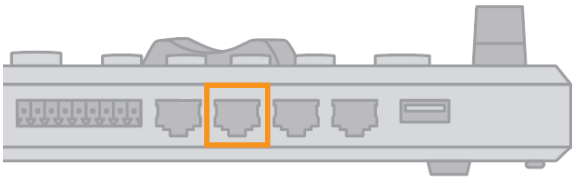


Power

You'll have to decide how you are going to power your PTZ 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 12VDC 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.

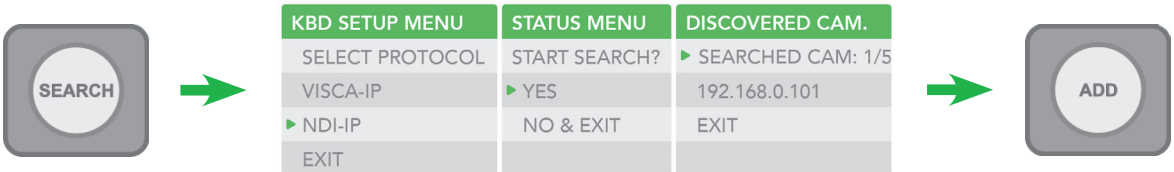
Network

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



Camera Search

Two control knobs on PTZ Keyboard are used to navigate the menus. Please refer to Navigating the Menus for more information.



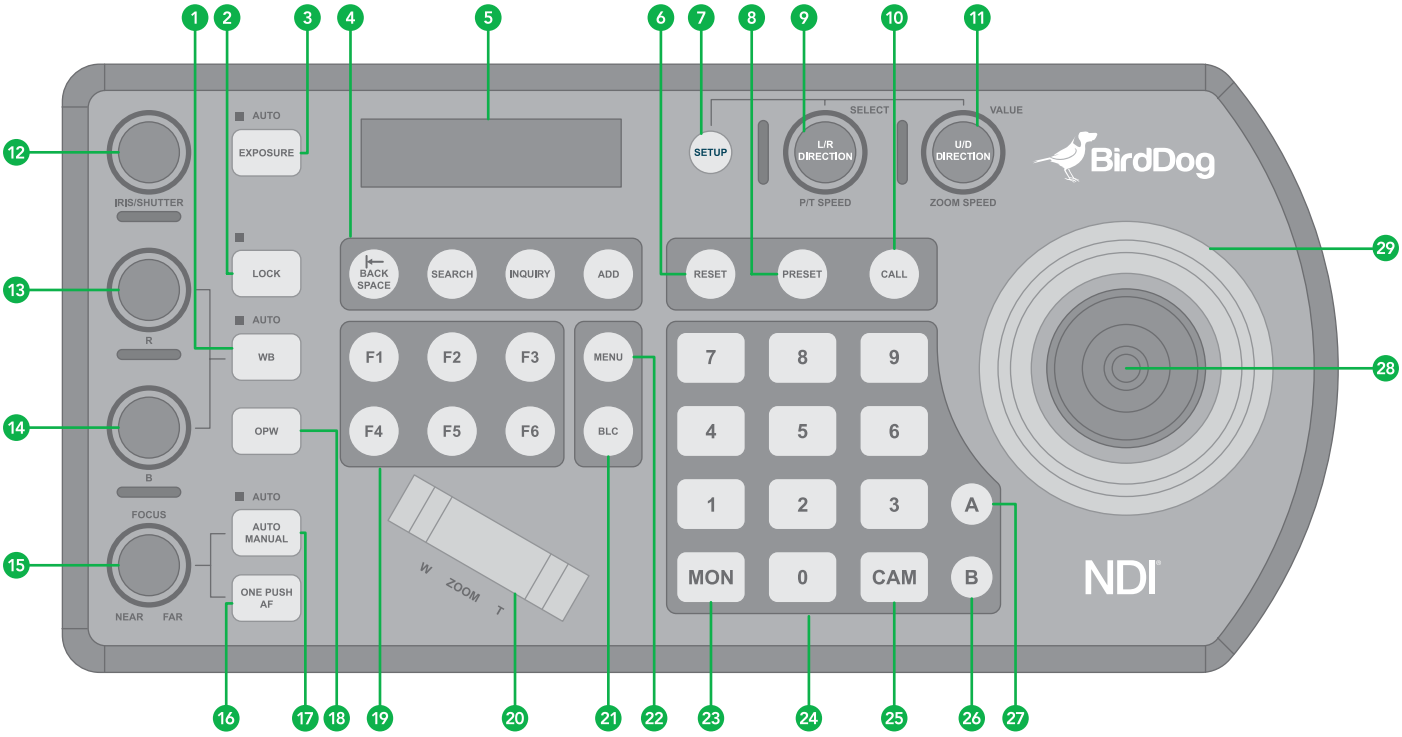
1. Press the Search button to display the Search menu.
2. Select NDI-IP as the Protocol. Click the P/T Speed dial.
3. Select Yes to start the search by once again clicking the P/T Speed dial.
4. A list of discovered cameras will be displayed. Scroll through the cameras using the Zoom Speed dial.
5. Press 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 PTZ 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.

NOTE: The Keyboard joystick control performs a calibration routine for a few seconds after power up. During this period control movements will not be sent to the camera.

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 PTZ Keyboard.

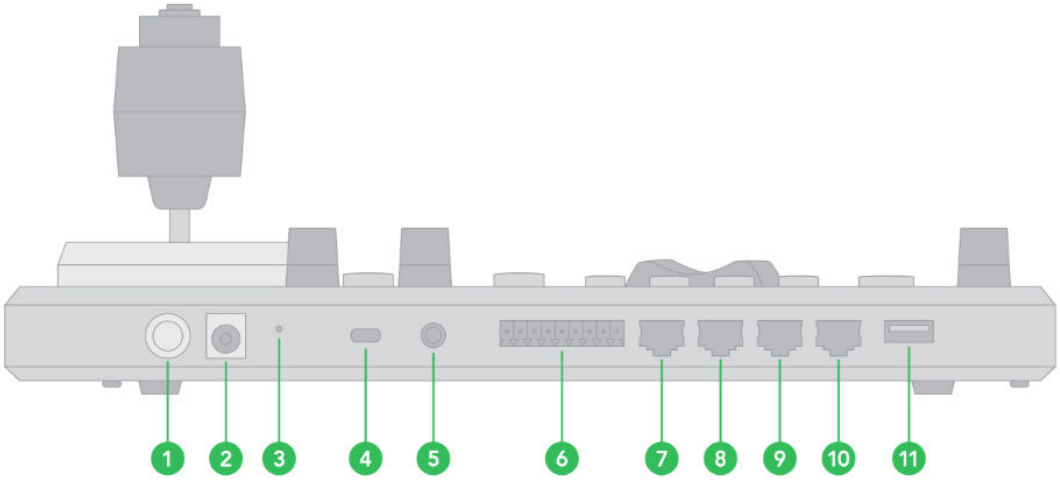
Keyboard Main Panel



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 PTZ Keyboard settings.
6. **Reset**
   For clearing presets.
7. **Setup**
   For keyboard menu setting.
8. **Preset**
   For saving camera presets.

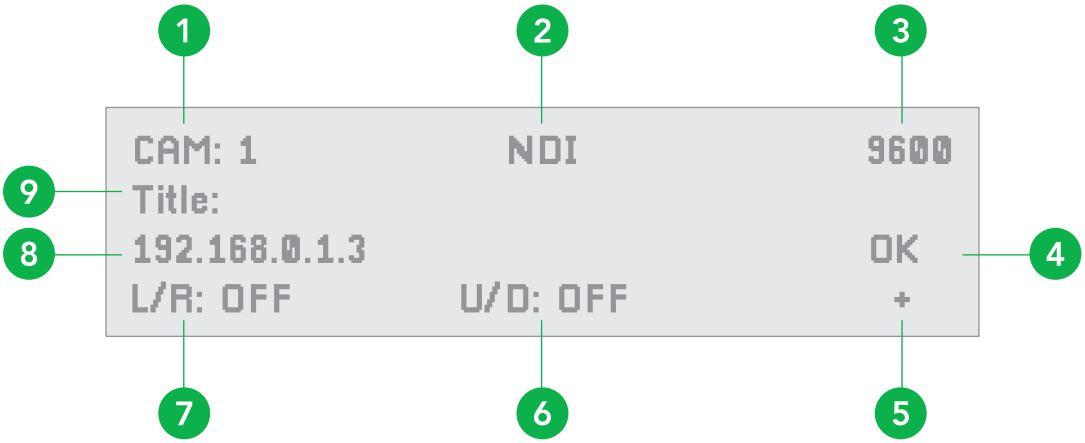
9. **Pan Tilt Speed knob**
    - Rotate: Speed adjustment / Navigate (in menu).
    - Press: Select (in menu).
    - Long press (3 sec): Invert L/R direction.
10. **Call**
    For calling camera presets.
11. **Zoom Speed knob**
    - Rotate: Zoom speed adjustment / adjust value (in menu).
    - Press: 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**
    Operates as a One Push Auto Focus button.
29. **PTZ Joystick**

Keyboard Rear Panel



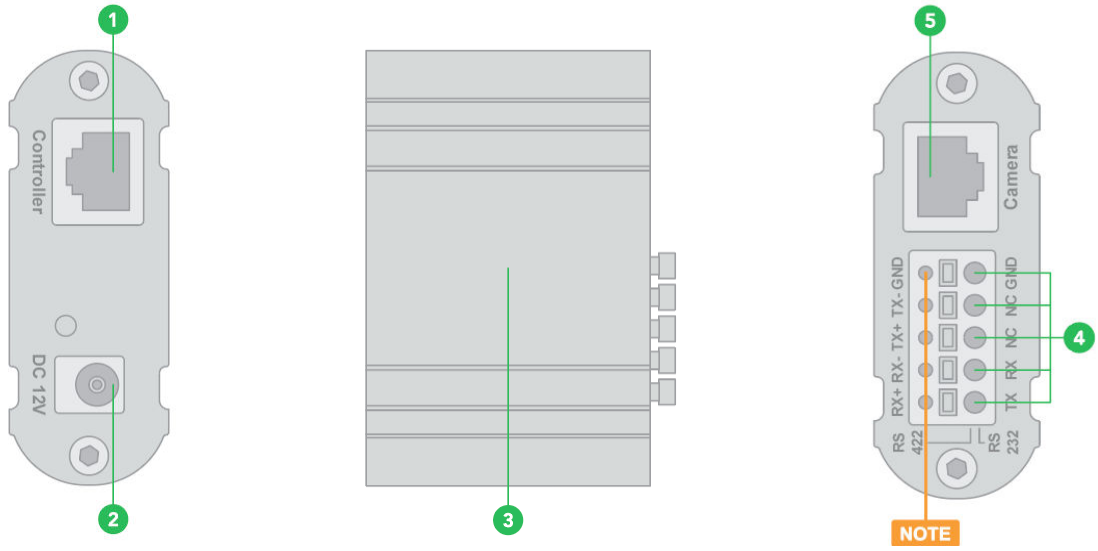
1. **Power Button**
   Power on / Power off the keyboard.
2. **12V DC Power Port (range input tolerance: 5V-48V DC)**
   Connect the supplied DC power adaptor and cord.
3. **Factory Reset/Network Reset**
   Performs factory reset including network settings.
4. **Kensington Security Slot**
   Use a lock to physically secure the keyboard in place.
5. **Audio Port**
   For headset use when PTZ 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. **Baud Rate**
4. **Communication Status Indicator (for the current device)**
5. **Network connectivity Indicator**
   a. "+" displayed means that the network is successfully connected.
   b. "+" not displayed means that the network is not connected.
6. **Tilt Reversal Indicator**
7. **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.

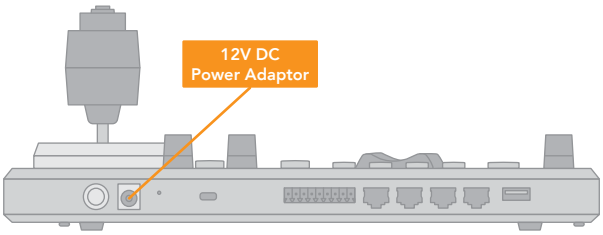
NOTE: Do not use the top row of holes, as these are not contact ports. All labels apply to the bottom row (Item #4 in the chart).

Powering PTZ Keyboard

Power the keyboard using one of the following options:

1. **Power Supply (included)**

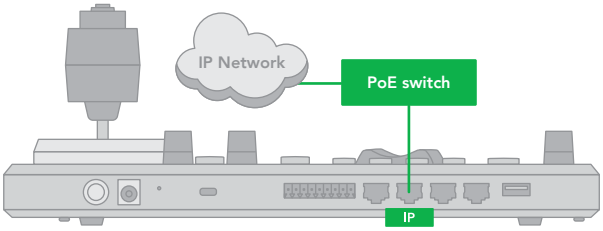
   - Power voltage tolerance = 5V - 48V.
   - The keyboard can be powered with at least 5VDC. This allows for longer power runs between the power source and the keyboard.
   - The keyboard can also tolerate 48VDC power, which makes the keyboard suitable for vehicle use (broadcast vans, commercial vehicles,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



2. **PoE**

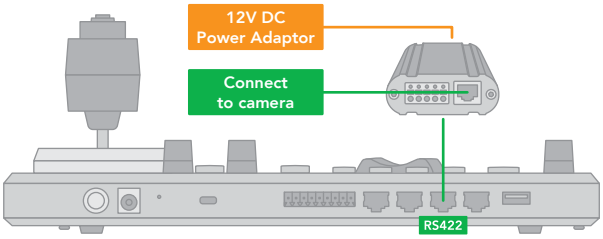
   PoE is a convenient way to power PTZ Keyboard as it allows both data and power to be sent through the same standard Ethernet cable. To take advantage of PoE, the network switch that PTZ Keyboard is directly plugged into must support 15.4W PoE (802.3af).

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



3. **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 PTZ Keyboard to Your network

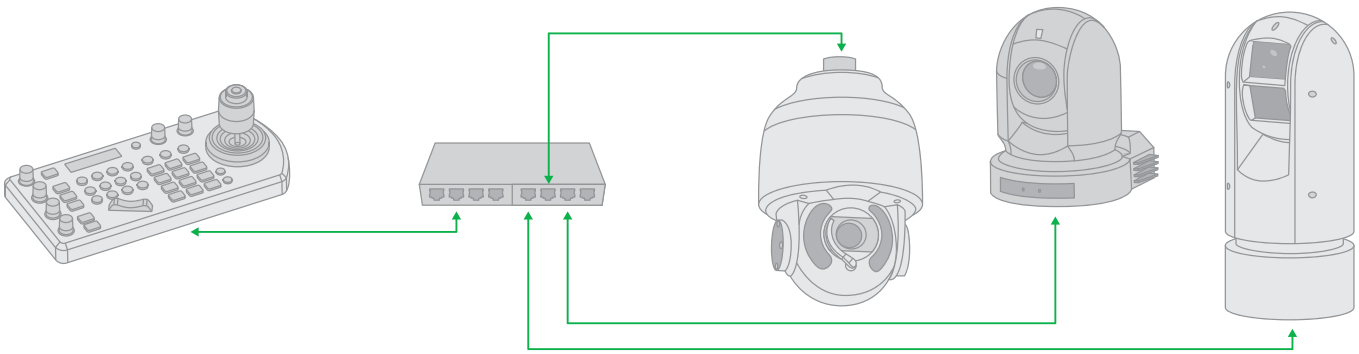
PTZ Keyboard is the world's first PTZ controller with NDI® and NDI|HX support. Along with NDI® there is support for Visca over IP, RS422, and RS232. You can mix and match cameras from any of the supported protocols and control them all from a single PTZ Keyboard.

NDI® Connection

If using PoE+, you can use a single Ethernet cable to connect the Keyboard's IP port to a port on an Ethernet switch. This allows you to use NDI for control as well as using the web interface for set up of PTZ Keyboard.

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

For more information on configurating Network and NDI settings, please refer to Web User Interface Configuration Panel.



Other Control Protocols

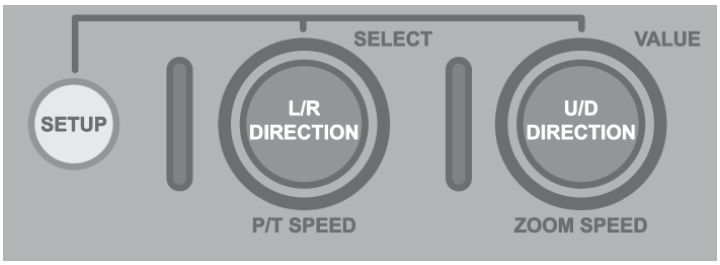
Please refer to here for information on using PTZ Keyboard with other control protocols.

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 value.
- Click: Save your value change.

Keyboard Configuration

Use these menus to configure PTZ Keyboard.

Keyboard Setting Menu

Navigate to KEYBOARD SETTING in the MAIN SETUP MENU.

MAIN SETUP MENU	KBD SETTING MENU
CAMERA SETTING	▶ IP CONFIGURATION
▶ KEYBOARD SETTING	BUTTON LIGHT
EXIT	ASSIGNED KEY: F1
	FACTORY DEFAULT
	GPI I/O
	PASSWORD SETTING
	JOYSTICK ZOOM: ON
	MODEL INFO
	EXIT

IP Configuration

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

KBD SETTING MENU	IP CONFIGURATION MENU
▸ IP CONFIGURATION	▸ TYPE: STATIC
BUTTON LIGHT	IP ADDRESS:
ASSIGNED KEY: F1	192.168.100.100
FACTORY DEFAULT	SUBNET MASK:
GPI I/O	255.255.255.0
PASSWORD SETTING	GATEWAY:
JOYSTICK ZOOM: ON	192.168.100.1
MODEL INFO	EXIT
EXIT	

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

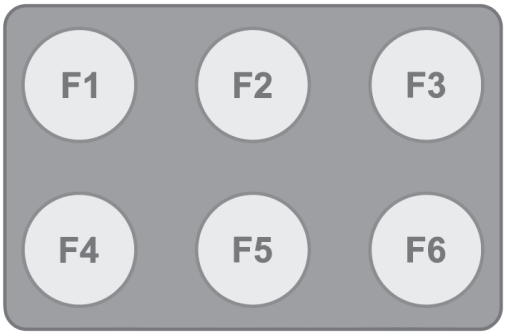
The BUTTON LIGHT value affects the brightness of the button backlight.

KBD SETTING MENU	BUTTON LIGHT MENU
IP CONFIGURATION	▸ LEVEL: 0
▸ BUTTON LIGHT	EXIT
ASSIGNED KEY: F1	
FACTORY DEFAULT	
GPI I/O	
PASSWORD SETTING	
JOYSTICK ZOOM: ON	
MODEL INFO	
EXIT	

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.



KBD SETTING MENU	ASSIGNED KEY MENU
IP CONFIGURATION	▸ HOME
BUTTON LIGHT	EXIT
▸ ASSIGNED KEY: F1	
FACTORY DEFAULT	
GPI I/O	
PASSWORD SETTING	
JOYSTICK ZOOM: ON	
MODEL INFO	
EXIT	

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 Seesaw while the DEFAULT setting is processing.

KBD SETTING MENU	FACTORY DEFAULT
IP CONFIGURATION	▸ YES?
BUTTON LIGHT	NO?
ASSIGNED KEY: F1	
▸ FACTORY DEFAULT	
GPI I/O	
PASSWORD SETTING	
JOYSTICK ZOOM: ON	
MODEL INFO	
EXIT	

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.

KBD SETTING MENU	TALLY SETTING MENU
IP CONFIGURATION	▸ COMMAND SEL: STANDARD
BUTTON LIGHT	EXIT
ASSIGNED KEY: F1	
FACTORY DEFAULT	
▸ GPI I/O	
PASSWORD SETTING	
JOYSTICK ZOOM: ON	
MODEL INFO	
EXIT	

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.

KBD SETTING MENU	PASSWORD SETTING MENU
IP CONFIGURATION	▸ OLD PASSWORD:
BUTTON LIGHT	NEW PASSWORD:
ASSIGNED KEY: F1	CONFIRM:
FACTORY DEFAULT	SAVE
GPI I/O	EXIT
▸ PASSWORD SETTING	
JOYSTICK ZOOM: ON	
MODEL INFO	
EXIT	

Joystick Zoom Setting

KBD SETTING MENU
IP CONFIGURATION
BUTTON LIGHT
ASSIGNED KEY: F1
FACTORY DEFAULT
GPI I/O
PASSWORD SETTING
▶ JOYSTICK ZOOM: ON
MODEL INFO
EXIT

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 and firmware version of the unit.

KBD SETTING MENU	MODEL INFO MENU
IP CONFIGURATION	▶ IP ADDRESS:
BUTTON LIGHT	192.168.100.100
ASSIGNED KEY: F1	FW VERSION: X.X.X
FACTORY DEFAULT	EXIT
GPI I/O	
PASSWORD SETTING	
JOYSTICK ZOOM: ON	
▶ MODEL INFO	
EXIT	

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 PTZ 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..

CAMERA SETTING MENU	NDI CAMERA SETUP MENU
CAM001	IP Address:
TITLE: -	192.168.0.13
PROTOCOL: NDI	EXIT
EXIT	

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-D 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.

MAIN SETUP MENU
▸ CAMERA SETTING
KEYBOARD SETTING
EXIT

CAMERA SETTING MENU
▸ CAM001
TITLE: -
PROTOCOL: VISCA
EXIT

CAMERA SETTING MENU
CAM001
TITLE: -
▸ PROTOCOL: VISCA
EXIT

BAUD RATE SETTING
▸ BAUD RATE: 9600
EXIT

Adding a VISCA over IP Camera to 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.

CAMERA SETTING MENU
CAM001
TITLE: -
▸ PROTOCOL: VISCAIP
EXIT

VISCAIP CONFIGURATION MENU
▸ IP ADDRESS:
192.168.0.100
EXIT

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 PTZ Keyboard.

Scanning the Local Network for Available VISCA over IP Cameras

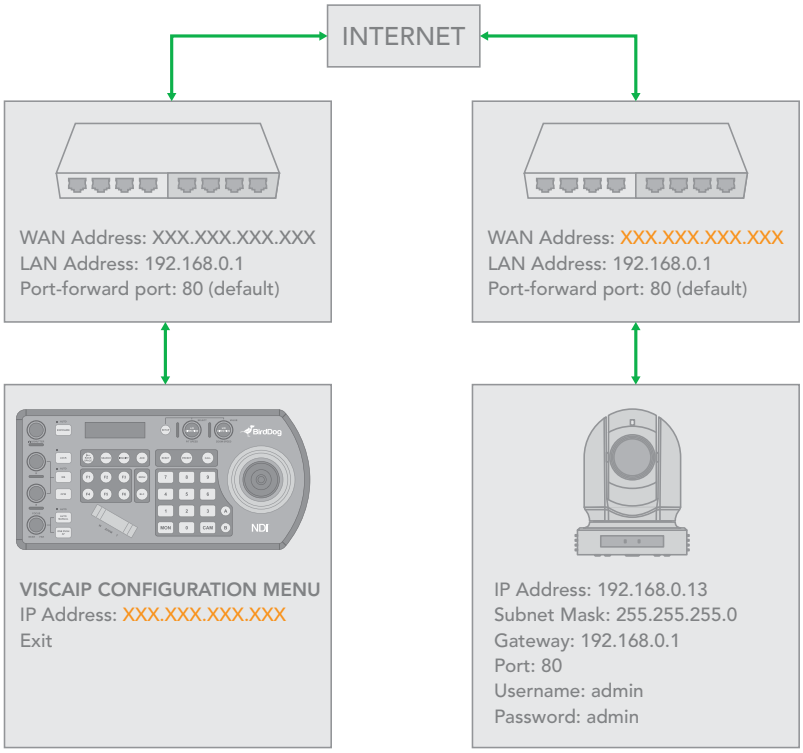
1. Press the Search button to display the Search menu.
2. Move the cursor to VISCA-IP.
3. Select Yes to start the search.
4. A list of discovered cameras will display. Scroll through the list using the Zoom Speed dial.
5. To add a camera to be controlled by the Keyboard, press the ADD button.
6. With 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 PTZ Keyboard.

Adding VISCA over IP Cameras Under WAN Control

Make the following changes at the camera and PTZ 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.

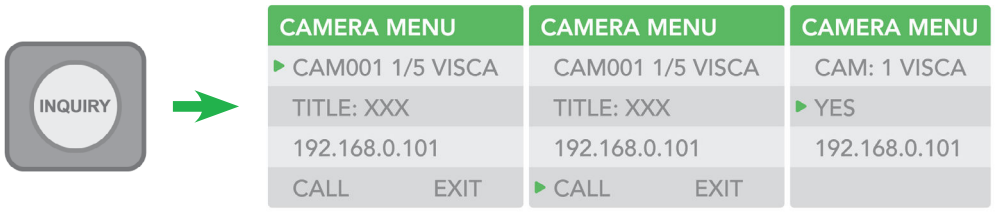
Interacting with Cameras

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.

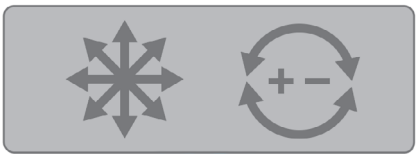
Engaging the Camera OSD Menu for PELCO-D Cameras

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

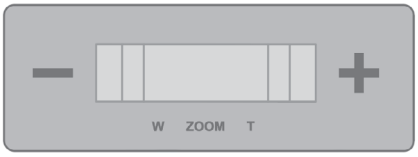
Manual Joystick Movements

NOTE: The Keyboard joystick control performs a calibration routine for a few seconds after power up. During this period control movements will not be sent to the camera.

- 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.

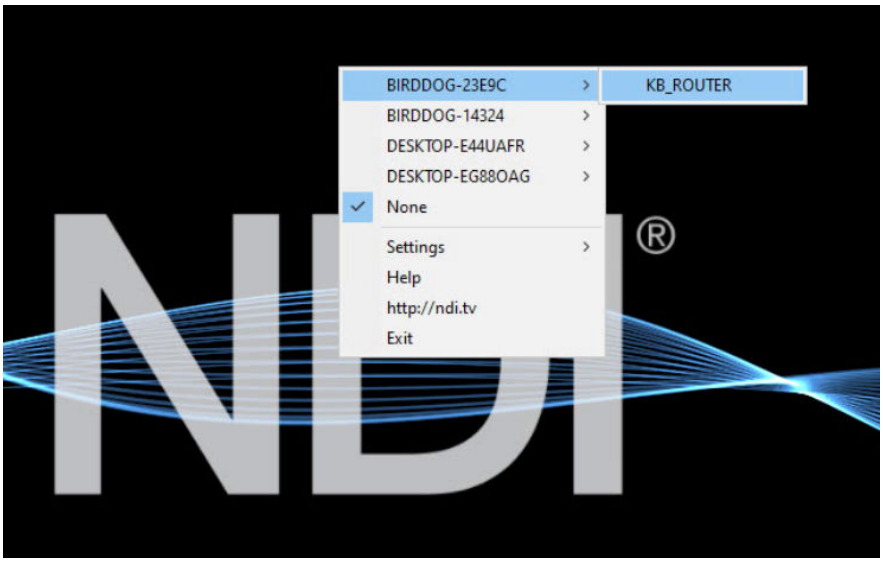


- When you are not in a menu, the P/T Speed and Zoom Speed dials control how fast the camera Pans, Tilts, and Zooms.
- Response to commands from the keyboard.
- The Zoom Seesaw can be engaged to zoom in / Zoom out.Setting and calling presets.

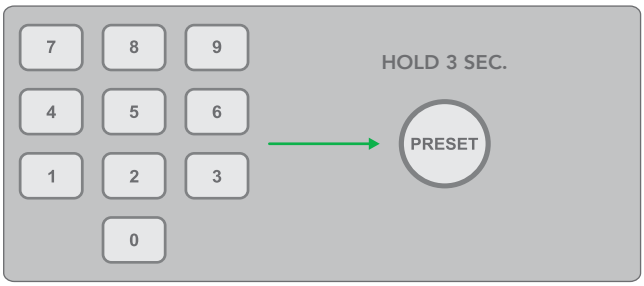


NDI Keyboard Router

To allow for more efficient monitoring of cameras, you can select KB_ROUTER as the output channel of an NDI source, enables the displayed video stream to follow the active controlled camera. For example, selecting Cam 1 on the keyboard will switch to the Cam 1 NDI stream, and then selecting Cam 2 on the keyboard will switch to the Cam 2 NDI stream.

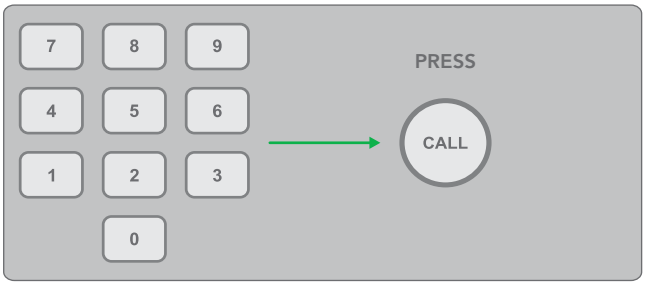


Creating Presets



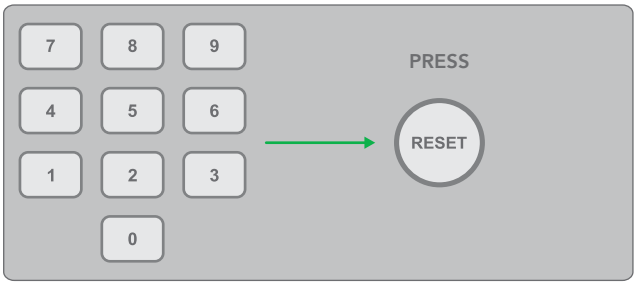
1. Move the camera to the desired position.
2. Enter the desired preset number on the alphanumeric keyboard, and then hold the Preset button for 3 seconds to save.

Calling Presets



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

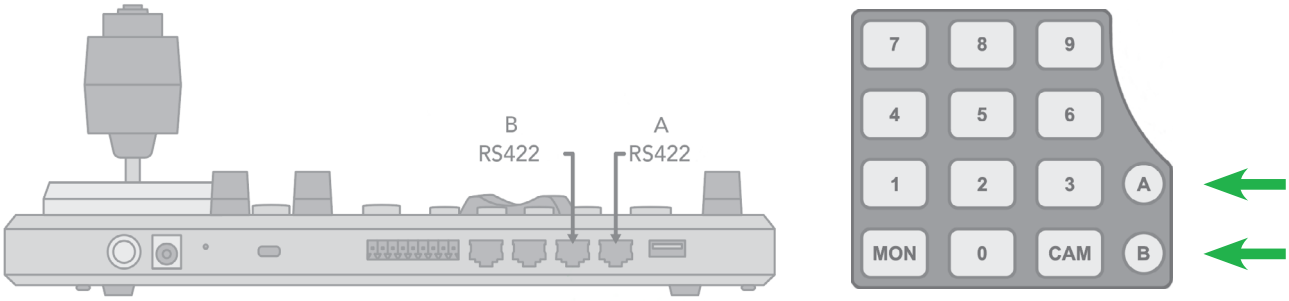
Resetting / Deleting Presets



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.

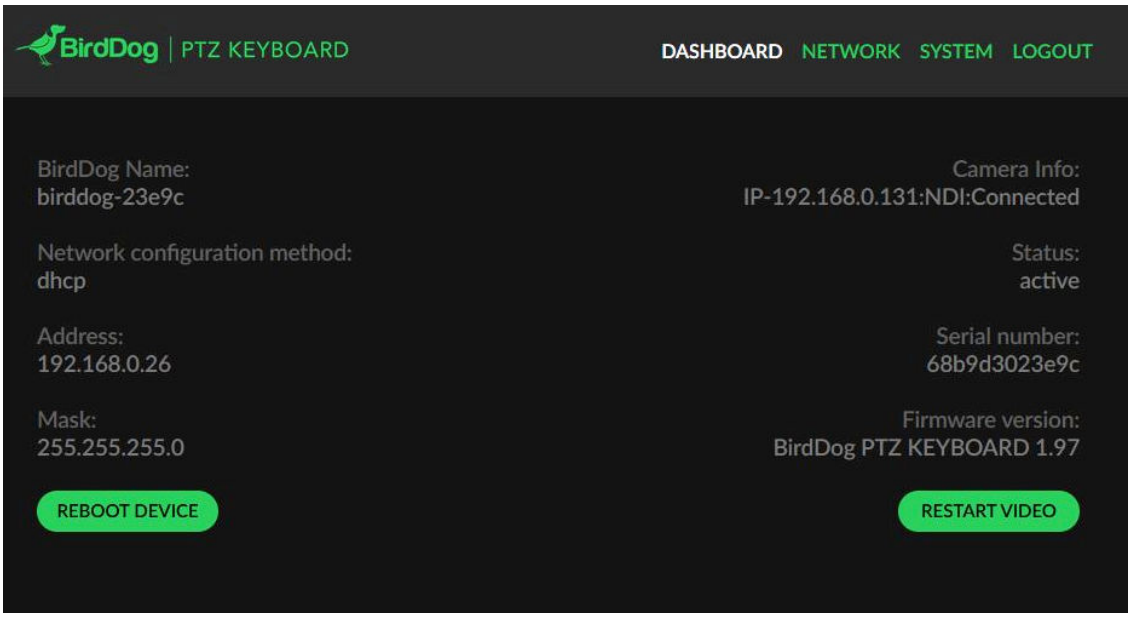
Web User Interface Configuration Panel

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

To access the Web UI, 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: support.apple.com/kb/dl999?locale=en_AU.

Dashboard



The Dashboard displays important PTZ Keyboard settings in one convenient window.

You can also:

- **Reboot PTZ Keyboard**

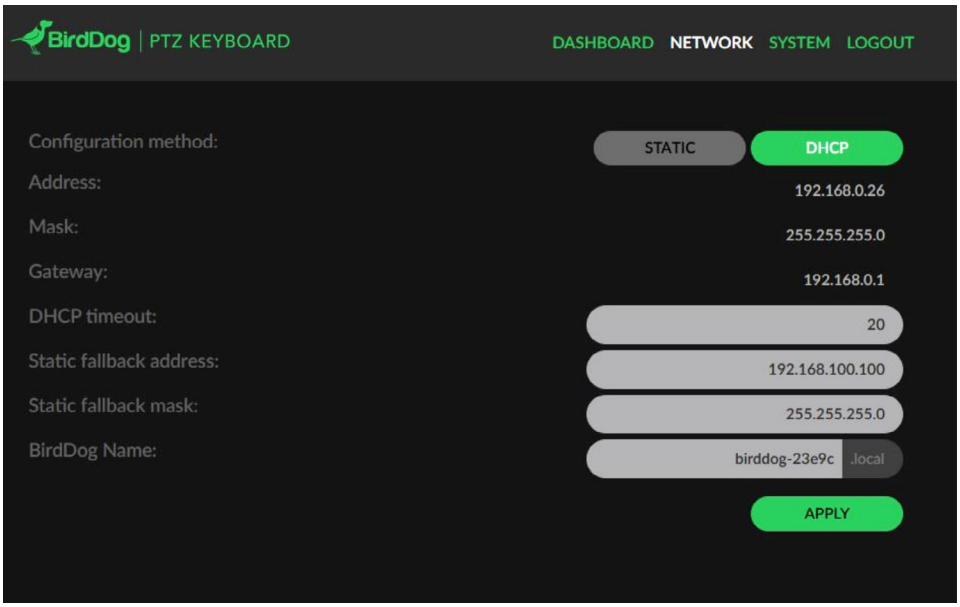
  Allows you to remotely soft reboot the device, for example, after installing new firmware.

- **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

IP Address Configuration



You can configure PTZ 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 PTZ 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 PTZ 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 PTZ 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 PTZ 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

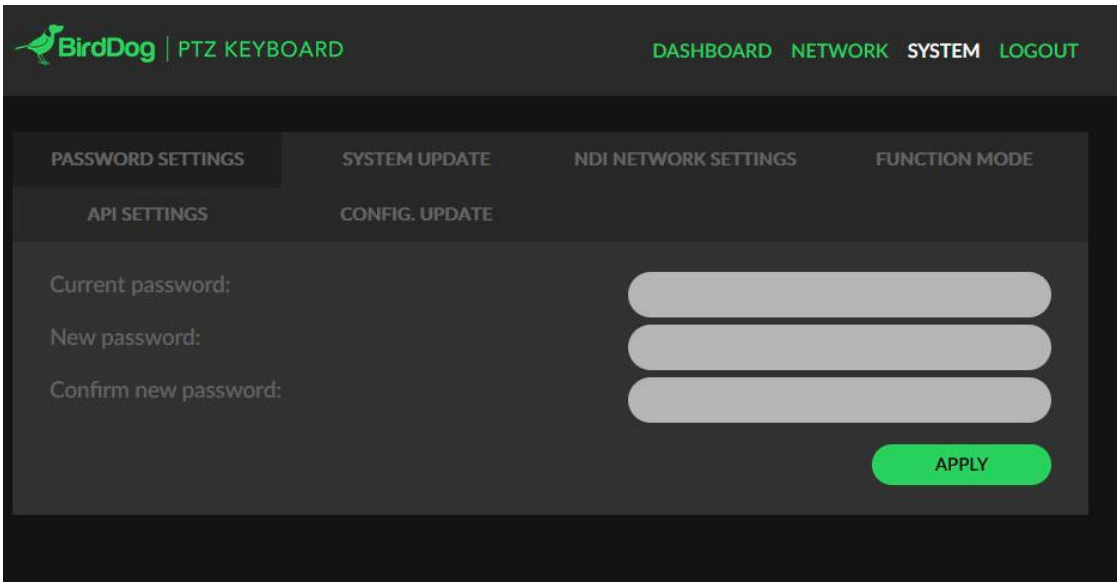
When PTZ Keyboard is first powered on, it defaults to the naming convention: http://birddog-xxxxx.local/.

You can name each PTZ 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 (lower case only), 1-0, and '–'.

System

Password Settings

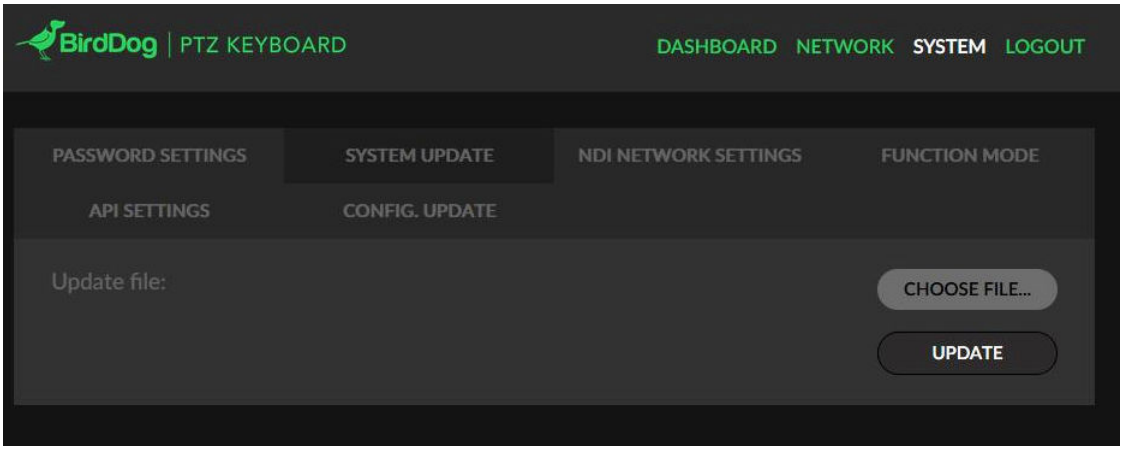


The Web UI is secured by a user-selectable password. The default password is **birddog** (one word, lower case).

You can change the password in the Password Settings tab.

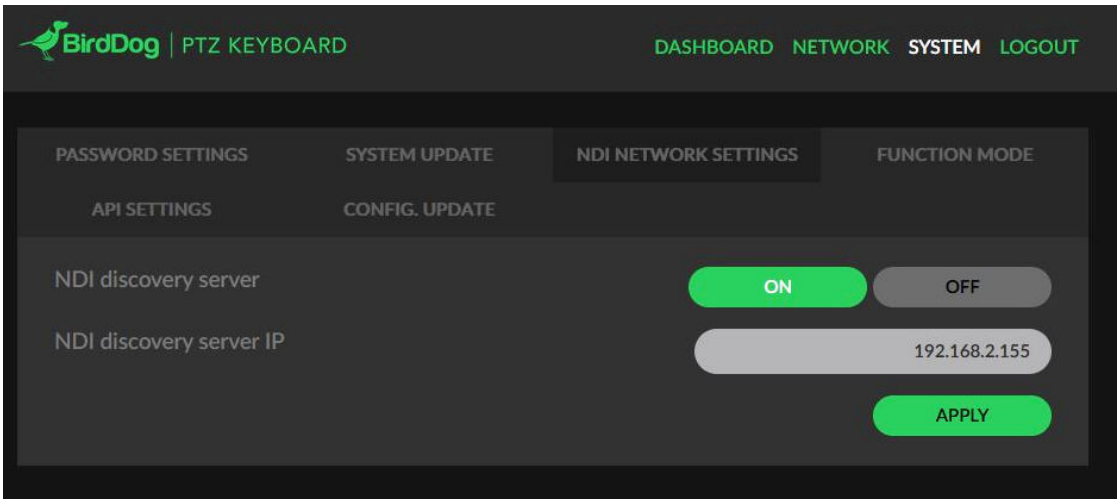
1. Enter the current password.
2. Enter the new password. It is recommended to change this password in a network environment where PTZ Keyboard is shared with other users (e.g. not private). By entering this password, the user is granted full access to the PTZ Keyboard configuration settings and could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

Update



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

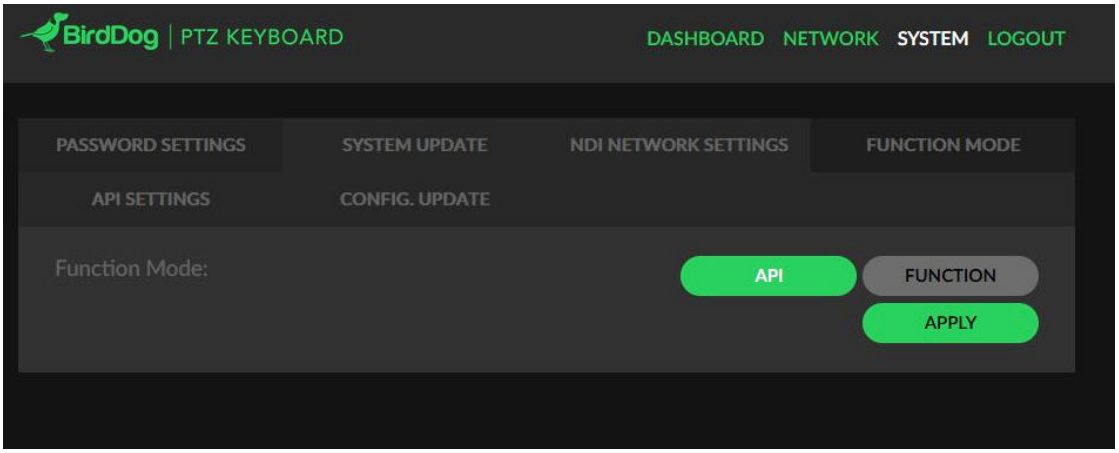


If you choose to use a NDI discovery server, you can configure it in this tab. By default, NDI utilizes mDNS (multicast Domain Name System) to create the zero configuration environment for discovery. The primary benefits of using mDNS is that it requires little or no administration to set up. Unless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

The NDI discovery service 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.

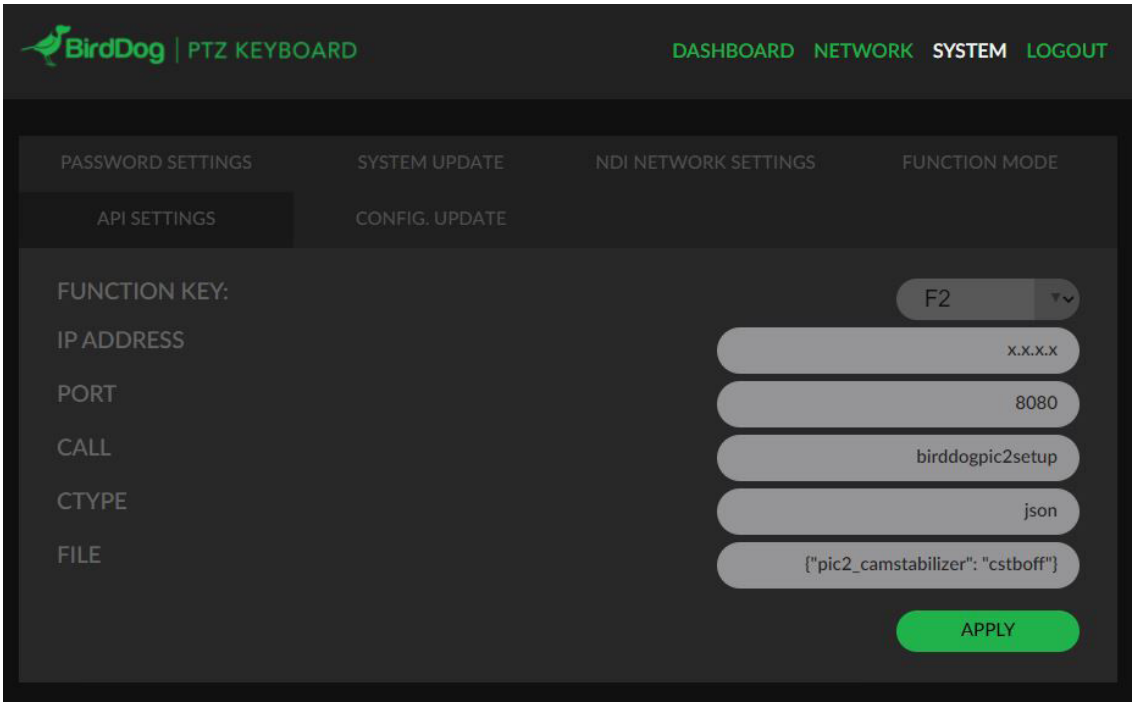
1. If you are using a NDI discovery server, click the ON button, otherwise click the OFF button.
2. Enter the IP address of your server.
3. Click the APPLY button to save your changes.

Function Mode



In this tab, choose whether the PTZ 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



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 PTZ 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://bird-dog.tv/developer 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

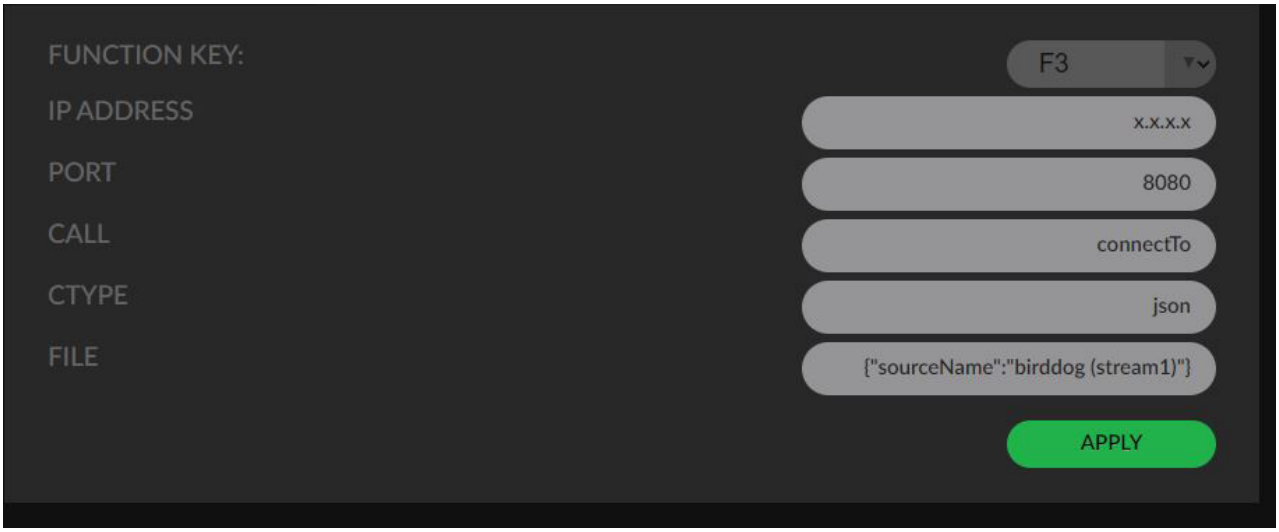
Parameter and value: {"pic2_camstabilizer": "cstboff"}

Example 2

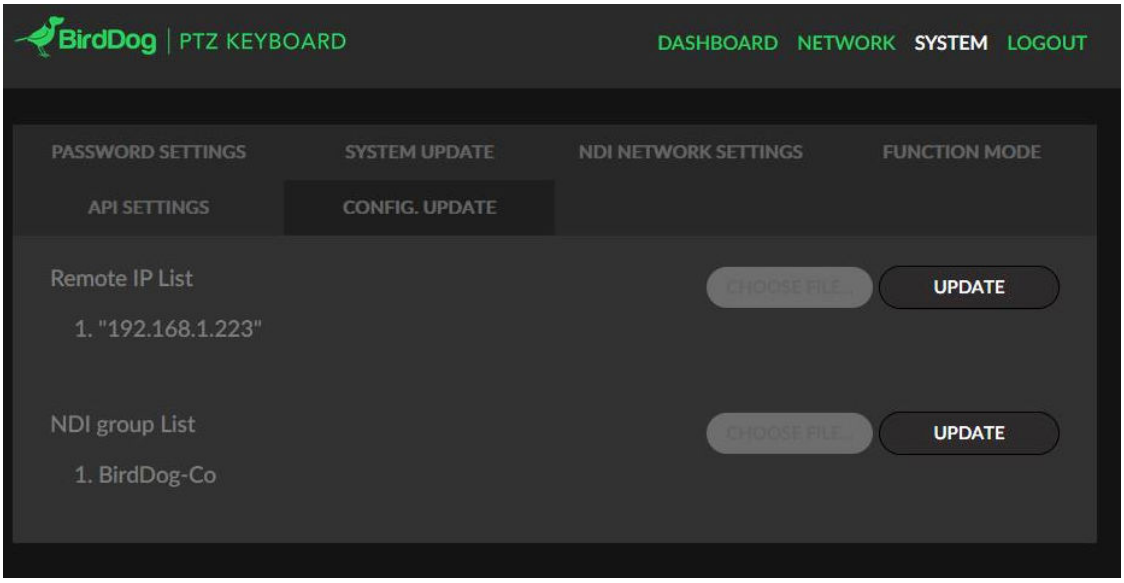
In the example below, the F3 key is configured to instruct a BirdDog device, identified by address 'x.x.x.x', to connect to a specific NDI source "birddog (stream1)".

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

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



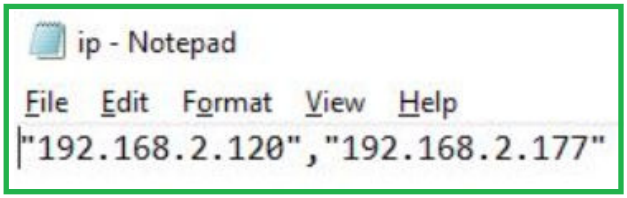
Configuration Update



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 need to add it's address manually as a Remote IP.

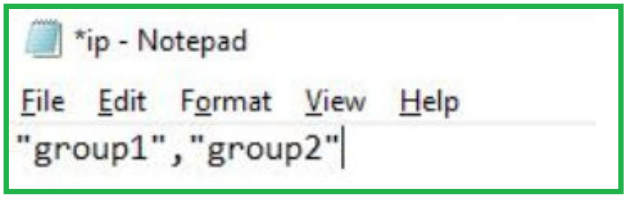
1. Click the CHOOSE FILE button to load your Remote IP List in JavaScript Object Notation (JSON) format.
2. Click the UPDATE button.



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 in larger environments to control visibility and access amongst various groups.

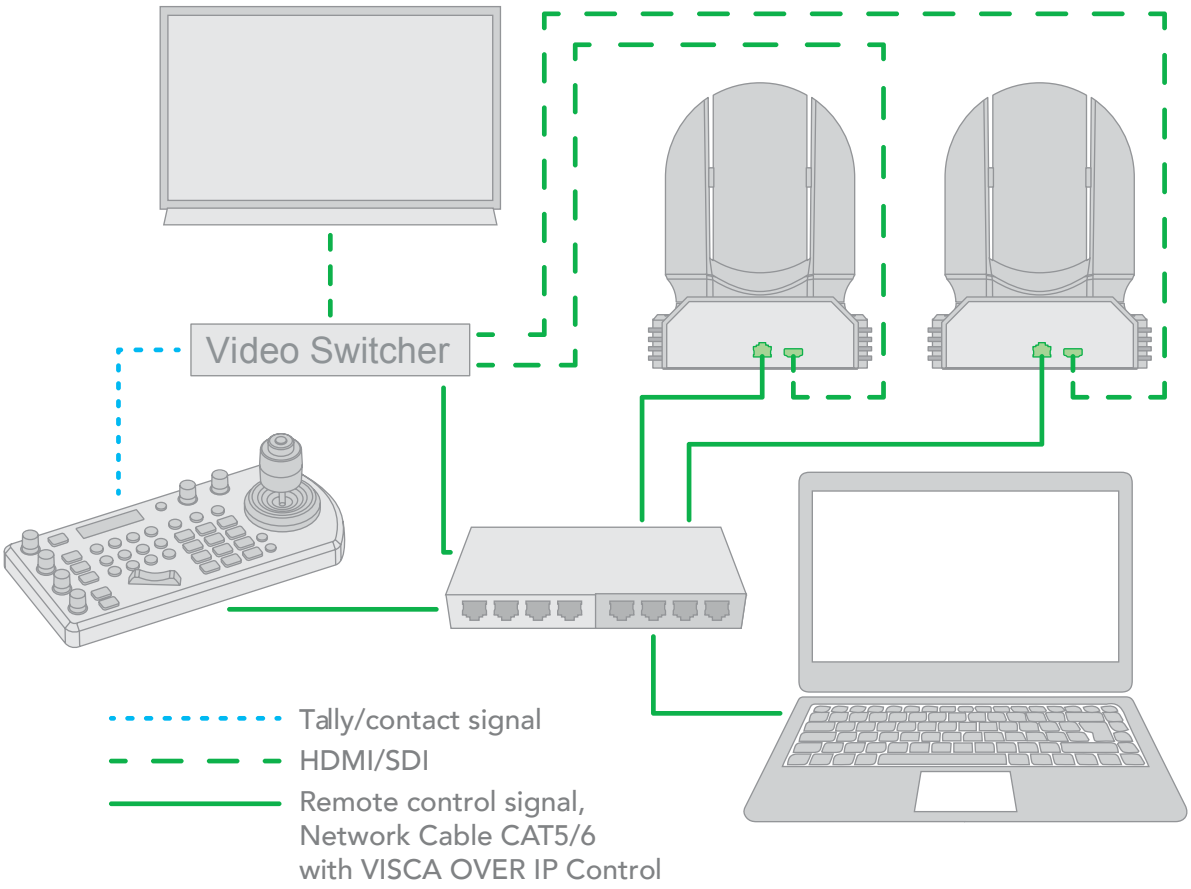
1. Click the CHOOSE FILE button to load your NDI Group List in JavaScript Object Notation (JSON) format.
2. Click the UPDATE button.



Using Other Control Protocols

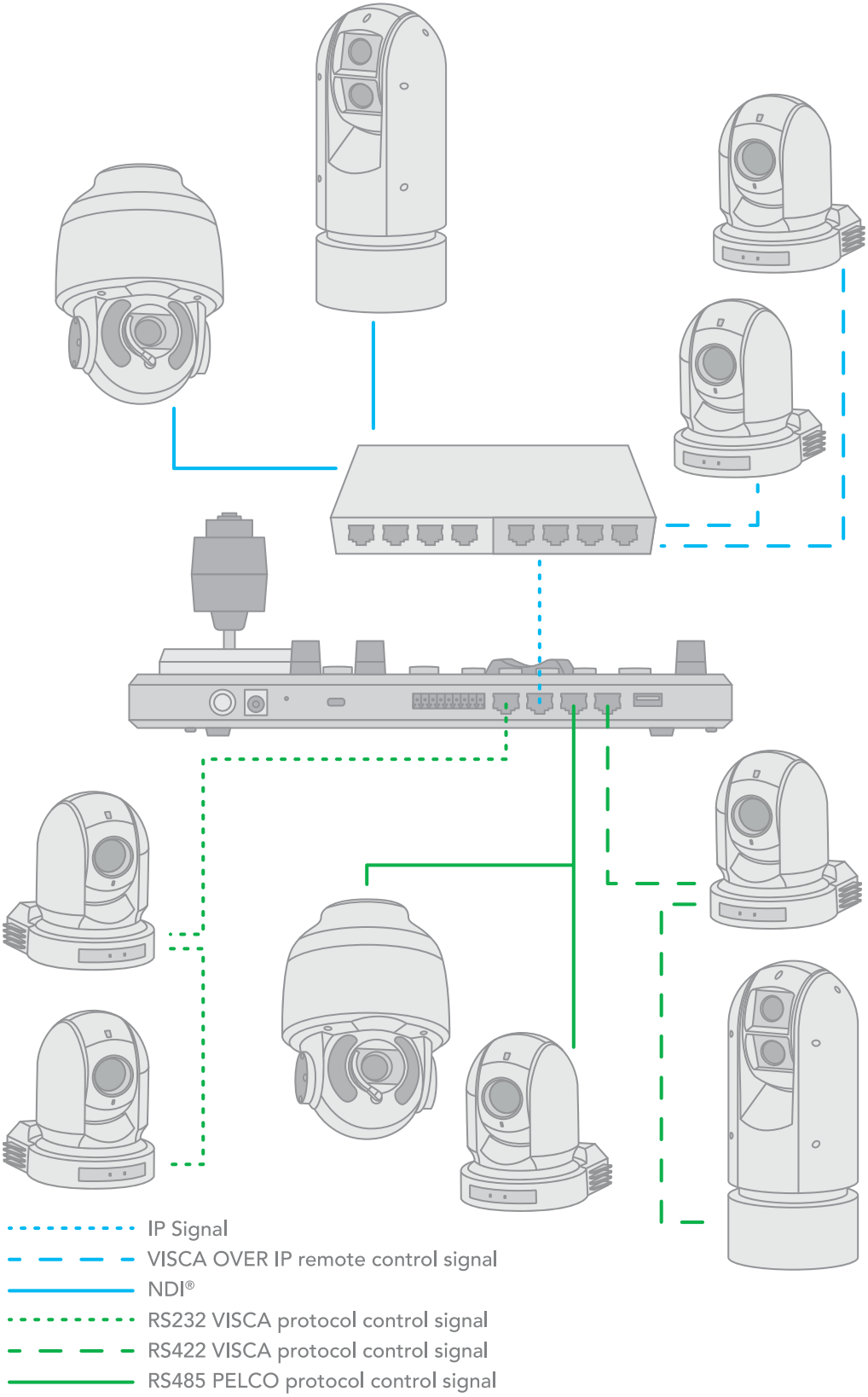
Use VISCA OVER IP Control

IP Connection – Using VISCA OVER IP Control Protocol – with a Visca Over IP ready Camera.

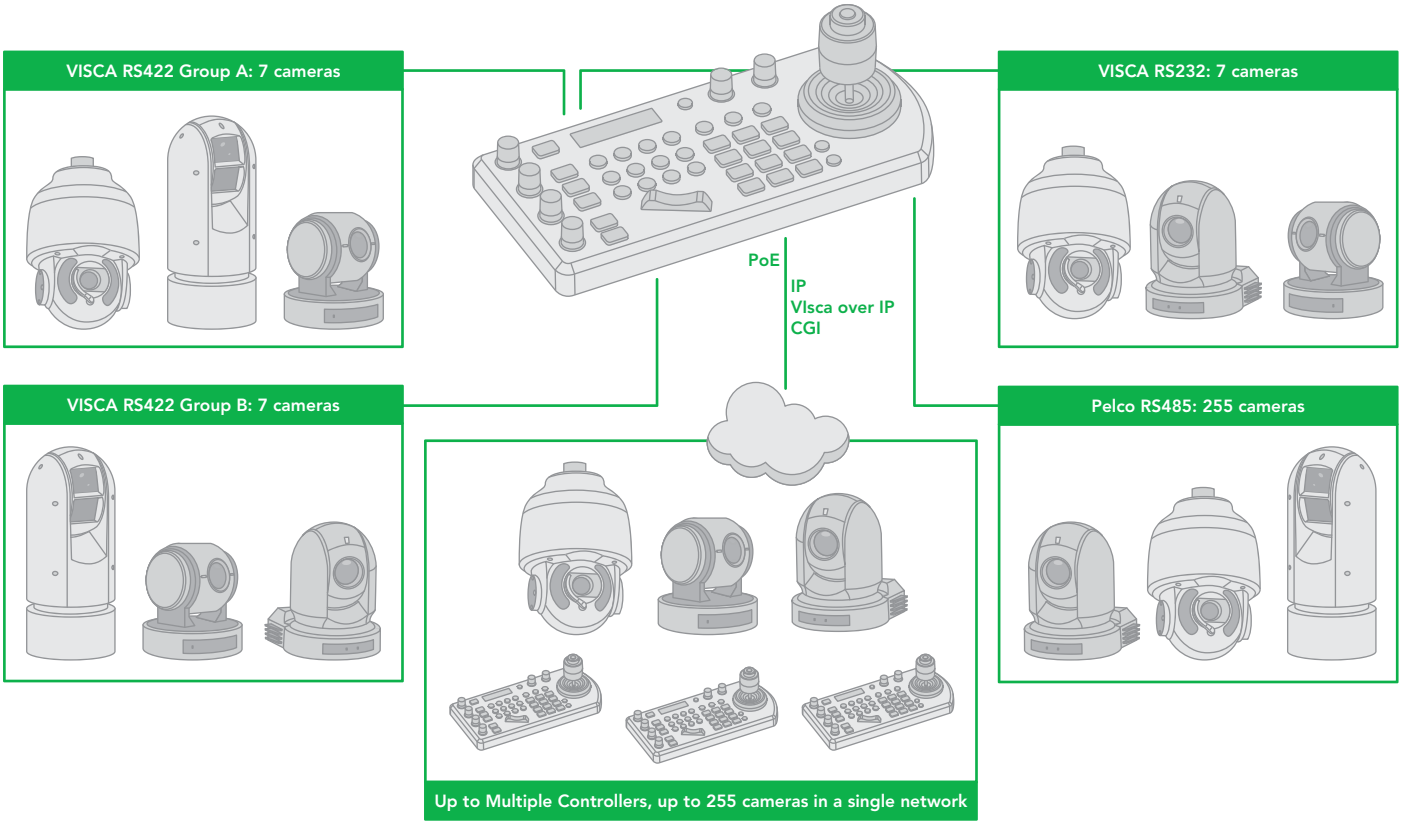


Cross-Protocol Mix Control

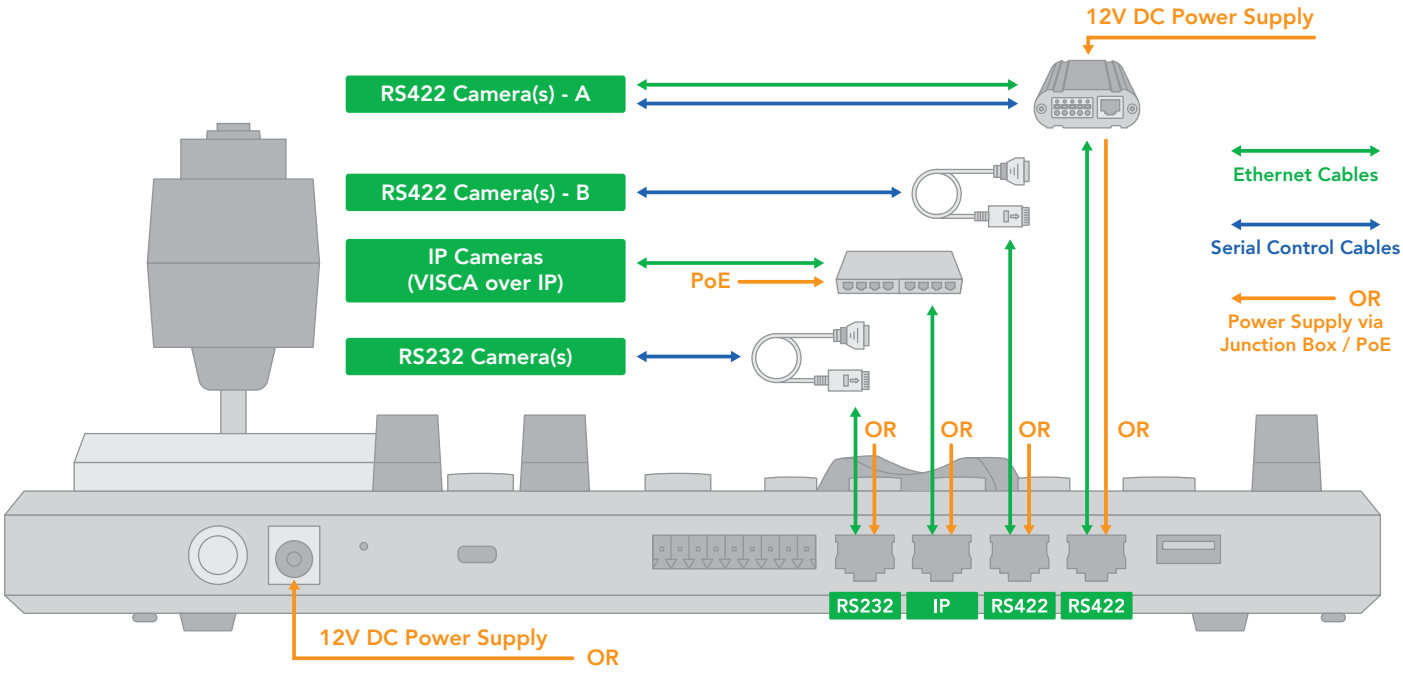
Using VISCA, PELCO, VISCA OVER IP, NDI® in one single system.



PTZ 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 simultanneously, 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).

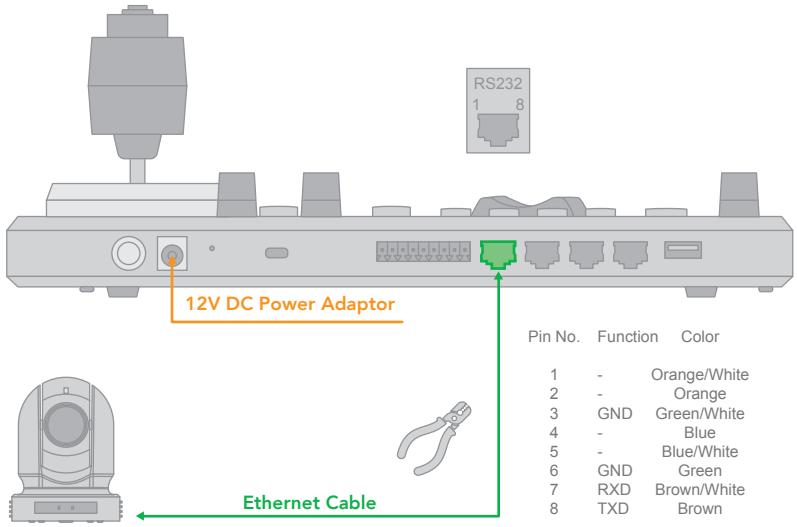
Serial Port Connection

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

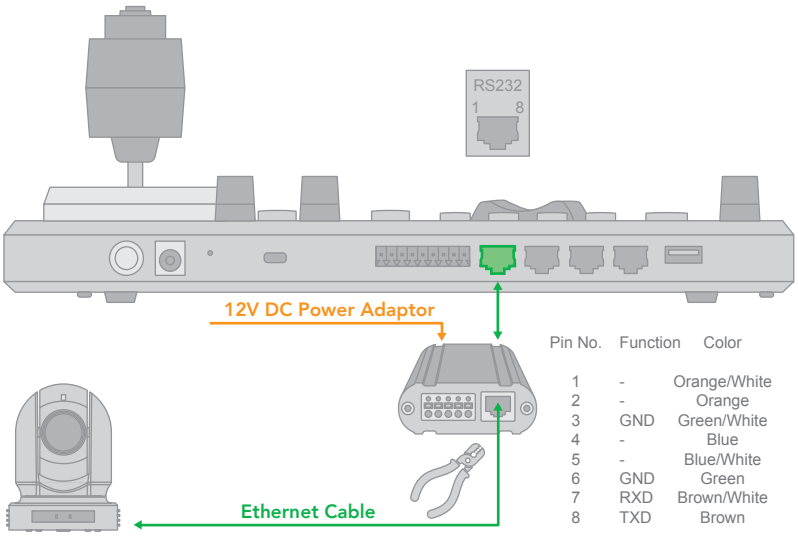
Use for the controller with non-BirdDog camera connection.

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



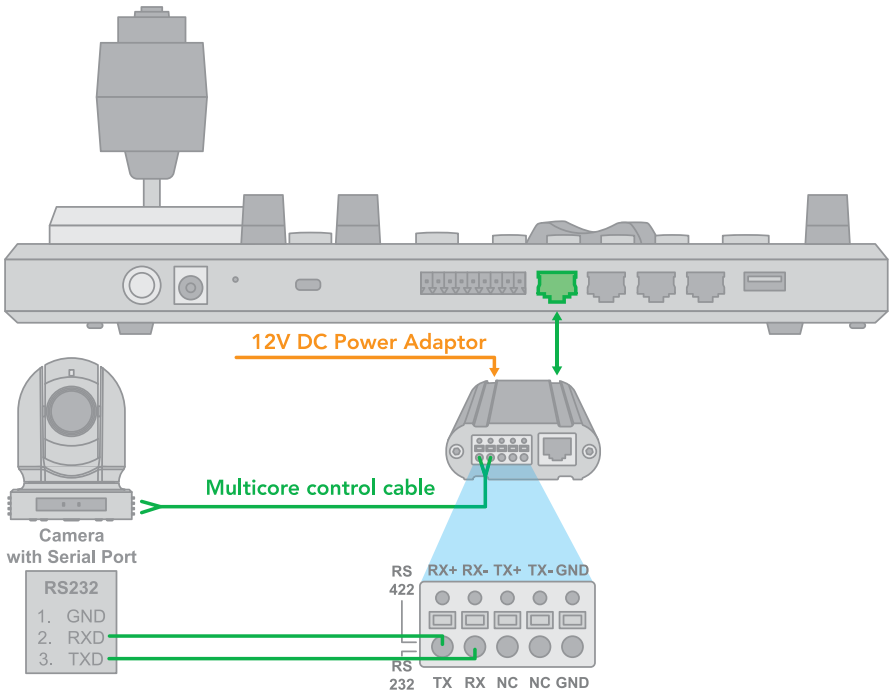
Pin No.	Function	Color
1	-	Orange/White
2	-	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	GND	Green
7	RXD	Brown/White
8	TXD	Brown

   b. Use Junction Box, 1 to 1 connection - Follow the pinout for the RS232 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 cable sutable for controlling your camera via Junction Box.

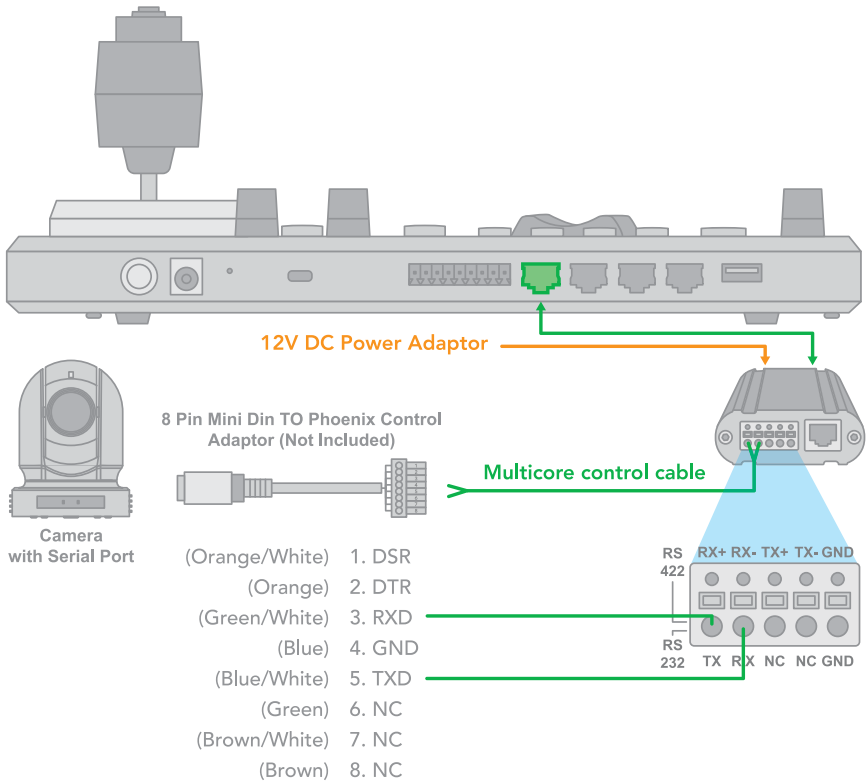


Pin No.	Function	Color
1	-	Orange/White
2	-	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	GND	Green
7	RXD	Brown/White
8	TXD	Brown

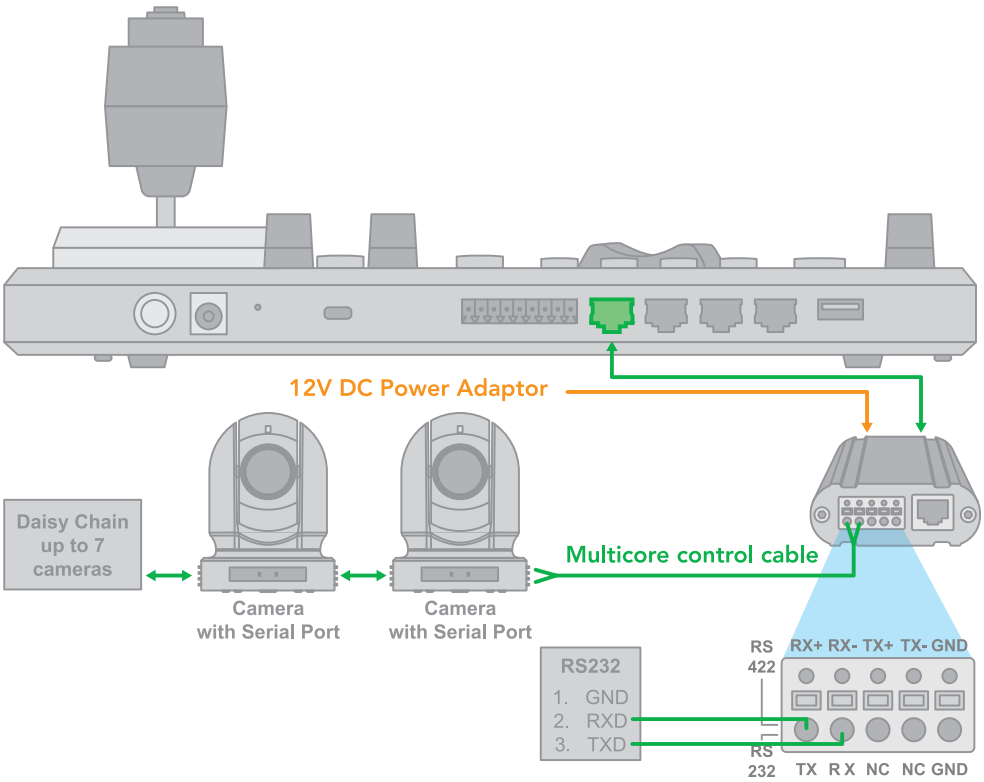
2. RS232 connection using multicore control cable.
RS232 connection – Via Junction Box – Camera with RS232–Serial connector.



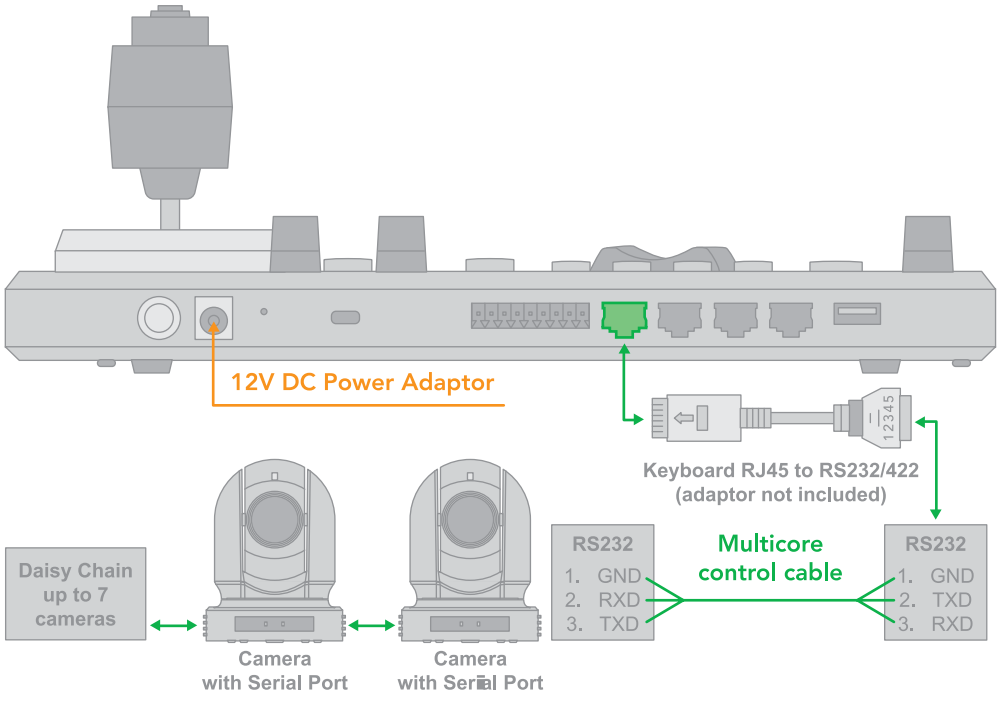
3. RS232 connection with the camera having 8 Pin Mini Din RS232 connector.
RS232 connection – Via Junction Box – Camera with 8 Pin MIni Din RS232 serial connector.



4. RS232 Daisy Chain Multiple Camera connection.
RS Daisy Chain Connection – Via Junction Box – Camera with RS232 serial connector



5. RS232 connection using RJ45 to Phoenix connector adaptor.
RS232 Daisy Chain Connection – Using RJ45 to Phoenix connector adaptor (not included).

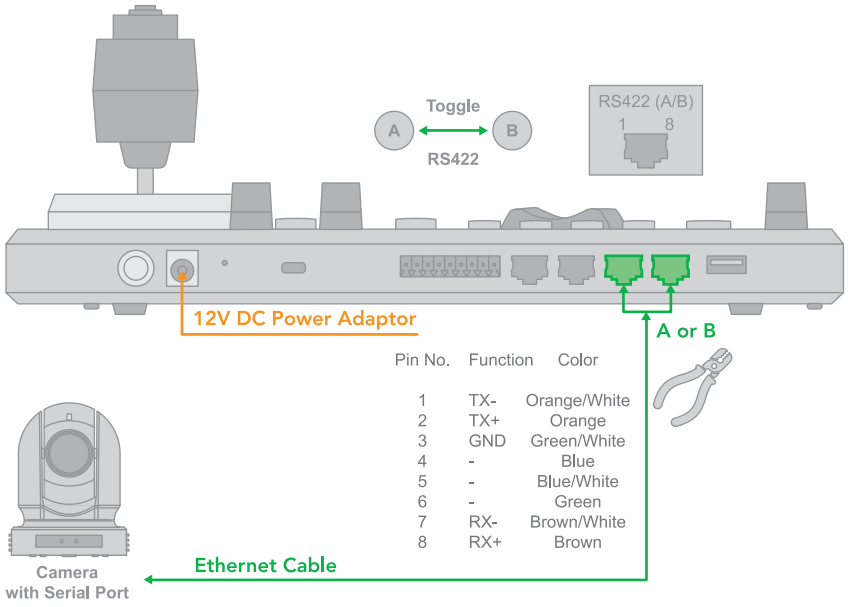


RS422 Connection

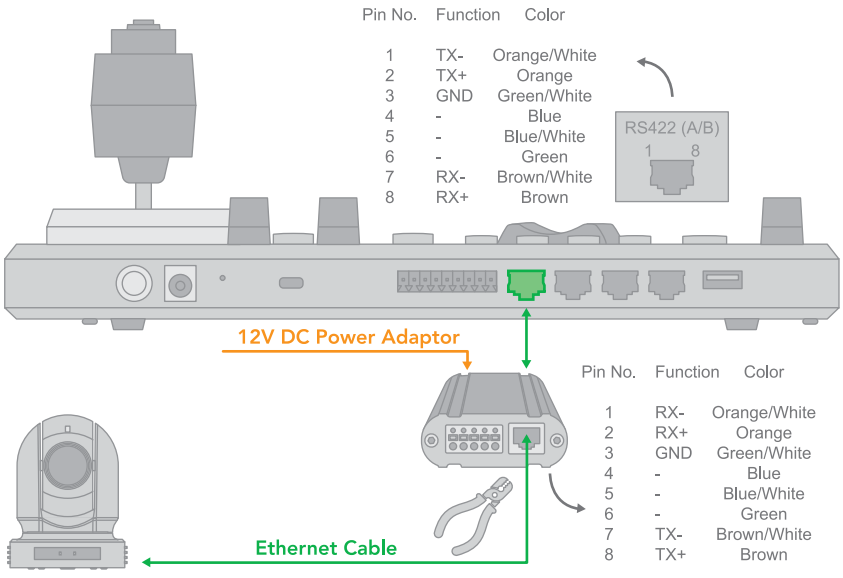
Use for the controller with non-BirdDog camera connection. For BirdDog camera connection see the separate section following.

Follow the diagram below for the following options:

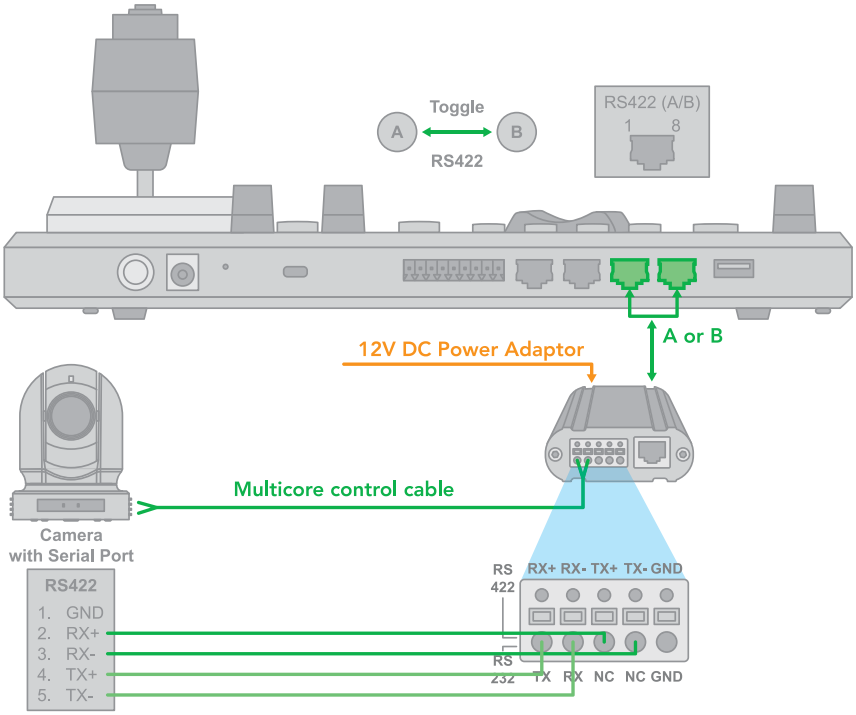
1. RS422 connection using network cable (follow T-568B standard pinout at keyboard end):
    a. 1 to 1 connection - Follow the pinout for the RS422 port on the keyboard to use CAT5/6 cable to make a cable suitable for controlling your camera.



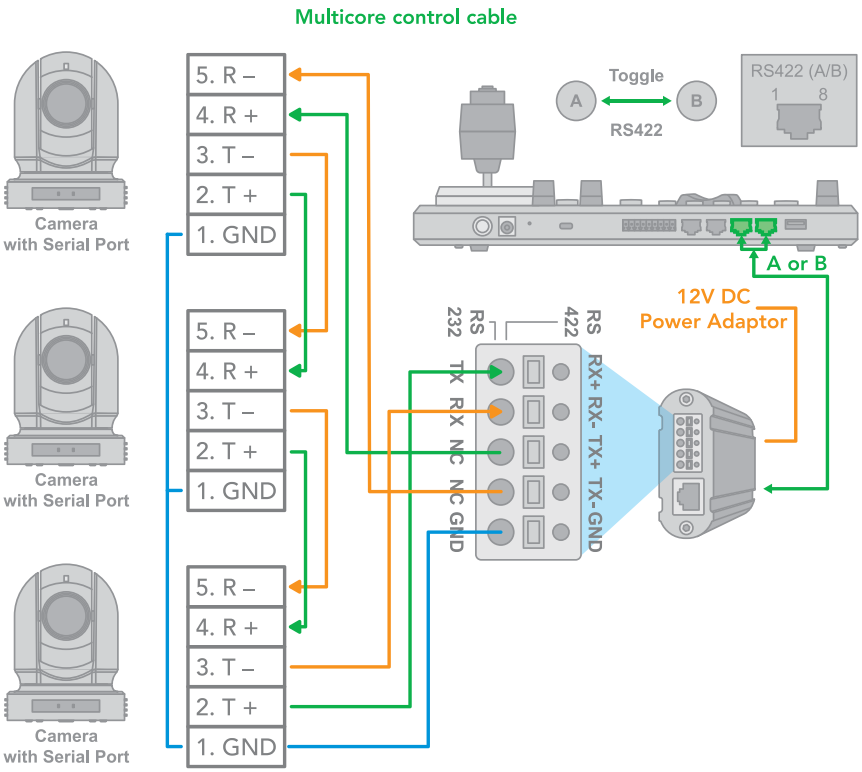
    b. Use Junction Box, 1 to 1 connection - Follow the pinout for the RS422 port on the keyboard and Junction Box to use CAT5/6 cable (follow T-568B standar pinout between keyboard and Junction Box) to make a cable suitable for controlling your camera via the Junction Box.



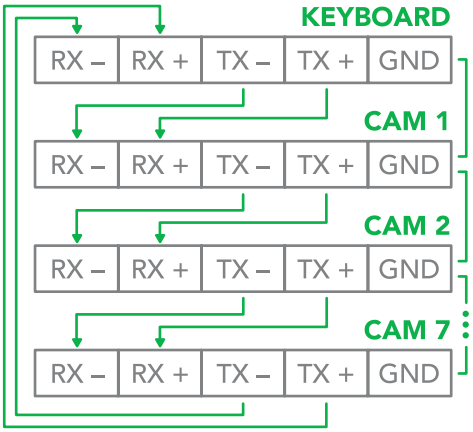
2. RS422 connection using multicore control cable.



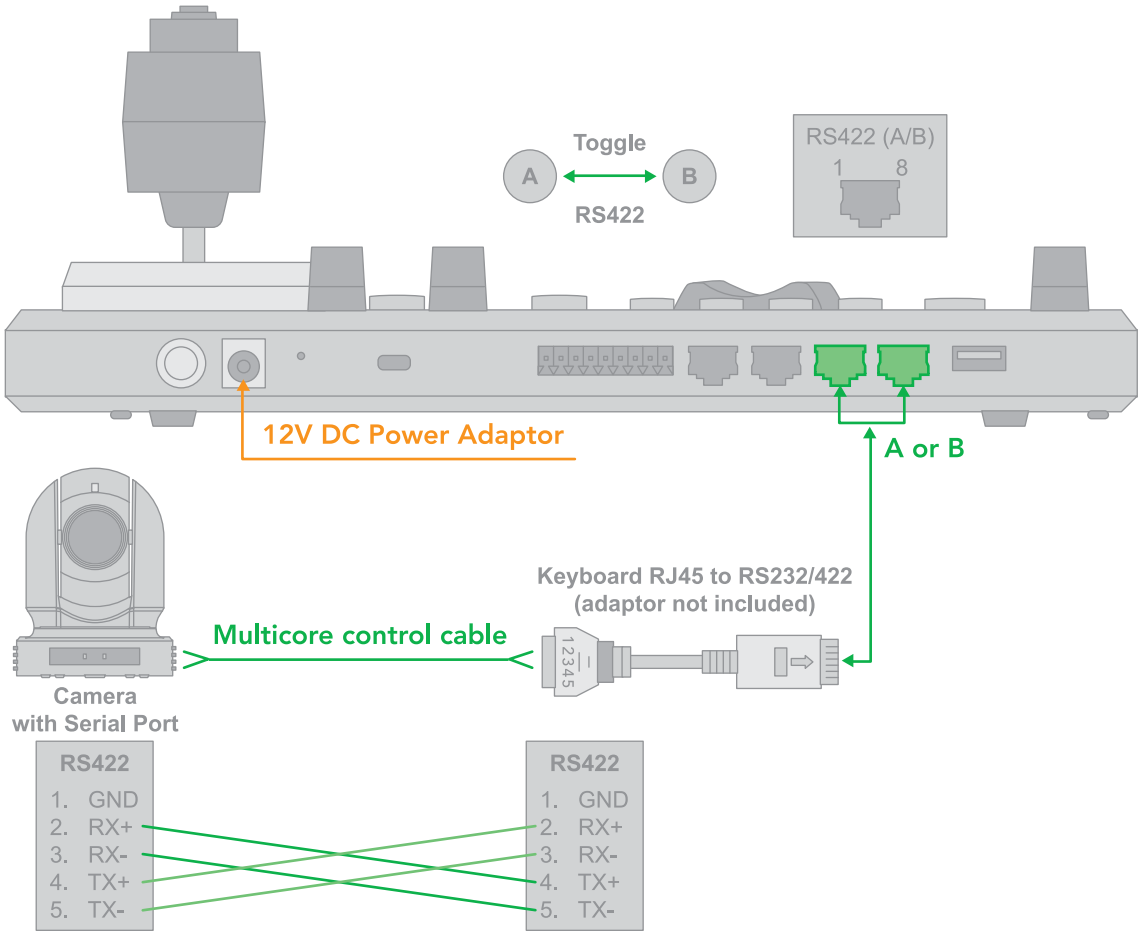
3. RS422 Daisy Chain Multiple Cameras connection.
RS422 Daisy Chain Connection – Via Junction Box – Camera with RS422 Serial Port.



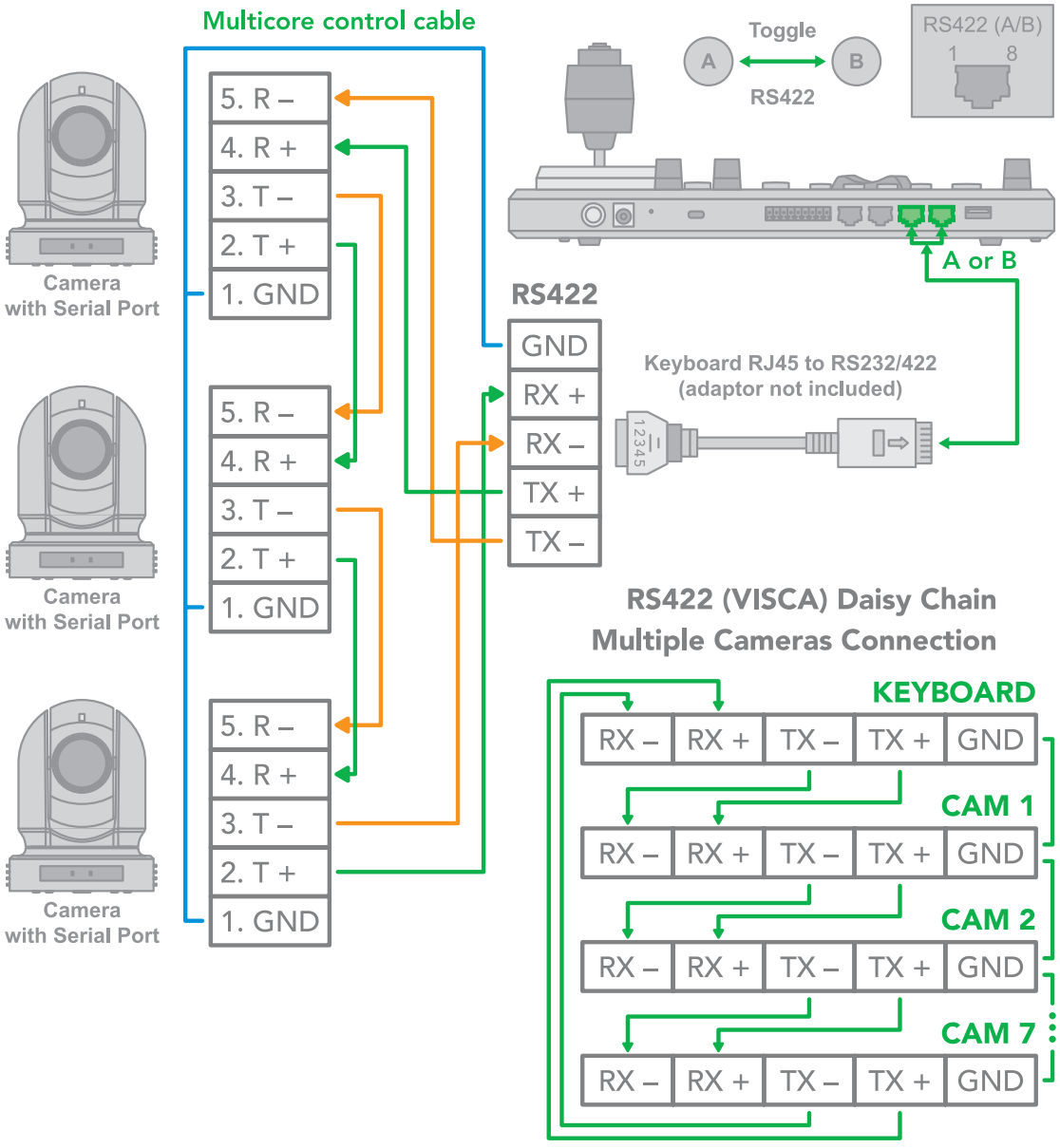
RS422 (VISCA) Daisy Chain
Multiple Cameras Connection



4. RS422 1 to 1 connection using RJ45 to Phoenix connector adaptor (Not Included).
RS422 Connection – Use RJ45-RS422 adapter – Camera with RS422 serial connector.



5. RS422 Daisy Chain connection using RJ45 to Phoenix connector adaptor (not included).
   RS422 Daisy Chain connection – Via RJ45 to RS422/232 Adaptor – Camera with RS422 Serial Port.

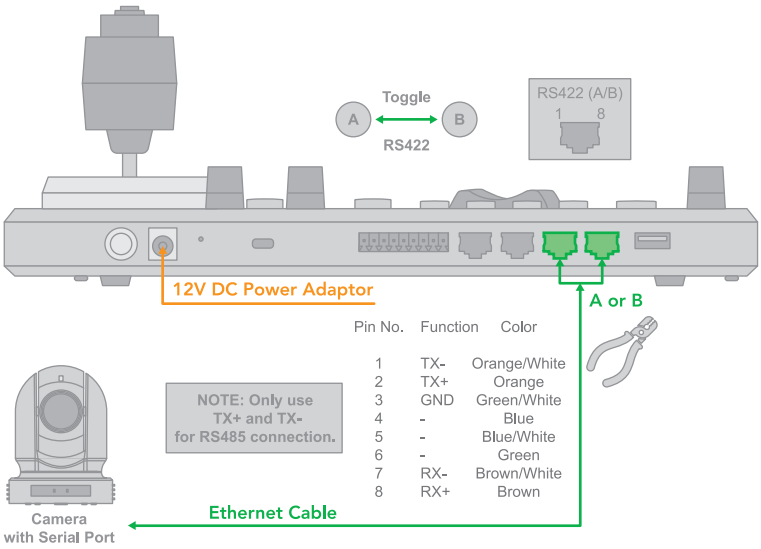


RS485 Connection

Use for the controller with non-BirdDog camera connection. Follow the diagram below for the following options:

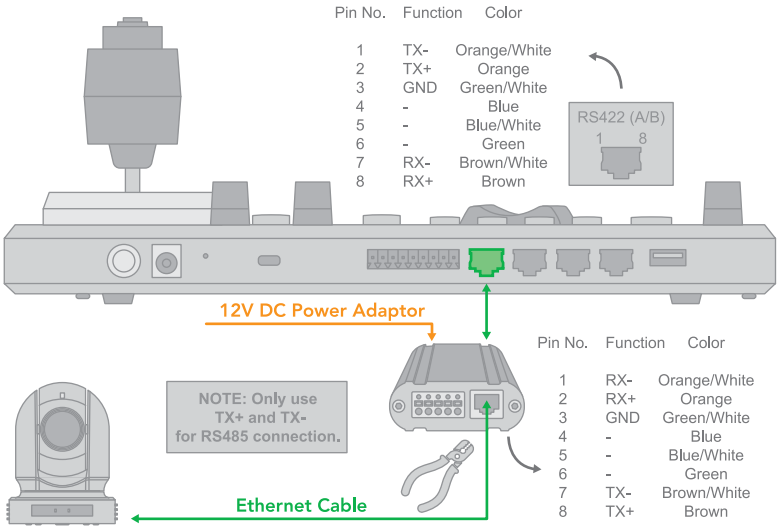
1. RS485 connection using network cable (follow T-568B standard pinout at keyboard end):
   a. 1 to 1 connection - Follow the pinout for the RS485 port on the keyboard to use CAT5/6 cable to make a cable suitable for controlling your camera.

      NOTE: Use RS422 ports for RS485 connection.

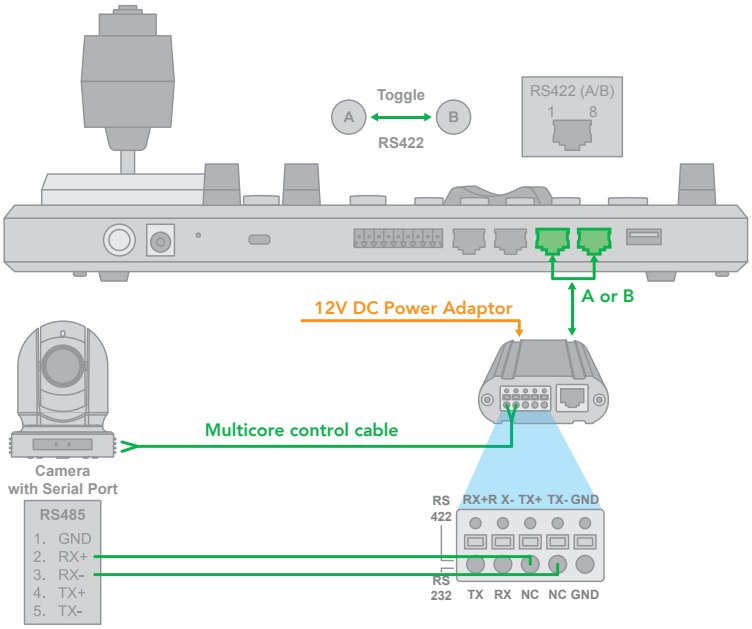


   b. Use the Junction Box, 1 to 1 connection - Follow the pinout for the RS485 port on the keyboard and Junction Box to use CAT5/6 cable (follow T-568B standar pinout between keyboard and Junction Box) to make a cable sutable for controlling your camera via Junction Box.

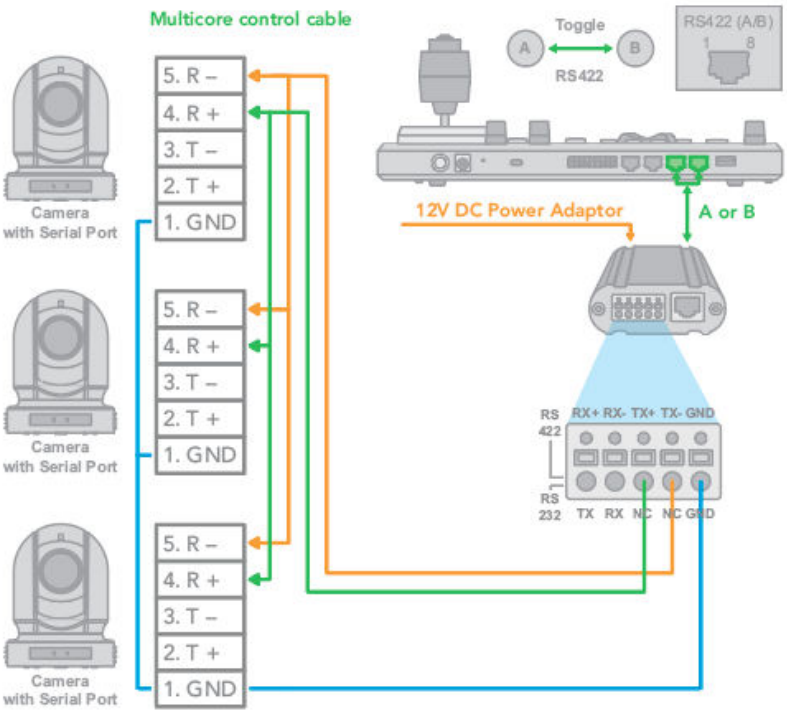
      RS485 connection - Via Junction Box to make a network cable - Camera with R485-Serial connector.

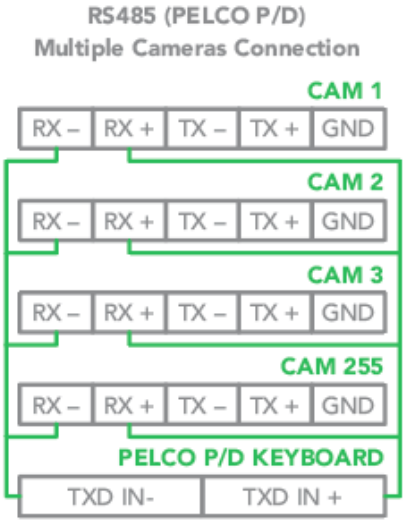


2. RS485 connection using multicore control cable.
   RS485 Connection – Via Junction Box – Camera with RS485 serial connector.

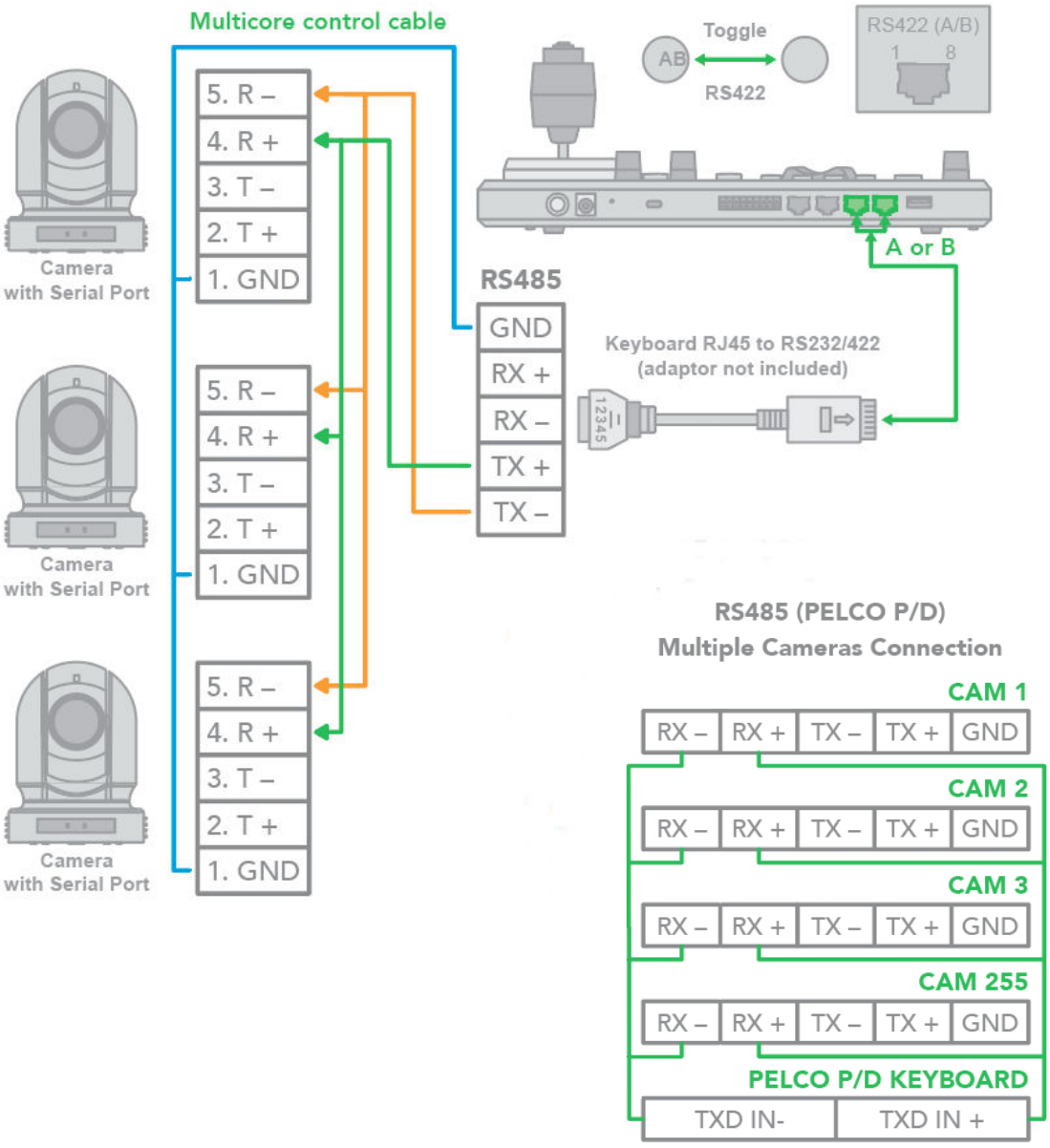


3. RS485 Daisy Chain Multiple Cameras connection.
   RS485 Daisy Chain Connection – Via Junction Box – Camera with RS485 Serial Port.





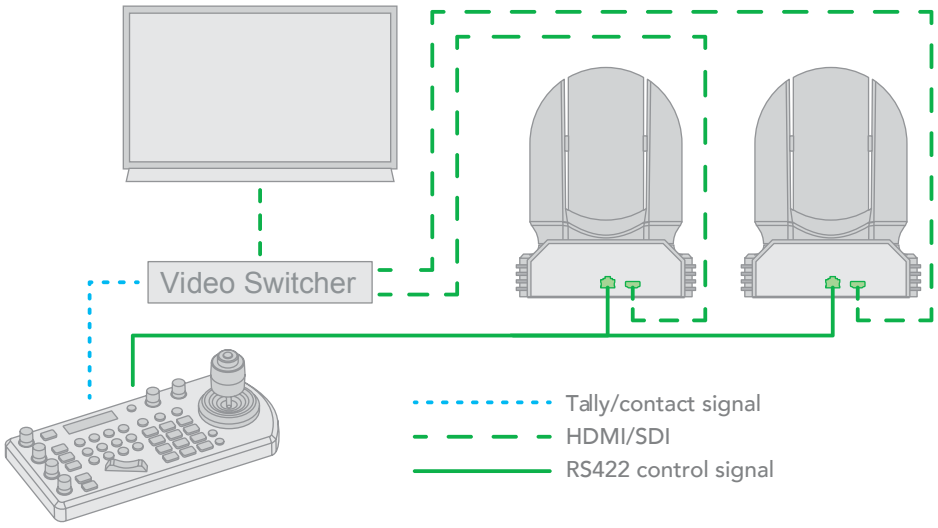
4. RS485 Daisy Chain connection using RJ45 to Phoenix connector adaptor (Not included).
   RS485 Daisy Chain Connection – Via RJ45 to RS422 Adaptor – Camera with RS485 Serial Port.



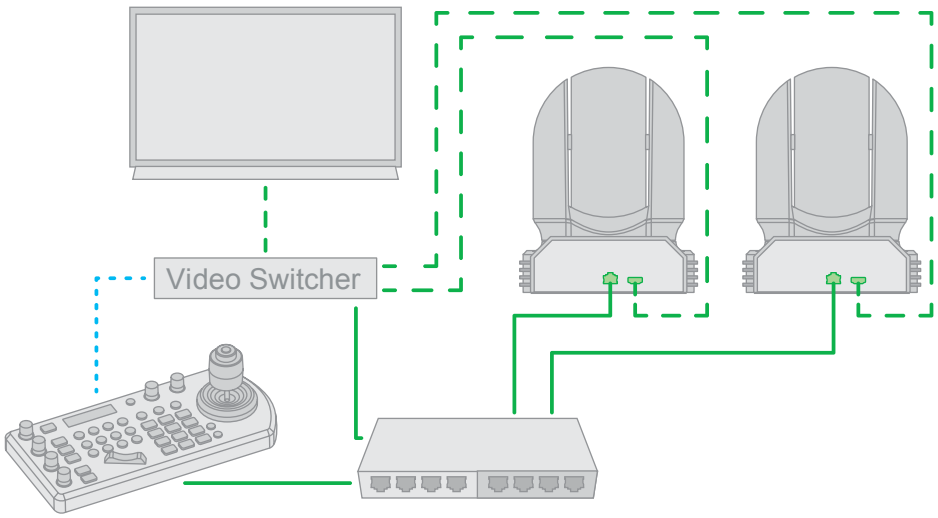
Tally Light GPI I/O Connection

GPI Connection with RS422 VISCA Control Connection

Tally Light GPI Connection.

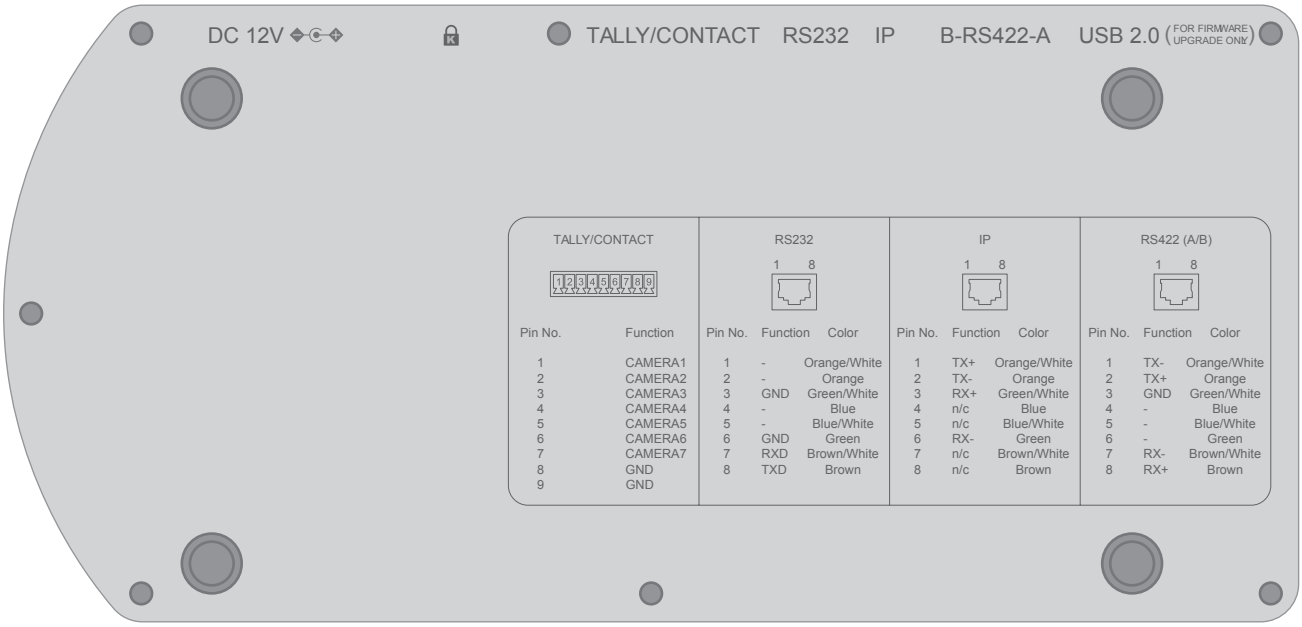


GPI Connection with VISCA OVER IP Control Connection



Appendix

PTZ Keyboard Pinout



TALLY/CONTACT

Pin No.	Function
1	CAMERA1
2	CAMERA2
3	CAMERA3
4	CAMERA4
5	CAMERA5
6	CAMERA6
7	CAMERA7
8	GND
9	GND

RS232

Pin No.	Function	Color
1	-	Orange/White
2	-	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	GND	Green
7	RXD	Brown/White
8	TXD	Brown

IP

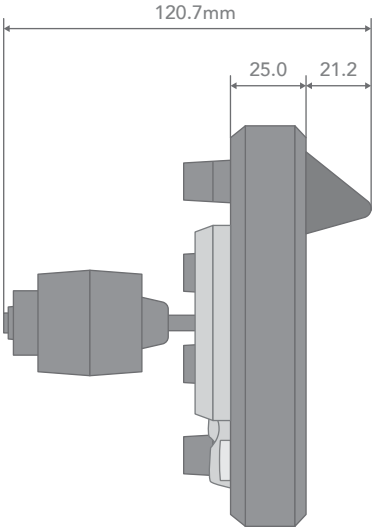
Pin No.	Function	Color
1	TX+	Orange/White
2	TX-	Orange
3	RX+	Green/White
4	n/c	Blue
5	n/c	Blue/White
6	RX-	Green
7	n/c	Brown/White
8	n/c	Brown

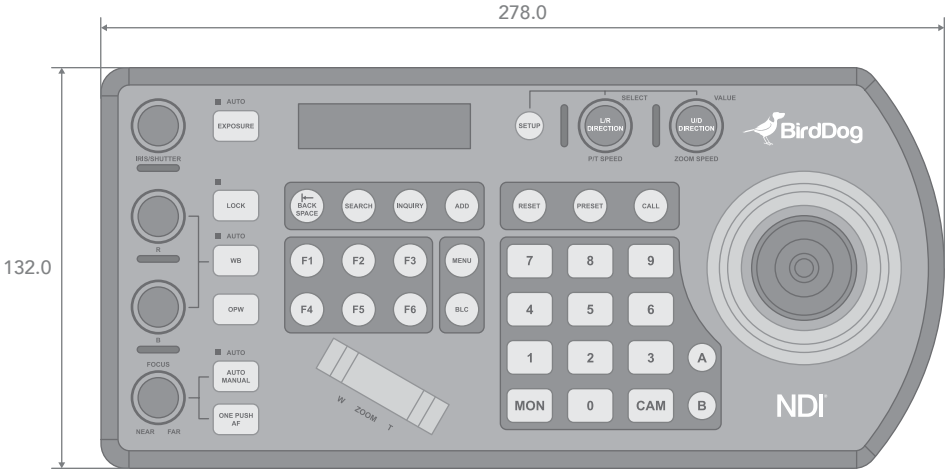
RS422 (A/B)

Pin No.	Function	Color
1	TX-	Orange/White
2	TX+	Orange
3	GND	Green/White
4	-	Blue
5	-	Blue/White
6	-	Green
7	RX-	Brown/White
8	RX+	Brown

PTZ Keyboard Physical 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 in 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.

WELCOME TO THE FUTURE.

bird-dog.tv

hello@bird-dog.tv