



# PF120

UNBOX YOUR NEW NDI® BOX CAM.



USER GUIDE

NDI®

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# Operating Instructions

Thank you for purchasing our product. If there are any questions, please contact your authorized dealer.

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

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# IMPORTANT INFORMATION

## Legal Notice

### Attention:

To ensure account security, please change the password after your first login. You are recommended to set a strong password (no less than eight characters).

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.

# WHAT'S IN THE BOX

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

1x BirdDog PF120  
1x Camera Power Adaptor & Power Cord  
1x Welcome Pack

## OVERVIEW

This user guide is suitable for the following models: BirdDog PF120.

### About NDI

Network Device Interface (NDI) is a high performance standard that allows anyone to use real time, ultra low latency video on existing IP video networks.

NDI® harnesses the power of Software, Computers, and Networks to make video creation and sharing accessible and fun for millions, helping fuel the software defined visual storytelling revolution. NDI makes video a standard part of every computer network, from common IT implementations to mobile environments and has changed the picture- giving everyone access to easy-to-use, high-quality video using the equipment they have today.

NDI® moves live digital media around with your existing software applications, computing devices, and networks using what you already have.

NDI® empowers even small teams of creatives to achieve big show results, as there are no limitations from specialized upgrades, networks, or hardware.

### About BirdDog PF120

BirdDog PF120 is a remotely controllable camera based on BirdDog's unique Full-bandwidth NDI A/V transfer protocol. It is equipped with many features to ensure the quality of images and control is kept to the highest standards as well as being fully compatible with industry standards.

### Features

- Resolution: Up to 1080P60, 1080i59.94
- Zoom: Optical 20X
- Video Output: HDMI, NDI®, USB (UVC protocol) simultaneously
- 128 presets
- Standard mounting and ceiling mounting with E-Flip function
- Control supports RS-232 control, VISCA-over-IP, Pelco D/P, NDI® Control
- Image parameter setting restore with presets and quick access operation
- Supports Audio input, Audio output with NDI® streaming.
- Power: DC 12V, PoE(IEEE802.3af)
- Firmware upgrade via IP.

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.



## **WARNING!**

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

### **Warnings:**

- If the product does not work properly, please contact your dealer. Never attempt to disassemble the camera yourself. (We will not assume any responsibility for problems caused by unauthorized repair or maintenance.)
- This installation should be made by a qualified service person and should conform to all the local codes.
- When shipping, the camera should be packed in its original packaging.
- Make sure the power supply voltage is correct before using the camera.
- Do not drop the camera or subject it to physical shock.
- Do not touch sensor modules with fingers. If cleaning is necessary, use a clean cloth with a bit of ethanol and wipe it gently. If the camera will not be used for an extended period of time, put on the lens cap to protect the sensor from dirt.
- Do not aim the camera lens at the strong light such as sun or incandescent lamp. The strong light can cause fatal damage to the camera.

### **Maintenance Precautions:**

- If there is dust on the front glass surface, remove the dust gently using an oil-free brush or a rubber dust blowing ball.
- If there is grease or a dust stain on the front glass surface, clean the glass surface gently from the center outward using antistatic gloves or an oil-free cloth. If the grease or the stain still cannot be removed, use anti-static gloves or an oil-free cloth dipped with detergent and clean the glass surface gently until it is removed.
- Do not use organic solvents, such as benzene or ethanol when cleaning the front glass surface.

### **Regulatory Compliance**

#### **FCC Part 15**

This equipment has been tested and found to comply with the limits for digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: This device may not cause harmful interference.

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



#### **LVD/EMC Directive**

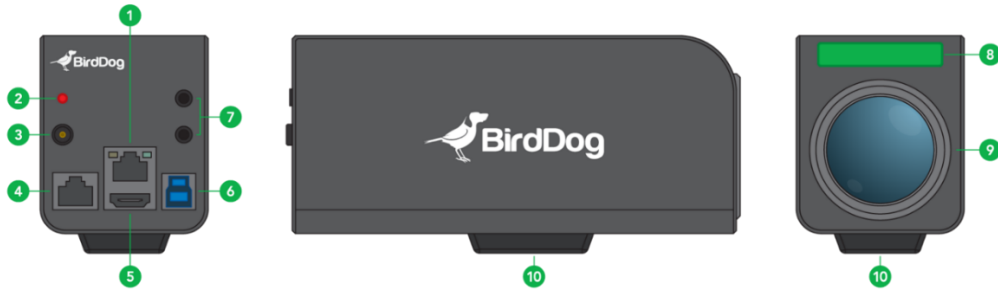
This product complies with the European Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC.



#### **WEEE Directive–2002/96/EC**

The product this manual refers to is covered by the Waste Electrical & Electronic Equipment (WEEE) Directive and must be disposed of in a responsible manner.

# Camera Diagrams



1. **PoE / NDI® Ethernet Port**
2. **Power LED Indicator**
3. **12V DC Power Port**  
Connect the supplied DC power adaptor and cord.
4. **RS-232 Control Port (RJ45)**
5. **HDMI Port (HDMI 1.4)**
6. **USB Connector (TYPE B)**  
USB 2.0 video output.
7. **Audio In/Out port**  
3.5mm audio jack
8. **Tally indicator**
9. **Lens**  
This is a 20X magnification optical zoom lens
10. **Tripod mounting holes**

## Powering PF120

PF120 is equipped with a sophisticated system allowing power from various sources:

### PoE (Power over Ethernet)

PoE is a convenient way to power PF120 as it allows both data and power to be sent through the same standard Ethernet cable. To take advantage of PoE, the network switch that PF120 is directly plugged into must support PoE (802.3af).

Different network switches are capable of providing differing amounts of total power to all connected devices. PF120 uses approximately 10 watts in PoE mode.

### DC

Located at the rear of the PF120 is a DC connection port. This power input socket is capable of accepting 12vDC power. PF120 should only be powered by the included AC adaptor.

## Thermal management

This product has been engineered to be actively cooled. In order to achieve best thermal performance the fan assembly has been carefully designed to provide optimum cooling while remaining extremely quiet. The main processor is capable of operating up to 100° C / 212° F. In extreme circumstances (a hot day/direct hot sun) it is advised to power PF120 via DC as this produces less heat than PoE.

BirdDog PF120 has been tested in extreme environments.



# System Configuration

## Booting up your BirdDog PF120

### Indication of system boot process

As soon as BirdDog PF120 detects a power input signal the power light on the back panel will light up red.

### On the ethernet/NDI connector on the rear.

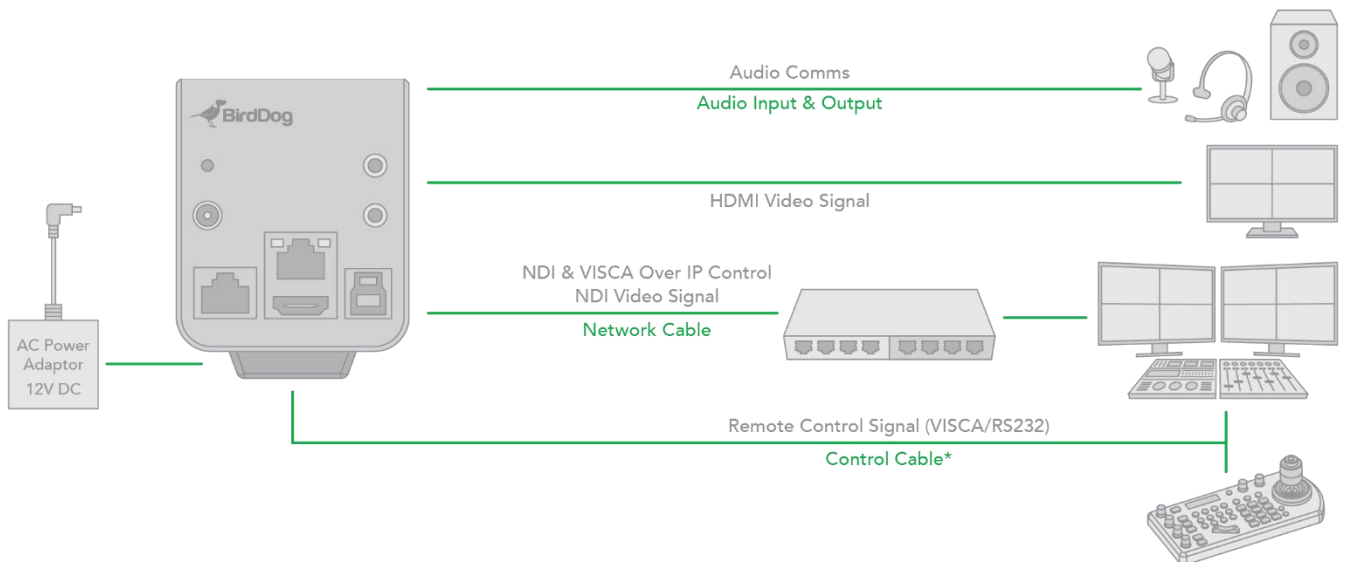
After initial boot up is complete your PF120 unit will be visible as a source on any NDI compatible devices on the SAME ethernet subnet. For further networking architecture instructions including routing please consult either your system administrator or the support page at [bird-dog.tv](http://bird-dog.tv).



## Connection

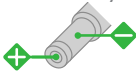
When the camera is connected to a computer and joystick keyboard with a VISCA cable (cross type, RS-232), you can operate the camera with the computer and the joystick keyboard.

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



## Power

- Use only the DC power adaptor (JEITA type4) supplied with the unit. Do not use any other DC power adaptor.



- If using PoE to power the camera, PoE(IEEE802.3af) is supported.
- Ensure that the PoE power source has sufficient power budget to power the camera, or some features may not function properly.

## Obtain Video Signal

The camera can simultaneously have HDMI video output, USB video output and NDI® video output.

### HDMI HD Video signal

Connect the camera to a HD monitor/TV using HDMI cable.

1. Turn on the camera, video will display on the monitor after running initializing.
2. Information of the camera initial setting status will display for 5 seconds.
3. You can set the video format of the camera to the one you want to display.

### IP Video Signal

The camera can simultaneously stream NDI® video output and HDMI video output.

1. Connect the camera to the network using Cat5/Cat6 network cable.
2. You need to have a web browser for product configuration.
3. PELCO address and Baud Rate setting on the camera must be as same as the setting on camera IP WEB interface.
4. To obtain NDI® video please configure your NDI® video network.

### USB Video Signal

This camera supports USB 2.0 video (UVC protocol).

## Camera Initial setting status Information

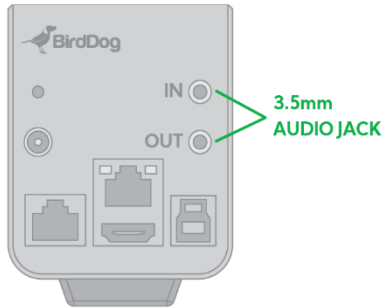
Information of the camera initial setting status will display for 5 seconds.

1. Camera PELCO ID for RS-485 control
2. Camera ID for IR Remote Controller
3. Baud Rate current setting
4. Control COMM Port current setting
5. Video format current setting
6. HDMI current setting
7. Model number
8. Firmware version

CAMERA STATUS INFO DISPLAY	
PELCO ID	001
BAUD RATE	9600
COMM TYPE	232
FORMAT	1080p29.97
HDMI OUT	YUV
MODEL TYPE	PF120
SV	V0B1100S36[...]



## Audio IN / OUT



- A microphone can be connected to the Audio IN port, which feeds audio into the camera.
- A speaker can be connected to the Audio OUT port, which will output any audio that is captured on the Audio In port.

## Camera control method and system configuration

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

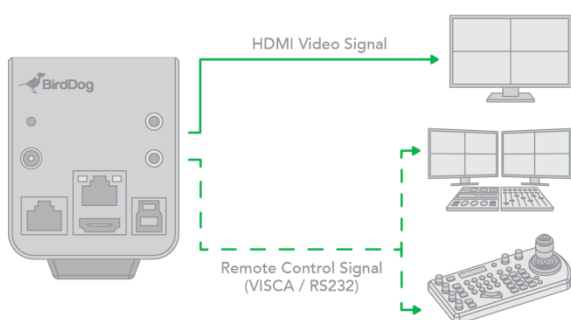
1. Use RS-232 (VISCA)
2. Use IP (VISCA/PELCO P/D)
3. NDI® Control

### Use RS-232 (VISCA)

You can use RS-232 port to connect to optional controllers, such as joystick control keyboard, control PC station, to operate the camera.

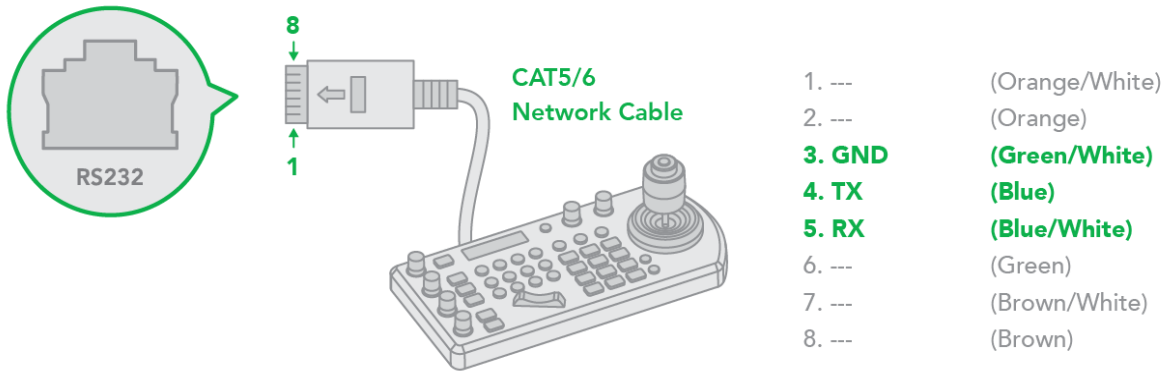
To perform zoom operations using the joystick of the control keyboard, and to perform the Preset operation using the control buttons.

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



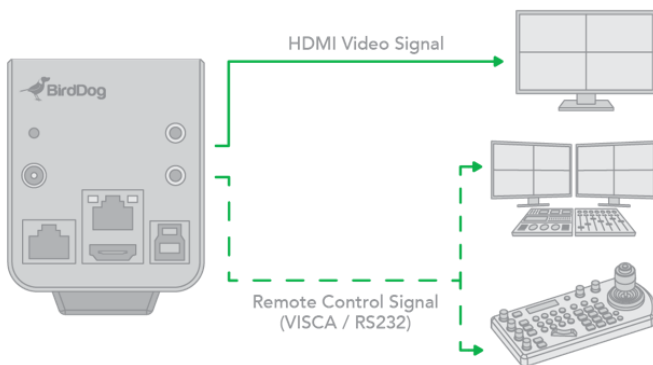
### RS232 Connection

1. Set Baud Rate settings the same as Baud Rate setting on the keyboard you are using.
2. Set specific camera address that you want to control the camera for.
3. Reboot the camera.
4. Camera supports Daisy Chain connection up to 7 cameras.
5. Use the RJ45 to RS232 (VISCA) control cable. The controller must be VISCA compatible.
6. Or you can use CAT5/6 network cable (T-568B standard pinout) to make RS232 connection by following the pin definition below:



### VISCA over IP Control

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



The communication specifications of VISCA over IP are followings:

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

## VISCA over IP Network Configuration

### Re-assign the camera

The default information of the IP camera is following:

- Static IP: 192.168.100.100
- Subnet mask: 255.255.255.0
- Gateway: 192.168.100.1
- VISCA over IP control port: **52381**.

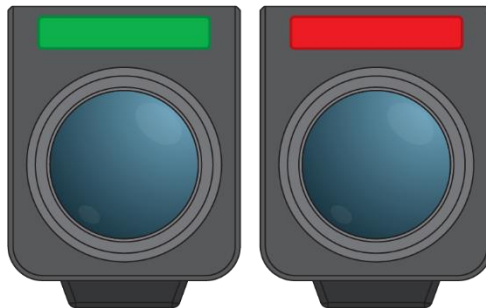
The camera IP address needs to be assigned to the IP address that works with your local network.

### Controlling via VISCA over IP

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

### Onboard Tally

PF120 supports Tally within the NDI protocol. Tally is a method of identifying which source is being used 'on air' at any particular time. Whenever a PF120 source is being used on the program output of an NDI compatible receiver that supports Tally metadata, the LED will light up red on the front of the PF120 unit.



## Operating BirdDog PF120

### Web configuration panel

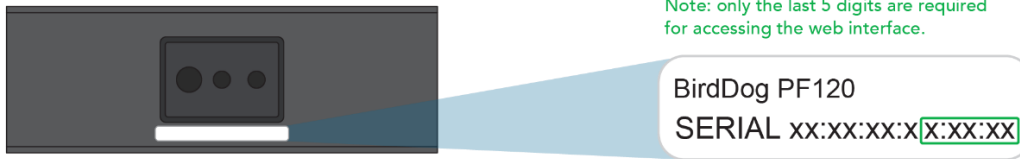
In this release, the web configuration panel allows you to alter key settings of PF120, specifically A/V settings, and video frame rates, restarting the video processing engine, changing networking parameters, recalling presets and applying firmware updates.

### Access via web browser (URL)

To access the BirdDog Dashboard please point your computer web browser to:

<http://birddog-xxxxx.local/>

“xxxxx” is the serial number of the PF120, the serial number is printed on the box and on the main unit. Note the web address is case sensitive and should be all lower case. Your computer will need to have ‘Bonjour’ services loaded in order to access the unit via it’s ‘friendly’ name described above. Apple devices come pre-installed with Bonjour, while Windows devices need a small plugin available here: [support.apple.com/kb/dl999?locale=en\\_AU](http://support.apple.com/kb/dl999?locale=en_AU)



### Accessing PF120 via an IP address

PF120 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 PF120 receives an IP address automatically from this server (DHCP) the IP address can be discovered in several ways, including BirdDog Central Lite available from: <http://www.bird-dog.tv/>

### Accessing PF120 on a network without a DHCP server

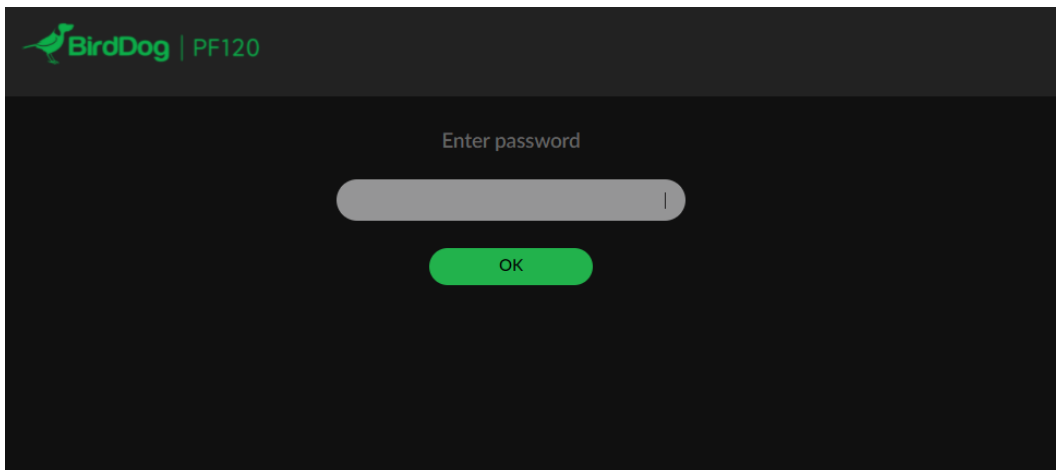
Some standalone or private networks may not have a DHCP server. After 30 seconds of searching for an automatically assigned IP address PF120 will fall back to a default address which is: 192.168.100.100

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

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

### Password management

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



### Default password

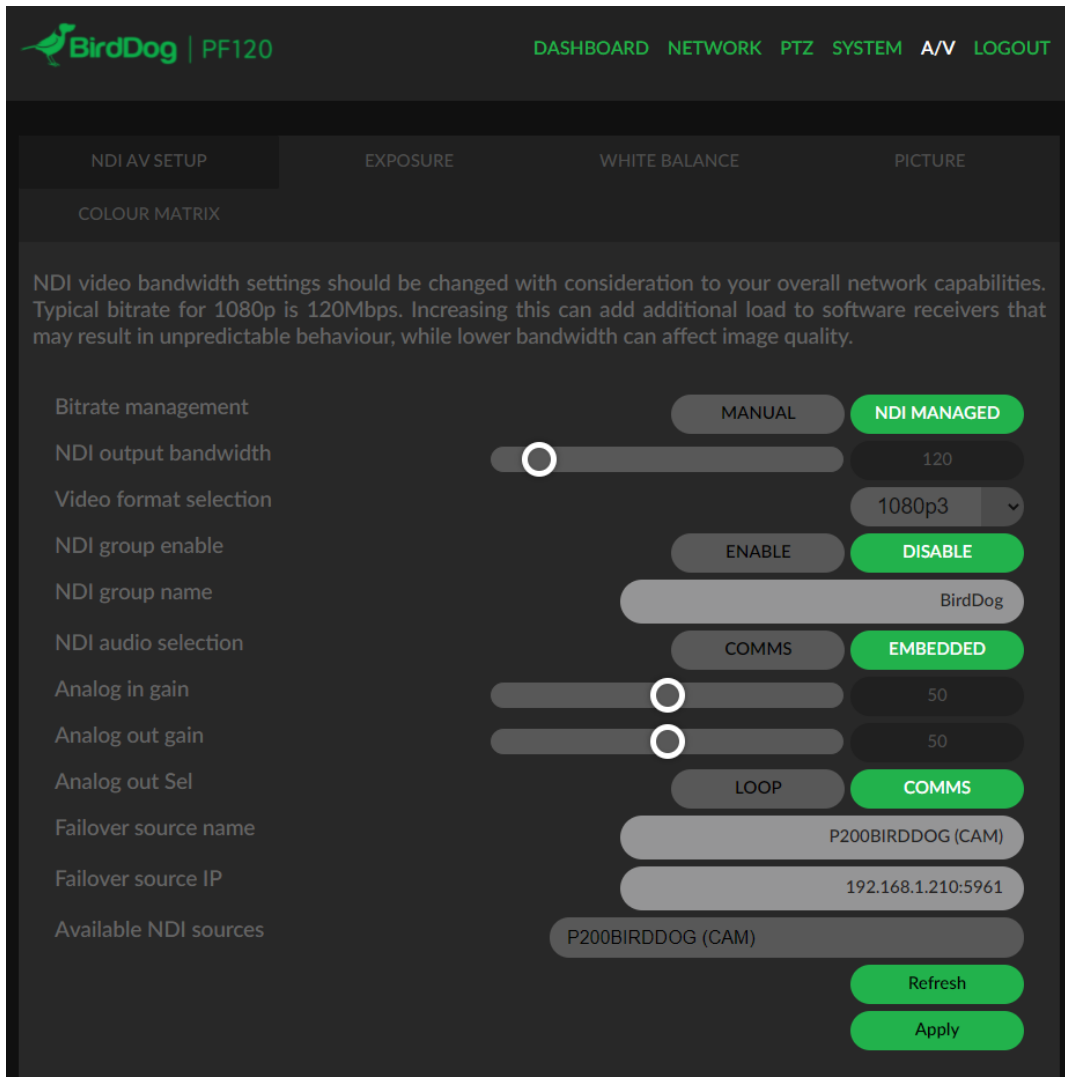
The web configuration panel is secured by a user-selectable password. The default password is:

**birddog** (one word, lower case).

To change the password simply login using the default password, navigate to the network tab in the web interface, and select change password.

It is recommended to change this password in a network environment where PF120 is shared with other users (e.g. not private). By entering this password, the user is granted full access to the PF120 configuration settings and could interrupt a live program.

## AV



### 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 on your networking infrastructure (lower bandwidth) or higher image quality for critical footage. The scale allows you to select anywhere from 60mbps to 360mbps.

By setting Bitrate Management to NDI MANAGED, the BirdDog device will manage the target bitrate in accordance with the NDI® standard.

By selecting MANUAL you are able to manually select a target bitrate. **NDI video bandwidth settings should be changed with consideration to your overall network capabilities. Typical bitrate for 1080p is 120Mbps. Increasing this can add additional load to software receivers that may result in unpredictable behavior, while lower bandwidth can affect image quality.**

### NDI Video format selection

You can change the video format by adjusting this item. Depending on the video client software you are using, some video software may need to be restarted to obtain the new video format.

The video formats that you can select from are:

1080P:60/59.94/50/30/29.97/25,1080I:60/59.94/50, 720P:60/59.94/50/30/25

### NDI Group Enable

NDI v 4.5x supports NDI groups. This allows you to set the BirdDog PF120 camera to only announce it's availability to other devices that belong to the same NDI group. By default this setting is DISABLED. When enabled the receiver device needs to also be set to the same identical group name. Commonly this is done using the NDI Access Manager application provided by NewTek free of charge.

NDI Groups can be very useful in larger environments to control visibility and access amongst various groups.

### NDI Audio Selection

BirdDog PF120 has the ability to route the incoming audio from the 3.5mm audio input socket to either be embedded in the main NDI® stream, or to behave as an audio comms end-point. If you operate the BirdDog Comms application you can then use the PF120 as an output for IFB communications.

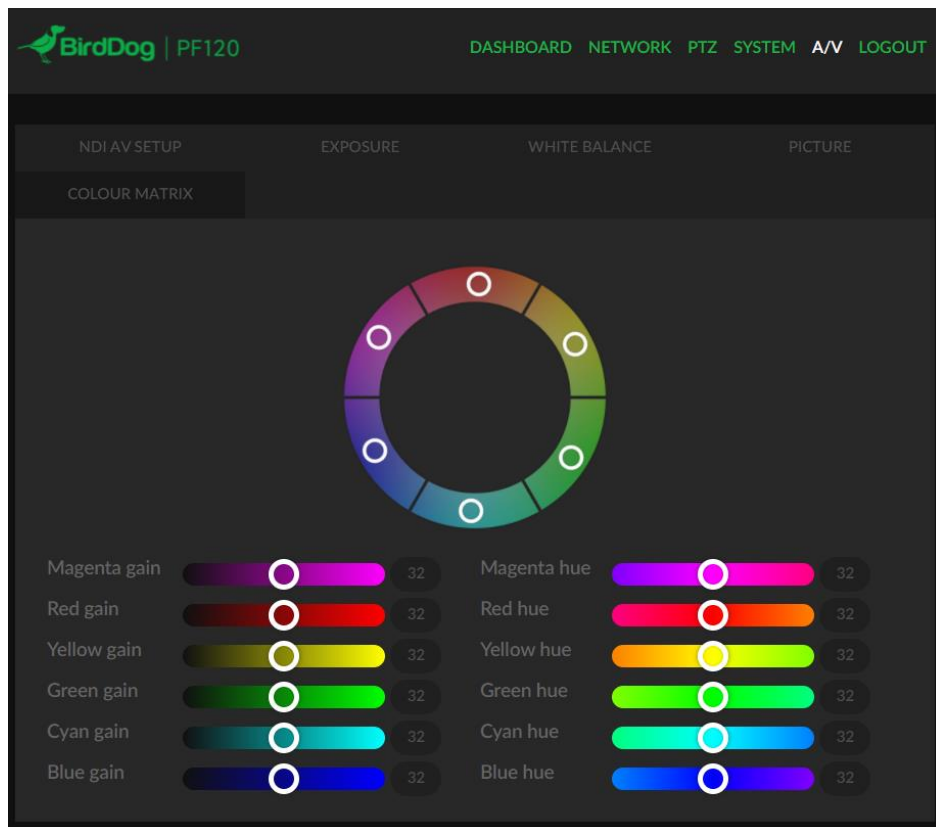
### Failover Source

BirdDog PF120 can inform any receiving device of a failover scheme. This means if their BirdDog NDI stream is interrupted for any reason the receiver can automatically switch to a pre-determined alternative NDI stream. This is particularly useful for live 'on air' productions where there can be no risk of still frames or black being broadcast should any source no longer be available. Select an available NDI source for the failover function from the dropdown list in 'Available NDI sources'. You can update this list by pressing Refresh source list in either Chrome or Firefox web browsers.

## Advanced Controls

BirdDog PF120 supports some advanced controls to enable greater fine-tuning of image properties for either matching images with other cameras in your production or pushing the overall dynamic performance of the camera for more true to life and sharper images.

These advanced controls are placed into three distinct setting sections: Colour Matrix, Colour Enhancement and Image Enhancement.



### Colour Matrix

The Colour matrix section allow you to fine-tune the cameras performance for individual colours across the spectrum.



You can see in this figure that the color spectrum is divided into six sections, these being Red, Green, Blue, Cyan, Magenta and Yellow.

The Colour Matrix control allows individual fine-tuning of each of these colour sections without affecting the response of other colour components. The controls allow for adjustment of Gain (Intensity) and Hue (offset) of each colour.

### Colour Gain

The Gain control of each colour component defines how intense that colour is represented in the image that is produced by the camera. The default level (32) is a moderate gain which shows an even bias between all pixels that contain the colour. I.e. a dark red will have the red component shown as vividly as a bright red, this generally gives a balanced look to your colour representation.



By increasing the gain value, the camera will add additional intensity to all parts of the image pertaining to this colour. For example, if you increase the Red gain value to 64 all pixels that are red in the image will have a boost of colour compared to other colours in the image resulting in a more vivid representation of this colour.

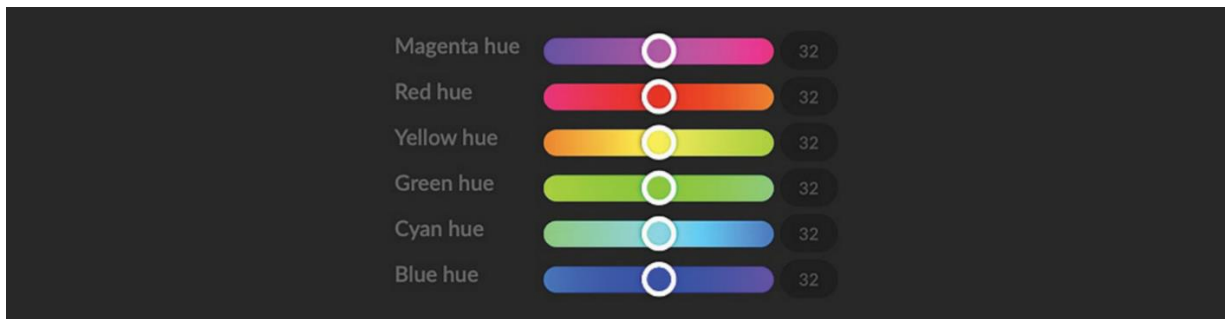
Conversely reducing the colour gain will take some intensity out of the target colour. This can be useful in some lighting conditions where certain colours appear over saturated to the camera.

### Colour Hue

The Colour Hue option adjusts the temperature or phase in which any colour is represented. When looking at the colour spectrum, beyond the true colour points for each of the main colour adjustments in the camera (Red, Green, Blue, Cyan, Magenta and Yellow there are areas where the colours transition to their neighboring colour point.



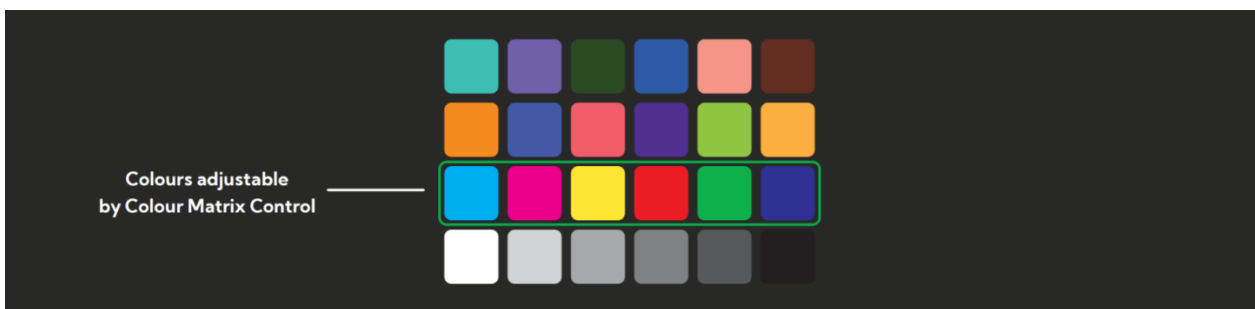
In PF120 Colour Matrix controls you can adjust the colour offset in a negative (counter clockwise) or positive (clockwise) direction, effectively moving the cameras response to any colour towards its neighbouring colour transition point.



Adjusting individual colour Hue can assist dramatically in matching colour representation from the camera to true-to like colours or matching the PF120 to other cameras in your production.

### Recommended practice for using Colour Matrix controls

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 PF120 Colour Matrix.



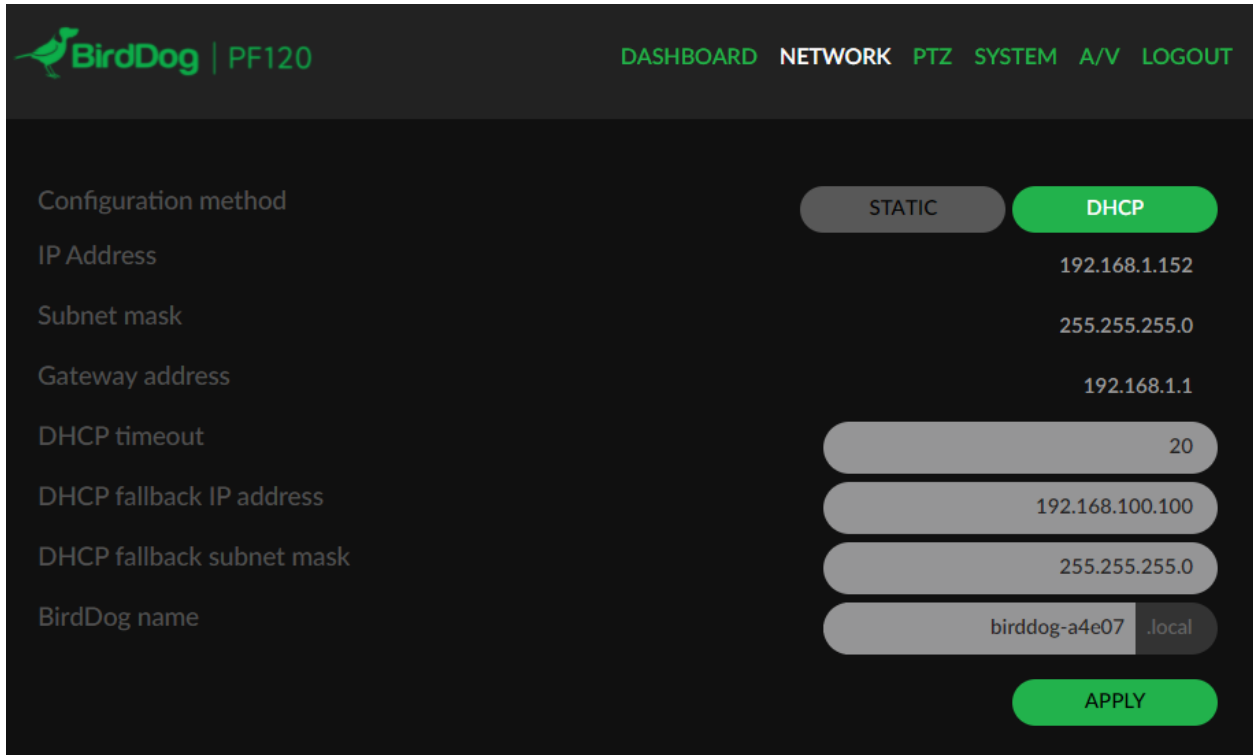
## Network settings and device naming

### Device naming

When PF120 is first powered on it defaults to the naming convention as described in the web configuration panel section of this manual.

<http://birddog-xxxxx.local/>

It is possible to change the name along with the network settings to better suit your environment. In the web configuration panel, navigate to the network section.



The screenshot shows the BirdDog PF120 web configuration interface. At the top, there is a navigation menu with 'DASHBOARD', 'NETWORK', 'PTZ', 'SYSTEM', 'A/V', and 'LOGOUT'. The 'NETWORK' section is active. The configuration method is set to 'DHCP'. The IP Address is 192.168.1.152, Subnet mask is 255.255.255.0, and Gateway address is 192.168.1.1. The DHCP timeout is 20. The DHCP fallback IP address is 192.168.100.100 and the DHCP fallback subnet mask is 255.255.255.0. The BirdDog name is birddog-a4e07.local. An 'APPLY' button is visible at the bottom right.

Configuration method	STATIC	DHCP
IP Address		192.168.1.152
Subnet mask		255.255.255.0
Gateway address		192.168.1.1
DHCP timeout		20
DHCP fallback IP address		192.168.100.100
DHCP fallback subnet mask		255.255.255.0
BirdDog name		birddog-a4e07.local

### IP configuration method

You can configure PF120 to operate on the network with a dynamic (DHCP) IP address or a fixed address.

For smaller networks DHCP networking is generally suitable, however larger networks with managed operations will often determine each device needs to have a dedicated and static IP address.

### DHCP IP address

DHCP is set as the network configuration by default for PF120.

### Static IP address

To enable a static IP address, change configuration method to static and fill in the details required in Address, Mask and Gateway. Particular attention should be paid to the Address and Mask fields as incorrect information entered will result in PF120 not being visible on the network and a factory reset will be required in order to recover the unit.

### IP address recovery

In the event that the PF120 is not visible on the network, the network has changed, or the static IP address details have been lost, reset the BirdDog back to its default settings by following the factory reset procedure.

### BirdDog name

You can name each PF120 with a friendly name that makes sense for each production (camera 1, camera 2, etc). This name will appear on any NDI receiver when it looks for video coming from PF120 over the network. The name must not include any special characters and can be any combination of 'a-z, 1-0, and -'.

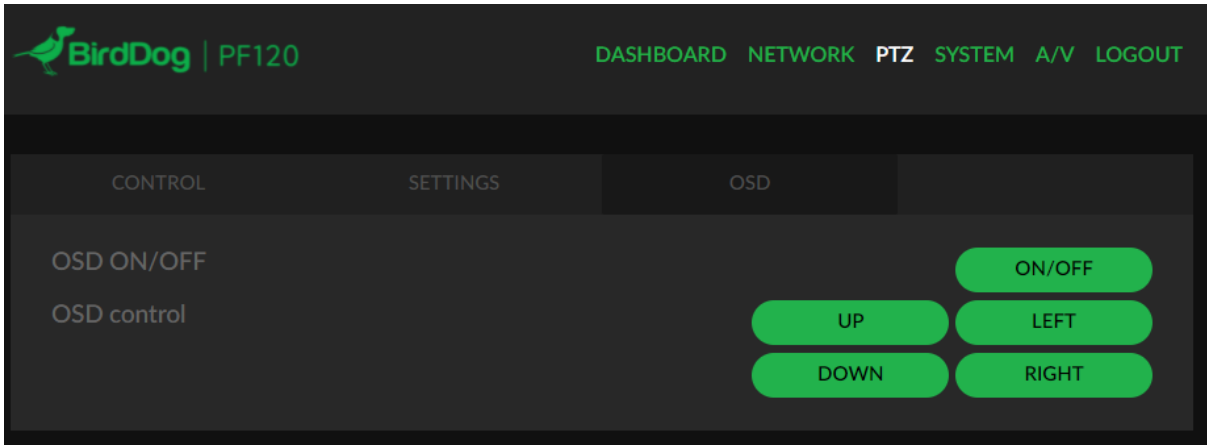
Note: no uppercase characters are valid.

On NDI receiving devices, PF120 will present as a source as follows:

**birddog-name [CAM]**

when the unit is set to automatic input.

## PTZ



### Control

You are able to save and recall presets from the Web Dashboard using the Select Preset option. To operate this, simply press the Preset number you wish to recall or save followed by APPLY PRESET or SAVE PRESET

### Settings

The PF120 communicates with the camera head via a serial interface, these settings should remain as per default:

VISCA ADDRESS: 1  
VISCA BAUDRATE: 115200

### Zoom Max Speed

When controlling the PF120 over NDI you can limit the maximum speed of Zoom movement by affecting this option, the higher the number (18) the faster and more sensitive the movements will be on the PF120.

### OSD

To adjust all cameras settings please press the OSD ON/OFF button to illuminate the OSD.

The OSD is visible on both the NDI output and HDMI and can equally be accessed via the included remote control.

Please take note that the Zoom will not operate normally (control of movement) until the OSD menu is closed again.

## NDI NETWORK SETTINGS

BirdDog | PF120

DASHBOARD NETWORK PTZ SYSTEM A/V LOGOUT

PASSWORD SETTINGS SYSTEM UPDATE MCU UPDATE NDI NETWORK SETTINGS

NOTE. Changing of NDI network settings can have a major impact on system compatibility and performance across your network. You should carefully consider the need to change these settings. Consult the user guide for more details.

Preferred transmit method TCP

Multicast net prefix 239.255.0.0

Multicast net mask 255.255.0.0

Multicast TTL 1

NDI discovery server ON OFF

NDI discovery server IP 192.168.1.242

APPLY

BirdDog PF120 operates with the latest NDI Libraries. There are several options to configure the PF120's 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. Transmit Preferred Method.

### TCP

TCP is the default transmission method 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.

### 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 need to receive a confirmation of each packet being received successfully – vastly improving performance on distance WANs. UDP can have some consequences if there are other issues on the network such as jitter or lost packets as it will not inherently re-sent a lost packet.

### Multicast

Multicast is especially useful for use-cases that require a single source to be received on multiple receivers simultaneously. Utilising Multicast offloads the distribution of the NDI A/V packets from the BirdDog PF120 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.

### MultiTCP

MultiTCP is a new NDI transport method that allows users to send NDI video over poor network topography such as WAN (Wide Area Networks) without experiencing issues such as packet loss and lost frames. In the past in order to send NDI video over a WAN the UDP transport was the only option available. UDP solved some issues of WAN applications by allowing the NDI video to travel without dropping masses of frames but results in dropped packets being missed which could cause unstable video. UDP also places more performance demands on devices sending and receiving the signal.

MultiTCP employs a new method of sending TCP packets whereby it opens a mass of TCP connections over the WAN and uses them in a 'round robin' manner, this allows each individual TCP connection enough time to acknowledge the receiving packet, confirm nothing is lost and prepare for the next one before it's sent the next TCP packet in the round robin. This is similar to a RAID setup in traditional storage.

## Adjusting Setting with On-Screen Menus

### About On-Screen Menus

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

This section explains how to read the on-screen menus before starting menu operations. The menu parameters may vary according to the different product model numbers.

**NOTE: You cannot perform zoom operations while the menu is displayed.**

### Main Menu

To display the main menu, press the ON/OFF button on the Web configuration panel (see Part 4 of the PF120 NDI user guide).

1. **Selected Items**  
Selects a setting menu.  
The selected item is shown by the cursor. The cursor moves up or down by pressing the “↑, ↓” button the Web configuration panel.
2. **Menu Items**  
To display a setting menu, select one using the “↑, ↓” button and press the ON/OFF button on the Web configuration panel.

### Setting Menus

The setting menu selected on the main menu is displayed.

1. **Setting Menu**  
The name of the setting menu currently selected is displayed here.
2. **Selected Item**  
Selects a setting item.  
The selected item is shown by the cursor.  
Move the cursor up or down by pressing the “↑, ↓” button on the Web configuration panel.
3. **Setting Items**  
The setting items for this setting menu are displayed. Select the setting item using the “↑, ↓” button on the Web configuration panel.
4. **Set Value**  
The currently set values are displayed.  
To change a set value, use the “←, →” button on the Web configuration panel.

**NOTE: In some product models, only use “←” button on the infrared remote controller to change the value. To confirm the value, you can use either “→” button or ON/OFF button.**

### Control Button

You can select the item by pressing “↑, ↓, ←, →” and ON/OFF button.

1. You can select a menu item by “↑, ↓” button on the Web configuration panel. The selected item is shown by the cursor (Color change). You can change the value of the item by pressing “←, →” button.
2. You can move to the next layer by pressing the RIGHT button.
3. You can return to the normal display by pressing the ON/OFF button.

## EXPOSURE Menu

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

### MODE (Exposure Mode)

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

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

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

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

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

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

OSD	EXPOSURE MENU: SHUTTER PRI	
▶ EXPOSURE	MODE	SHUTTER PRI
WHITE BALANCE	SPEED	1/60
PICTURE 1	GAIN LIMIT	21.4dB
COLOR MATRIX		
ZOOM		
SYSTEM	EX COMP	OFF

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

**GAIN:** Select the gain from the following:

0dB, 3.6 dB, 7.1 dB, 10.7 dB, 14.3 dB, 17.8 dB, 21.4 dB, 25 dB, 28.6 dB, 32.1 dB, 35.7 dB, 39.3 dB, 42.8 dB, 46.4 dB, 50 dB

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

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

**SPEED:** Select the electronic shutter speed from the following. When video format is set to 720P50, 1080P50, 1080i50, 1080P25, 720P50, 'speed' can be selected from the following: 1/1, 1/2, 1/3, 1/6, 1/12, 1/25, 1/50, 1/75, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10K.

When video format is set to 720P60, 1080i59.94, 1080P29.97, 720P59.94, 1080P59.94, 1080i60, 1080P30, 1080P60, 720P60, 'speed' can be selected from the following: 1/1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10K.

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

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

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

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

**EX-COMP (Exposure Compensation):** When MODE is set to one of FULL AUTO, SHUTTER PRI or IRIS PRI, set this item to ON to enable exposure compensation. When you set EX-COMP to ON, LEVEL appear and you can select the exposure compensation level from the following: -10.5, -9, -7.5, -6, -4.5, -3, -1.5, 0, +1.5, +3, +4.5, +6, +7.5, +9, +10.5

If you set the level to 0, exposure compensation will be disabled. Level +10.5 is the brightest and -10.5 is the darkest compensation value.

When EX-COMP is set to OFF, exposure compensation does not function.

## WHITE BALANCE Menu

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

### MODE (white balance mode)

Select the white balance mode from the following:

OSD	WHITE BALANCE MENU	
EXPOSURE	WB MODE	AUTO
▶ WHITE BALANCE		
PICTURE 1		
COLOR MATRIX		
ZOOM		
SYSTEM		

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

**INDOOR:** 3200K Base Mode

**OUTDOOR:** 5800K Base Mode

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

#### NOTE: When you select the OPW (One Push White Balance)

Perform the following operations:

1. Place an image of white subject (For example: A piece of white paper) in the center of the screen.
2. Press the HOME button of the infrared remote controller. The one-push white balance adjustment is activated.

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

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

**USER2:** This is a mode that enables you to manually set the control temperature from 2800K to 6500K.

OSD	WHITE BALANCE MENU	
EXPOSURE	WB MODE	USER
▶ WHITE BALANCE	R GAIN	106
PICTURE 1	B GAIN	217
COLOR MATRIX		
ZOOM		
SYSTEM		

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

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

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

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

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

## PICTURE1 Menu

OSD	PICTURE 1 MENU	
EXPOSURE	SHARPNESS	3
WHITE BALANCE	EFFECT	OFF
▶ PICTURE 1	NOISE REDUCTION	3
COLOR MATRIX	FLIP	OFF
ZOOM	MIRROR	OFF
SYSTEM	WDR	OFF
	SATURATION	1
	HUE	5
	CONTRAST	128
	GAMMA	0
	DE-FLICKER	ON

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

**EFFECT:** (Picture Effect). It consists of the following functions:

**B&W:** Monochrome Image Image effect from Off, B&W

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

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

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

**WDR:** Wide Dynamic: ON, OFF. The camera distinguishes light and dark areas within the same scene, adjusts the brightness for dark areas, and also controls the blown-out highlights. You can select the wide dynamic range mode between ON and OFF.

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

**HUE:** You can adjust color phase from 1-15.

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

**GAMMA:** You can adjust gamma level from 0-2.

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

## Colour Matrix

OSD	COLOR MATRIX MENU	
EXPOSURE	MAGENTA GAIN	32
WHITE BALANCE	RED GAIN	32
PICTURE 1	YELLOW GAIN	32
▶ COLOR MATRIX	GREEN GAIN	32
ZOOM	CYAN GAIN	32
SYSTEM	BLUE GAIN	32

OSD	COLOR MATRIX MENU	
EXPOSURE	MAGENTA HUE	32
WHITE BALANCE	RED HUE	32
PICTURE 1	YELLOW HUE	32
▶ COLOR MATRIX	GREEN HUE	32
ZOOM	CYAN HUE	32
SYSTEM	BLUE HUE	32

**NEXT PAGE:** You can navigate to the next page.

**MAGENTA GAIN:** You can configure the color gain from 0-64.

**RED GAIN:** You can configure the color gain from 0-64.

**YELLOW GAIN:** You can configure the color gain from 0-64.

**GREEN GAIN:** You can configure the color gain from 0-64.

**CYAN GAIN:** You can configure the color gain from 0-64.

**BLUE GAIN:** You can configure the color gain from 0-64.

**MAGENTA HUE:** You can configure the color phase from 0-64.

**RED HUE:** You can configure the color phase from 0-64.

**YELLOW HUE:** You can configure the color phase from 0-64.

**GREEN HUE:** You can configure the color phase from 0-64.

**CYAN HUE:** You can configure the color phase from 0-64.

**BLUE HUE:** You can configure the color phase from 0-64.



## ZOOM Menu

OSD	ZOOM MENU	
EXPOSURE	DIGITAL ZOOM	OFF
WHITE BALANCE	ZOOM RATIO OSD	OFF
PICTURE 1	MF SPEED	2
COLOR MATRIX	PRESET SPEED	5
▶ ZOOM	TALLY MODE	OFF
SYSTEM		

**DIGITAL ZOOM:** Set to DIGITAL ZOOM ON, 16X digital zoom is activated. You can set digital zoom to ON or OFF. When set to OFF, digital zoom does not operate, and only optical zoom is available. When set to ON, digital zoom takes over after optical zoom reaches MAX (20X). Up to 200X/300X can be zoomed digitally. When digital zoom is available, the resolution decreases.

**ZOOM RATIO OSD (Zoom times display):** Set Ratio OSD to ON, the number of the zoom ratio that you are operating displays on screen.

**MF SPEED:** Manual Focus variable speed, that has eight speed levels.

**PRESET SPEED:** Set preset speed value from 0 to 5 to change the preset speed.

## SYSTEM Menu

OSD	SYSTEM MENU	
EXPOSURE	PELCO ID	001
WHITE BALANCE	DISPLAY INFO	ON
PICTURE 1	PRESET MEMORY	ON
COLOR MATRIX	FACTORY RESET	
ZOOM	RELOAD PRESET 1	ON
▶ SYSTEM	AUTO FOCUS	NORMAL
	FORMAT	1080p29.97
	SV	V0B1100S36[...]

**PELCO ID:** When using PELCO P/D control, Set Camera ID to the address that you want to control to. This value is from 001–255.

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

**AUDIO:** This feature turns the embedded audio ON or OFF.

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

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

**BAUDRATE:** This feature sets the RS232 baudrate. The default value is 9600.

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

**VIDEO FORMAT:** You can change the video format by adjusting this item.

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

The video formats that you can select from are:

1080P:60/59.94/50/30/29.97/25,1080I:60/59.94/50, 720P:60/59.94/50/30/25

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

## Firmware update

It is important to know the overall firmware structure of the camera. There are 2 separate locations that require firmware to be updated in order for the camera to operate in all conditions.

### PF120 MCU Firmware

The MCU firmware handles all communication between the image sensor and the rest of the camera hardware, and controls image adjustments such as color balance, and exposure settings. By updating the PF120 baseboard improvements in control compatibility, accuracy, and speed can be achieved.

### PF120 NDI® Firmware

The NDI firmware handles all network-based activities including the Web User Interface and the encoding of video into NDI® video to be sent over the network. PF120 NDI Firmware includes many important performance updates, features, functions, and compatibility updates.

## UPDATING YOUR PF120 CAMERA FIRMWARE

From time-to-time BirdDog will update the recommended firmware version for the PF120 camera.

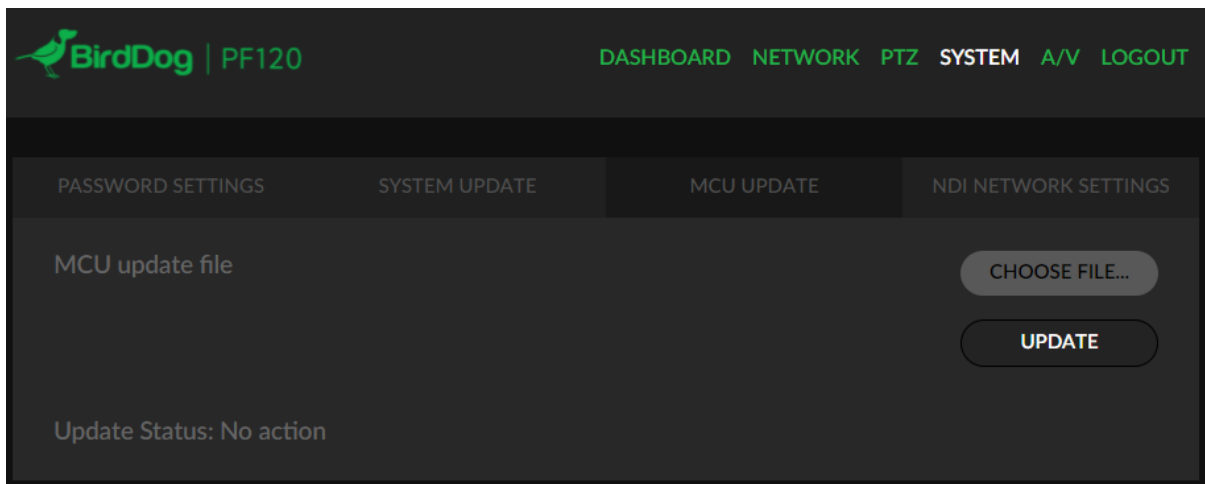
Updating your PF120 is a 2-step process. Please update the camera as per these instructions and in this specific order.

Please download the firmware ZIP file from the link below. This contains all the resources you need to successfully update your PF120 cameras.

<https://bird-dog.tv/features/firmware-updates/>

### STEP 1. MCU FIRMWARE UPDATE

1. Please navigate to your PF120's Web User Interface.
2. Log into the PF120 Web user interface, the default password is 'birddog'.
3. Navigate to the SYSTEM Menu and select MCU UPDATE.



4. When the popup dialogue window opens allowing you to select a file, navigate to the STEP 1 folder and select the .bin file that is located within. Select this file and press UPDATE.

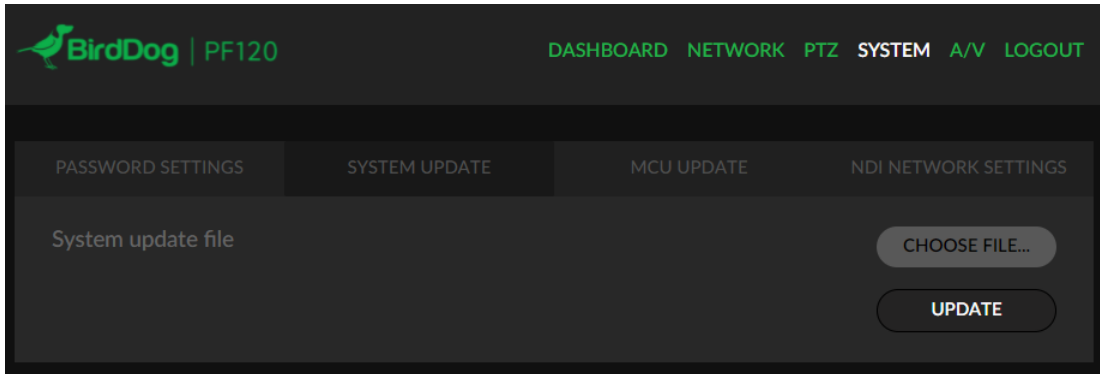
Note. This process will take up to 5 minutes and will require the camera board to reboot – DO NOT power off the unit while this process completes.

5. After the process reports as complete, please allow 2 minutes for the PF120 to reboot and then refresh your browser, you will need to log in again to the Web User Interface.

**The process is now complete. Please proceed to the next step.**

## STEP 2. NDI® FIRMWARE UPDATE

1. Please navigate to your PF120's Web User Interface.
2. Log into the PF120 Web user interface, the default password is 'birddog'.
3. Navigate to the SYSTEM Menu and select SYSTEM UPDATE.



4. When the popup dialogue window opens allowing you to select a file, navigate to the STEP 2 folder and select the .fw file that is located within. Select this file and press UPDATE

Note. This process will take up to 5 minutes and will require the camera board to reboot – DO NOT power off the unit while this process completes.

5. After the process reports as complete, please allow 2 minutes for the PF120 to reboot and then refresh your browser, you will need to log in again to the Web User Interface.

**The update process is now complete.**

## SUPPORT RESOURCES

BirdDog are committed to the success of all our users of the PF120 and other devices. We have a team of support engineers located globally so access to timely assistance should be easy. This document should assist greatly in ensuring your camera is set up correctly and for the greatest performance. Should you need further assistance please do not hesitate to reach out.

**Email us at [help@bird-dog.tv](mailto:help@bird-dog.tv)**

This email address hits our team with priority and is received by support, the support ticketing system, engineering, and management.

## Receiving NDI streams

There are many applications that support receiving the NDI signal that PF120 produces. Each application will vary slightly on how you choose your source.

### **NewTek Studio Monitor**

NewTek provide a free Studio Monitor application that 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 Mini from the drop-down list.

Once connected to the PF120 you will notice a configuration cog appears on the bottom right-hand side of the video display, this is a shortcut to access the PF120 web configuration panel.

### **NewTek TriCaster Series**

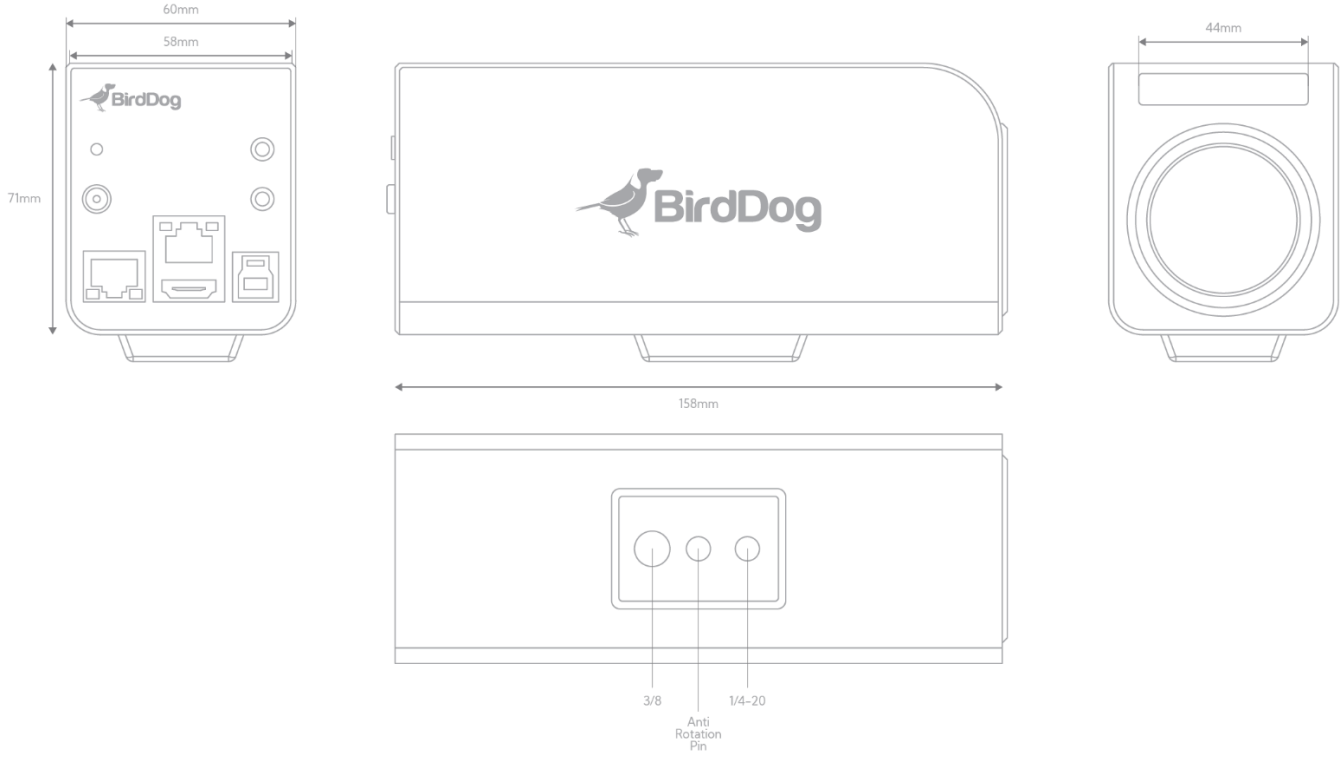
NewTek TriCaster series devices allow several NDI sources to be received simultaneously, the amount of simultaneous connections varies by what model TriCaster you have. Consult your TriCaster user manual to determine how many connections are available on your device.

To select PF120 as a source on your TriCaster, simply click on the configuration cog below your desired source location, this will bring up the Input Setting dialog, select from the drop-down list your PF120 source.

Once connected to the PF120 you will notice a configuration cog appears next to the source drop down window, this is a shortcut to access the PF120 web configuration panel.

# Dimensions

Unit: mm





WELCOME TO THE FUTURE.

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