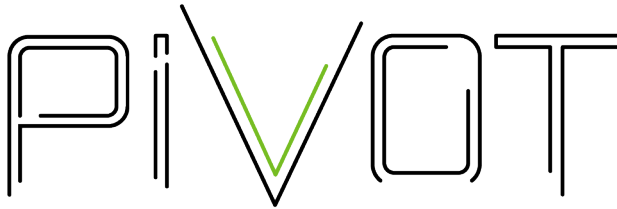




<https://www.rossvideo.com/support/product-documentation/pivotcam/>



# PIVOTCam

## User Manual

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# Thank You For Choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:

1. Provide a Superior Customer Experience
  - offer the best product quality and support
2. Make Cool Practical Technology
  - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at [solutions@rossvideo.com](mailto:solutions@rossvideo.com).

A handwritten signature in black ink that reads "David Ross". The "D" is large and stylized, with the "a" and "v" connected. "Ross" is written in a simpler, slightly cursive hand.

David Ross

CEO, Ross Video

[dross@rossvideo.com](mailto:dross@rossvideo.com)

## Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.

- 
8. We will cooperate with and help other friendly companies.
  9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

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# Document Information

- Ross Part Number: **5000DR-300-06**
- Release Date: November, 2018.

## Copyright

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VideoLAN, VLC, VLC media player and x264 are trademarks of the videoLAN registered non-profit organization.

## Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the “**Important Safety Instructions**” listed in the front of this manual to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

## Symbol Meanings



**Protective Earth:** This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.



**Important:** This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.



**Warning:** The symbol with the word “Warning” within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION:** The symbol with the word “Caution” within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



**Warning Hazardous Voltages:** This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.



**ESD Susceptibility:** This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

## Important Safety Instructions

1. **Read Instructions** All the safety and operating instructions should be read before the product is operated.
2. **Retain Instructions** The safety and operating instructions should be retained for future reference
3. **Heed Warnings** All warnings on the product and the operating instructions should be adhered to.
4. **Follow Instructions** All operating and use instructions should be followed.
5. The camera power input range is 100-240VAC (50-60Hz). Ensure the power supply input is within this range before powering on.
6. The camera power voltage is 12VDC with a rated current of 2A. We suggest you use it with the original power supply adapter supplied by the factory.
7. Please keep the power cable, video cable, and control cable in a safe place. Protect all cables, especially the connectors.
8. Operational environment: 0°C-50°C, humidity less than 90%.
9. To avoid any danger, do not put anything inside the camera, and keep it away from corrosive liquids.
10. Avoid stress, vibration, and damp during transportation, storage, and installation.
11. Do not detach the camera housing and cover. For any service, please contact the authorized dealer.

12. RF cable and control cable should be individually shielded, and cannot be substituted with other cables.
13. Do not direct the camera lens towards a strong light source, such as the sun or an intense light.
14. Use a dry soft cloth to clean the camera housing. A neutral cleaning agent can be applied when needed. To avoid damage to the camera lens, never use strong or abrasive cleaning agents on the camera housing.
15. Do not move the camera by holding the camera head. To avoid mechanical trouble, do not rotate the camera head by hand.
16. Put the camera on a fixed, smooth desk or platform. The camera should not be leaning on anything when installed.
17. Power Supply Polarity:



**Note:** The video quality may be affected by specific frequencies in electromagnetic field.



**CAUTION:** Do NOT pick up the camera by the lens barrel. Doing so may damage the rotary mechanism and internal cables.



**CAUTION:** Do NOT move or rotate the lens barrel by hand. Doing so may damage the rotary mechanism as well as the rotation limiters.

## Warranty and Repair Policy

Ross Video Limited (Ross) warrants its cameras and related options, to be free from defects under normal use and service for a period of ONE YEAR from the date of shipment.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

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In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross Video's notification of change of ownership.

## Environmental Information

**The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.**

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

## Company Address

**Ross Video Limited** — 8 John Street Iroquois, Ontario, Canada, K0E 1K0

**Ross Video Incorporated** — P.O. Box 880, Ogdensburg, New York, USA,  
13669-0880

General Business Office: (+1)613-652-4886

Fax: (+1)613-652-4425

Toll Free Technical Support (North America): 1-844-652-0645

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Technical Support:	(+1)613-652-4886
After Hours Emergency:	(+1)613-349-0006
E-Mail (Support):	<a href="mailto:techsupport@rossvideo.com">techsupport@rossvideo.com</a>
E-Mail (General):	<a href="mailto:solutions@rossvideo.com">solutions@rossvideo.com</a>
Website	<a href="http://www.rossvideo.com">www.rossvideo.com</a>

## Technical Support

At Ross Video, we take pride in the quality of our products, but if a problem does occur, help is as close as the nearest telephone.

Our 24-Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support are provided directly by Ross Video personnel. During business hours (eastern standard time), technical support personnel are available by telephone. Outside of normal business hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. Our Technical support staff are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

## Supporting Documentation

Ross Video provides a wide variety of helpful documentation for the setup and support of your equipment. Most of this documentation can be found on the Ross Video website ([www.rossvideo.com](http://www.rossvideo.com)), or on the Ross Video Community site ([discussions.rossvideo.com/](http://discussions.rossvideo.com/))



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# Contents

<b>Box Contents.....</b>	<b>11</b>
<b>Camera Overview.....</b>	<b>12</b>
<b>Cabling.....</b>	<b>14</b>
PIVOTCam-20 Cabling.....	14
PIVOTCam-SE Cabling.....	14
Supported Reference Formats (PIVOTCam-SE).....	15
Daisy Chain.....	16
DIP Switches.....	17
<b>Remote Control.....</b>	<b>18</b>
<b>Onscreen Menu System.....</b>	<b>20</b>
System.....	20
Exposure.....	21
Image.....	22
Quality.....	22
PTZ.....	23
Video Format.....	24
IP.....	24
Reset.....	25
INFO.....	25
<b>Web Interface (PIVOTCam-SE only).....</b>	<b>27</b>
To Log Into the Web Interface.....	27
Preview.....	28
PTZ Control.....	28
Preset Control.....	29
Settings.....	29
Video Encoding.....	30
Image Parameters.....	31
Ethernet.....	36
Firmware Upgrade.....	37
Reset to Default.....	38
Account.....	39

---

<b>Troubleshooting.....</b>	<b>40</b>
<b>Specifications.....</b>	<b>41</b>
<b>Ports.....</b>	<b>43</b>
RS232 (VISCA IN/OUT).....	43

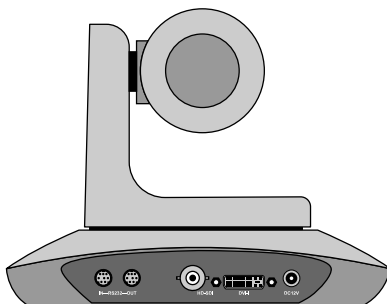
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## Box Contents

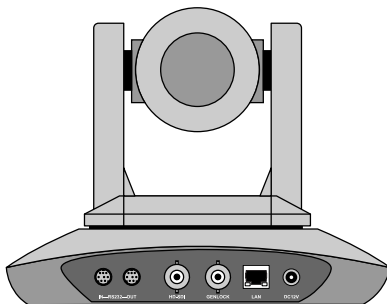
Verify the contents of the box against the packing list. If any items are missing or damaged, contact Ross Video Technical Support.

Item	Qty
PIVOTCam Camera	1
Power Supply	1
Power Cord	1
RS-232 Control Cable	1
Remote Control	1
User Guide (this document)	1
Double-sided Tape	1

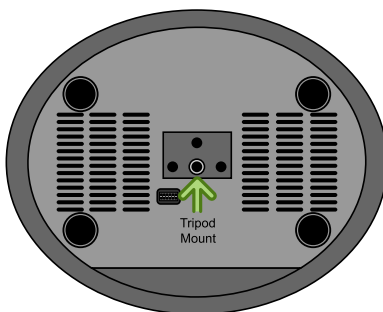
# Camera Overview



**Figure 1: PIVOTCam-20 Rear View**



**Figure 2: PIVOTCam-SE Rear View**



**Figure 3: Bottom View**

- **RS232 IN** — 8-Pin miniDIN for RS-232 or RS-485 serial VISCA IN control.
- **RS232 OUT** — 8-Pin miniDIN for RS-232 or RS-485 serial VISCA OUT control.
- **HD-SDI** — BNC for HD-SDI video output. This is the main video output of the camera.
- **DVI-I (PIVOTCam-20 only)** — DVI-I port for analog (YPrPb and VGA) and digital (HDMI) video output.
- **GENLOCK (PIVOTCam-SE only)** — BNC for external reference input.
- **LAN (PIVOTCam-SE only)** — RJ45 for standard ethernet connection.
- **DC12V** — 12V DC power from external brick. Use only the external power supply provided with your camera.
- **Tripod Mount** — 1/4" - 20 UNC tripod mounting hole (6.5mm depth)

- 
- **Tally (PIVOTCam-SE only)** — tally light on the front of the camera base shows red (on-air), blue (operating), green (on preview). Tally status is implemented in the VISCA protocol.

**Note:** *If you mount the PIVOTCam-20 on a wall or the ceiling, you may notice a tilt in the image. This is due to a small amount of play in the mount connecting the lens assembly to the support arm.*

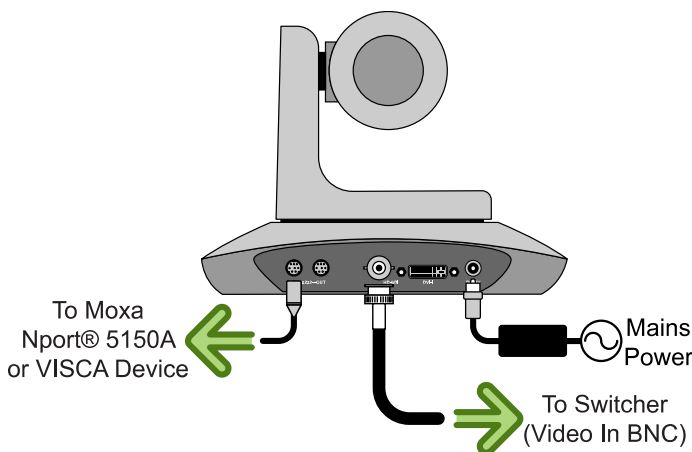
# Cabling

The PIVOTCam-20 and PIVOTCam-SE can be controlled manually using the included remote control, through a serial connection to a compatible VISCA device, or through an ethernet connection to a video switcher and/or DashBoard.

## PIVOTCam-20 Cabling

To control the PIVOTCam-20 from the switcher and/or DashBoard you must connect a serial cable to the 8-Pin Mini-DIN **RS232 IN** port on the camera to a Serial to Ethernet converter (such as the Moxa Nport® 5150A available from Ross®) and then an ethernet connection from the Nport® 5150A to the switcher and/or DashBoard.

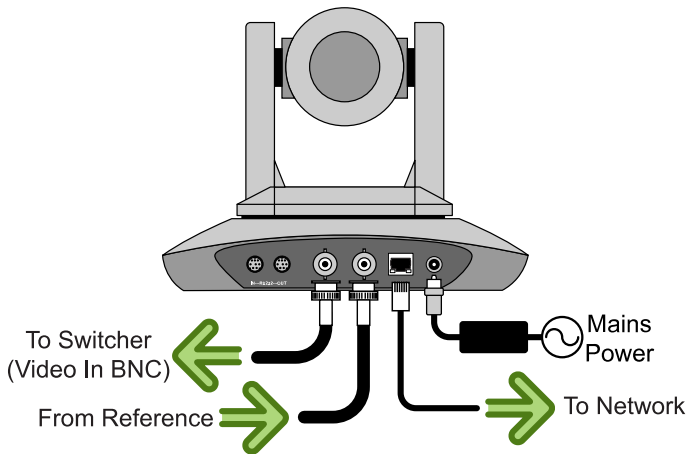
The Moxa Nport® 5150A is a serial to ethernet converter that allows DashBoard and the switcher to connect to a serial device over ethernet, but any serial to ethernet converter device can be used.



## PIVOTCam-SE Cabling

To control the PIVOTCam-SE from the switcher and/or DashBoard you can connect an ethernet cable to the LAN port on the camera that is connected to the same subnet as the switcher and/or DashBoard. You must connect on port 52381 for direct control from the switcher.

**Note:** The camera accepts PoE (Power over Ethernet) and can be powered either by the ethernet connection or the mains power connection. Both can be connected at the same time.



**Tip:** You can also cable the PIVOTCam-SE the same as the PIVOTCam-20 using an 8-Pin Mini-DIN **RS232 IN** to a Serial to Ethernet converter (such as the Moxa Nport® 5150A).

The 1Gb/s ethernet connection can stream ITU-T H.264 and H.265.

## Supported Reference Formats (PIVOTCam-SE)

The camera can accept analog blackburst, trilevel, and 1080p 23.98/24Hz

**Table 1: Supported Reference Formats**

Input Reference	Usable Format
480i	1080p 59.94Hz
	1080p 29.97Hz
	1080i 59.94Hz
	720p 59.94Hz
576i	1080p 50Hz
	1080p 25Hz
	1080i 50Hz
	720p 50Hz
720p 50Hz	1080p 50Hz
	1080p 25Hz
	1080i 50Hz
	720p 50Hz

Input Reference	Usable Format
720p 59.94Hz	1080p 59.94Hz
	1080p 29.97Hz
	1080i 59.94Hz
	720p 59.94Hz
1080i 59.94Hz	1080p 59.94Hz
	1080p 29.97Hz
	1080i 59.94Hz
	720p 59.94Hz
1080i 50Hz	1080p 50Hz
	1080p 25Hz
	1080i 50Hz
	720p 50Hz
1080p 23.98Hz	1080p 23.98Hz
1080p 24Hz	1080p 24Hz

## Daisy Chain

You can connect multiple cameras together in a daisy chain. Connect a cable from the **RS232 OUT** port on the first camera in the chain to the **RS232 IN** port on the second. Up to 7 cameras can be connected in this way using the VISCA protocol. Each camera in the chain must be set to a different VISCA address (1-7). The protocol and address of the camera is set from the **SYSTEM** menu.

**Note:** The onscreen menu system is shown on the video output of the camera. Press the **MENU** button on the remote control to turn the menu system on or off.

**Tip:** To control multiple PIVOTCam-SE cameras you can also use a separate ethernet connection to each camera.

**Tip:** Refer to the external device setup site for information on connecting your camera to a Carbonite or Acuity® switcher. Navigate to <http://www.rossvideo.com/DashBoard/PIVOTCam> for information on setting up and using DashBoard with the camera.



# DIP Switches

The DIP switches on the bottom of the camera are used for diagnostics as well as turning some features on or off. The settings of the DIP switches is broken up into three pairs. Each pair of switches are used together to set the functionality and are not affected by the other two pairs.

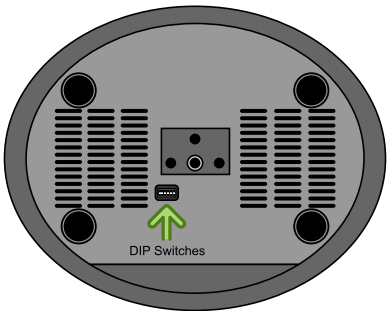


Table 2: DIP Switch Functions

SW1	SW2	SW5	SW6	Description
OFF	OFF	-	-	Updating Mode
ON	OFF	-	-	Debugging Mode
OFF	ON	-	-	n/a
ON	ON	-	-	Working Mode (default)
-	-	OFF	OFF	n/a
-	-	ON	OFF	Working Mode (default)
-	-	OFF	ON	Updating Mode (PIVOTCam-20)
-	-	ON	ON	n/a

**Note:** By default, DIP switches SW1-5 should be set to ON and SW6 set to OFF.

**Note:** DIP switches 3 and 4 are not used at this time.

# Remote Control

The remote control can be used to control one, or up to four cameras, and is supported by both the PIVOTCam-20 and PIVOTCam-SE cameras.



- **POWER** — Turns the camera on or off. The camera recalls to Home position when turned on. Camera must be in Working Mode.
- **FREEZE** — Freezes or unfreezes the output video of the camera.
- **IRT** — Turns IR pass-through on or off. Signals from the remote control are passed through the serial port to other cameras or devices.
- **SET1-SET4** — Sets the address of the camera. Press and hold a button for 3 seconds to set the camera to that address. For example **SET1** corresponds to **CAM1**.
- **CAM1-4** — Selects a specific camera.
- **Numbers 0-9** — Store or recall a camera shot. Press and hold a number button for 3 seconds to store the current camera setting to that shot. Press and release a number button to recall that camera shot.
- **LEARN** — Used with the **LIMIT L** and **LIMIT R** buttons to set the pan limits.
- **CLR PRE** — Deletes a camera shot. Press **CLR PRE** and the number of the shot you want to delete. Press and hold **CLR PRE** to delete all shots.
- **FOCUS +/-** — Increase or decrease focus manually. Focus must be set to manual.
- **ZOOM +/-** — Increase or decrease zoom.
- **Navigation Buttons** — Pans and tilts the camera head or navigate the onscreen menus when the menu system is active. Camera must be in Working Mode
- **OK** — Recalls the Home position or select a menu item when the menu system is active. Camera must be in Working Mode.
- **AF** — Turns auto focus on. Manual focus is turned off.
- **MF** — Turns manual focus on. Auto focus is turned off.
- **RESET** — Resets the camera. Press and hold the **RESET** button for 3 seconds to reset the camera.

- 
- **MENU** — Turns the onscreen menu system on or off.
  - **F1-F4** — These button are not used at this time.
  - **LIMIT L** — Sets the left pan limit. Press **LEARN** and then press **LIMIT L** to set the left limit.
  - **LIMIT R** — Sets the right pan limit. Press **LEARN** and then press **LIMIT R** to set the right limit.
  - **LMT CLR** — Clears both pan limits. Press **LEARN** and then press **LMT CLR** to clear the limits.
  - **SCAN** — This button is not used at this time.
  - **BLC OFF** — Turns off backlight compensation.
  - **BLC ON** — Turns on backlight compensation.
  - **BRIGHT-** — Decreases the brightness of the output video of the camera. Only available in Bright Priority Exposure Mode.
  - **BRIGHT +** — Increases the brightness of the output video of the camera. Only available in Bright Priority Exposure Mode.
  - **Video Format Buttons** — Selects a video format for the output video of the camera. Press and hold the format button for 3 seconds to select the format.

# Onscreen Menu System

The menu system is displayed on the video output of the camera and allows you to set up and configure various aspects of the camera. The menu system is accessed using the remote control by pressing the **MENU** button and using the navigation and **OK** buttons to make selections and navigate to sub-menus. Use the navigation buttons to highlight an item and the **OK** button to select it. Press the **MENU** button again to go up one layer in the menu tree or exit the menu system. You are prompted to save your settings when you exit the menu system.

## System

Item	Settings	Camera Support	
		20	SE
<b>PROTOCOL</b>	VISCA (fixed)	Y	Y
<b>ADDRESS</b>	1 to 7	Y	Y
<b>BAUD RATE</b>	2400, 4800, 9600, 115200	Y	Y
<b>PTL LOCK</b> (protocol lock)	<ul style="list-style-type: none"><li><b>ON</b> — protocol setting (above) is locked</li><li><b>OFF</b> — protocol setting is unlocked</li></ul>	Y	Y
<b>RS485</b>	<ul style="list-style-type: none"><li><b>ON</b> — serial communication set to RS-485 (2-wire only)</li><li><b>OFF</b> — serial communication set to RS-232</li></ul>	Y	Y
<b>VGA OUT</b>	Set the VGA output format to YPbPr or a customized VGA output.	Y	
<b>VISCA</b>	<ul style="list-style-type: none"><li><b>OVER COM</b> — remote control (VISCA protocol) on serial port.</li><li><b>OVER IP</b> — remote control (VISCA protocol) on ethernet port.</li></ul>		Y
<b>TRANSFER</b> (IR pass-through)	<ul style="list-style-type: none"><li><b>SERIAL</b> — signals from the remote control are passed through the serial port to other cameras or devices.</li><li><b>OFF</b> — signals from the remote control are not passed through.</li></ul>	Y	
<b>LANGUAGE</b> (menu language)	<ul style="list-style-type: none"><li>PIVOTCam-20 — English, Chinese, Spanish, Russian</li><li>PIVOTCam-SE — English, Chinese</li></ul>	Y	Y

## Exposure

Item	Settings	Camera Support	
		20	SE
<b>EXPOSURE MODE</b>	Auto, Manual, Shutter, Iris, Bright	Y	Y
<b>SHUTTER</b> (manual exposure mode only)	1080p 50/25Hz, 720p 50/25Hz — 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, 1/10000	Y	Y
	1080p 59.94/29.97, 1080i 59.94/50, 720p 59.94/29.97 — 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, 1/10000	Y	Y
<b>IRIS</b>	<ul style="list-style-type: none"> <li>PIVOTCam-20 — Closed to F1.8 (manual exposure mode only)</li> <li>PIVOTCam-SE — Closed to F1.6 (manual exposure mode only)</li> </ul>	Y	Y
<b>GAIN</b>	<ul style="list-style-type: none"> <li>PIVOTCam-20 — 0dB to +28dB (in 2dB increments)</li> <li>PIVOTCam-SE — 0dB to +30dB (in 2dB increments)</li> </ul>	Y	Y
<b>EBRIGHT</b>	000 to 027		Y
<b>BRIGHT</b>	000 to 015	Y	Y
<b>WD Mode</b> (wide dynamic range)	<ul style="list-style-type: none"> <li><b>ON</b> — turns on WD mode and enables the WD level.</li> <li><b>OFF</b> — turns off WD mode</li> </ul>	Y	Y
<b>WD Level</b>	001 to 006 (when WD Mode is on only)	Y	Y
<b>BLC</b>	<ul style="list-style-type: none"> <li><b>ON</b> — turns on backlight compensation</li> <li><b>OFF</b> — turns off backlight compensation</li> </ul>	Y	Y

# Image

Item	Settings	Camera Support	
		20	SE
<b>WB Mode</b> (white balance)	<ul style="list-style-type: none"><li>• PIVOTCam-20 — ATW, Manual, Auto, Indoor, Outdoor, One Push</li><li>• PIVOTCam-SE — ATW, Manual, Sodium, Fluores, Auto, Indoor, Outdoor, Push</li></ul>	Y	Y
<b>R GAIN</b> (red gain)	0 to 255 (manual white balance mode only)	Y	Y
<b>B GAIN</b> (blue gain)	0 to 255 (manual white balance mode only)	Y	Y
<b>FLICK</b> (anti-flicker)	50Hz, 60Hz, OFF	Y	Y
<b>DZOOM</b> (digital zoom)	<ul style="list-style-type: none"><li>• <b>ON</b> — turn on digital zoom.</li><li>• <b>OFF</b> — turn off digital zoom.</li></ul>	Y	Y
<b>FOCUS</b>	Auto, Manual	Y	Y

# Quality

Item	Settings	Camera Support	
		20	SE
<b>2D NR</b> (image noise reduction)	<ul style="list-style-type: none"><li>• <b>ON</b> — turn image noise reduction on</li><li>• <b>OFF</b> — turn image noise reduction off</li></ul>	Y	Y
<b>3D NR</b> (motion noise reduction)	<ul style="list-style-type: none"><li>• PIVOTCam-20 — AUTO, 2, 3, 4, 5</li><li>• PIVOTCam-SE — AUTO, 001, 002, 003, 004</li></ul>	Y	Y
<b>SHARPNESS</b>	000 to 015	Y	Y
<b>CONTRAST</b>	000 to 015	Y	Y
<b>SATURATION</b>	000 to 015	Y	Y
<b>GAMMA</b>	000 to 004	Y	Y
<b>AF SENSIT</b>	NORMAL, HIGH, LOW	Y	Y

Item	Settings	Camera Support	
		20	SE
<b>TRACK MODE</b>	<ul style="list-style-type: none"> <li>• <b>PRECISE</b> — precise recall of preset position, but may have lag</li> <li>• <b>FLUENT</b> — more fluid recall of preset position with no lag, but not as precise</li> </ul>	Y	

## PTZ

Item	Settings	Camera Support	
		20	SE
<b>PWR ACT</b>	<ul style="list-style-type: none"> <li>• <b>OFF</b> — no preset is recalled when the camera is powered on</li> <li>• <b>PRE0</b> — preset 0 is recalled when the camera is powered on</li> <li>• <b>PRE1</b> — preset 1 is recalled when the camera is powered on</li> </ul>	Y	
<b>SPEEDBYZ</b>	<ul style="list-style-type: none"> <li>• <b>ON</b> — proportional pan/tilt speed based on zoom level (Higher value gives slower pan/tilt speed at higher zoom levels.)</li> <li>• <b>OFF</b> — pan/tilt speed not affected by zoom level</li> </ul>	Y	Y
<b>MOUNT M</b>	<ul style="list-style-type: none"> <li>• PIVOTCam-20 <ul style="list-style-type: none"> <li>• <b>UP</b> — camera is mounted right-side-up</li> <li>• <b>DOWN</b> — camera is mounted upside-down and pan/tilt controls are reversed</li> </ul> </li> <li>• PIVOTCam-SE <ul style="list-style-type: none"> <li>• <b>OFF</b> — camera is mounted right-side-up</li> <li>• <b>ON</b> — camera is mounted upside-down and pan/tilt controls are reversed</li> </ul> </li> </ul>	Y	Y
<b>FLIP HOR</b>	<ul style="list-style-type: none"> <li>• <b>ON</b> — flip video image horizontally</li> <li>• <b>OFF</b> — don't flip image</li> </ul>	Y	Y
<b>FLIP VER</b>	<ul style="list-style-type: none"> <li>• <b>ON</b> — flip video image vertically</li> <li>• <b>OFF</b> — don't flip image</li> </ul>	Y	Y

Item	Settings	Camera Support	
		20	SE
<b>PT SPD</b> (pan/tilt speed)	<ul style="list-style-type: none"> <li>PIVOTCam-20 — 5 to 25</li> <li>PIVOTCam-SE — 5 to 24</li> </ul>	Y	Y
<b>ZOOM SPD</b> (zoom speed)	1 to 7	Y	Y
<b>DZOOM</b> (digital zoom)	<ul style="list-style-type: none"> <li><b>ON</b> — digital zoom on</li> <li><b>OFF</b> — digital zoom off</li> </ul>		Y
<b>MENU MIR</b>	<ul style="list-style-type: none"> <li><b>NORMAL</b> — onscreen menu is displayed normally</li> <li><b>MIRROR</b> — onscreen menu is mirrored</li> </ul>	Y	Y

## Video Format

The video format information on this menu applies to the SDI output.

Item	Settings
Available video formats	<ul style="list-style-type: none"> <li>PIVOTCam-20 — 1080P59.94, 1080P50, 1080I59.94, 1080I50, 1080P29.97, 1080P25, 720P59.94, 720P50, 720P29.97, 720P25</li> <li>PIVOTCam-SE — 1080P60, 1080P59.94, 1080P50, 1080P30, 1080P29.97, 1080P25, 1080P24, 1080P23.98, 1080I60, 1080I59.94, 1080I50, 720P60, 720P59.94, 720P50, 720P30, 720P29.97, 720P25</li> </ul>

## IP

**Note:** You must power cycle the camera for the network settings (DHCP, IP Address) to be applied.

Item	Settings	Camera Support	
		20	SE
<b>DHCP</b>	<ul style="list-style-type: none"> <li><b>ON</b> — use DHCP to obtain IP address</li> <li><b>OFF</b> — use fixed IP address</li> </ul>		Y
<b>IP</b>	IP address for camera		Y
<b>GW</b>	Gateway for camera		Y



Item	Settings	Camera Support	
		20	SE
<b>MASK</b> (protocol lock)	Network Mask for camera		Y
<b>MAIN</b>	Main Stream format (1920×1080, 3840×2160)		Y
<b>BITRATE</b> (main)	Main Stream bit rate		Y
<b>SUB</b>	Sub Stream format (1280×720, 1024×576, 640×360)		Y
<b>BITRATE</b> (sub)	Sub Stream bit rate		Y

## Reset

To reset a setting you must select **YES** for the item you want to reset and then press **OK** on the remote to commit the change.

Item	Settings	Camera Support	
		20	SE
<b>SYS RESET</b>	system reset	Y	Y
<b>CAM RESET</b>	camera reset (change format to 1080p 29.97Hz)	Y	Y
<b>PT RESET</b>	pan/tilt reset	Y	Y
<b>ALL RESET</b>	all reset	Y	Y
<b>ZOOM DISPLAY</b>	shows the current zoom level on the output video for 3 seconds after a zoom change or memory recall	Y	

## INFO

Item	Settings	Camera Support	
		20	SE
<b>IR ADDR</b>	infrared control address of camera	Y	Y
<b>FOCUS</b>	focus mode	Y	Y
<b>CLIENT</b>	client protocol	Y	Y

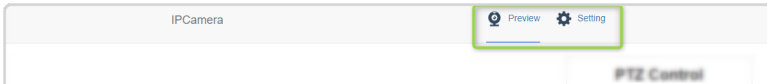
Item	Settings	Camera Support	
		20	SE
<b>MODEL NO</b>	model number	Y	Y
<b>ARM VER</b>	ARM firmware version	Y	Y
<b>MD VER</b>	motor driver firmware version		Y
<b>FPGA VER</b>	FPGA firmware version	Y	Y
<b>CAM VER</b>	camera version	Y	Y
<b>RELEASE</b>	firmware release date	Y	Y

# Web Interface (PIVOTCam-SE only)

The web interface allows you to control various aspects of the camera as well as preview the camera output.

To connect to the web interface of the PIVOTCam-SE, you must point your browser to the IP address of the camera. You can find the IP address on the **IP** menu.

The web interface operates in two modes, **Preview** and **Settings**. Preview allows you to preview the output of the camera as well as control the Pan/Tilt/Zoom (PTZ) of the camera, and store and recall shots on the camera. Settings allows you to configure various parameters of the camera. The mode is selected in the upper right corner of the page.



## To Log Into the Web Interface

The web interface requires a user-name and password.



**Important:** The web interface uses Adobe® Flash® Player for the video preview. You may have to turn on permissions and add the camera IP address to allow the preview. Refer to the documentation for your particular browser for information on setting permissions for Flash®.

1. Point your web browser to the IP address of the camera.

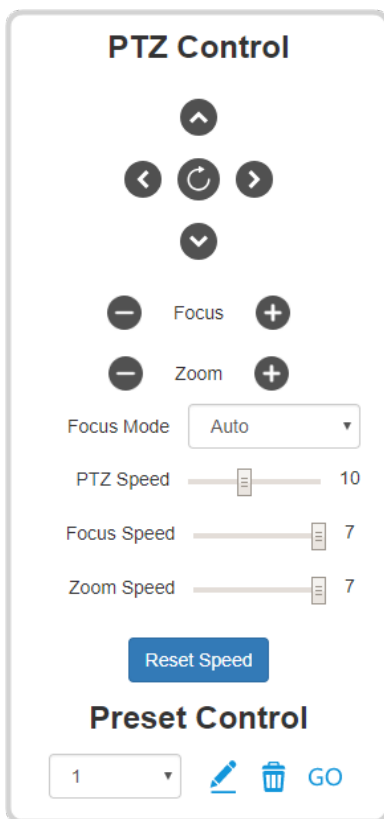
A screenshot of the 'Login Form' in the PIVOTCam web interface. It features two input fields: the first contains the username 'admin' and the second contains masked characters '\*\*\*\*\*'. Below these fields are radio buttons for language selection, with the UK flag selected. A blue 'Login' button is positioned to the right of the language options.

2. Select the language you want the interface to be in.
3. Enter the name and password for the camera and click **Login**.

**Tip:** There is only one account per camera. The default user-name is `admin` and the password is `admin`. You can change these settings from the web interface.


## Preview

The **Preview** page has a PTZ Control area for controlling the camera manually, and a Preset Control area for saving and loading shots on the camera.



## PTZ Control

The controls in PTZ area allow you to pan the camera head in both axis as well as increase or decrease the focus and zoom.

**Tip:** The  button moves the camera to the home position and reset the focus and zoom settings.

- **Focus** — increase or decrease focus.
- **Zoom** — increase or decrease the zoom level.
- **Focus Mode** — set the focus mode to manual or automatic. The **Focus Mode** is set to **Manual** when you press the **Focus** buttons.

- **PTZ Speed** — set how fast the camera head moves when the PTZ buttons are used. This does not affect the speed of a shot recall.
- **Focus Speed** — set how fast the camera manually focusses when the **Focus** buttons are used.
- **Zoom Speed** — set how fast the camera zooms when the **Zoom** buttons are used.

## Preset Control

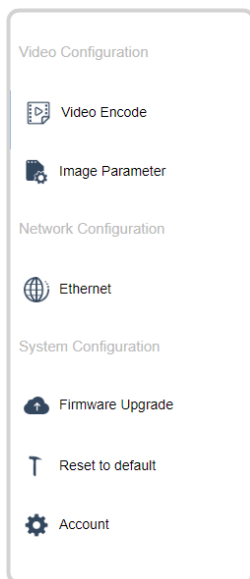
Up to 128 shots can be stored on the camera. Once stored, the shot can be recalled or deleted. If a register has not had a shot stored to it, the camera will not move when that shot is recalled.



1. Select the shot register you want to use.
2. Store the current camera shot to the selected register.
3. Delete the camera shot stored in the selected register.
4. Recall the camera shot from the selected register.

## Settings

The **Settings** page offers a number of configuration options for the camera.



## Video Encoding

The **Video Encoding** tab (**Settings > Video Encoding**) allow you to set the video mode and parameters for the main and sub video streams

Stream	Main	Sub
Enable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Encode Mode	H.264	H.264
RTSP Address		
RTMP Address		
Resolution	1920x1080	1024x576
Bitrate(Kb/s) (1024-20480)	8448	8448
Framerate	30	30
Bitrate Control	CBR	CBR
I Frame Interval (5-120)	30	30

Save

- **Stream** — identifies the Main and Sub streams.
- **Enable** — enable or disable the main or sub streams.
- **Encode Mode** — select the encoding mode you want to use (H.264 or H.265).
- **RTSP Address** — identifies the main and sub Real Time Streaming Protocol (RTSP) addresses.
- **RTMP Address** — identifies the main and sub Real Time Messaging Protocol (RTMP) addresses.
- **Resolution** — select the resolution for the main (1920x1080, 3840x2160) and sub (1280x720, 1024x576, 640x360) streams.

**Note:** The substream must be disabled if you select 1920x1080 at a 50 or 60 framerate for the main stream.

- **Bitrate(Kb/s)** — enter a bit-rate for the main and sub streams.
- **Framerate** — enter a frame-rate for the main and sub streams.
- **Bitrate Control** — select a Constant Bit Rate (CBR) or a Variable Bit Rate (VBR) for the main and sub streams.
- **I Frame Interval** — select how often the I-Frame, or full frame, is transmitted for the main and sub streams.

---

## To Use VLC® to View RTSP/RTMP Video

The VLC media player® can be used to view the RTSP and RTMP streams from the camera.

**Note:** Download and install the VLC media player® to use this procedure.

1. Launch the VLC media player®.
2. Click **Media > Open Network Stream...**
3. In the **Please enter a network URL:** field, enter the address of the RTSP or RTMP stream that you want to view.

**Tip:** If there is too much lag in the video update, select **Show more options** and set **Caching** to a lower value.

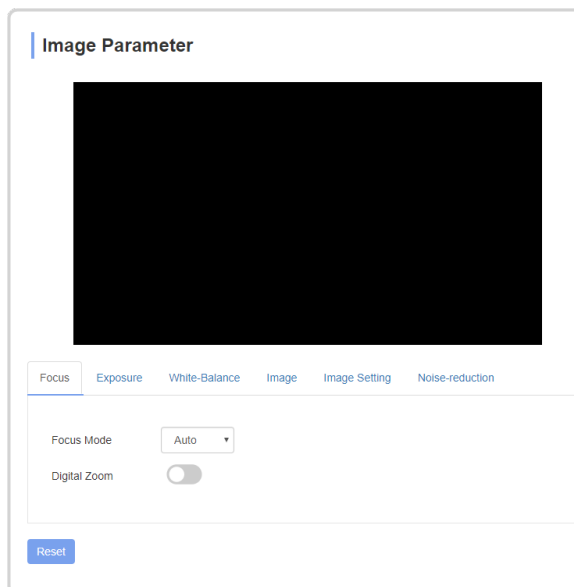
4. Click **Play**.

## Image Parameters

The **Image Parameter** page allows you to adjust the various image settings on the camera. These parameters are broken down into a number of sub pages.

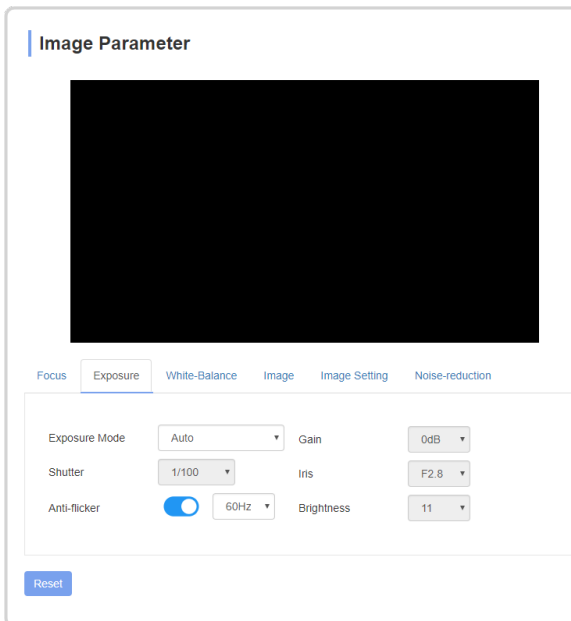
**Tip:** The **Reset** button at the bottom of the page resets all of the **Image Parameter** settings.

## Focus



- **Focus Mode** — select **Auto** or **Manual** focus mode.
- **Digital Zoom** — turn digital zoom on or off.

## Exposure



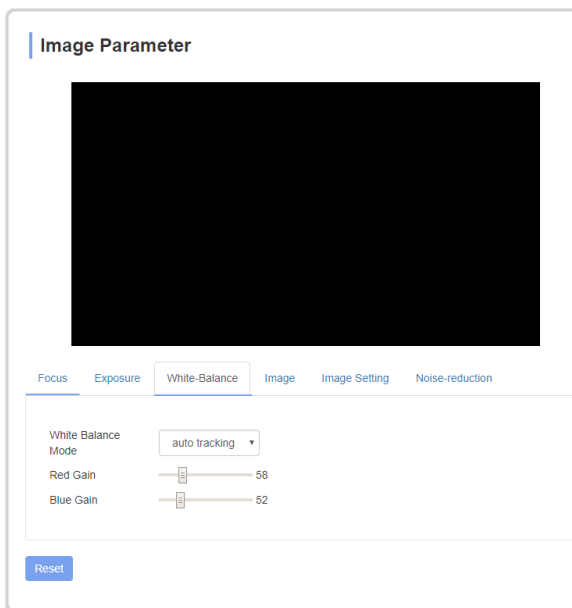
The screenshot shows the 'Image Parameter' web interface. At the top, there's a title 'Image Parameter' and a large black video feed area. Below the feed are five tabs: 'Focus', 'Exposure' (which is selected), 'White-Balance', 'Image', 'Image Setting', and 'Noise-reduction'. The 'Exposure' tab contains several controls: 'Exposure Mode' (a dropdown menu set to 'Auto'), 'Shutter' (a dropdown menu set to '1/100'), 'Anti-flicker' (a toggle switch turned on, with a '60Hz' dropdown next to it), 'Gain' (a dropdown menu set to '0dB'), 'Iris' (a dropdown menu set to 'F2.8'), and 'Brightness' (a dropdown menu set to '11'). A 'Reset' button is located at the bottom left of the control area.

- **Exposure Mode** — select the exposure mode (Auto, Manual, Iris Priority, Shutter Priority, Brightness Priority) you want the camera to operate in.
- **Shutter** — select the shutter speed you want to use. The **Exposure Mode** must be set to **Manual** or **Shutter Priority** to set the shutter speed.
- **Anti-flicker** — turn anti-flicker on and select the frequency (50Hz or 60Hz).
- **Gain** — adjust the gain (30-0dB). The **Exposure Mode** must be set to **Manual** to adjust the gain.
- **Iris** — adjust the iris. The **Exposure Mode** must be set to **Manual** or **Iris Priority** to adjust the iris.
- **Brightness** — adjust the brightness (0-27). The **Exposure Mode** must be set to **Manual** or **Brightness Priority** to adjust the brightness.



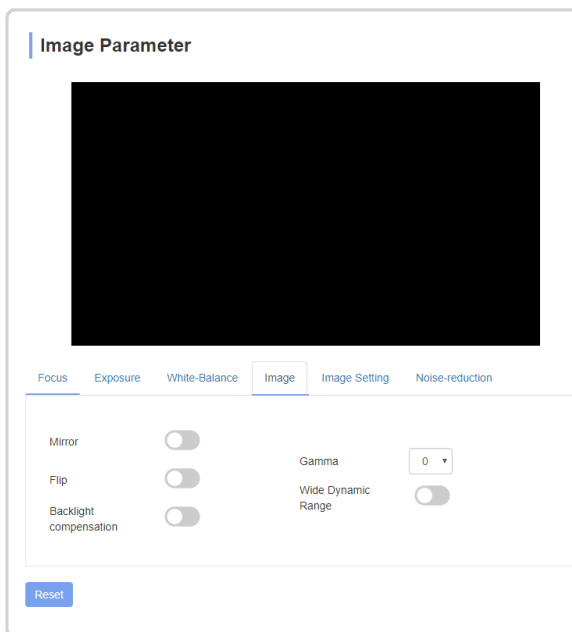
---

## White Balance



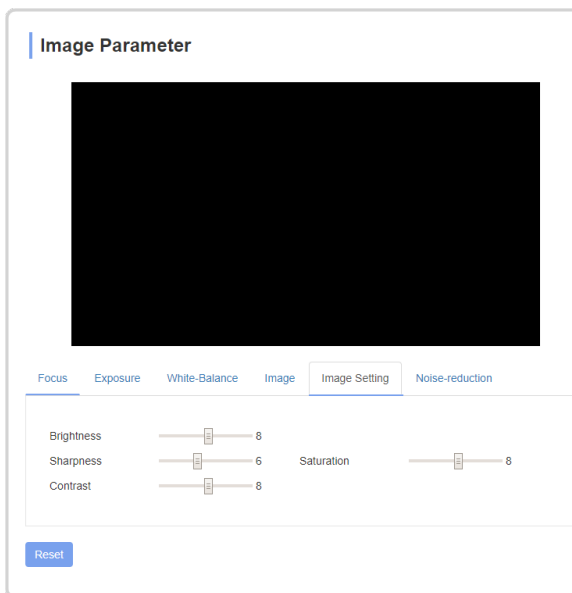
- **White Balance Mode** — select a preset white balance mode (Auto, Indoor, Outdoor, One Push, Auto Tracking) or set the mode to **Manual** to be able to adjust the **Red Gain** and **Blue Gain**.
- **Red Gain** — manually adjust the red gain.
- **Blue Gain** — manually adjust the blue gain.

## Image



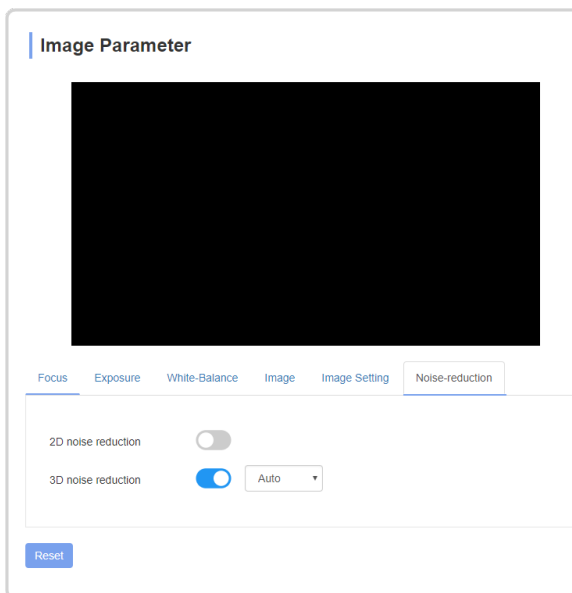
- **Mirror** — flip the image horizontally.
- **Flip** — flip the image vertically.
- **Backlight Compensation** — turn backlight compensation on or off.
- **Gamma** — select the gamma level (0-4).
- **Wide Dynamic Range** — turn wide dynamic range (WDR) on or off. Select the WDR level you want to use.

## Image Setting



- **Brightness** — adjust the brightness of the image (0-15).
- **Sharpness** — adjust the sharpness of the image (0-15).
- **Contrast** — adjust the contrast of the image (0-15).
- **Saturation** — adjust the saturation of the image (0-15).

## Noise-Reduction



- **2D Noise Reduction** — turn image noise reduction on or off.
- **3D Noise Reduction** — turn motion noise reduction on or off. Select the level of noise reduction (Auto, Level1-4) you want to use.

## Ethernet

The **Ethernet** tab allows you to set confirm and set the ethernet settings for the camera.

**Note:** You must power cycle the camera to use the new ethernet settings. When the camera powers back on it will be using the new ethernet settings and you will have to point your browser to the new address.

**Tip:** You can also view the current ethernet settings from the onscreen menus.

**Ethernet**

DHCP ☒

IP Address

Subnet Mask

Default Gateway

HTTP Port

RTSP Port

RTMP Port

**Save**

- **DHCP** — select DHCP (on) or a static (off) IP address.
- **IP Address** — the current IP address of the camera. If **DHCP** is off you can enter a new value.
- **Subnet Mask** — the current subnet mask for the camera. If **DHCP** is off you can enter a new value.
- **Default Gateway** — the current default gateway for the camera. If **DHCP** is off you can enter a new value.
- **HTTP Port** — the port being used for the web interface.
- **RTSP Port** — the port being used for RTSP communication.
- **RTMP Port** — the port being used for RTMP communication.

**Note:** If you make any changes, you must click **Save** to store the new settings and then power cycle the camera.

## Firmware Upgrade

The **Firmware Upgrade** page allows you to identify the versions of the components on the camera and upgrade part of the firmware if required.

**Note:** You can only upgrade the ISP firmware at this time.

Firmware Upgrade

Control Version

1.0.0.0

Device Name

PIVOTCam-SE

Serial Number

0000000000000000

Bootloader Version

1.0.0.0

System Version

1.0.0.0

App Version

1.0.0.0

Upgrade

Select File

## To Upgrade the Firmware

Use the web interface to select the upgrade file and upload it to the camera.



**Important:** Do NOT power off or operate the camera during the upgrade.

1. Click **Select File**.
2. Locate the upgrade file and select it.
3. Click **Open**.
4. Click **Upgrade**.
5. Follow any prompts to upgrade the camera.

**Tip:** You may have to reset the camera parameters to get update the camera settings.

## Reset to Default

The **Reset to Default** page allows you to reset just the image parameters or all the camera settings and reboot the camera.

Reset to default

Reset simply

To reset the image parameter

Reset completely

To reset all parameter and reboot the device

Reboot

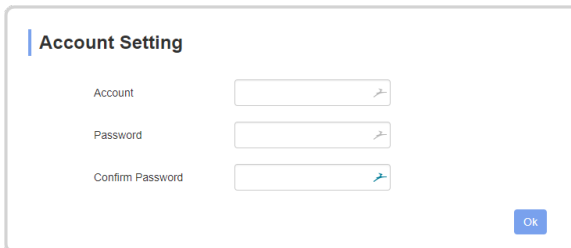
- **Reset Simply** — click this button to reset only the image parameters.
- **Reset Completely** — click this button to reset all parameters of the camera.

- **Reboot** — click this button to reboot the camera.

## Account

The **Account Setting** page allows you to change the account name and password used to access the camera

**Note:** *There is only ONE account for a camera. If you change the account name and password you cannot use the old account to access the camera.*

A screenshot of the 'Account Setting' web interface. The title 'Account Setting' is at the top left. Below it are three input fields: 'Account', 'Password', and 'Confirm Password'. Each field has a small icon on the right side of the input box. At the bottom right of the form is a blue 'OK' button.

Account Setting

Account

Password

Confirm Password

OK

### To Set a New Account Name and Password

1. Enter a new account name in the **Account** field.
2. Enter a new password in the **Password** field.
3. Enter the same password in the **Confirm Password** field.
4. Click **Ok** to set the new account name and

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# Troubleshooting

- **Grinding noise near limits** — The camera may have lost position reference. Either power-cycle the camera or use the PT Reset function to reset the pan/tilt positioning.



# Specifications

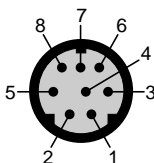
Item	PIVOTCam-20	PIVOTCam-SE
Video Formats (SDI)	1080p 59.94/50/29.97/25Hz	1080p 60/59.94/50/30/29.97/25/24/23.98Hz
	1080i 59.94/50Hz	1080i 60/59.94/50Hz
	720p 59.94/50/30/25Hz	720p 60/59.94/50/30/29.97/25Hz
Video Formats (Main Stream)	--	3840×2160, 1920×1080 (1-30Hz)
Video Formats (Sub Stream)	--	1280×720, 1027×576, 640×360 (1-30Hz)
Video Outputs	HD-SDI: 3G SDI	HD-SDI: 3G SDI
	DVI-I: HDMI, YPbPr/VGA	LAN: H.264, H.265
Image Sensor	1/1.8 inch, HD CMOS	1/1.7 inch (½ inch type), 12.4M Pixel CMOS
Lens	f6.7(wide), 134.5mm(tele)	f6.5(wide), 149.5mm(tele)
	FOV: 60°(wide), -3°(tele)	FOV: 60°(wide), 2.02°(tele)
	20× Optical Zoom + 12× Digital Zoom	23× Optical Zoom + 2× Lossless Digital Zoom
Rotation Angle	Pan: ±170°	Pan: ±170°
	Tilt: -35° to +90° (upside-down mounting supported)	Tilt: -30° to +90° (upside-down mounting supported)
Rotation Speed	Pan: 0.1° to 120°/s	Pan: 0.1° to 120°/s
	Tilt: 0.1° to 80°/s	Tilt: 0.1° to 80°/s
Presets	Remote Control: 10	Remote Control: 10
	COM: 128	COM: 128
	DashBoard: 1,000	DashBoard: 1,000
	Preset Accuracy: 0.1°	Preset Accuracy: 0.1°
Serial Control	RS-232, RS-485 (2-wire only)	RS-232, RS-485 (2-wire only)
Ethernet Control	Serial to Ethernet Converter Required	1Gb Ethernet Direct (port 52381)
Daisy Chain	Supported	Supported
Tally	(DashBoard Tallies)	Red/Blue/Green (VISCA protocol)

Item	PIVOTCam-20	PIVOTCam-SE
Minimum Lux	Day: 0.2	0.01
	Night: 0.01	
	DSS On: 0.005	
White Balance	ATW, Manual, Auto, Indoor, Outdoor, One Push	ATW, Manual, Sodium, Fluorescent, Auto, Indoor, Outdoor, Push
Focus	Auto/Manual	
Iris	Auto/Manual	
Shutter	Auto/Manual	
Exposure Compensation	Supported	
WDR	Supported	
BLC	Supported	
2D/3D Noise Reduction	Supported	
Input Voltage	12VDC Brick	12VDC Brick and/or PoE
Dimension	220mm × 173mm × 117mm (8.7in × 6.8in × 4.6in)	220mm × 173mm × 117mm (8.7in × 6.8in × 4.6in)
Net Weight	1.25kg (2.8lb)	1.25kg (2.8lb)

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# Ports

## RS232 (VISCA IN/OUT)



**Table 3: RS232 Port Pinouts**

Pin	Signal
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	A(+)
7	IR OUT
8	B(-)