BirdDog | P240

USER GUIDE

December 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

- If the product does not work properly, please contact your dealer. Never attempt to disassemble the camera yourself. (We will not assume any responsibility for problems caused by unauthorized repair or maintenance.)
- This installation should be made by a qualified service person and should conform to all the local codes.
- When shipping, the camera should be packed in its original packaging.
- Ensure the power supply voltage is correct before using the camera.
- Do not drop the camera or subject it to physical shock.
- If the camera will not be used for an extended period of time, attach the lens cap to protect the lens.
- Do not aim the camera lens directly at the sun. This may cause irreversible damage to the camera.

Maintenance Precautions

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

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

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

Regulatory Compliance

FCC Part 15

This equipment has been tested and found to comply with the limits for digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

- This device may not cause harmful interference.

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

LVD/EMC Directive

This product complies with the European Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC.

Welcome to BirdDog!

Thank you for purchasing your P240 camera. If you have any questions regarding the camera, please contact your authorized dealer.

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

Using This Manual

Your P240 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 cameras, begin with the Quick Start Guide. This will give you a good introduction to the setup of your new camera.

Tip

You can use the 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 P240, 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.

We're Invested In Your Success

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

Dan Miall	**Eamon Drew**
Co-Founder and CEO	Co-Founder and CMO
dan@bird-dog.tv	eamon@bird-dog.tv

BirdDog P240 Overview

Camera Features

- Resolution: Up to 1080P60, 1080i60

- Zoom: Optical 40X when running in native scan mode.

- Image stabilizer and true WDR 130dB

- Video Output: Simultaneous NDI® , HDMI, 3G-SDI.

- Tally Display: Bi-colour, full overhead and rear with included 0-9 silicon number plugs

- Onboard OLED Display: 5-line, RGB color

- ±350-degree continuous pan, ±120-degree continuous tilt

- 128 presets, Speed up to 150 degrees/sec

- Standard mounting and ceiling mounting with E-Flip function

- Control supports NDI® Control, RS-232 control, RS-422/485 control, VISCA-over-IP, IR Remote Controller

- Presets store camera directions and image parameters. (Up to 6 presets on remote controller or 128 presets via protocol programming)

- Image parameter setting restore with presets and quick access operation

- Analogue Audio I/O:
    - IN: Balanced XLR (via breakout cable) with 48V Phantom power, unbalanced 3.5mm TRS stereo
    - OUT: Balanced XLR (via breakout cable), unbalanced 3.5mm TRS stereo

- Power: DC 12V, PoE+(IEEE802.3at)

Specifications

Please refer to the product webpage for complete specifications.

Welcome to the Future

What is NDI®?

Your new P240 camera 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 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 neccessary endpoints.

BirdDog has been on the NDI® journey since the very beginning and your P240 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.
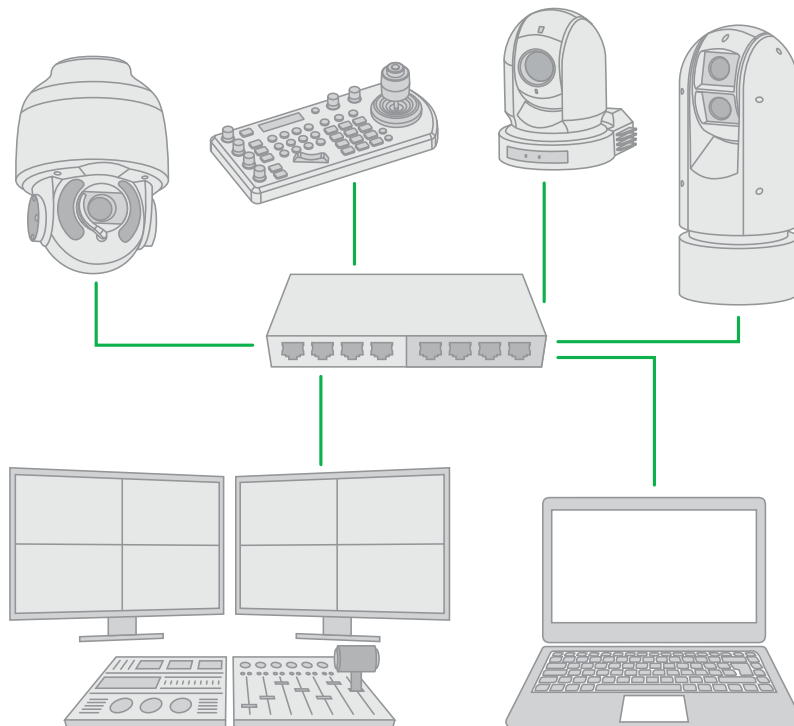
What's in the Box?

NOTE: The camera color may be white or black in colour depending on the item purchased.

1 x BirdDog P240

1 x IR Remote Controller
   (3V CR2032 Coin Lithium Battery Required)

1 x Camera Power Adaptor

1 x Bag of Camera Mounting Screws and number inserts

1 x RJ45 to RS232 Adaptor Cable

1 x RJ45 to RS422 Adaptor Cable

Optional Accessories

Depending on your requirements, you may need to purchase these optional accessories. Please browse to this page on our website for all your accessory needs.

Wall Mount

Ceiling Mount

Quick Start Guide

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. You can also view a similar online video.

Be sure to check the many helpful product videos on our YouTube page.

Basic Connections

Power

First off, you'll have to decide on how you are going to power the camera. 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 the video, audio and data. For the purposes of this quick start guide, we'll assume your network offers PoE+ (IEEE 802.3at).

Network

Connect your camera to a network switch with a Cat5/6 cable. By default, the camera is configured to automatically obtain an IP address via DHCP. Some standalone or private networks may not have a DHCP server. After 30 seconds of waiting for an automatically assigned IP address, your camera will fall back to a default address of 192.168.100.100. To ensure that you can always reach your camera, it is recommended that you don't change this default.

Power Up

When first powered up, the camera will perform it's initialization routine by rotating to the left and then centering again.

Basic Configuration

NDI® Tools

NDI® Tools is a free suite of applications designed to introduce you to the world of IP video and is available here.

Once installed, launch the Studio Monitor (Video Monitor, if using a Mac) application. This simple application allows you to view all NDI® sources on your network. Right–click on the Studio Monitor window to view your camera as an NDI® source. In the example to the right, three cameras and a desktop computer are shown as NDI® sources.

Tip

By default, the displayed sources have names that include the last five digits of your camera MAC address which is displayed on the bottom of the camera.

Clicking on your camera in the source list will display the image from your camera with the default automatic settings.
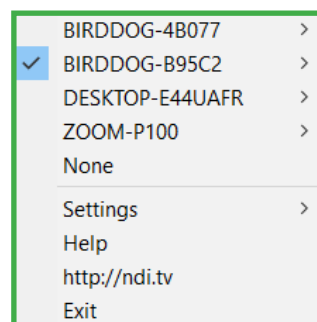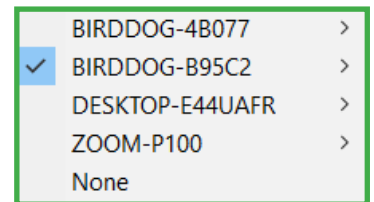
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The BirdUI
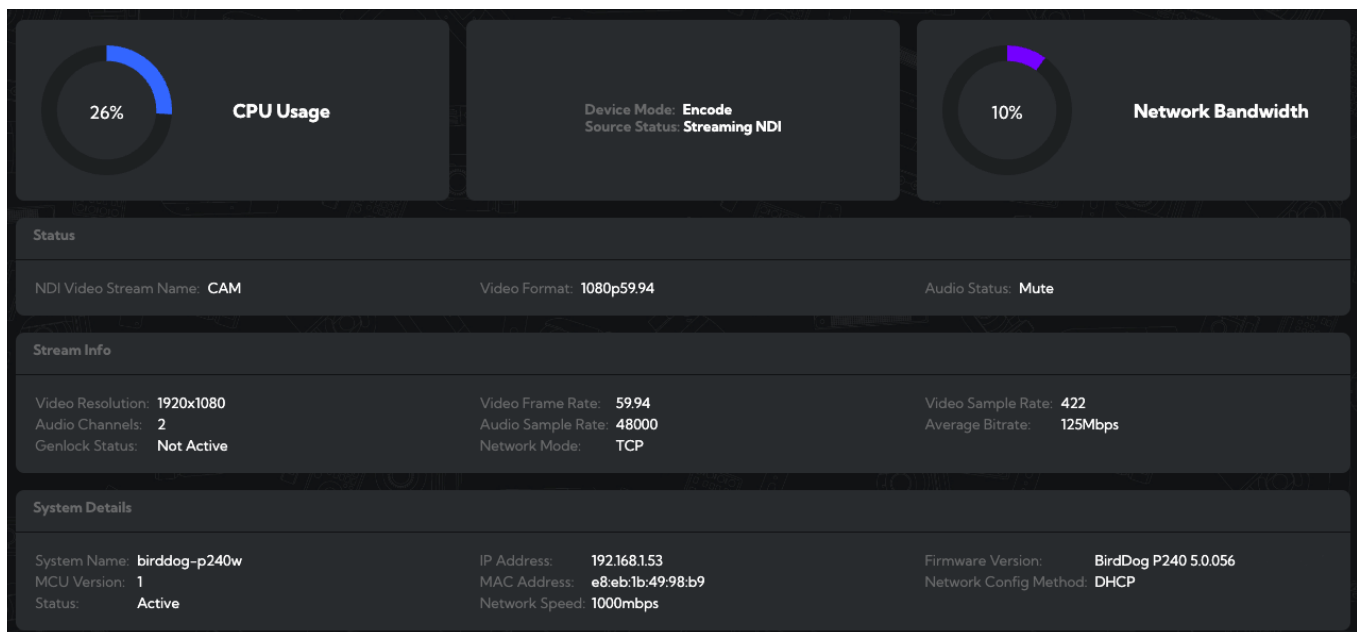
BirdDog cameras have a web interface (BirdUI) that is displayed by your computer brower and can be used to configure your camera remotely.

1. Click on the gear icon on the bottom right of the Studio Monitor window.

2. In the displayed window, type the default password 'birddog' (all lower case) and click the OK button. The Dashboard window is displayed.

   The Dashboard shows important basic camera settings. For now, check that the displayed Status is Active and take note of the frame rate that is currently output from the camera (displayed under NDI® connection info). In the example above, it is 29.97 fps. This frame rate should be set identically for all cameras according to the requirements of your production. Let's see how to change this and other important camera settings.

NDI Encode Settings

Bitrate Management

Because you're sending NDI® video over your computer network, you may need to be mindful of the amount of bandwith your video will consume. By setting Bitrate Management to NDI MANAGED, the target bitrate will be set in accordance with the NDI® standard. This will achieve an optimum balance between bandwith consumption and video quality. In this mode, the video bitrate will be around 120–140 Mbps.

Encode Settings					
Bitrate Management	NDI MANAGED		Encode Screensaver	BirdDog	
NDI Video Bandwidth		140	Capture Screen Frame		CAPTURE
NDI Group Enable	DISABLE	ENABLE	Onboard Tally	OFF	
NDI Group Name	BirdDog		Genlock Source	None	
NDI Stream Name	CAM		Failover Source	None	
Video Format	1080p59.94		Update Source List	RESET	REFRESH
NDI Audio	ANALOGUE	MUTE	Apply Source		APPLY
Stream To Network	OFF	ON			

If you do opt for Manual management, you may select a bitrate within a range of 60–360 Mbps. Do this with care, as the actual bitrate may be greater, straining the capacity of the network and the receiving device, and lower settings may result in reduced image quality.

Video Format

Here you can set the frame rate of the camera to match that of your production. All cameras should be set to the same frame rate. You can also set the desired level of chroma subsampling.

NDI Group

NDI® supports **Grouping** which allows you to hide the visibility of video sources to viewers that are not part of the group. If disabled, the video source is public and viewable by any receiver on your network.

Stream Name

Give the output video stream of the camera a memorable name to make identification easier on other devices.

NDI Failover Source

If the selected HDMI source is interrupted for any reason, P240 can automatically switch to a pre–determined alternative NDI® source. Select an available NDI® source for the failover function from the *Available NDI® sources* dropdown list. Pressing the Refresh button will add new sources to the list, whereas pressing Reset will populate the list with only active NDI® sources. Click the Apply button to apply your failover source change.

Network Configuration

For the final part of this quick start guide, let's set up the network configuration of your camera so it can work with your wider network. Most computer networks provide for both automatic and manual configuration of network devices and the P240 can accomodate both.

Network Details				
Configuration Method	STATIC	DHCP	DHCP Timeout	20
IP Address	192.168.1.53		DHCP Fallback IP Address	192.168.100.100
Subnet Mask	255.255.255.0		DHCP Fallback Subnet Mask	255.255.255.0
Gateway Address	192.168.1.20		BirdDog Name	birddog-p240w .local
				APPLY

Static or DHCP

Here you can set the network configuration to either DHCP (default) or Static. DHCP simplifies the management of IP addresses on networks. No two hosts can have the same IP address, so assigning them manually can potentially lead to errors.

If your network is set up for DHCP, this is generally the best configuration to choose. If you do choose to go with a Static IP address, you'll need to add the IP Address, Subnet Mask and Gateway Address information according to the requirements of your network.

DHCP Timeout, Fallback IP address, Fallback Subnet Mask

You can set the timeout period during which P240 will look for a DHCP IP address. After this period, the camera will default to the designated fallback IP address.

This can be useful if you use your camera in other network environments. For example, if a DHCP server is available in your normal office or studio application, the camera will use the DHCP supplied IP address. If you then use the camera in another application without a DHCP server, your camera will always default to the known fallover IP address.

BirdDog Name

You can give your camera a meaningful name to make identification easier when viewing NDI® sources on a receiver such as a TriCaster, vMix or Studio Monitor. Be sure to make the name unique, as no two devices on the network should have the same name. The name can be any combination of a–z, 0–9, and '–'.

After renaming your camera, navigate back to the Dashboard and click REBOOT DEVICE. The camera will re-initialize and you'll be good to go.

NOTE: Your computer will need to have 'Bonjour' services loaded in order to access the unit via it's user defined name. Apple devices come pre-installed with Bonjour, while Windows devices need a plugin available here.
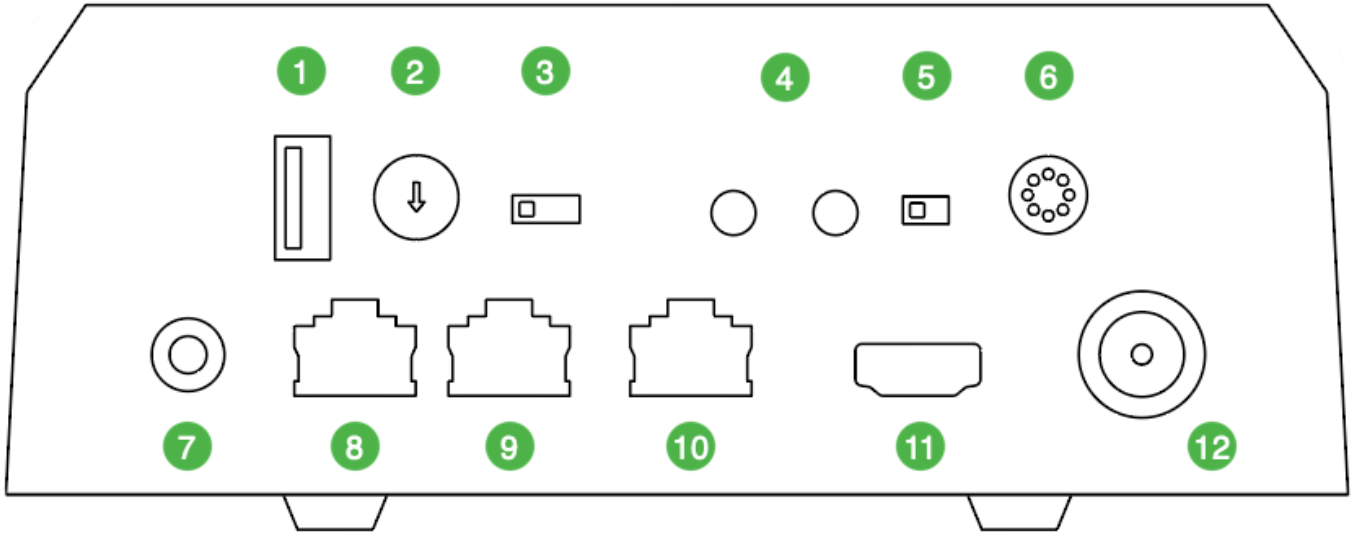
You're Done!

That concludes our quick start guide for P240. Your camera has many other features, so to get the most out of your camera, please review the rest of this manual.

To learn about more advanced camera options, such as exposure, white balance and colour management, please refer to here in this manual.

Camera Connections

1. **USB2.0**

    For Firmware upgrade

2. **Video Format Selection SDI/HDMI**

    For video format selection. It is recommended to set this to the most frequently used resolution and thereafter use the BirdUI to make changes.

3. **IR Remote ID Selector**

4. **Audio Line-in / Line-out**

    Analog 3.5mm Audio Input/Output. Audio format is stereo, unbalanced line level.

5. **Line/microphone Selector**

    Select between line level or microphone with phantom power input.

6. **Balanced Audio breakout Cable Connector**

    • Input and output via breakout cable.

7. **12V DC Power Input**

8. **RJ45 port**

    For RS232 Control
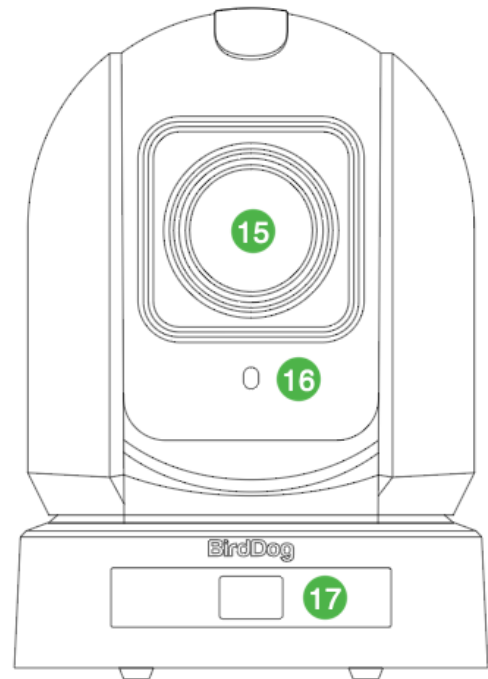
9. **RJ45 port**

    For RS-422/485 Control

10. **Ethernet Port**

    For VISCA over IP control and NDI® output. Requires PoE+ (IEEE802.3at).

11. HDMI Video Output

12. 3G–SDI Video Output

13. Mohawk Style Tally Light

14. User Changeable Iluminated Camera ID Numbers

15. Lens

   40X optical zoom

16. IR sensor

17. OLED Screen

Powering P240

P240 can be powered in two ways.

- **PoE+ (Power over Ethernet)**

  PoE+ is a convenient way to power P240 as it allows both data and power to be sent through the same standard Ethernet cable. The network switch must support PoE+ (802.3at).

- **DC Connection**

  Located at the rear of the P240 is a 12VDC connection port. Use only the DC power adaptor (JEITA type4) supplied with the unit.
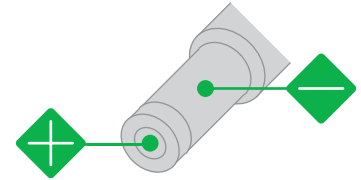
WARNING

Do not attempt to manually move the camera head when the device is powered up. Doing so may damage the camera.

Thermal Management

Although the camera is equipped with a fan, the entire enclosure is designed to dissipate heat. The main processor is capable of operating up to 100° C / 212° F. Various factors can affect how much heat the camera will produce, and it is normal for it to feel warm to the touch. In extreme circumstances (a hot day/direct hot sun) it is advised to power P240 via DC as this produces less heat than PoE.

Video Output

The camera can simultaneously produce SDI, HDMI and NDI® video output.

NDI Signal

1. Connect the camera to the network using Cat5e/Cat6 network cable.
2. You'll need to use a web browser on a connected computer for camera configuration.
3. To obtain, and configure NDI® video, please refer to NDI Encode Settings.

HDMI Signal

1. Connect the camera to a HD monitor/TV using HDMI cable.
2. Turn on the camera. After initialization, video will display on the monitor.
3. Information of the camera initial setting status will display on the monitor for 5 seconds.
4. You can set the displayed video format in the camera System menu.

SDI Signal

1. Connect an SDI cable in between the camera your SDI Device/display.

Audio In/Output

Analog 3.5mm audio In\Out ports. The Audio Out will output any audio that is captured on the Audio In port. Audio format is stereo, unbalanced line level.
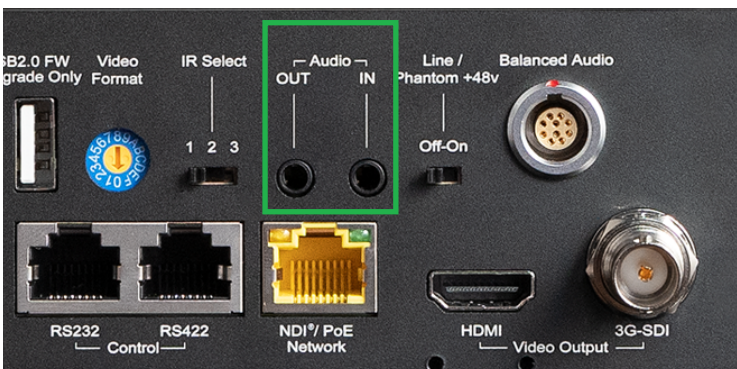
Using the Camera Menus

You can use the infrared remote controller to change camera settings while viewing the On Screen Display (OSD) menus on a connected monitor. The OSD is viewable over NDI®, SDI or HDMI.

However, the Web Configuration Panel (BirdUI) affords greater control of your camera with more parameters as well as allowing remote adjusting of camera settings over NDI®, and is the recommended method of adjusting your camera.

1. To display the main menu, press the MENU button on the supplied infrared remote controller. The main menu is displayed.

OSD
▶ EXPOSURE
WHITE BALANCE
PICTURE 1
PICTURE 2
PAN TILT ZOOM
SYSTEM

2. Use the "↑, ↓" buttons to navigate between main menu items. For example, clicking the "↓" button once will move the cursor to the item below.

OSD	WHITE BALANCE MENU	
EXPOSURE	WB MODE	AUTO
▶ WHITE BALANCE		
PICTURE 1		
PICTURE 2		
PAN TILT ZOOM		
SYSTEM		

3. To enter the sub menu of a selected item, click either the "→" button or the HOME button. In the example below, we are navigating between two sub menus of the Exposure main menu. Sub menus can also be navigated vertically to select sub menu items.

OSD	EXPOSURE MENU: FULL AUTO	
▶ EXPOSURE	MODE	FULL AUTO
WHITE BALANCE	SLOW SHUTTER	OFF
PICTURE 1	S. SHUTTER LIMIT	1/4
PICTURE 2	AE RESPONSE	01
PAN TILT ZOOM	GAIN LIMIT	21.4dB
SYSTEM	EX COMP	OFF

OSD	EXPOSURE MENU: MANUAL	
▶ EXPOSURE	MODE	MANUAL
WHITE BALANCE	GAIN	12dB
PICTURE 1	GAIN LIMIT	21.4dB
PICTURE 2	SPEED	1/60
PAN TILT ZOOM	IRIS	F1.6
SYSTEM	HIGH SENSITIVITY	OFF

4. Once you've navigated to a setting value, use the "←, →"buttons to increment or decrement the value.

5. Press the MENU button to exit the menus.

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

Camera Menus

Exposure Menu

The Exposure menu sets items related to exposure.

Mode

Full Auto: IRIS, GAIN and SPEED (shutter speed) are set automatically using the values set for SLOW SHUTTER, S. SHUTTER LIMIT, AE SPEED, GAIN LIMIT, GAIN POINT, POINT, HIGH SENSITIVITY, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT and EX-COMP.

Manual: Allows manual adjustment of the GAIN, GAIN LIMIT, SPEED, IRIS, and HIGH SENSITIVITY.

Iris Pri: Iris Priority mode. This mode allows you to set a fixed IRIS. The gain and shutter speed are set automatically according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for IRIS, GAIN LIMIT, GAIN POINT, AE SPEED, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT and EX-COMP.

Shutter Pri: Shutter Priority mode. This mode allows you to set a fixed shutter SPEED with exposure achieved by automatic setting of IRIS and GAIN, according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for SPEED, GAIN LIMIT, AE SPEED, BACK LIGHT, SPOT LIGHT and EX-COMP.

Bright: The bright control function adjusts both gain and iris using an internal algorithm, according to a brightness level freely set by the user. Exposure is controlled by gain when dark, and by iris when bright. As both gain and iris are fixed, this mode is used when exposing at a fixed camera sensitivity. When switching from Full Auto or Shutter Priority Mode to Bright Mode, the current status will be retained for a short period of time. The exposure is adjusted automatically using the values manually set for the bright level (LEVEL) and HIGH SENSITIVITY.

Gain Pri: Gain Priority mode. This mode allows you to set a fixed GAIN. The IRIS and SPEED are set automatically according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for GAIN, GAIN POINT, AE SPEED, HIGH SENSITIVITY, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT and EX-COMP.

Below are the various settings for these exposure modes.

Gain

Select the gain from the following: 0dB, 3dB, 6dB, 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, 27dB, 30dB, 33dB, 36dB.

Gain Limit

The gain limit can be set at Full Auto, Shutter Priority, Iris Priority, Bright, Spot Exposure and Manual in AE mode. This is useful to limit the automatic setting of gain which can lead to excessive image noise at extreme settings. Choose from: 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, 27dB, 30dB, 33dB, 36dB.

Gain Point

Set the Gain Point between 0dB and the gain limit. The shutter speed can be changed from the point when the set gain value is reached. When you want to obtain a motion-priority image, use this setting.

High Sensitivity

This function increases the max. gain to allow bright output in darker environments. However, with a strong gain (up to 10×), the image may exhibit higher levels of noise.

Iris

Select the iris the following: F11, F10, F9.6, F8.7, F8.0, F7.3, F6.8, F6.2, F5.6, F5.2, F4.8, F4.4, F4.0, F3.7, F3.4, F3.1, F2.8

Slow Shutter

When set to "On," the slow shutter functions automatically in low light conditions. This setting is available only when the AE mode is set to "Full Auto." The default setting is Off.

S. Shutter Limit

With certain settings, in low light conditions, the shutter speed slows and the gain is increased. This function allows you to limit the shutter speed reduction. This helps prevent image shake when shooting a moving subject in low light conditions.

AE Speed

This setting allows you to reduce the exposure response speed. By default, optimum exposure can be obtained automatically within approx. 1 second. The slow AE response function allows you to lengthen this response time.

Maximum Speed (Maximum Shutter Limit)

In auto modes, the brighter the object is, the shutter speed will increase. You can set the upper limit on the shutter speed increase, helping to make images with motion more smooth.

Minimum Speed (Minimum Shutter Limit)

In low light conditions, the shutter speed may becomes slow and the gain is increased. Here you can put a limit on the shutter speed reduction, helping to prevent camera shake when you shootingb moving subjects.

Back Light

When the background of the subject is too bright, or when the subject is too dark due to shooting in the AE mode, back light compensation can help make the subject better exposed.

Spot Light

Spotlight compensation will attempt to compensate exposure in conditions where strong light falls on the subject, such as a person's face in a spotlight. You can choose either ON or OFF. This setting is enabled when MODE is FULL AUTO, SHUTTER PRI, IRIS PRI, or GAIN PRI. SPOT LIGHT becomes disabled when BACK LIGHT is ON.

Ex–Comp (Exposure Compensation)

When MODE is set to FULL AUTO, SHUTTER PRI or IRIS PRI, setting EX–COMP to ON allows exposure compensation levels to be set from the following values: –10.5, –9, –7.5, –6, –4.5, –3, –1.5, 0, +1.5, +3, +4.5, +6, +7.5, +9, +10.5.

Setting the level to 0 disables exposure compensation. Level +10.5 is the brightest and –10.5 is the darkest compensation value. When EX–COMP is set to OFF, exposure compensation is disabled.

White Balance Menu

WB Mode (White balance mode)

Select the white balance mode from the following:

Auto: This mode computes the white balance value within a range of values from 2500K to 7500K. This mode uses color information from the entire frame and calculates according to manually set values for SPEED (white balance speed), OFFSET and the MATRIX. This mode is the default setting.

Indoor: Sets the color temperature to 3200K. You can fine tune this setting using the MATRIX.

Outdoor: Sets the color temperature to 5800K. You can fine tune this setting using the MATRIX.

OPW (One Push White Balance): The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only at the request of the user (One Push Trigger), assuming that a white subject, in correct lighting conditions can occupying more than 1/2 of the image. One Push White Balance data is lost when the power is turned off. If the power is turned off, you'll need to reset One Push White Balance.

To select OPW:

1. Place a white subject (i.e., sheet of white paper) in the center of the frame.

2. Press the remote controller HOME button to activate the one–push white balance adjustment. You can fine tune this setting using the MATRIX and OFFSET.

ATW (Auto Tracking White Balance): Auto Tracking White balance (2000K to 10000K), allows the camera to adjust the white balance according to the temperature of the light source illuminating the subject. You can fine tune this setting using the MATRIX, SPEED (white balance speed) and OFFSET.

User: This is a mode that enables you to manually set the control of Red and Blue gain up to 256 steps. You can fine tune this setting using the MATRIX.

Outdoor Auto: This is an auto white balance mode specifically for outdoors. It allows you to capture images with natural white balance in morning and evening light. You can fine tune this setting using the MATRIX.

SVL Auto (Sodium Vapor Lamp Auto): This is an auto white balance mode that compensates for the orange light from sodium vapor lamps. You can fine tune this setting using the MATRIX.

SVL (Sodium Vapor Lamp): This is a fixed white balance mode specifically for sodium vapor lamps. You can fine tune this setting using the MATRIX.

SVL Outdoor A. (Sodium Vapor Lamp Outdoor Auto): This is an auto white balance mode specifically for outdoors, which is compatible with sodium vapor lamps. You can fine tune this setting using the MATRIX.

The following parameters are available depending on the chosen white balance mode:

Speed (white balance speed)

You can adjust the speed at which the camera reaches the white convergence point when AUTO1 or AUTO2 is chosen. Choose a value from 1, 2, 3, 4, and 5. 5 is the fastest and 1 is the slowest.

Offset

The white convergence point can be shifted when WHITE BALANCE mode is AUTO1, AUTO2, or ONE PUSH. The range is from –7 to 0 to +7. White balance is shifted toward blue when a negative value is chosen, and it is shifted toward red when a positive value is chosen.

Matrix (Color Matrix)

You can emphasize or weaken a specific color region while keeping the white convergence point unchanged. When you turn this ON, the following items are displayed for adjustment.

Select

You can choose an internal preset matrix for matrix calculation. You can choose from STD, HIGH SAT, FL LIGHT, MOVIE, STILL, CINEMA, PRO, ITU709, and B/W. This becomes disabled when MATRIX is turned OFF.

Level (color level)

You can adjust the color density of the picture. Choose a value in the range from 0 to 14. The greater the number, the denser the colors, and vice versa. This becomes disabled when MATRIX is turned OFF.

Phase

You can adjust the color tone of the entire picture. Choose a value from –7 to 0 to +7. This becomes disabled when MATRIX is turned OFF.

R–G, R–B, G–R, G–B, B–R, B–G

You can set a coefficient for each combination of RGB individually, to adjust the hue of the entire picture. Choose a value from –99 to 0 to +99. This becomes disabled when MATRIX is turned OFF.

Detail Menu

When you choose AUTO as the mode, contour correction signal is automatically added. When you want to make adjustment by yourself, choose MANUAL. Only LEVEL will be displayed when you choose AUTO.

Mode

Auto: Contour correction signal is automatically added. You can set the amount of the contour correction signal. Choose a LEVEL value from 0 to 15. The greater the value, the stronger the contour correction signal.

Manual: You can set the bandwidth for signals undergoing contour emphasis. You can choose from DEFAULT, LOW, MIDDLE, HIGH, and WIDE. For example, when you choose MIDDLE, the middle range of the signals is elevated, and contours in that middle range are emphasized.

Crispening

You can choose the fineness of the objects subject to contour correction with contour correction signals. Choose a value from 0 to 7. When you choose a higher value, minute contour correction signal elements are removed, and only the high level contour correction signals are left,which reduces noise. When you choose a lower value, minute contour correction signal elements are added to the picture, increasing noise.

H/V Balance

You can choose the ratio for horizontal and vertical contour correction signal elements. Choose a value from −2 to 0 to +2. When you choose a higher value, the horizontal contour correction elements become greater compared to the vertical elements.

B/W Balance

You can adjust the balance between contours in black on the low brightness side of the spectrum and contours in white on the high brightness side. Choose from TYPE 1 to TYPE 5. The ratio of contours in black is higher for TYPE1 while the ratio of contours in white is higher for TYPE 5.

Limit

You can set the maximum value for the amount of contour emphasis in black on the low brightness side of the spectrum and in white on the high brightness side. Choose a value from 0 to 7.

Highlight Detail

You can adjust the level of contour added to brightly lit objects. Choose a value from 0 to 4. Adjust this when you want to emphasize the contour of a brightly lit object in a bright background.

Super Low

Emphasizes contours in the super low range. Choose a value from 0 to 7. The greater the value, the greater the contour emphasis. Contrast and resolution increase.

Picture Menu

2D /3D NR

2D Noise Reduction is a method of reducing noise within an image by comparing the image from frame to frame, removing variations that do not appear in each frame. 3D Noise Reduction is a method of reducing noise by comparing variances within the same frame, as well as comparing frame to frame. This will often reduce noise without leaving trails behind a moving object.

Flip

Flips the image upside down for ceiling mounted cameras. Select from upright mode (OFF) or ceiling mount (ON).

Mirror

Displays a mirror image of the video image.

Color

Adjusts the intensity of colours in the image from a range of 1–15.

Hue

Adjusts the color phase from 1–15.

IR Cut Filter

An IR (infrared) cut filter can be disengaged for increased image sensitivity in low light conditions. The filter will automatically engage depending on the ambient light, allowing the camera to be effective in day/night environments. When the mode is set to NIGHT, a monochrome (black and white) image will be displayed.

Chroma Suppress

The chroma suppress mode can be engaged for low light conditions when color noise may be particularly noticeable. You can set the brightness from OFF, LOW, MID, HIGH in each mode of the variable gamma modes.

HLC Mode (Highlight Light Compensation)

HLC attempts to adjust AE and AF to compensate for high intensity spot lights aimed toward the camera lens.

Stablizer

This function can reduce image blur caused by camera movement. The correction effect works best at vibration frequencies of around 10 Hz and may not be as effective in conditions of high frequency vibration. In such high frequency vibration conditions, turn the image stabilizer function off. The image stabilizer function uses digital zoom methodology that may result in reduced angle of view and resolution.

Gamma Menu

Mode

Standard: Standard setting (same as the MOVIE setting on the camera).

Straight: This selects a straight GAMMA curve.

Pattern: You can choose a gamma curve from 512 patterns stored in the camera. You can specify the a pattern from 512 patterns using PATTERN and PATTERN FINE. PATTERN defines the upper two digits of the pattern, and PATTERN FINE defines the last digit.

Pattern

Choose a value from 0 to 51. This can be chosen when Mode is PATTERN.

Pattern Fine

Choose a value from 0 to 9. When PATTERN is 0 (zero), zero cannot be chosen for PATTERN FINE. When PATTERN is 51, a value larger than 2 cannot be chosen for PATTERN FINE. This can be chosen when Mode is PATTERN.

Offset

You can choose the offset of the output level of gamma curves. Choose a value from –64 to +64.

Level

Gamma level, you can choose a level value from –7 to +7.

Black Gamma

You can adjust the black gamma level to recreate gradation in the dark areas of the picture or to sup– press noise with blackout. Choose a value from –7 to +7.

Black Gamma Range

You can adjust the brightness range for which BLACK GAMMA becomes effective. Choose from LOW, MIDDLE, and HIGH. The range becomes small when LOW is chosen, and it becomes large when HIGH is chosen.

Black Level

You can adjust the master BLACK LEVEL. Choose a value from –48 to +48.

Visibility Enhancer

Depending on the imaging scene, the Visibility Enhancer function makes the darker part of a camera image brighter, and automatically correct brightness and contrast to show bright parts clearly.

Pan Tilt Zoom Menu

Digital Zoom

On: A 12X digital zoom is activated. This digital zoom activates after the optical zoom reaches its maximum. This results in 240x zoom with Tele Convert Mode set to OFF, and 480x when set to ON.

Off: Optical zoom only is available.

SRZ (Super Resolution Zoom): Adds a high quality 2x digital zoom on top of the selected zoom range, resulting in, for example, an 80x maximum zoom with Tele Convert Mode set to ON.

Zoom Ratio OSD
Determines whether the zoom ratio displays on screen.

AF Sen

When set to NORMAL, autofocus response will be fast and suited for frequently moving subjects. When set to LOW, the autofocus response is slowed which can improve the stability of the focus in low light conditions.

MF Speed

Choose between eight manual focus speeds.

Near Limit

You can set the camera to ignore focusing on subjects that are closer than a designated distance. Can be set in a range from 1cm, 11cm, 30cm, 80cm, 1.2m, 1.4m, 1.6m, 2.0m, 2.5m, 3.1m, 4.2m, 6m, 10m, 20m.

Adaptive P/T

When set to ON, the Pan and Tilt speed is adaptive to the zoom range. For example, the higher zoom ratio you use, the slower the speed of P/T.

P/T Speed

The Pan and Tilt speed can be set from 0 to 5 (from low to high), when controlling the movements using the remote controller.

Preset Speed

Set the speed at which the camera will move from one preset to another.

Pan Dir

You can reverse the left and right pan orientation.

Tilt Dir

You can reverse tilt up and down orientation.

System Menu

Pelco ID

When using RS485 (PELCO P/D) control, set Camera ID to the controlled address. This value is from 001–255.

IR–Receive (Infrared Signal Reception)

When this is set to OFF, the camera does not receive the signal from the infrared remote controller. Be sure to keep it set to ON when you use the infrared remote controller. Note that you cannot set IR–RECEIVE to OFF when you operate the menu using the infrared remote controller. To set it to OFF, use the appropriate VISCA controller.

Display Info

When this item is set to ON, the camera configuration is displayed for approx. 3 seconds on the screen when the camera is powered on or rebooted.

Preset Memory

This feature allows you to save the image parameters to PRESET memory. Parameters such as picture, white balance, exposure, focus mode, zoom positions can be saved with the preset.

Factory Reset

Select this item to set camera back to the factory default setting. Press the HOME button to confirm the action. All user settings for the camera will be deleted.

Tally Mode

Select ON to enable the camera Tally lights.

Tele Convert Mode

The larger sensor of the P240 provides for two zoom ranges. When set to OFF, a 20x optical zoom is available. When set to ON, a HD crop of the sensor provides for a 40x optical zoom.

Reload Preset 1

When set to ON, preset 1 is set to the Home position. The camera moves to the Home position when it is powered on or reset.

Auto Focus

Set the speed of auto–focusing from Low to Normal.

Video Format

Select VIDEO FORMAT, press the "←" button to choose the video format, then press "→" (Pressing "→" button changes the value on some product models) or HOME button to confirm. After confirmation, press the HOME button again to restore it. The camera will reboot by itself and the new video format is activated.

- You can cancel it by pressing the MENU button.
- Depending on the video client software you are using, some video software may need to be restarted to obtain the new video format.

The camera video format can also be changed by setting the rotary DIP switch at the back of the unit.

SV (Software Version)

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

Remote Controller

1. **Power**
    - Power ON the camera to set the camera to operational status.
    - Power OFF the camera to set the camera to standby status.
    - When the camera is powered OFF, the camera turns to the rear.
    - When the camera is powered ON, the camera turns to the front.
    - Powering the camera ON/OFF would not restart the camera.

2. **Camera ID (Total 3) Selector**

3. **Preset Position (Total 6) Calling and Setting**

4. **PAN–TILT**
    - Pan and Tilt direction control.
    - HOME: Home position, Resolution reset.

5. **L/R Direction Set**
    - Left and right orientation setting.

6. **ZOOM/FOCUS**
    - Far – for objects further from the camera.
    - Near – for objects closer to the camera.

7. **Auto/Manual Focus**

8. **Back Light**

9. **Video Format Switching**
    - You can change the video format by keep pressing the button. (When video format is changed, the camera would restart and the screen turns black for few seconds.)

10. **MENU**
    - On screen menu display ON/OFF.

11. **Fast/Slow Zooming Speed Switching**

12. **White Balance**
    - Change the White Balance setting by pressing the button.

13. **De–Flicker**
    - Can reduce image flicker caused by interaction between your camera shutter speed and the lights in the space.

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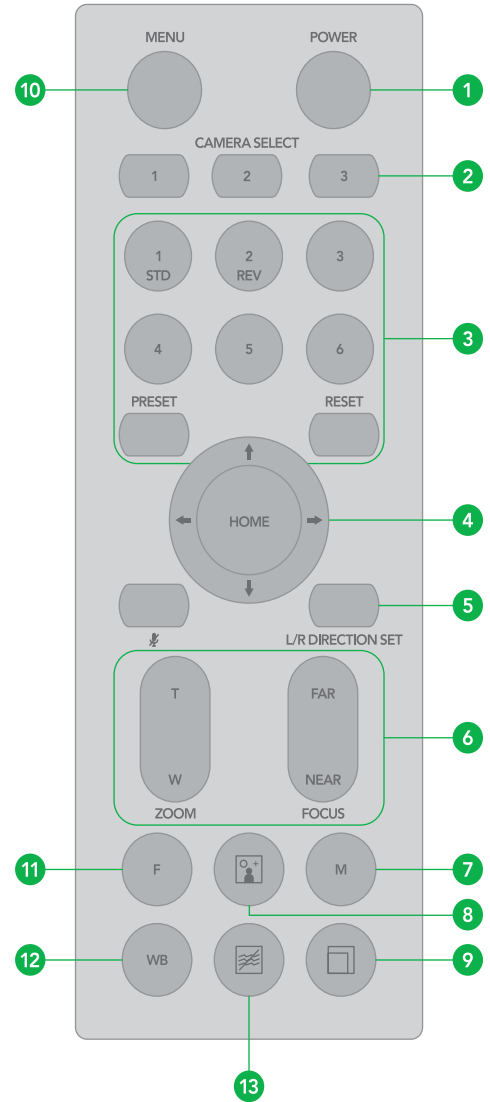
Controlling the Camera Using the Remote Controller
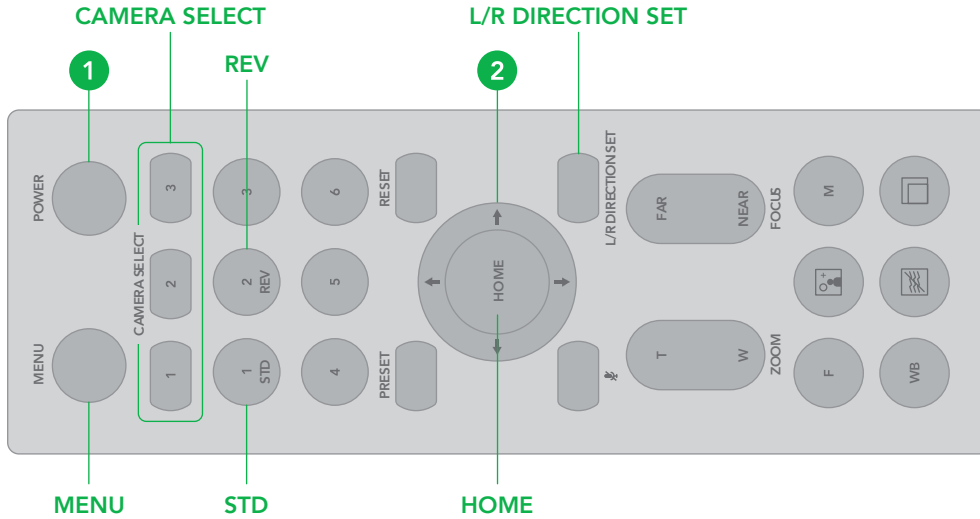
Panning and Tilting

1. Press the POWER switch. The camera will turn on and perform the pan/tilt reset operation automatically.

2. Press the arrow button to pan or tilt the camera. While checking the picture on the screen, press the desired arrow button.

3. To move the camera in short increments, press the button.

4. o move the camera in long increments, press and hold the button.

5. To move the camera diagonally, press the "← or →" button while holding down the "↑ or ↓" button.

6. Press the HOME button to return to the starting position

7. If the camera moves in a different direction from the one that you intended, be aware that the camera is set so that the image output from the camera is rotated toward the right whenever you press the " →" button.

   To set the remote to move the camera toward the opposite direction from that of the button you pressed, press the 2 (REV) button while holding down the L/R DIRECTION SET button.

Arrow Button	Movement of the Camera	Setting
		L/R DIRECTION SET **While holding down** 2 REV **Press**

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

A blinking STANDBY lamp may indicate physical interference with the camera movement, and the camera may fail to memorize the pan/tilt position. In this case, press the PAN–TILT RESET button to reset the pan/tilt position.
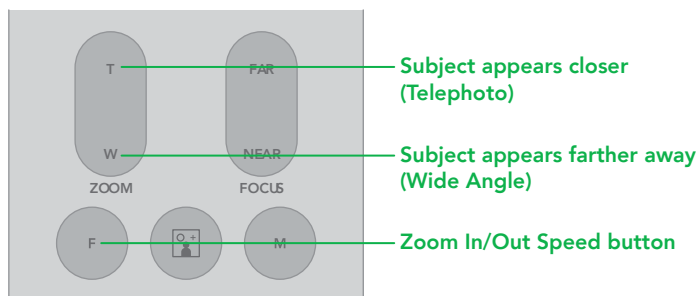
Zooming

Button [T]: Zoom In.

Button [W]: Zoom Out.

Button [F]: Fast / Slow toggle.

Subject appears closer (Telephoto)

Subject appears farther away (Wide Angle)

Zoom In/Out Speed button

Focusing

Focusing the camera on a subject automatically

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

Focusing the camera on a subject manually

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

Focus on a far subject

Focus on a near subject

AUTO/MANUAL

Subject appears brighter
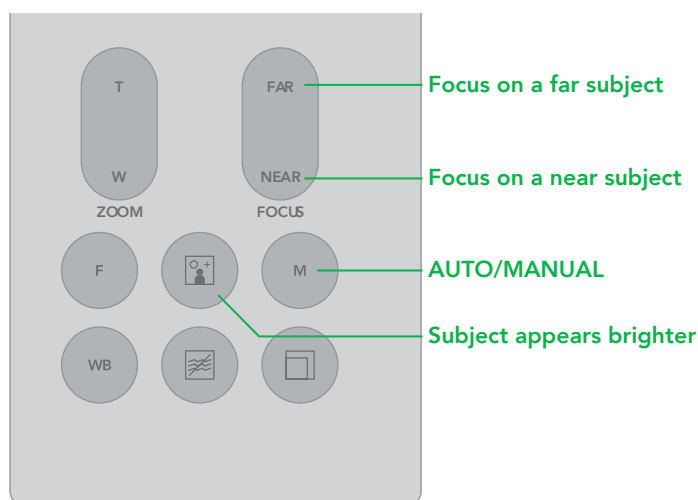
Shooting with Back Lighting

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

NOTE: The BACK LIGHT function is effective if MODE is set to FULL AUTO in the EXPOSURE menu of the camera.

Changing Resolution

1. Press the RESOLUTION button.
2. Use the arrow keys to navigate the displayed menu.
3. Press Home to select.
4. Screen will display 'CHANGING...'
5. Press Menu to exit.
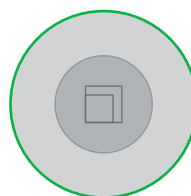
Storing the Camera Settings in Memory Using Presets

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

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

- Pan/Tilt Position
- Zoom Position
- Focus Auto/Manual
- Focus Position
- AE Mode
- Shutter control parameters
- Bright Control
- Iris control parameters
- Gain control parameters

- Exposure Compensation On/Off
- Exposure Level
- Backlight Compensation On/Off
- White Balance Mode
- R/B Gain
- Aperture Control
- WD Parameter

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

1. Press the RESET button to reset the pan/tilt position.
2. Adjust the position, zooming, focusing and backlighting of the camera.
3. While holding down the PRESET button, press any of the POSITION buttons, 1 to 6, in which you want to store the settings.

Recalling the stored settings
Press any of the POSITION buttons, 1 to 6, in which you have stored the settings.

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

Press a POSITION button

While holding down PRESET Button
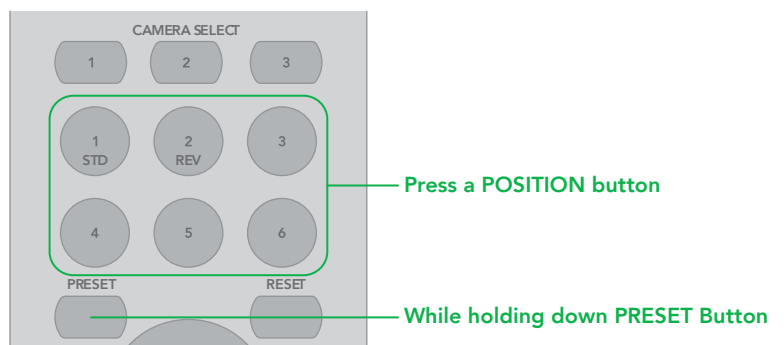
NOTE:
- When the power is turned on, the camera starts with the settings stored in POSITION 1, so if you want to retain the previous pan and tilt positions, store those positions in POSITION 1.
- While storing or cancelling the settings in one POSITION, you cannot call up, store or cancel the settings in another POSITION.
- When the menu is displayed on the screen, you cannot store, recall, or cancel a setting. Return to the normal display before starting these operations.

Operating Multiple Cameras with the Infrared Remote Controller

1. Assign a number to the camera (1, 2 or 3) using the switch on the rear of the camera.

2. Press the CAMERA SELECT button on the infrared remote controller that corresponds to the number set in step 1.

3. The remote can now control the camera(s) specified by the selected number. Each time the infrared remote controller is used, the chosen CAMERA SELECT button illuminates.
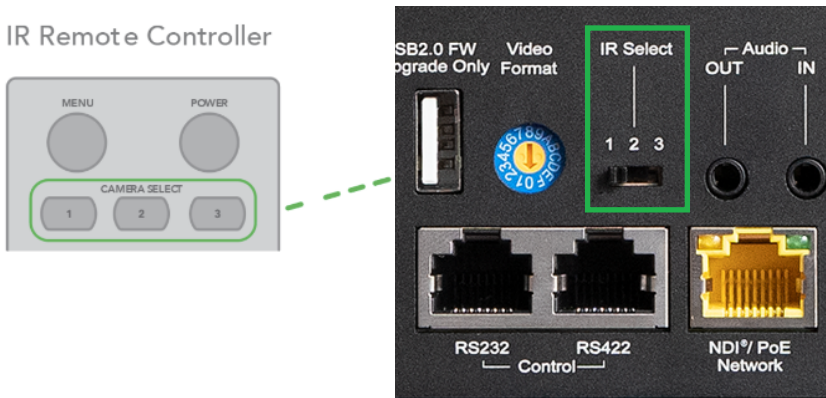
Web Configuration Panel

The web configuration panel (BirdUI) allows you to alter key settings of P240, such as A/V settings, video frame rates, restarting the video processing engine, changing networking parameters, recalling PTZ presets and applying firmware updates.

Access via web browser (URL)

P240 is configured to automatically receive a network IP address from the computer network via DHCP (Dynamic Host Configuration Protocol). 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.

If P240 receives an IP address automatically from this server (DHCP), the IP address can be discovered in several ways, including BirdDog Central Lite available from <u>here</u>.

NOTE: Your computer will need to have 'Bonjour' services loaded in order to access the unit via it's user defined name. Apple devices come pre-installed with Bonjour, while Windows devices need a plugin available <u>here</u>.

Accessing P240 on a network without a DHCP server

Some standalone or private networks may not have a DHCP server. After 30 seconds of waiting for an automatically assigned IP address, the camera will reassign to the designated fallback address (the default is 192.168.100.100).

In order to access the BirdUI 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 BirdUI, choose your IP address to match the rest of the devices on your network.

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

Password Management

Once you direct your web browser to the BirdUI you will need to log in to change any settings.

Default Password

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

Password Reset

To change the password simply login using the default password, navigate to the Network tab in the BirdUI, and select Change Password.

It is recommended to change this password in a network environment where P240 is shared with other users (e.g. not private). By entering this password, the user is granted full access to the configuration settings and could interrupt a live program.
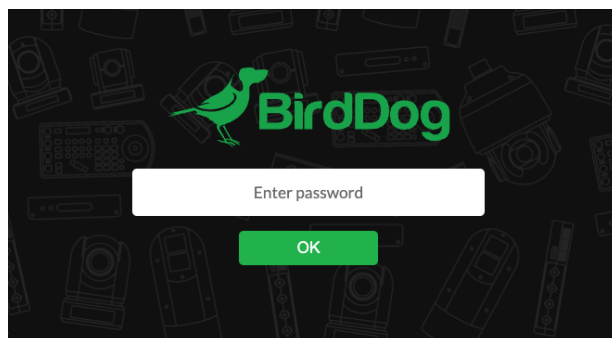
BirdUI Layout

The BirdUI is organized into the following panels:

1. **Dashboard**

   Overall view of important information such as the network connection type and video stream format and resolution.

2. **Network**

   General network settings such as DHCP IP Address details, timeout fallback address and camera network name, as well as NDI® specific network set-tings

3. **System**

   System admin functions such as updates, password change, designation of group access and camera reboot.

4. **AV Setup**

   Full NDI® encode management and audio settings.

5. **CamControl**

   Exposure, white balance, picture and color settings.

6. **Scopes**

   Settings for the Histogram, Waveform, RGB Parade and Vectorscope.

7. **Logout**

   Click to logout from the BirdUI.
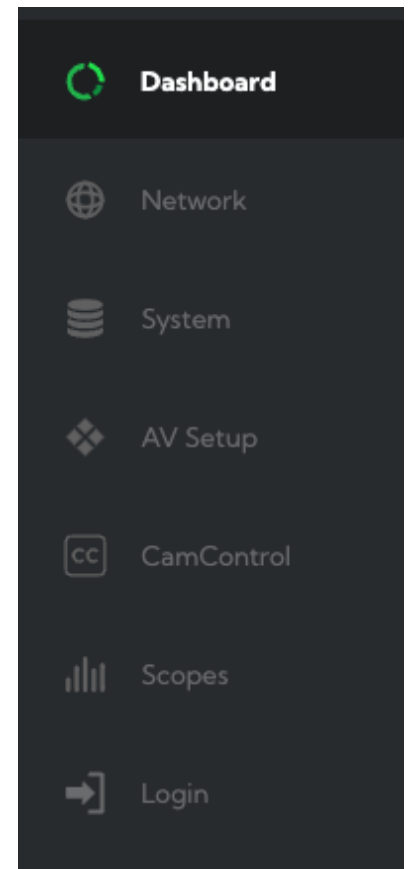
Dashboard

The Dashboard displays an overall view of important information.

1. **CPU Usage**

   Current computer system CPU utilization.

2. **Device mode**

   Encode or Decode. For a camera this is fixed at Decode.

3. **Network Bandwidth**

   Network bandwidth consumption of the current NDI® output stream(s).

4. **Status**

   a. NDI video stream name

   b. Selected video format.

   c. NDI audio status.

5. **Stream Info**

   a. Video resolution. Number of audio channels of the camera.

   b. Video frame rate. The audio output sample rate of the camera.

   c. Video chroma subsample rate and average NDI® bitrate of the camera.

6. **System Details.**

   a. Camera name.

   b. Network details.

   c. Online status of the camera.

   d. MAC address and current firmware version of the camera.

7. **Device Restart**

   Click this button to restart the NDI® stream. This may be necessary after changing key image settings e.g., resolution.

8. **System Reboot**

   Click this button to reboot the unit after changing key network settings or the BirdDog name.

Network

Network Details

Most computer networks provide for both automatic and manual configuration of network devices and the P240 can accomodate both.

Configuration Method

Here you can set the network configuration to either DHCP (default) or Static. DHCP simplifies the management of IP addresses on networks. No two hosts can have the same IP address, so assigning them manually can potentially lead to errors. If your network is set up for DHCP, this is generally the best configuration to choose. If you do choose to go with a Static IP address, you'll need to add the IP Address, Subnet Mask and Gateway Address information according to the requirements of your network.

DHCP Timeout, Fallback IP address, Fallback Subnet Mask

You can set the timeout period during which P240 will look for a DHCP IP address. After this period, the camera will default to the designated fallback IP address.

This can be useful if you use your camera in other network environments. For example, if a DHCP server is available in your normal office or studio application, the camera will use the DHCP supplied IP address. If you then use the camera in another application without a DHCP server, your camera will always default to the known fallover IP address. NOTE: Do not set the fallback IP address the same as the camera IP address. It is recommended to keep the fallback IP address.

BirdDog Name

You can give your camera a meaningful name to make identification easier when viewing NDI® sources on a receiver such as a TriCaster, vMix or Studio Monitor. Be sure to make the name unique, as no two devices on the network should have the same name. The name can be any combination of 'a–z, 0–9, and –'.

After renaming your camera, navigate back to the Dashboard and click REBOOT DEVICE. The camera will re-initialize and you'll be good to go.

NDI Network Settings

P240 operates with the latest NDI® Libraries. There are several options to configure camera behaviour in an NDI® network. Each configuration has its benefits, however it is recommended to utilise the default TCP transmit method unless you have reason to change.

### Preferred Transmit Method

TCP

TCP is the default method of transmission for NDI®. It operates well within local networks with predictable latency and limited jitter. BirdDog recommends that TCP be used for typical applications, and only using alternative transports for specific reasons.

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UDP

UDP is recommended for networks where there is extended latency from one end to the other. The nature of UDP means that it does not receive a confirmation of each packet being received successfully – vastly improving performance on busy networks. UDP can have some consequences f there are other issues on the network such as jitter or lost packets as it will not inherently re-sent a lost packet.
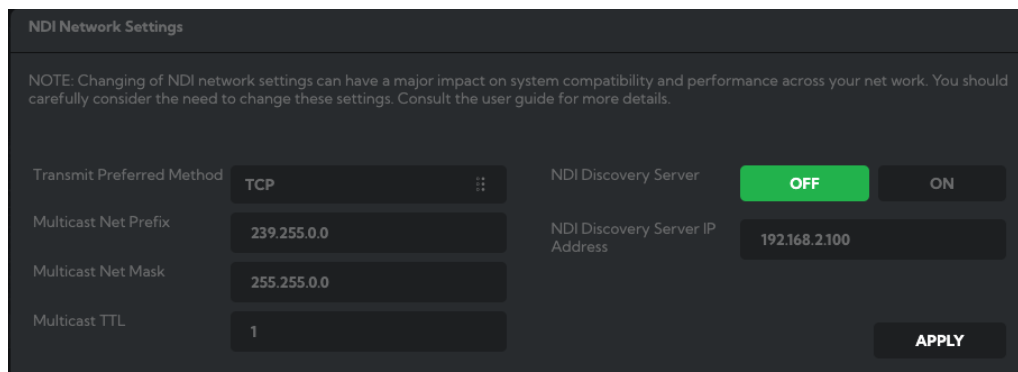
R-UDP (Reliable UDP)

This protocol bridges the performance of TCP and UDP. Compared to TCP, it reduces overall network load (allowing more NDI® streams) by not requiring every packet to be 'acknowledged' by every receiver – has error correction built in for smoothness and reliability.

Multicast

Multicast is especially useful for use-cases that require a single source to be received on multiple receivers simultaneously. Utilizing Multicast offloads the distribution of the NDI® A/V packets from the camera to the network infrastructure. You should take care to ensure your network is specifically configured to support Multicast as using it on an ill-prepared network can create unintended network problems.

NDI Discovery

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. Unless the network is specifically configured to not allow mDNS, NDI® sources will be discovered.

The NDI® discovery service is designed 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. Multiple servers can be specified for failover reduntancy. 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 one or more NDI® Discovery Servers, click the ON button.

2. Enter a comma delimited list of the IP address(es) of your NDI® Discovery Server(s).

3. Click the APPLY button to save your changes.

System

Password Settings
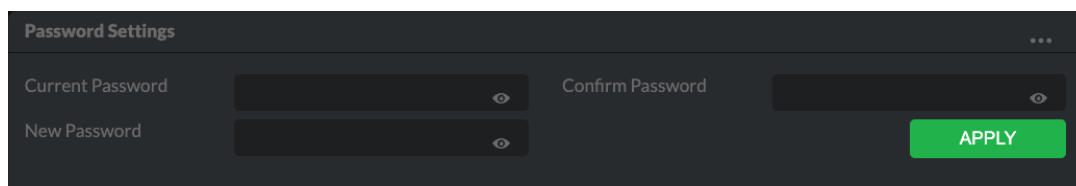
The BirdUI is secured by a user-selectable password. The default password is **birddog** (one word, lower case). It is recommended that the default password be changed, since the BirdUI grants full access to the camera configuration settings.

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 to retain administration rights to prevent unauthorized changes in a network environment where PTZ Keyboard is shared with other users (e.g. not private). Confirm the new password and click the *Apply* button.

System Update

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 download the firmware and follow the **Firmware Upgrade Instructions** located in your firmware folder.
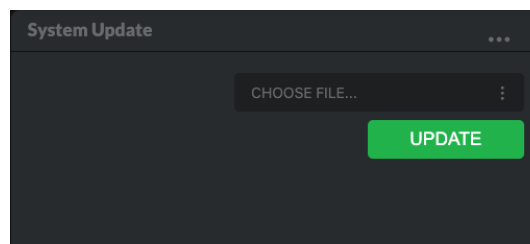
Access Manager Configuration

Remote IP List

By default, NDI® devices are visible to each other only when they're on the same subnet. If you want visibility or control of a device on a different subnet, you need to 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.
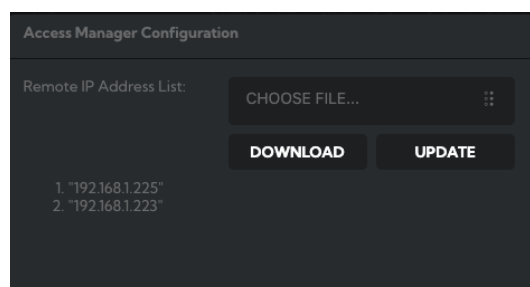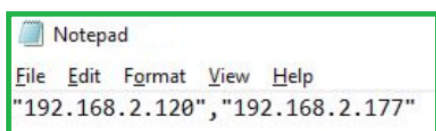
NDI Group List

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 in larger environments to control visibility and access amongst various groups. 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.
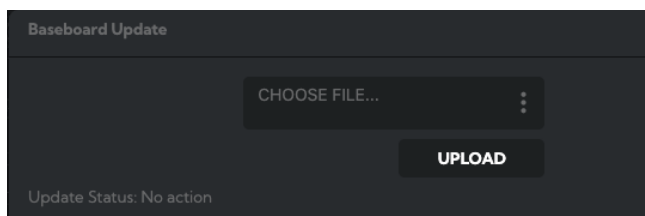
To upload a list:

1. Click the CHOOSE FILE button to load your NDI® Group List in UTF–8 encoded string format.

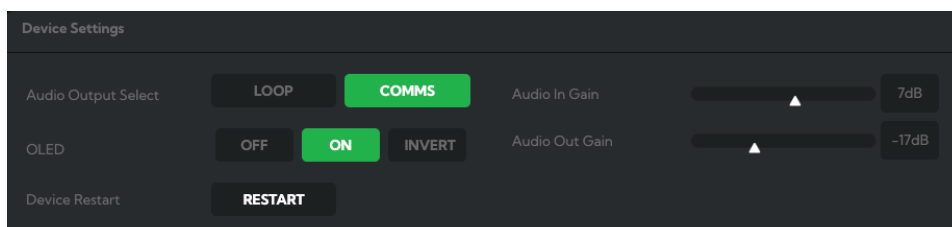2. Click the UPDATE button. Do not upload a blank list.
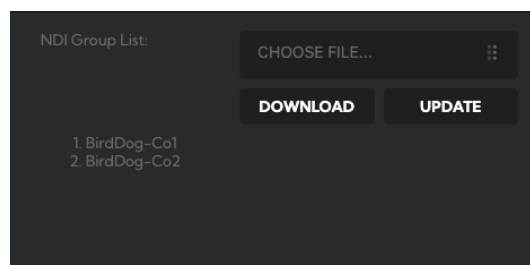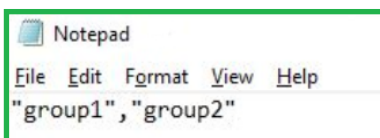
Baseboard Update

Follow the instructions included with your downloaded update file to update the camera baseboard. Updates can be found here.

AV Setup

Device Settings

Audio Output Select

Loop: Audio from the Audio In port, for example, from a connected microphone, is directed to the Audio Out port for monitoring.

Comms: Audio from NDI® stream is directed to the audio out for camera operator comms. You'll need software such as BirdDog Comms Lite/Pro to use this function.

OLED

Turn the camera OLED screen on, off or invert the display.

Audio In / Out Gain

Controls for adjusting the audio in/out gain.

Device Restart

Restarts the NDI® stream. This may be necessary after changing key image settings e.g., resolution and Low latency mode.

NDI Encode Settings

Bitrate Management	MANUAL	NDI MANAGED	Encode Screensaver	BirdDog	
NDI Video Bandwidth		140	Capture Screen Frame		CAPTURE
Chroma Subsampling	4:2:0	4:2:2	Onboard Tally	TallyOff	
NDI Group Enable	DISABLE	ENABLE	GenLock Source	None	
NDI Group Name	BirdDog		Failover Source	None	
NDI Stream Name	CAM		Update Source List	RESET	REFRESH
Video Input Format	2160p29.97		Apply Source		APPLY
NDI Audio	ANALOG	MUTE			
Stream To Network	OFF	ON			

Bitrate Management

Birddog Devices allow you to set your target NDI® output bitrate. This allows you to select a compression ratio that is more efficient for your networking infrastructure (lower bandwidth) or higher image quality for critical footage. The scale allows you to select the range of 60 Mbps – 360 Mbps.

By setting Bitrate Management to NDI MANAGED, the target bitrate will be set in accordance with the NDI® standard. By selecting MANUAL you are able to manually select a target bitrate. Select MANUAL with care, as you will need to account for the capacity of the network and the receiving device.

Chroma Subsampling

Set the desired level of chroma subsampling.

NDI Groups

NDI® supports **Grouping** which allows you to hide the visibility of video sources to viewers that are not part of the group. If disabled (default), the video source is public and viewable by any receiver on your network. Click on the field and type a group name. Receivers can then scan for, and select your group.

Stream Name

You can give the camera NDI® output stream a meaningful name to make identification easier on on any NDI®-capable receiver, particularly on networks where there are a large amount of NDI® streams.

NDI Video Format

P240 is capable of outputting independent video formats for both NDI® and SDI/HDMI. This setting affects only the NDI® video output. Please note that the video rate you select here must be of the same family as the SDI/HDMI video output, for example 720p50 aligns with 1080i50/1080p50 but will not co-exist with any 29.97/30fps based camera setting.

NDI Audio

Select MUTE to disable the NDI® audio. Select ANALOG to receive audio from the audio inputs.

Stream to Network

You can choose to disable the NDI output stream.

Encoder Screensaver

Assign a captured frame, black frame, or BirdDog logo as a screensaver.

Capture Screensaver Frame

Click the Capture button to capture the current frame for use as a screensaver.

Onboard Tally

Enable the camera Tally lights.

Genlock Source

Select the NDI® genlock source from the dropdown list.

NDI Failover Source

NDI® features a failover function where you can designate an alternate camera or NDI® source for the receiver, should this camera become disconnected or otherwise unavailable on the network. Click on the *Available NDI Sources* field to select your alternate source.

Update Source List

Pressing the Refresh button will add new sources to the list, whereas pressing the RESET button will populate the list with only active NDI® sources. Click the APPLY button to apply your failover source change.

Cam Control

Camera Control Tab

Menu On / Off

To adjust cameras settings via the OSD (On Screen Display), click the Menu ON/OFF button.

The OSD is visible on both the NDI® output and SDI/HDMI, and can also be accessed via the included remote control. Since it uses the same controls for menu navigation, PTZ control of the camera movement will not be possible until the OSD menu is closed again.

Zoom

Click the TELE button to zoom in and the WIDE button to zoom out.

Focus Mode

Select between Auto and Manual focus modes.

Focus

Click the IN button to focus on nearer subjects and the OUT button to focus on subjects further from the camera.

Pan / Tilt / Zoom Speed

When controlling P120 over NDI® you can individually set the maximum speed of PTZ movements. Higher numbers produce faster and more sensitive movements of the camera.

Image Settings Reset

Click this button to reset all image settings to their factory default.
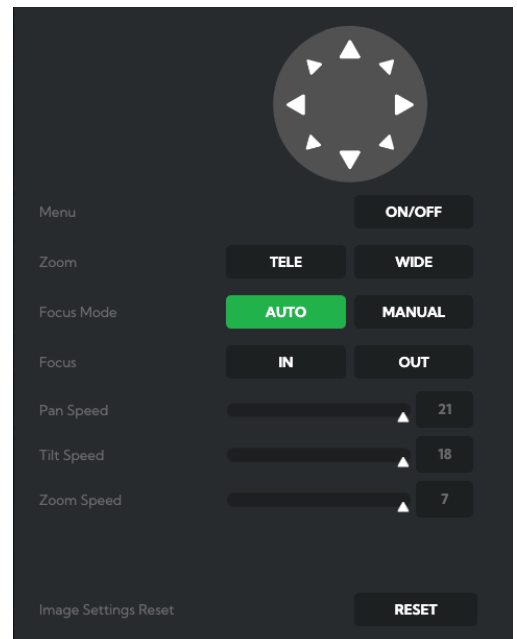
FreeD Tab

Enable or disable FreeD. FreeD is a protocol for real time camera PTZ position query. Any application that uses FreeD can use this data, usually in a virtual environment, where a physical camera move (i.e. pan, tilt, zoom or iris change) can trigger the virtual environment to follow that move in real time.

IP Address / Port

Enter the IP address of the host and the port that the data package will be sent to.

Apply FreeD Settings

Click the APPLY button to save your changes.

Preset Tab

To save a Preset select a number, make your desired changes, click the Save button and then click a Preset number. To recall a Preset, click the Preset number. You can save two separate and different types of Presets:

BirdDog

Saves only PTZ information with the Preset.

Camera

If System/Preset Memory is enabled in the camera Menu via the OSD, image parameters such as picture, white balance, exposure, focus mode, zoom positions will also be saved with the Preset.

Exposure Tab

Mode

Full Auto: IRIS, GAIN and SPEED (shutter speed) are set automatically using the values set for SLOW SHUTTER, S. SHUTTER LIMIT, AE SPEED, GAIN LIMIT, GAIN POINT, POINT, HIGH SENSITIVITY, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT and EXPOSURE COMPENSATION.

Manual: Allows manual adjustment of the GAIN, GAIN LIMIT, SPEED, IRIS, and HIGH SENSITIVITY.

Iris Pri: Iris Priority mode. This mode allows you to set a fixed IRIS. The gain and shutter speed are set automatically according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for IRIS, GAIN LIMIT, GAIN POINT, AE SPEED, MAX SPEED, MIN SPEED, BACK LIGHT, SPOT LIGHT and EXPOSURE COMPENSATION.

Shutter Pri: Shutter Priority mode. This mode allows you to set a fixed shutter SPEED with exposure achieved by automatic setting of IRIS and GAIN, according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for SPEED, GAIN LIMIT, AE SPEED, BACK LIGHT, SPOT LIGHT and EXPOSURE COMPENSATION.

Bright: The bright control function adjusts both gain and iris using an internal algorithm, according to a brightness level freely set by the user. Exposure is controlled by gain when dark, and by iris when bright. As both gain and iris are fixed, this mode is used when exposing at a fixed camera sensitivity. When switching from Full Auto or Shutter Priority Mode to Bright Mode, the current status will be retained for a short period of time. The exposure is adjusted automatically using the values manually set for the bright level (LEVEL) and HIGH SENSITIVITY.

Gain Pri: Gain Priority mode. This mode allows you to set a fixed GAIN. The IRIS and SPEED are set automatically according to the brightness of the subject. The exposure is adjusted automatically using the values manually set for GAIN, GAIN POINT, AE SPEED, HIGH SENSITIVITY, MAX SPEED, MIN SPEED, BACKLIGHT, SPOTLIGHT and EXPOSURE COMPENSATION.

Below are the various parameters for these exposure modes.

Gain

Select the gain from the following: 0dB, 3dB, 6dB, 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, 27dB, 30dB, 33dB, 36dB.

Gain Limit

The gain limit can be set at Full Auto, Shutter Priority, Iris Priority, Bright, Spot Exposure and Manual in AE mode. This is useful to limit the automatic setting of gain which can lead to excessive image noise at extreme settings. Choose from: 9dB, 12dB, 15dB, 18dB, 21dB, 24dB, 27dB, 30dB, 33dB, 36dB.

Gain Point/Position

Set the Gain Point between 0dB and the gain limit. The shutter speed can be changed from the point when the set gain value is reached. When you want to obtain a motion-priority image, use this setting.

High Sensitivity

This function increases the max. gain to allow bright output in darker environments. However, with a strong gain (up to 10×), the image may exhibit higher levels of noise.

Iris

Select the iris the following: F11, F10, F9.6, F8.7, F8.0, F7.3, F6.8, F6.2, F5.6, F5.2, F4.8, F4.4, F4.0, F3.7, F3.4, F3.1, F2.8

Slow Shutter

When set to "On," the slow shutter functions automatically in low light conditions. This setting is available only when the AE mode is set to "Full Auto." The default setting is Off.

Shutter Limit

With certain settings, in low light conditions, the shutter speed slows and the gain is increased. This function allows you to limit the shutter speed reduction. This helps prevent image shake when shooting a moving subject in low light conditions.

AE Response

This setting allows you to reduce the exposure response speed. By default, optimum exposure can be obtained automatically within approx. 1 second. The slow AE response function allows you to lengthen this response time.

Maximum Speed (Maximum Shutter Limit)

In auto modes, the brighter the object is, the shutter speed will increase. You can set the upper limit on the shutter speed increase, helping to make images with motion more smooth.

Minimum Speed (Minimum Shutter Limit)

In low light conditions, the shutter speed may becomes slow and the gain is increased. Here you can put a limit on the shutter speed reduction, helping to prevent camera shake when you shootingb moving subjects.

Backlight

When the background of the subject is too bright, or when the subject is too dark due to shooting in the AE mode, back light compensation can help make the subject better exposed.

Spotlight

Spotlight compensation will attempt to compensate exposure in conditions where strong light falls on the subject, such as a person's face in a spotlight. You can choose either ON or OFF. This setting is enabled when MODE is FULL AUTO, SHUTTER PRI, IRIS PRI, or GAIN PRI. SPOT LIGHT becomes disabled when BACK LIGHT is ON.

Exposure Compensation

When MODE is set to FULL AUTO, SHUTTER PRI or IRIS PRI, setting EXPOSURE COMPENSATION to ON allows exposure compensation levels to be set from the following values: −10.5, −9, −7.5, −6, −4.5, −3, −1.5, 0, +1.5, +3, +4.5, +6, +7.5, +9, +10.5. Setting the level to 0 disables exposure compensation. Level +10.5 is the brightest and −10.5 is the darkest compensation value. EXPOSURE COMPENSATION is set to OFF, exposure compensation is disabled.

White Balance Tab

Cam White Balance

Auto: This mode computes the white balance value output using color information from the entire frame with a range of values from 2500K to 7500K. This mode is the default setting.

Indoor: Sets the color temperature to 3200K.

**Outdoor:** Sets the color temperature to 5800K.

OPW (One Push White Balance): The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only at the request of the user (One Push Trigger), assuming that a white subject, in correct lighting conditions can occupying more than 1/2 of the image. One Push White Balance data is lost when the power is turned off. If the power is turned off, you'll need to reset One Push White Balance.

To select OPW:

1. Place a white subject (i.e., sheet of white paper) in the center of the frame.

2. Press the remote controller HOME button to activate the one–push white balance adjustment.

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

Manual 1: This user mode allow you to manually set the color balance parameters.
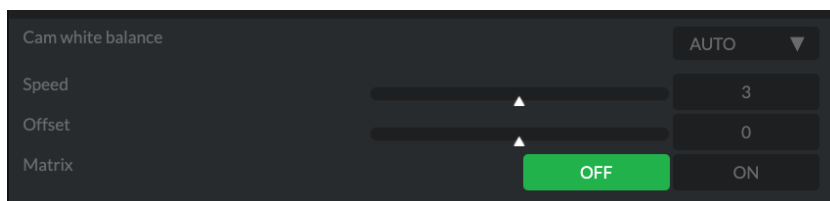
Below are the various parameters for these white balance modes.

Cam Red/Blue Gain

Sets the intensity of red and blue colors of the image.

Cam Color Temp

Sets the color temperature of the image in degrees Kelvin.

Speed (white balance speed)

You can adjust the speed at which the camera reaches the white convergence point when AUTO is chosen. Choose a value from 1 – 5, from slow to fast.

Offset

The white convergence point can be shifted when WHITE BALANCE mode is AUTO or ONE PUSH. The range is from −7 to 0 to +7. White balance is shifted toward blue when a negative value is chosen, and it is shifted toward red when a positive value is chosen.

Matrix (Color Matrix)

You can emphasize or weaken a specific color region while keeping the white convergence point unchanged. When you turn this ON, the following items are displayed for adjustment.

Detail Tab

Detail Mode	AUTO	MANUAL
Level	▲	3

Mode

Auto: Contour correction signal is automatically added.You can set the volume of the contour correction signal. Choose a LEVEL value from 0 to 15. The greater the value, the stronger the contour correction signal.

Manual: This setting allows you to manually configure the following settings.

Bandwidth

Set the bandwidth for signals undergoing contour emphasis. You can choose from DEFAULT, LOW, MIDDLE, HIGH, and WIDE. For example, when you choose MIDDLE, the middle range of the signals is elevated, and contours in that middle range are emphasized.

Crispening

Choose the fineness of the objects subject to contour correction with contour correction signals. Choose a value from 0 to 7. When you choose a higher value, minute contour correction signal elements are removed, and only the high level contour correction signals are left,which reduces noise. When you choose a lower value, minute contour correction signal elements are added to the picture, increasing noise.

H/V Balance

Choose the ratio for horizontal and vertical contour correction signal elements. Choose a value from −2 to 0 to +2. When you choose a higher value, the horizontal contour correction elements become greater compared to the vertical elements.

B/W Balance

Adjust the balance between contours in black on the low brightness side of the spectrum and contours in white on the high brightness side. Choose from TYPE 1 to TYPE 5. The ratio of contours in black is higher for TYPE1 while the ratio of contours in white is higher for TYPE 5.

Limit

Choose the maximum value for the amount of contour emphasis in black on the low brightness side of the spectrum and in white on the high brightness side. Choose a value from 0 to 7.

Highlight Detail

Adjust the level of contour added to brightly lit objects. Choose a value from 0 to 4. Adjust this when you want to emphasize the contour of a brightly lit object in a bright background.

Super Low

Emphasizes contours in the super low range. Choose a value from 0 to 7. The greater the value, the greater the contour emphasis. Contrast and resolution increase.

Picture Tab

2D/3D NR

2D Noise Reduction is a method of reducing noise within an image by comparing the image from frame to frame, removing variations that do not appear in each frame. 3D Noise Reduction is a method of reducing noise by comparing variances within the same frame, as well as comparing frame to frame. This will often reduce noise without leaving trails behind a moving object.
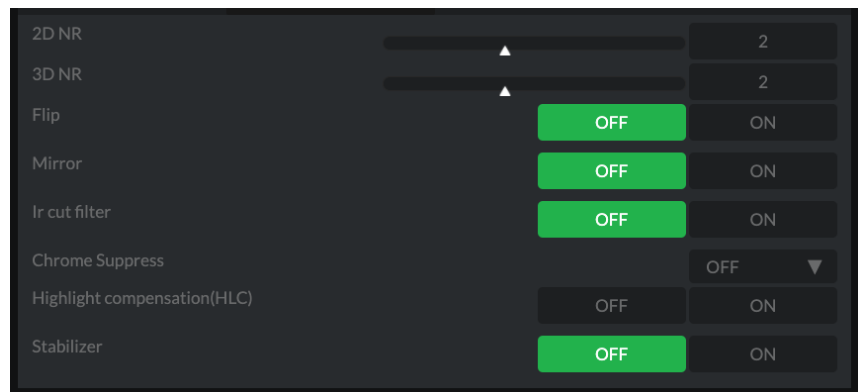
Flip

Flips the image upside down for ceiling mounted cameras. Select from upright mode (OFF) or ceiling mount (ON).

Mirror

Displays a mirror image of the video image.

IR Cut Filter

An IR (infrared) cut filter can be disengaged for increased image sensitivity in low light conditions. The filter will automatically engage depending on the ambient light, allowing the camera to be effective in day/night environments. When the mode is set to NIGHT, a monochrome (black and white) image will be displayed.

Chroma Suppress

The chroma suppress mode can be engaged for low light conditions when color noise may be particularly noticeable. You can set the brightness from OFF, LOW, MID, HIGH in each mode of the variable gamma modes.

Highlight Compensation

Highlight Light Compensation attempts to adjust AE and AF to compensate for when high intensity spot lights are detected.

Stabilizer (available on 30X zoom)

This function can reduce image blur caused by camera movement. The correction effect works best at vibration frequencies of around 10 Hz and may not be as effective in conditions of high frequency vibration. In such high frequency vibration conditions, turn the image stabilizer function off.

The image stabilizer function uses the digital zoom methodology and may result reduced angle of view and resolution.
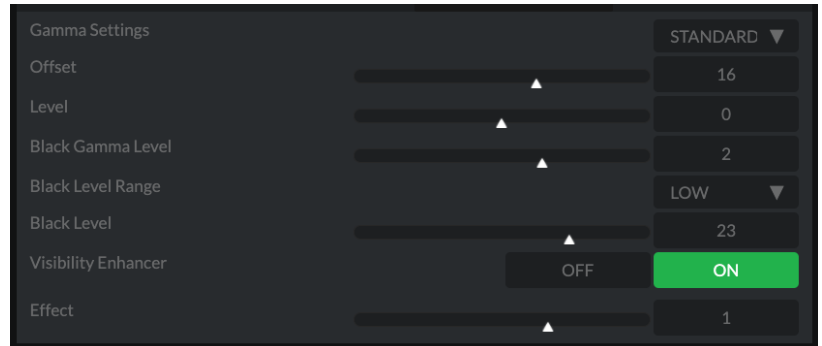
Gamma Tab

Gamma Mode

Standard: Standard setting (same as the MOVIE setting on the camera).

Straight: This selects a straight GAMMA curve.

Pattern: You can choose a gamma curve from 512 patterns stored in the camera. You can specify the a pattern from 512 patterns using PATTERN and PATTERN FINE. PATTERN defines the upper two digits of the pattern, and PATTERN FINE defines the last digit.

Gamma Settings		STANDARD ▼
Offset	▲	16
Level	▲	0
Black Gamma Level	▲	2
Black Level Range		LOW ▼
Black Level	▲	23
Visibility Enhancer	OFF	ON
Effect	▲	1

Offset

You can choose the offset of the output level of gamma curves. Choose a value from −64 to +64.

Level

Gamma level, you can choose a level value from −7 to +7.

Black Gamma

You can adjust the black gamma level to recreate gradation in the dark areas of the picture or to sup- press noise with blackout. Choose a value from −7 to +7.

Black Gamma Range

You can adjust the brightness range for which BLACK GAMMA becomes effective. Choose from LOW, MIDDLE, and HIGH. The range becomes small when LOW is chosen, and it becomes large when HIGH is chosen.

Black Level

You can adjust the master BLACK LEVEL. The Black Level is the brightness of the darkest part of an image. Choose a value from −48 to +48.

Visibility Enhancer

Depending on the imaging scene, the Visibility Enhancer function makes the darker part of a camera image brighter, and automatically correct brightness and contrast to show bright parts clearly.

Effect

The Effect setting sets the intensity of the Visibility Enhancer function. Values range from −3 to +3.

Using a Colour Chart

It is recommended to utilise a colour chart or colour chip chart when adjusting the Colour Matrix controls. These charts are available readily and have colour chips for each of the colours that the camera can adjust. By utilising a colour chip chart you are more easily able to see the impact of any adjustment you are making.

Using a colour chip chart such as the Datacolor SpyderCheckr can be beneficial to fine-tuning adjustments in the Colour Matrix.

Colours adjustable by Colour Matrix Control
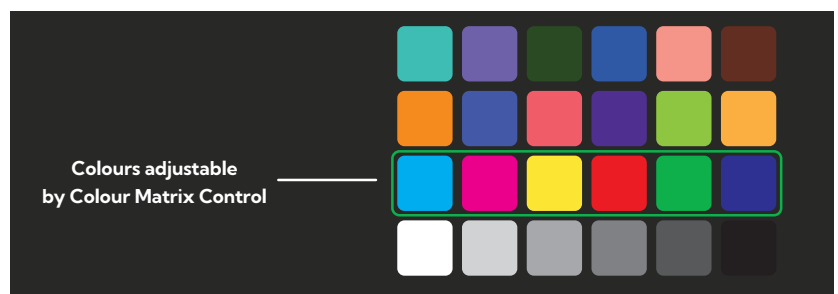
Scopes

Since there is variation in both the eyesight of individuals and video monitors, Cam Control offers NDI® video scopes to assist in evaluating the color and tonal qualities of your image.

Program / Preview Enable: Choose to overlay the scopes on either the program output, the preview output or both.

Transparency Enable: Click the ON button to enable scope transparency, allowing the video image to be visible behind the scopes.

Size: Click the desired scope size.

Position: Selects the position of the overlayed scope on the video image. Select from Top Left, Top Right, Bottom Left and Bottom Right.

**Gamma Gain:** Adjusts the brightness of the displayed scopes.

Mode

Histogram: The Histogram shows the distribution of luminance (brightness) in the image, from darker pixels on the left of the scope, to brighter pixels on the right. The height of the curve is a measure of the number of pixels in the image with a particular luminance value. Unlike the Waveform or RGB Parade scope, the Histogram does not indicate the left to right physical position of the luminance values in the image.

Waveform: The Waveform scope shows the distribution of luminance in the image as a waveform that ranges from zero at the lower horizontal line, to 100 % intensity at the upper horizontal line. The left to right position of the values match their position in the image.

RGB Parade: The RGB Parade shows the intensity of Red, Green and Blue in the image as separate waveforms that range from zero at the lower horizontal line, to 100 % intensity at the upper horizontal line. For each waveform, the left to right position of the values match their position in the image.

Vector: The Vectorscope is a circular graph that displays the chrominance (hue and saturation) of the image colors. The distance from the center indicates the degree of color saturation, from zero intensity at the center of the circle, to 100% intensity at the edge of the circle.

The graph is divided into color segments, each indicated by the colored perimeter of the circle, showing the dispersion of color in the image. A Waveform scope is also displayed on the left side of the Vectorscope.
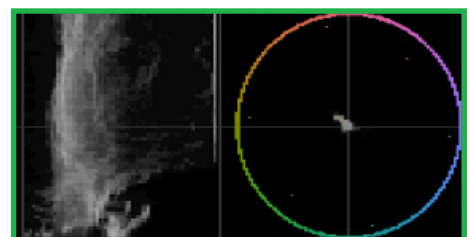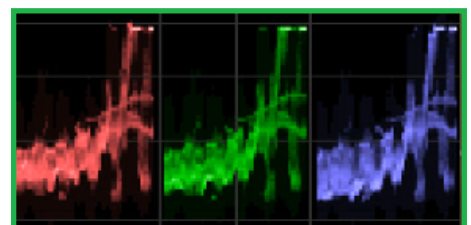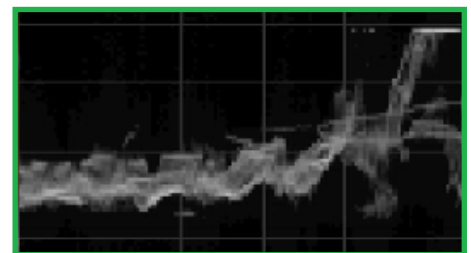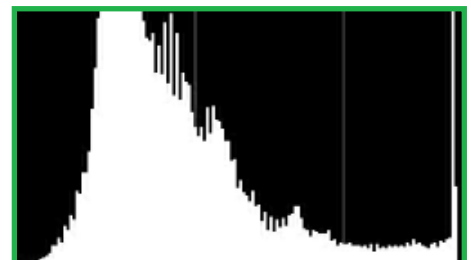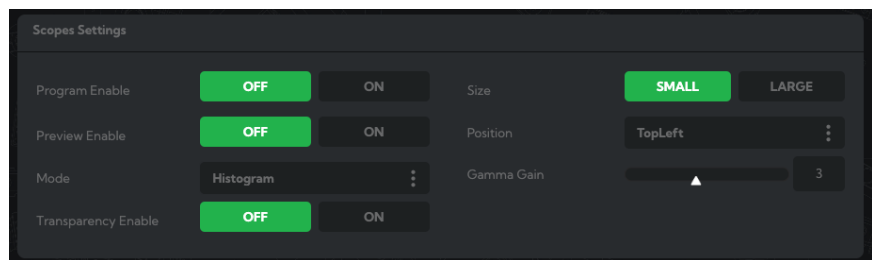
Receiving NDI® Video

There are many applications that support receiving the NDI® signal that the P240 produces. Each application will vary slightly on how you choose your source.

NewTek Studio Monitor

NDI® Tools is a free suite of applications designed to introduce you to the world of IP video and is available here.

The included Studio Monitor application allows you to monitor many NDI® sources on a standard Windows computer. Once Studio Monitor is launched on your computer, simply right click anywhere in the interface and select your camera from the dropdown list.

Once connected to the camera, a configuration gear icon is displayed on the bottom right–hand side of the video display that provides shortcut access the P240 BirdUI.

NewTek TriCaster Series

NewTek TriCaster series devices allow several NDI® sources to be received simultaneously, the amount of simultaneous connections varies by what model TriCaster you have. Consult your TriCaster user manual to determine how many connections are available on your device.

To select the P240 as a source on your TriCaster, click on the configuration gear icon below your desired source location. This will display the **Input Setting** dialog, from which you can select your P240 source from the dropdown list.

Once connected to the camera, a configuration gear icon displays next to the source drop down window that provides shortcut access the P240 BirdUI.

NDI® Camera Control

The easiest way to control your camera is via the BirdDog PTZ Keyboard!

BirdDog PTZ Keyboard 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.
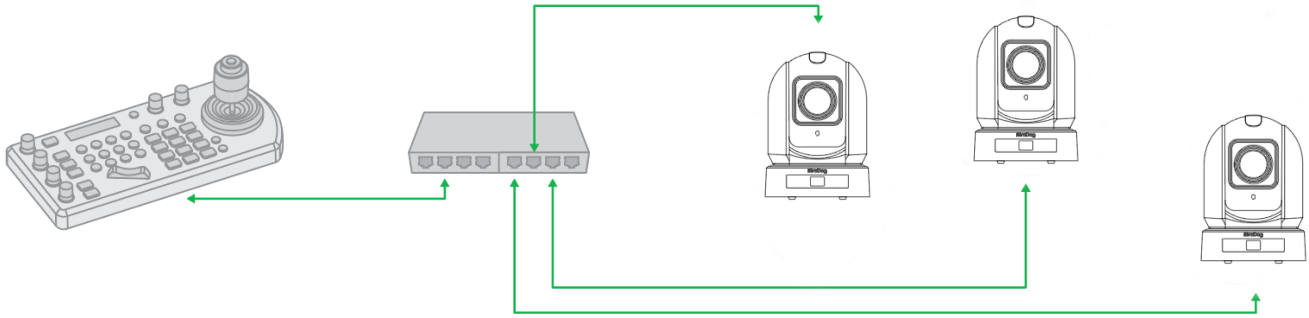
IP Connection

IP Port to Network Switch

1. Connect the camera NDI Ethernet port to a port in a Ethernet switch on your network. The switch must provide PoE+ if you are not using the power adaptor.

2. Connect the PTZ Keyboard's IP port to a port on the Ethernet switch (or other connected switch on the same network subnet).

3. Login to the web interface (BirdUI) of the camera and PTZ Keyboard to configure the appropriate settings.

Remote Controller

You can use the supplied remote controller to control your camera. For instructions on use, please refer here.

Controlling Your Camera Via Other Protocols

P240 also supports control via VISCA-over-IP, RS-232 and RS-422/485. This section details how to configure control under these protocols.

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

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

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

Camera Initial setting status Information

The following information of the camera initial setting status will display on the monitor for 5 seconds.

4. Camera PELCO ID for RS-485 control.
5. Camera ID for IR Remote Controller.
6. IR remote control signal receive current setting.
7. Baud Rate current setting.
8. Control COMM Port current setting.
9. Video format current setting.
10. HDMI current setting.
11. Model number.
12. Firmware version.

VISCA over IP Control

With VISCA over IP, you can control the camera using the VISCA protocol on a controller equipped with IP communication capabilities via LAN.

HDMI Video Signal

3G-SDI Video Signal

PoE Power   VISCA Over IP Control

IR Remote Controller
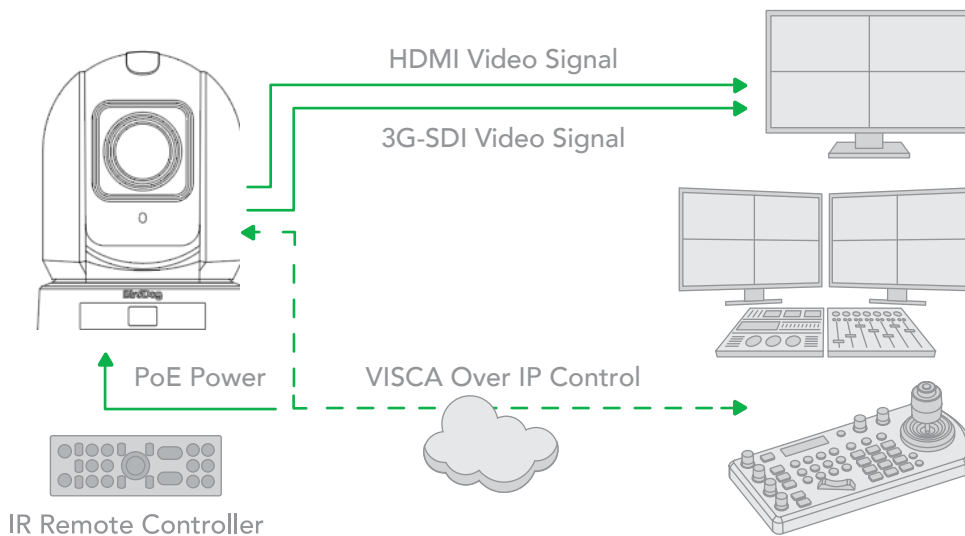
VISCA over IP communication specifications:

- Interface: RJ–45 10 / 100 / 1000 Mbps
- Interface protocol: IPv4
- Transport protocol: UDP
- IP address: 192.168.100.100 By default
- Port: 52381

Controlling via VISCA over IP

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

Setting the Camera Switches

The camera has two switches located on the camera rear panel and base. Turn off power to the camera before changing the switch settings. Power on the camera to have the new switch setting activated.

NOTE: The camera OSD and DIP switch settings override each other. Whichever was the last to be changed will be used by the camera on bootup. It is recommended to set this to the most frequently used resolution and thereafter use the BirdUI to make changes.
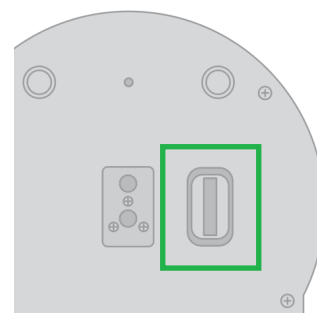
1. Bit 1~3: Camera Address setting for VISCA protocol

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

2. Bit 4: Video Output/Video Color Space
   When using HDMI output to display on HDMI device, set the DIP switch B4 to OFF. When using HDMI to DVI convertor to have DVI video output, set the DIP switch B4 to ON.

4	Colour Space Setting
OFF	YUV Output
ON	RGB Output

3. Bit 5: Reserved

4. Bit 6: RS–232/RS–422 Selection

6	Control Mode
OFF	RS-232
ON	RS-422

5. Bit 7~8: RS–232/RS–422 Baud Rate

7	8	Baud Rate Setting
OFF	OFF	2400 bps
ON	OFF	4800 bps
OFF	ON	9600 bps (Default)
ON	ON	38400 bps

Video Format Switch

The rotary switch on the camera rear panel sets the video format. The switch can select the video formats shown below. It is recommended to set this to the most frequently used resolution and thereafter use the BirdUI to make changes.

Numbers & Letters	Video Resolution
0	1080i 59.94
1	1080p 29.97
2	720p 59.94
3	1080p 59.94
4	1080p 50
5	1080i 60
6	1080p 30
7	1080p 60
8	1080i 50
9	1080p 25
A	720p 50
B	1080p 50
C	720p 25
D	720p 30
E	720p 60
F	-
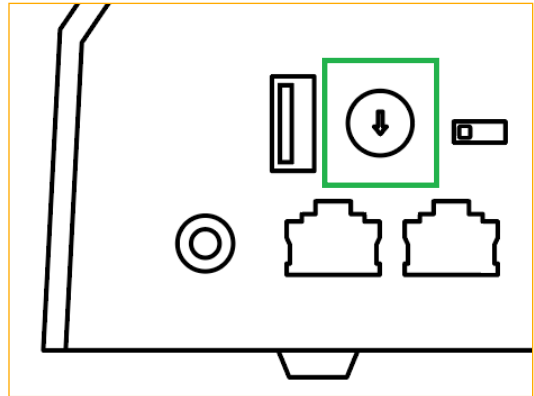
Using RS-232 (VISCA)

You can use the RS-232 port to connect to optional controllers, such as joystick control keyboard, control PC station, to operate the camera, perform pan, tilt and zoom operations using the joystick of the control keyboard, and to use the Preset function using the control buttons.

An application software that supports this unit is needed if you use a PC station.

HDMI Video Signal

SDI Video Signal

Remote Control Signal
(VISCA / RS232)

IR Remote Controller
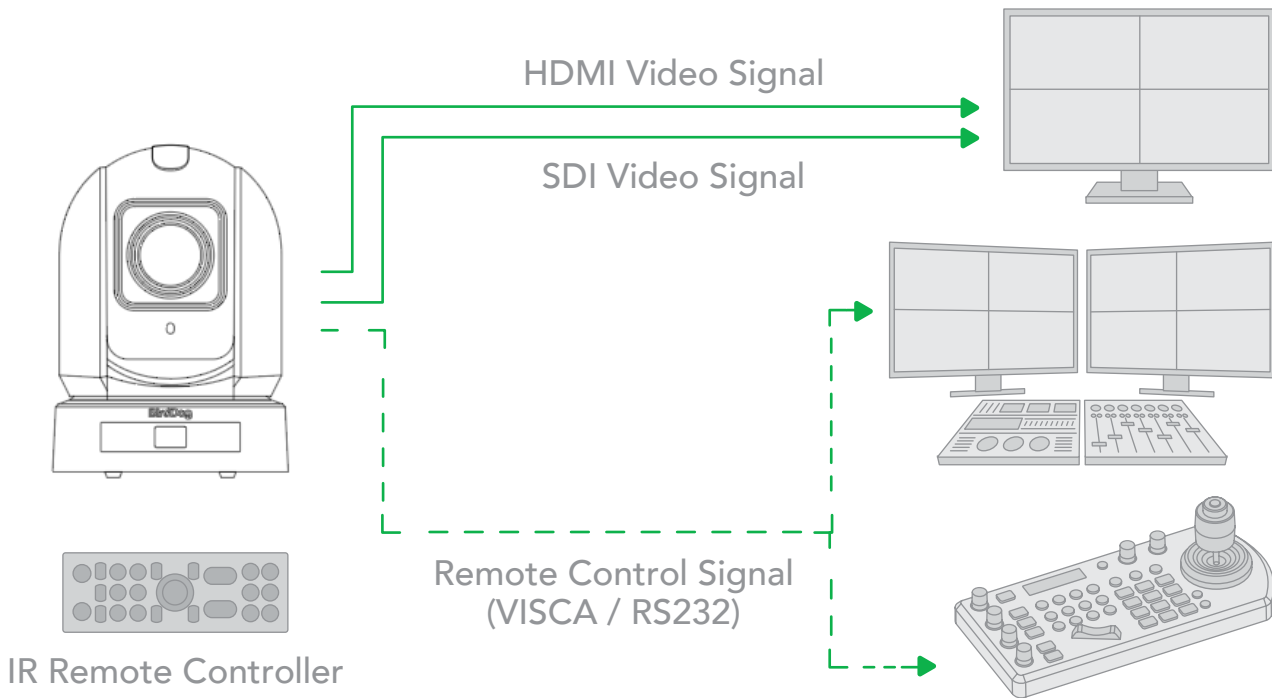
RS232 Connection

1. For base DIP switch:

    - Set to RS232 control.

    - Set the Baud Rate to the same setting as the keyboard you are using.

    - Set the camera control address that you wish to use.

    - If you want to have the camera address to be automatically assigned by VISCA controller, set the DIP switch 1 address to 0.

2. Reboot the camera by turning it Off and On after the DIP switch has been set up correctly.

3. The camera supports Daisy Chain connection up to 7 cameras.

4. Use the included RJ45 to RS232 (VISCA) cable. The controller must be VISCA compatible.

5. Use the included RJ45 to RS232 adaptor cable and an 8 pin Mini Din adaptor to make an RS232 connection for your control device.

1. DTR
3. TX
4. GND
5. RX
7. IR_OUT

IN

Extension cable
RS232 adaptor
included

8 pin Mini DIN
cable connector

OUT

2. DSR
3. TX
4. GND
5. RX

RS232 Serial Port
connection on
controller side

PTZ Keyboard

RS232
Daisy Chain Control
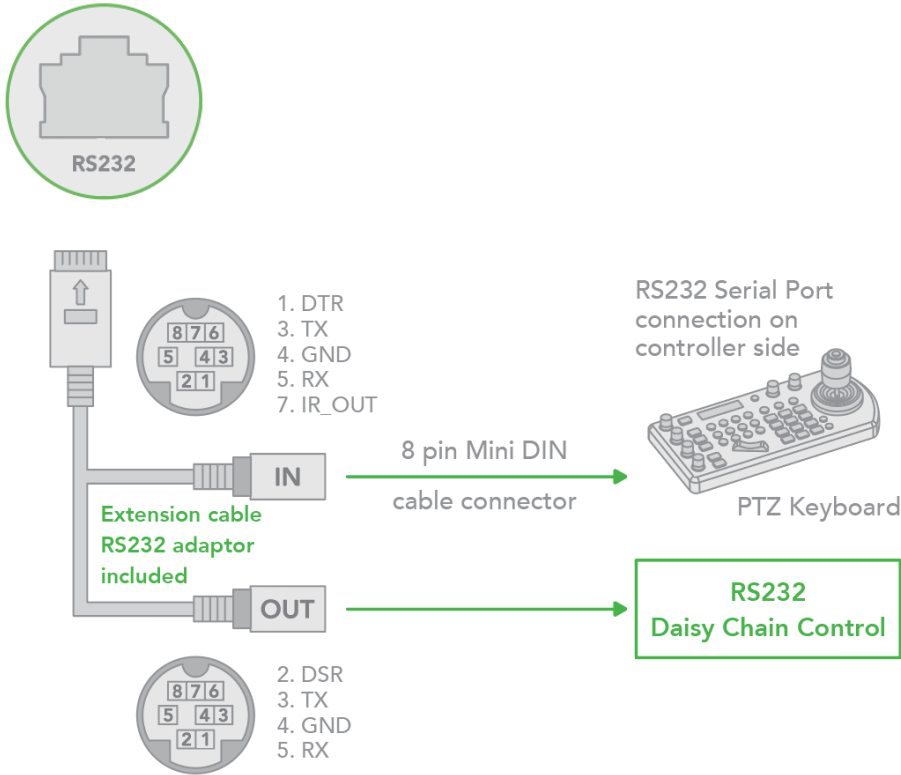
6. Use the included RJ45 to RS422/232 cable with a Phoenix terminal contact adaptor to make an RS232 connection for your control device.

RS232
1. GND
2. RXD
3. TXD

RS232
1. GND
2. RXD
3. TXD

RS232 Serial Port
connection on
controller side

Multicore Control Cable

VCC-CC45RS
RJ45 TO RS422 / 232
CONTROL CABLE ADAPTER

PTZ Keyboard

7. Use a CAT5/6 cable (T–568B standard pinout) to make an RS232 connection by following the pin definition below.

RS232

1 → [connector] ← 8

**CAT5/6
Network Cable**
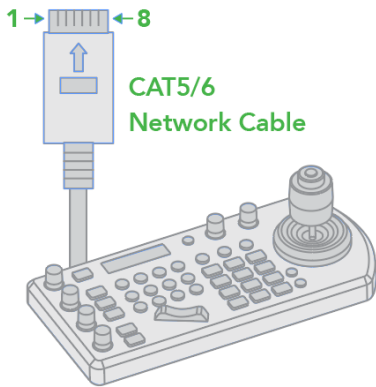
1. IR_OUT   **(Orange/White)**
2. DTR   (Orange)
3. GND   (Green/White)
4. DSR   (Blue)
5. TX_OUT   (Blue/White)
6. RX_OUT   (Green)
7. TX_IN   (Brown/White)
8. RX_IN   **(Brown)**

8. Make an RS232 Daisy Chain multiple camera connection with a standard RS232 serial port controller:

RS232

VCC - CC45232

IN

OUT

(Orange/White)   1. DSR
(Orange)   2. DTR
(Green/White)   3. RXD ⟶ GND
(Blue)   4. GND ⟶ TXD
(Blue/White)   5. TXD ⟵ RXD
(Green)   6. NC
(Brown/White)   7. NC
(Brown)   8. NC

**RJ45 TO RS232
CONTROL CABLE
ADAPTER**

IN

OUT

RS232 Connection
with standard RS232 Serial Port
PTZ Keyboard Controller

Daisy Chain up to 7 cameras
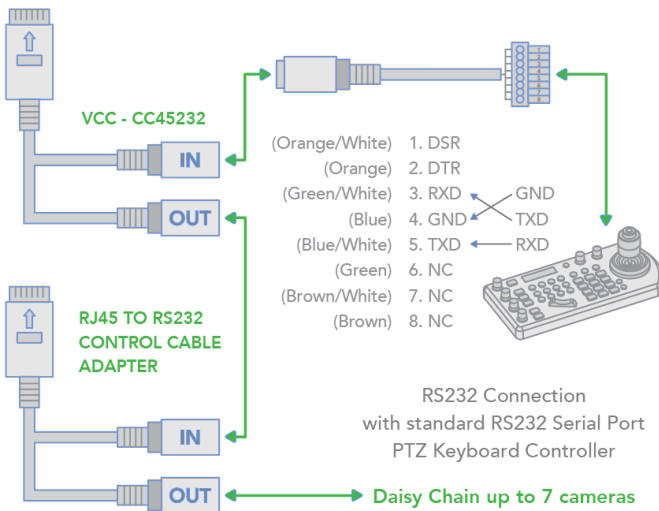
Using RS422 (VISCA)

You can use the RS422/485 port to connect to optional controllers, such as a joystick control keyboard, or control PC station, to operate the camera, perform pan, tilt and zoom operations and to use the Preset function using the control buttons.

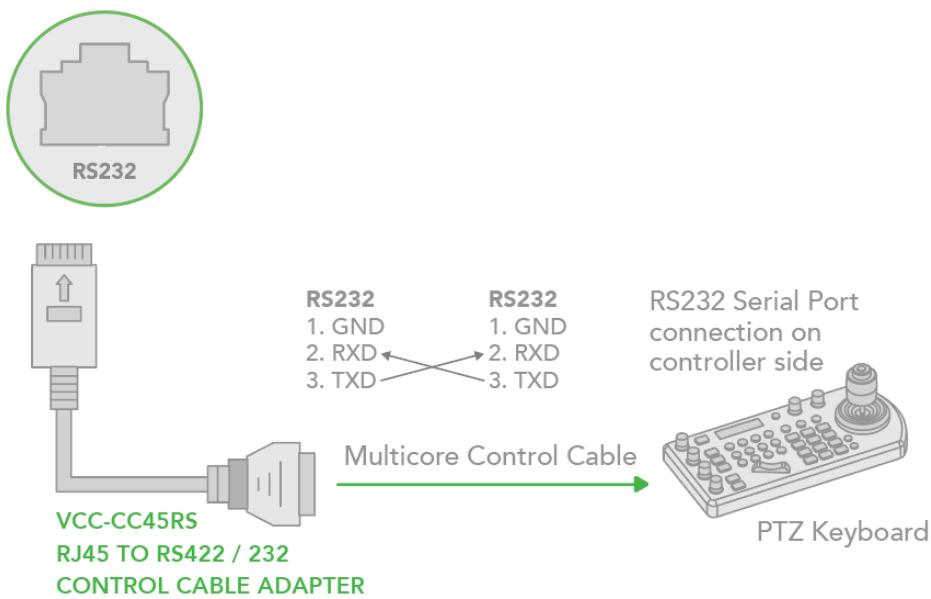An application software that supports this unit is needed if you use a PC station.
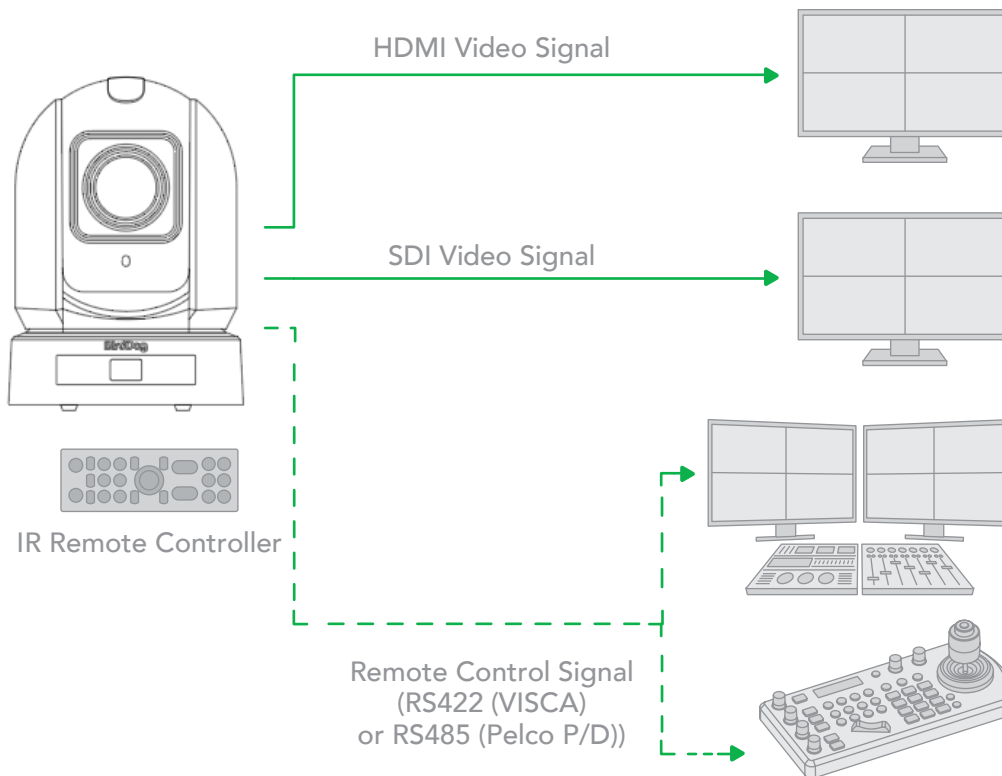

HDMI Video Signal

SDI Video Signal

IR Remote Controller

Remote Control Signal
(RS422 (VISCA)
or RS485 (Pelco P/D))

RS422 (VISCA) connection

1. For base DIP switch:

    *   Set to RS422 control.

    *   Set the Baud Rate to the same Baud Rate setting as the keyboard you are using.

    *   Set the specific address for the controlled camera.

    *   If you want to have the camera address to be automatically assigned by VISCA controller, set the DIP switch 1 address to 0.

2. Reboot the camera by turning it Off and On after the DIP switch has been set up correctly.

3. Use the included RJ45 to RS422 cable. The controller must be VISCA compatible.

4. The camera supports Daisy Chain connection of up to 7 cameras.

Sony Keyboard RS422 Connection

The connection of a SONY keyboard is different than other VISCA (non–Sony) keyboards. Follow the scheme below if daisy chaining multiple cameras using a SONY controller via a RS422 connection.

SONY Keyboard Connection

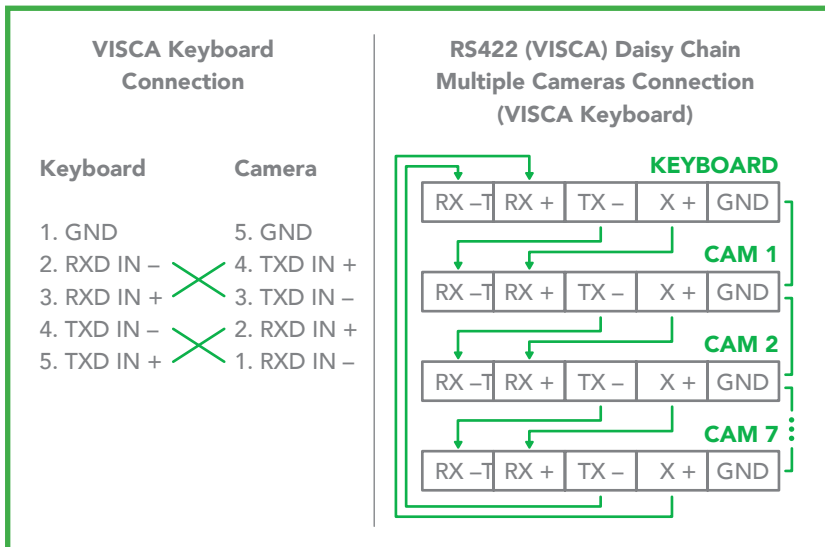| Keyboard	Camera
1. ---	
2. ---	
3. ---	
4. ---	
5. GND	5. GND
6. RXD IN –	4. T +
7. RXD IN +	3. T –
8. TXD IN –	2. R +
9. TXD IN +	1. R –

RS422 (VISCA) Daisy Chain Multiple Cameras Connection (SONY Keyboard)

KEYBOARD
| RX –T | RX + | TX – | X + | GND |

CAM 1
| RX – | RX + | TX – | TX + | GND |

CAM 2
| RX –T | RX + | TX – | X + | GND |

CAM 7
| RX –T | RX + | TX – | X + | GND |
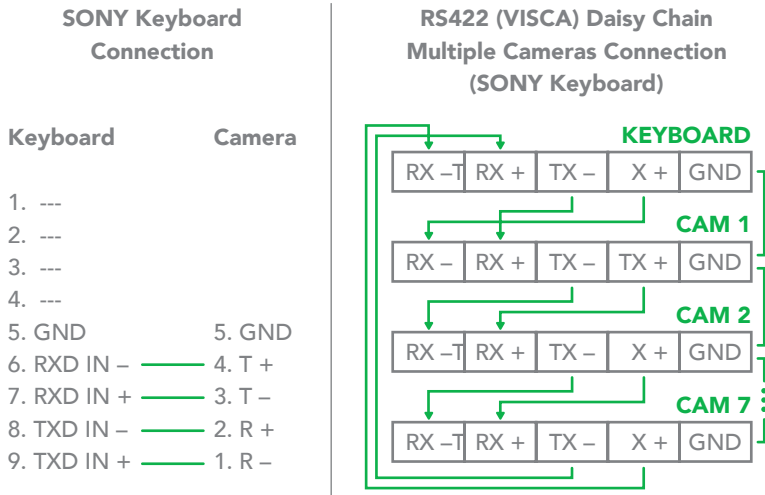
Non–Sony Keyboard RS422 Connection

Daisy chain multiple cameras with a non–Sony controller via a RS422 connection.

VISCA Keyboard Connection

Keyboard	Camera
1. GND	5. GND
2. RXD IN –	4. TXD IN +
3. RXD IN +	3. TXD IN –
4. TXD IN –	2. RXD IN +
5. TXD IN +	1. RXD IN –

RS422 (VISCA) Daisy Chain Multiple Cameras Connection (VISCA Keyboard)

KEYBOARD
| RX –T | RX + | TX – | X + | GND |

CAM 1
| RX –T | RX + | TX – | X + | GND |

CAM 2
| RX –T | RX + | TX – | X + | GND |

CAM 7
| RX –T | RX + | TX – | X + | GND |

a. Use the included RJ45 to RS422 with a Phoenix adaptor to make an RS422 connection for your control device.

RS422

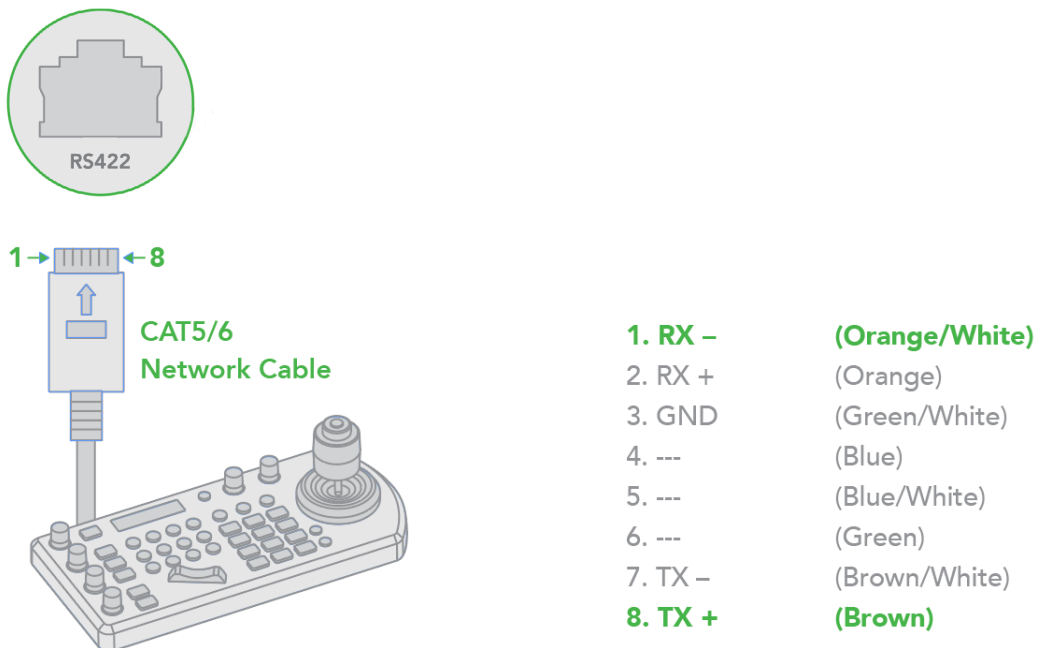RS422 Serial Port connection on controller side

5. R –
4. R +
3. T –
2. T +
1. GND

1 2 3 4 5

VCC-CC45RS
Extension cable RS422
adaptor included

Multicore

Control
Cable

PTZ Keyboard
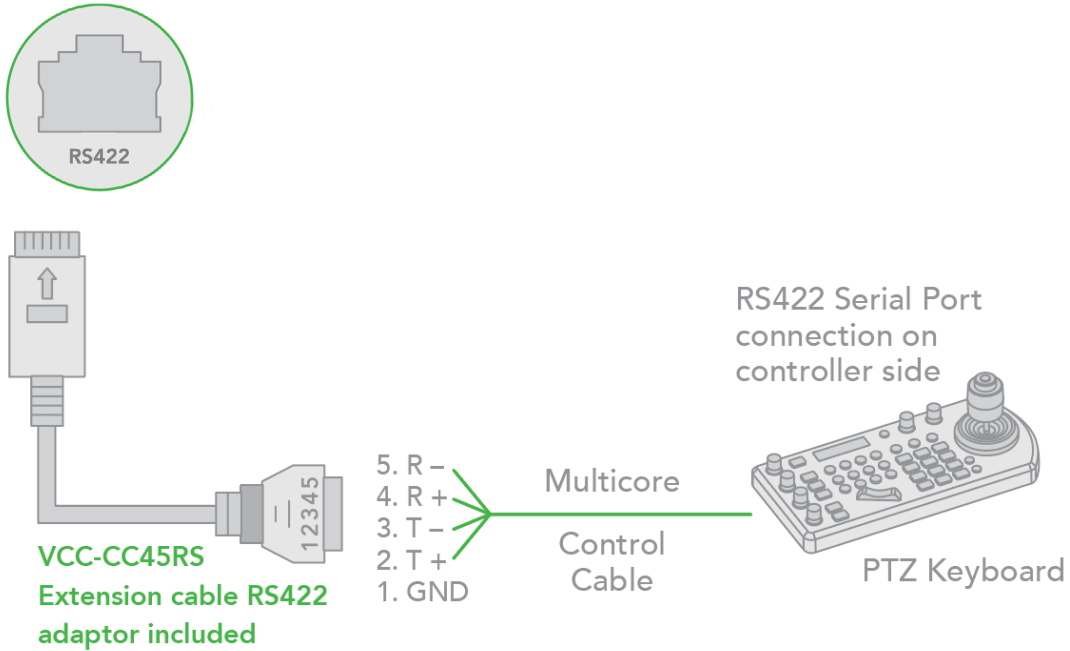
b. Use a CAT5/6 T–568B cable for an RS422 direct connection between the camera and the controller by following the pin definition below.

RS422

1 → 8

CAT5/6
Network Cable

1. RX –   (Orange/White)
2. RX +   (Orange)
3. GND   (Green/White)
4. ---   (Blue)
5. ---   (Blue/White)
6. ---   (Green)
7. TX –   (Brown/White)
8. TX +   (Brown)

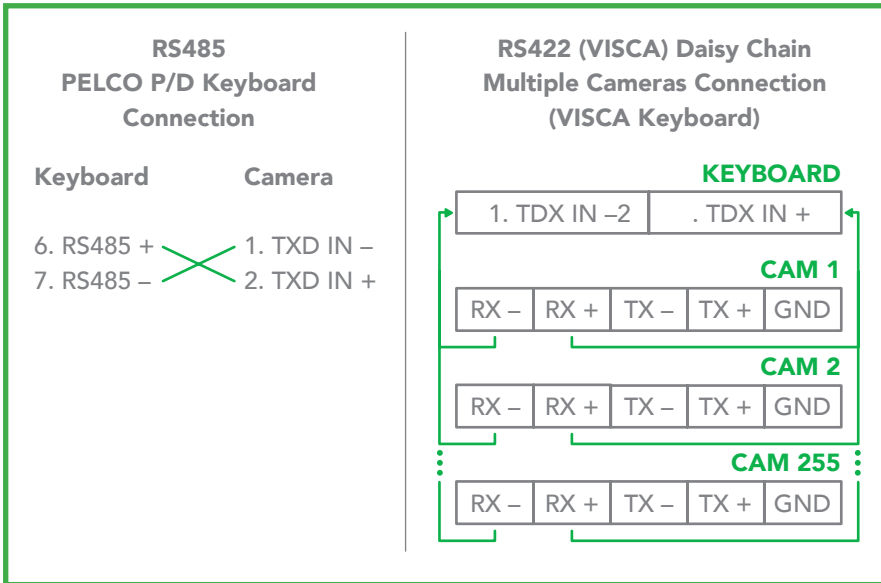c. Make an RS422 daisy chain multiple camera connection with an RS422 standard serial port controller.
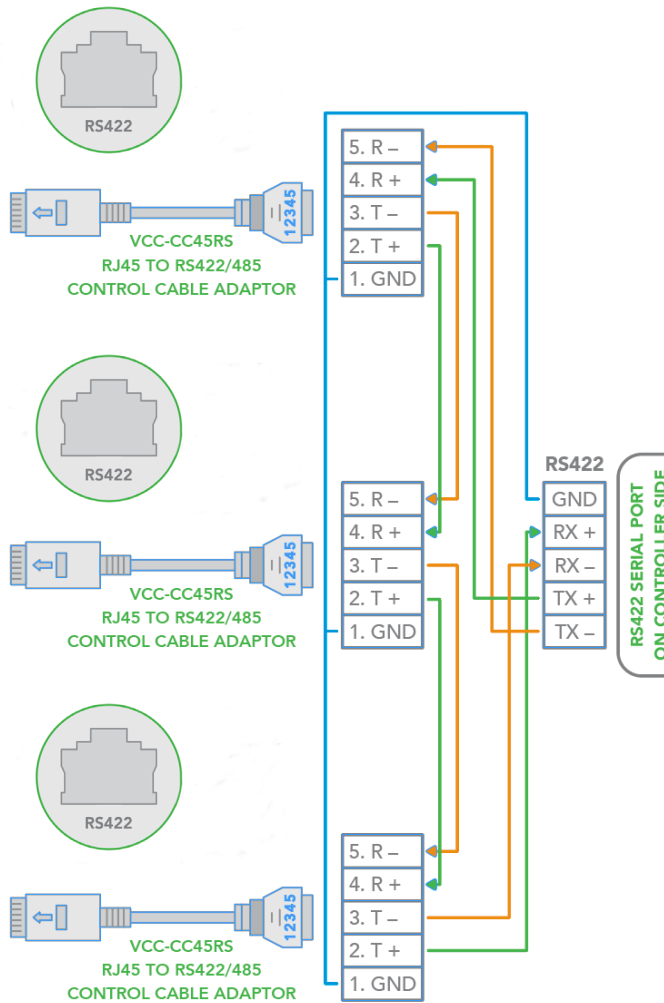
PELCO P/D Keyboard RS485 Connection

NOTE: Use the RS422 port for RS485 connection. Only use TX+ and TX− for RS485 connection.

1. For base DIP switch:

   • Set to RS422 control.

   • Set the Baud Rate to match the Baud Rate setting on the controller keyboard.

2. Set the camera ID on OSD menu by remote controller

3. Reboot the camera by turning it Off and then On after the DIP switch has been set.

4. Use a PELCO P/D compatible keyboard.

5. Use preset #95 on the keyboard to display and exit the camera OSD menu.

6. Use joystick and button "OPEN" or "CLOSE" to navigate the OSD menu.

7. To operate the keyboard, please refer to the keyboard user manual.
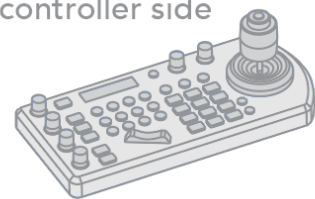
PELCO RS485 Connection

RS485 PELCO P/D Keyboard Connection	RS422 (VISCA) Daisy Chain Multiple Cameras Connection (VISCA Keyboard)

Keyboard   **Camera**

6. RS485 +   ⤬   1. TXD IN –
7. RS485 –   2. TXD IN +

KEYBOARD

1. TDX IN –2	. TDX IN +

CAM 1

RX –	RX +	TX –	TX +	GND

CAM 2

RX –	RX +	TX –	TX +	GND

CAM 255

RX –	RX +	TX –	TX +	GND

a. Use the included RJ45 to RS422 cable with a Phoenix adaptor to make an RS485 connection for your control device.

RS422

VCC-CC45RS
Extension cable RS422
adaptor included

1 2 3 4 5
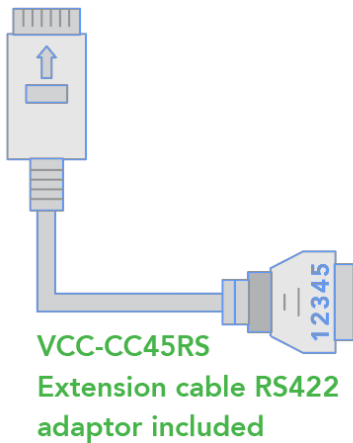
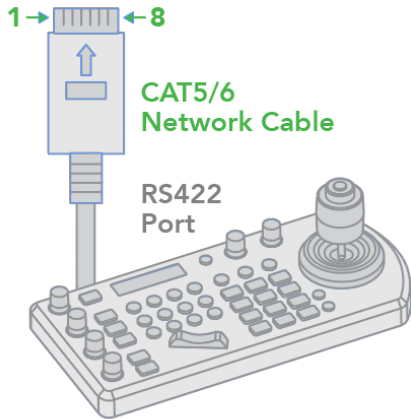5. R –
4. R +
3. T –
2. T +
1. GND

Multicore

Control
Cable

RS485 Serial Port
connection on
controller side

PTZ Keyboard

b. Use a CAT5/6 T–568B cable to make an RS485 connection between the camera and the controller by following the pin definition below.


CAT5/6 Network Cable

RS422 Port

1. **RX –**   **(Orange/White)**
2. RX +   (Orange)
3. GND   (Green/White)
4. ---   (Blue)
5. ---   (Blue/White)
6. ---   (Green)
7. TX –   (Brown/White)
8. **TX +**   **(Brown)**

c. Follow the scheme below for making connections for multiple cameras using an RS485 standard serial port controller.

   NOTE: For RS–232 VISCA control, P240 supports daisy chain connection of multiple cameras.
   For control details, refer to the operating instructions of your control keyboard/station software.

   • You need to match the communication speed (Baud Rate) between the camera and the joystick controller.

   • You cannot use the RS–232 connections while you are using the RS422/485 connection.
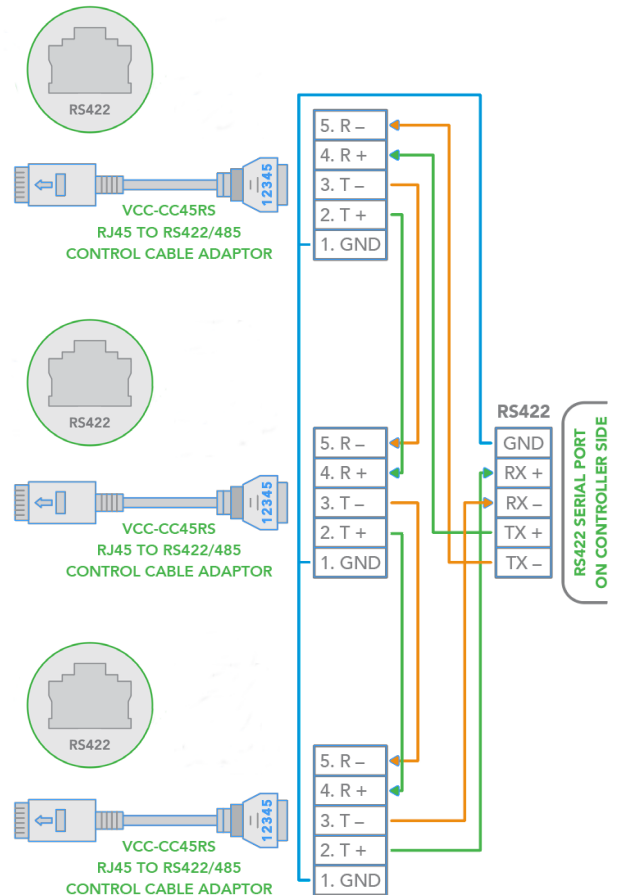
Operating Multiple Cameras using RS–232 and 422/485

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

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.

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