Active Silicon

Oriole HD-IP Board Camera
(Ethernet IP, H.264)

AS-BCAM-IP32-001-A

Technical Reference Manual

Edition: v1.00

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Contents

Disclaimer

While every precaution has been taken in the preparation of this manual, Active Silicon assumes no responsibility for errors or omissions. Active Silicon reserves the right to change the specification of the product described within this manual and the manual itself at any time without notice and without obligation of Active Silicon to notify any person of such revisions or changes.

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FEATURES

- **1/2.8” SONY Starvis CMOS sensor**
  3.13M Pixels (Total)
- **Full HD Resolution**
  1920x1080p,1280x720p, 800x600, 640x480, 640x360, 320x240
- **IP Streaming**
  Dual Streaming (H.264 & MJPEG)
- **10/100 Base T Ethernet**
- **ONVIF Profile S compatible**
- **Fast boot time**
- **M12, 3.6mm lens**
- **DC 12V**

CAUTIONS

- **Handling of the unit**

Do not apply excessive voltage to avoid getting an electric shock or causing fire.
Use only the specified voltage.
Don't drop the camera or subject it to severe physical shocks as it may damage the camera.
Do not remove labels or attempt to disassemble the camera. There are no user's serviceable parts inside. Refer servicing to qualified service personnel.
Never point the camera towards the sun. A smear on the picture might occur when the camera is directly faced to the sun, spotlights or light reflecting objects.
Do not spill water or other liquids on the unit.
When handling the unit, take precautions against Electrostatic discharge (ESD).

- **Operating and storage location**

Avoid operating or storing the unit in the following locations.

- Extremely hot or cold places (operating temperature -10 °C ~ 50 °C, however, we recommend that the unit be used within a temperature range of 0 °C ~ 45 °C)
- Damp or dusty places
- Places exposed to rain
- Places subject to strong vibration
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.

- **Care of the unit**

Avoid cleaning the surface of the CMOS sensor. If you must clean it, use a soft, lint free cloth dampened with a small quantity of high-quality window cleaner. Because electrostatic discharge can damage the CMOS sensor, you must use a cloth that will not generate static during cleaning (cotton is a good choice).

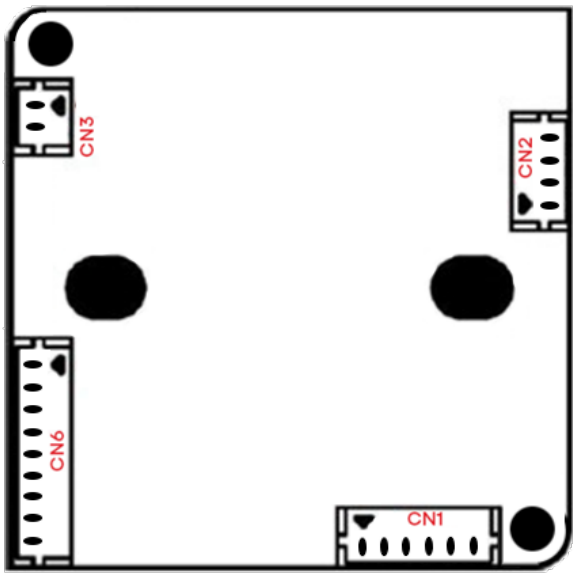
To clean the surface of the camera housing, use a soft, dry cloth. To remove severe stains, use a soft cloth dampened with a small quantity of neutral detergent, then wipe dry. Don't use volatile solvents such as benzine and thinners they can damage the surface finish.

SPECIFICATIONS

Model	AS-BCAM-IP32-001-A
Image Sensor	1/2.8" Sony STARVIS CMOS Sensor
Pixels	2.13M Pixels
Resolution	1920x1080, 1280x720, 800x600, 640x480, 640x360, 320x240
Minimum Illumination	0.05Lux (F2.5)
S/N ratio	≤50dB
Video Output	
Codec	H.264 Baseline profile, MJPEG
Max Framerate	First: 1080p 30/25fps, H.264 Second: 640x360p 30/25fps, H.264 Third: 1080p 30/25fps, MJPEG
Bitrate Control	CBR, VBR
Max. user access	5 users
Lens type	
Fixed 3.6mm	FOV: 112.3˚(D) x 93.7˚(H) x 49.3˚(V)
Operational	
White Balance	Auto, 3000K, 5000K, 8000K
WDR	116dB (estimated)
Electronic Shutter Speed	Auto, Manual (1/25~1/30,000)
Auto Gain Control (AGC)	Off ~ 69dB
Day&Night	AUTO/COLOR/B&W (Electronic D&N)
Privacy Masking Zone	16 Zones
Exposure	HLC/BLC
Defog	Off/On (Manual/Auto - Low, Middle, High)
Ethernet	
Standard	10/100 Base-T Ethernet, IPv4
Video compression	H.264 Baseline Profile, MJPEG
Protocols	ONVIF, HTTP, HTTPS, DNS, UDP, RTS/RTSP, TCP/IP(V4), SMTP, UpnP, DHCP
Streaming	Multiple Streaming, up to 3 profiles; Method: Unicast
General	
Power Input	12V DC (±10%)
Power Consumption	Max. 190mA @12VDC
Connectors	Molex Picoblade header
Board Dimensions	32 x 32 mm (height with Lens ~24.5mm)
Weight	Approx. 58g
Operating Conditions	Temperature: -10°C ~ +50°C, Humidity <90%
Storage Conditions	Temperature: -20°C ~ +60°C, Humidity < 90%

Design and specifications are subject to change without notice.

CONNECTORS



CN1 (Power & Network)			
Pin No.	**Name**	**Pin No.**	**Name**
1	DC IN	4	ETH-RX+, RXP
2	ETH-TX+, TXP	5	ETH-RX-, RXM
3	ETH-TX-, TXM	6	GND
Ref	**53047-0610 (MOLEX)**		

CN2 (IR LED)			
Pin No.	**Name**	**Pin No.**	**Name**
1	EXT 12V	3	CDS Signal IN
2	GND	4	IR LED on Signal OUT
Ref	**53047-0410 (MOLEX)**		

CN3 (Day & Night)			
Pin No.	**Name**	**Pin No.**	**Name**
1	TND MA+ (Drive1)	2	TND MA- (Drive2)
Ref	**53047-0210 (MOLEX)**		

CN6 (SD-Card)			
Pin No.	**Name**	**Pin No.**	**Name**
1	SDIDO0-D2 (SD DATA2)	6	GND
2	SDIDO0-D3 (SD DATA3)	7	SDIDO0-D0 (SD DATA0)
3	SDIDO0-CMD (COMMAND Signal)	8	SDIDO0-D1 (SD DATA1)
4	+3.3V	9	SDIDO0-NCD (SD Detect Signal)
5	SDIDO0-CLK (CLKCL Signal)		
Ref	**53047-0910 (MOLEX)**		

Accessing the Camera and Webpages

1. The camera is set to DHCP by default. Your PC/network must be running a DHCP server in order for the camera to get an IP address (e.g. TFTPD64).
2. Get the camera IP address from ONVIF device manager, your DHCP server or an IP address scanning application (e.g. Advanced IP Scanner).
3. Start a Web Browser application (e.g. MS Edge).
4. Enter the IP address in the Address Bar of the browser. A web page will open.
5. You will see dialog boxes for entering the ID and Password of the camera.
   Default values are ***admin*** and ***admin***
   When you deploy the product, you should change the admin password.
6. Once logged in you will see a page displaying the live video from the camera (Active X).

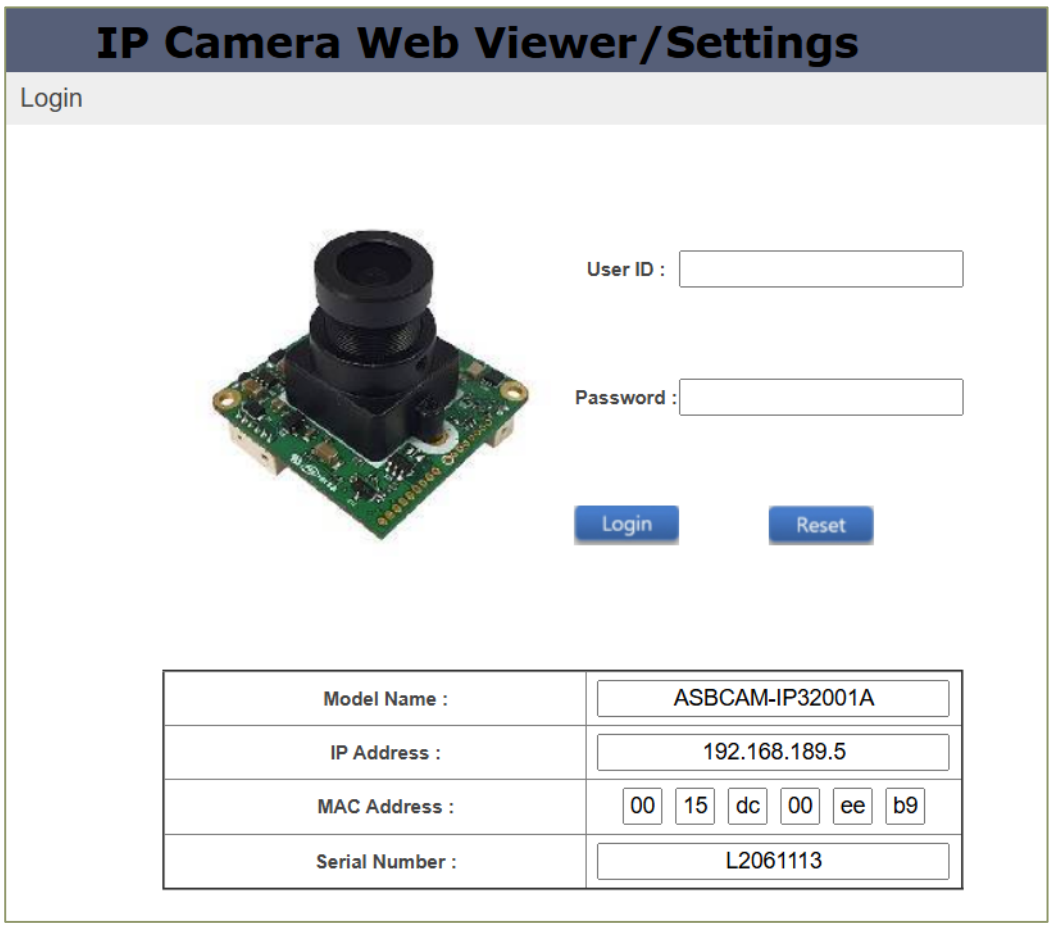


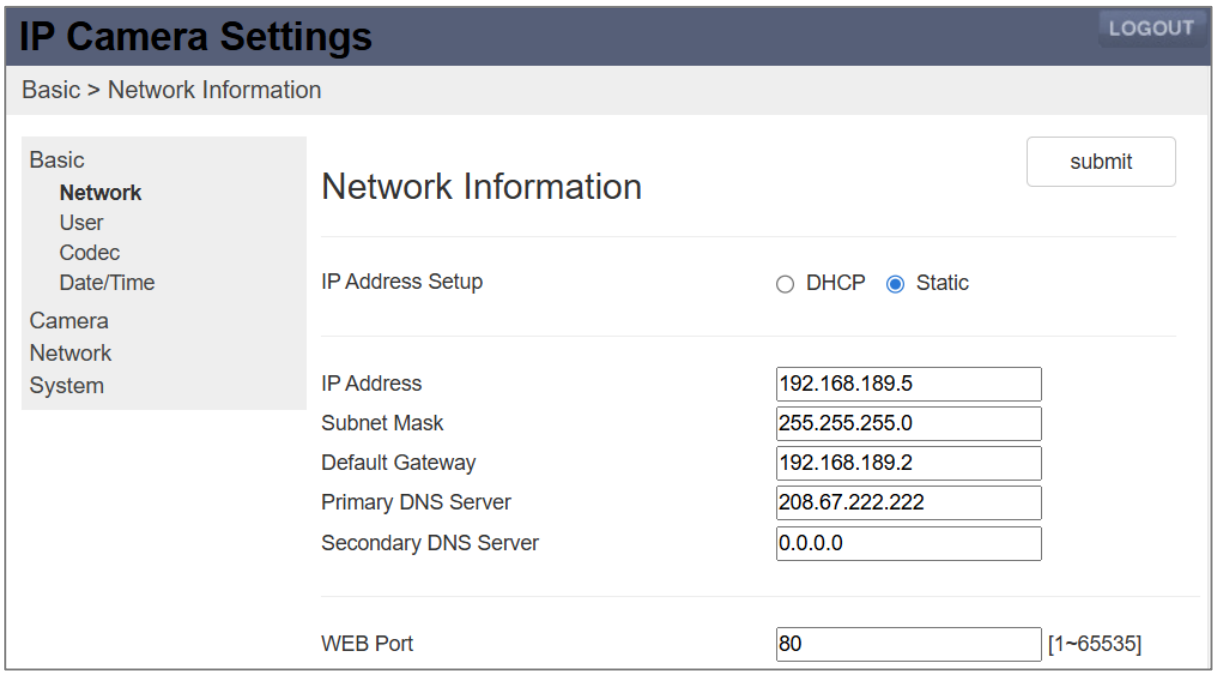
Figure 1. Oriole HD-IP board camera login web page.

Note: ActiveX Live view is only possible through the browser extension or IE mode.
(Please refer to the documentation of the browser you are using.)

All of the IP camera settings can be modified using the web pages.
Some settings can be changed using the http API.

Configuring the IP Camera

Basic → Network Page



Parameter	Options	Default
IP Address Setup	Static, DHCP	DHCP

On this page the IP address for the camera can be set automatically via DHCP or manually set to a static (fixed) IP address (as shown above).

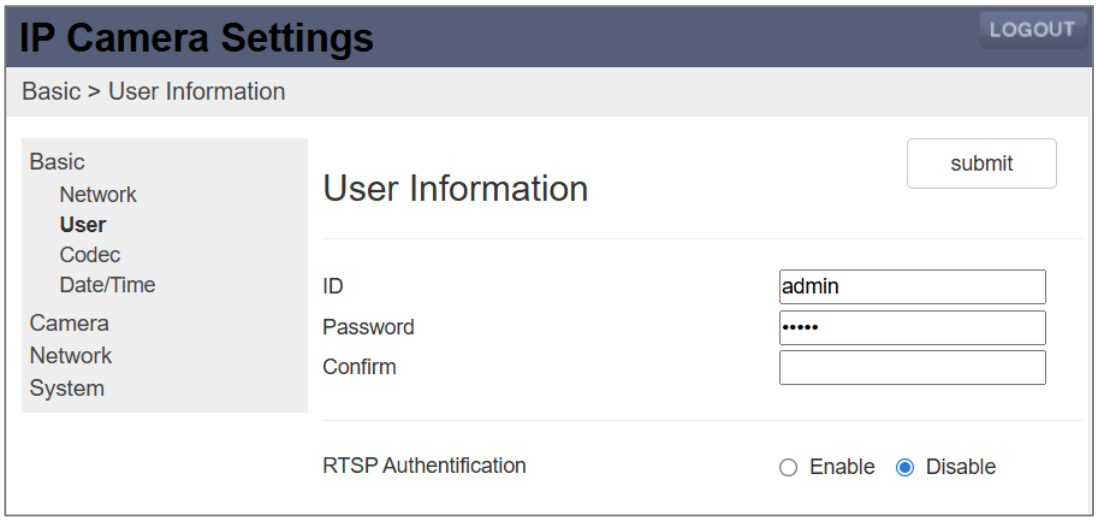
Using DHCP
Dynamic Host Configuration Protocol (DHCP) is a protocol that manages and automates the assignment of IP addresses on a network. The IP camera has DHCP enabled by default and your network must have a DHCP server running so that the camera will be assigned an IP address and can be contacted. Without an assigned IP address, it is not possible to connect to the IP camera. Note: with IP address assignment via DHCP the IP address may change each time you power up the camera, making it difficult to connect to the IP camera. This can be avoided by setting the DHCP server to always allocate the same IP address or use a static IP address setting on the IP camera.

Using a static IP address
To use a static IP address, check the Static radio button and then make the following settings:

- IP address - Enter an IP address that will be unique to the camera. Be careful not to set a duplicate IP address that is already used. Your network card must support the address set.
- Subnet mask - Specify the subnet mask (usually 255.255.255.0)
- Default gateway - Specify the IP address of the default router (gateway) used for connecting devices attached to different networks and network segments.
- Click on the “Submit” button.

Once the camera is connected and has a valid address, you can use an ONVIF based application (e.g. ONVIF device manager) to connect to the camera and display video.

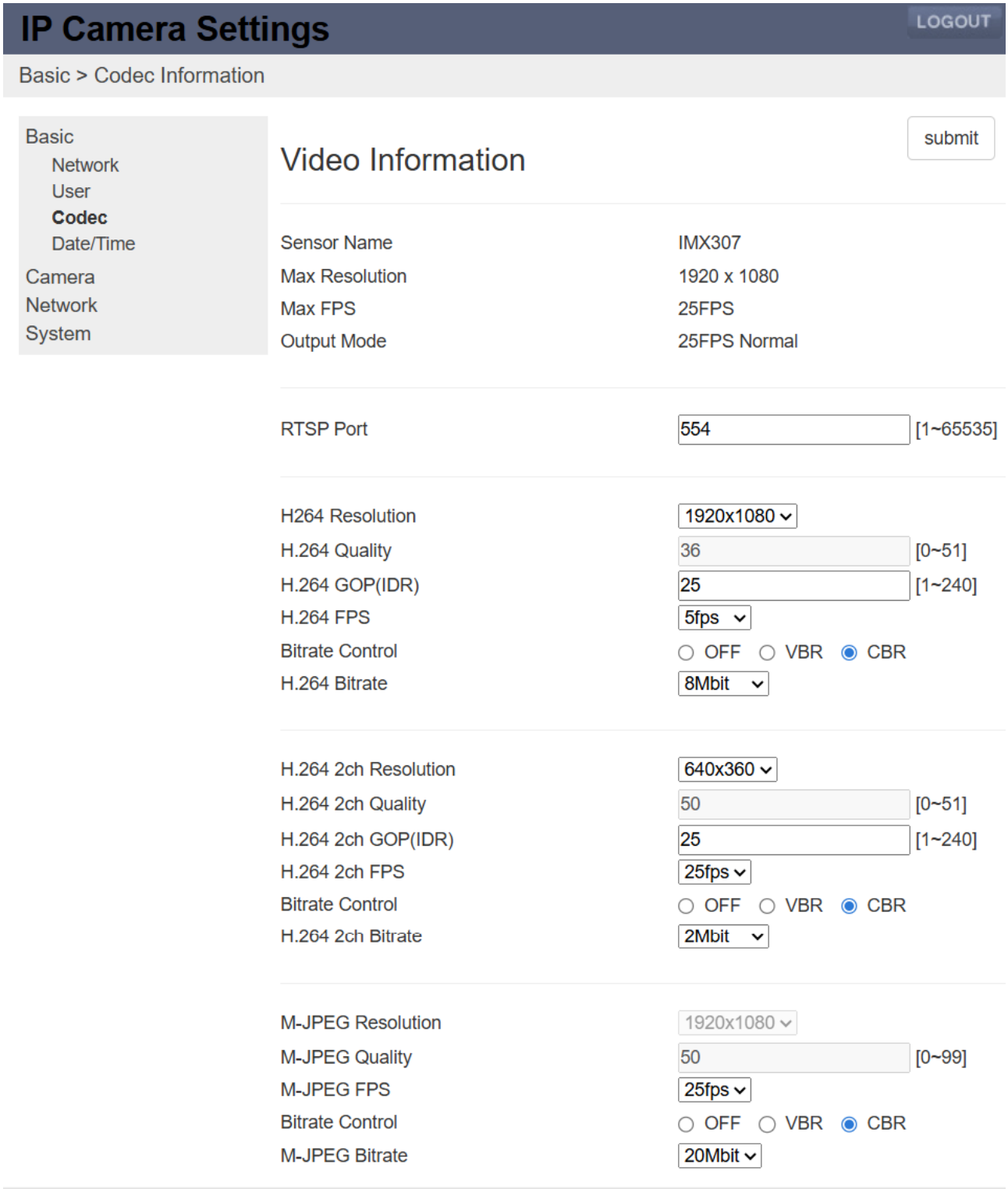
Basic → Users page



User Account
This page is used to setup user accounts/logins for the IP camera.
White space is not allowed in these fields, only alphanumeric characters can be used.

To apply the new settings, you must click on "Submit" before leaving the page.

Basic → Codec



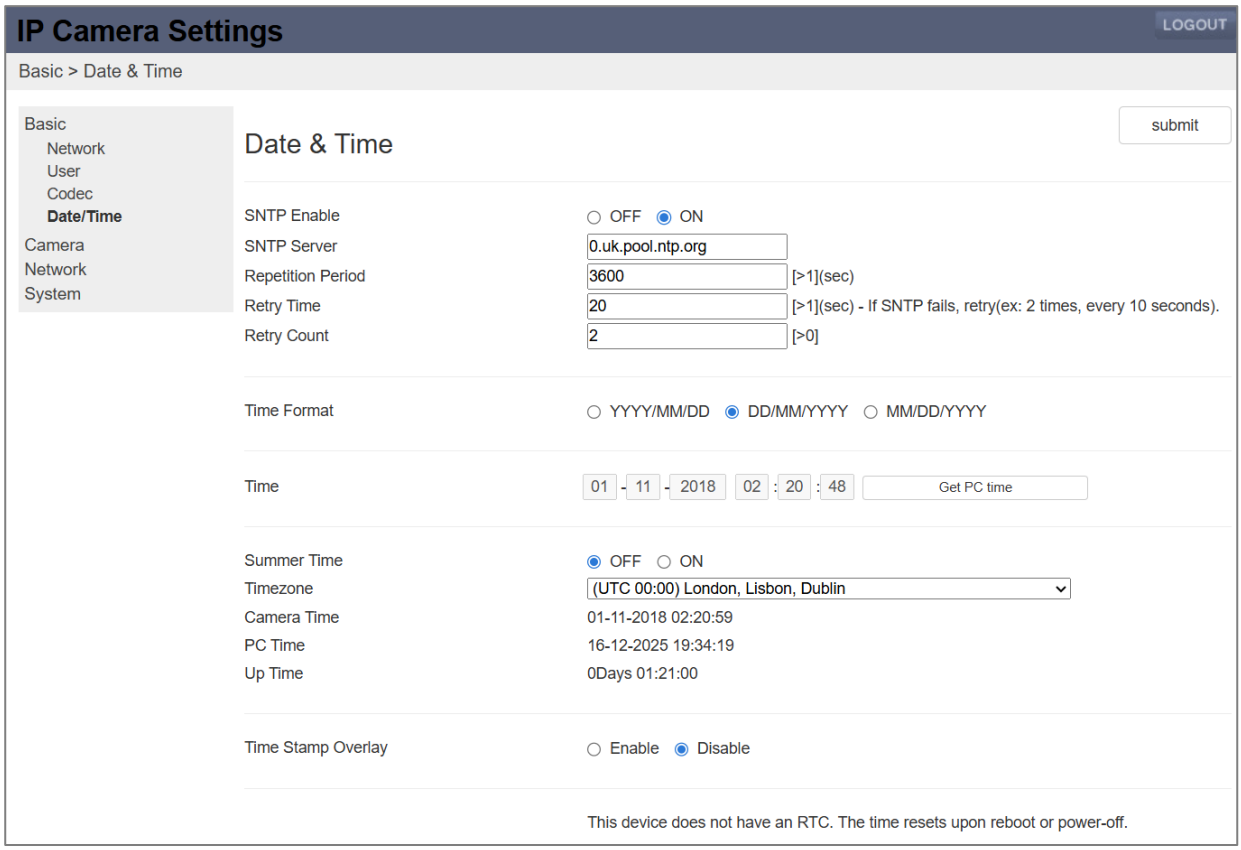
This page is used to configure the IP video output of the IP camera.

Video Parameters	Options	Default
RTSP Port	1-65535	554
H.264		
H.264 Resolution	1920x1080, 1280x720, 720x480, 640x480, 352x240	1920x 1080
H.264 Quality	0-51	36
H.264 GOP(IDR)	1-240	25
H.264 FPS	1, 5, 25 (fps)	5fps
Bitrate Control	OFF, VBR, CBR,	CBR
H.264 Bitrate	128Kbit~20Mbit	8Mbit
H.264 channel 2		
H.264 channel 2 Resolution	640x360, 320x240	640x360
H.264 channel 2 Quality	50	50
H.264 channel 2 GOP(IDR)	25	25
H.264 channel 2 FPS	1, 5, 25 (fps)	25fps
Bitrate Control	OFF, VBR, CBR	CBR
H.264 channel 22ch Bitrate	128Kbit~20Mbit	2Mbit
M-JPEG		
M-JPEG Resolution	1920x1080	1920x1080
M-JPEG Quality	50	50
M-JPEG FPS	1, 5, 25 (fps)	25fps
Bitrate Control	OFF, VBR, CBR	CBR
M-JPEG Bitrate	128Kbit~20Mbit	20Mbit

- Frame Rate setting is made on the **Camera->Output->Set** page.
- Bit-rate Range depends on Resolution setting.
- Frame Rate and Bit-rate can be adjusted while streaming to clients.

To apply the new settings, you must click on “Submit” before leaving the page.

Basic → Date & Time



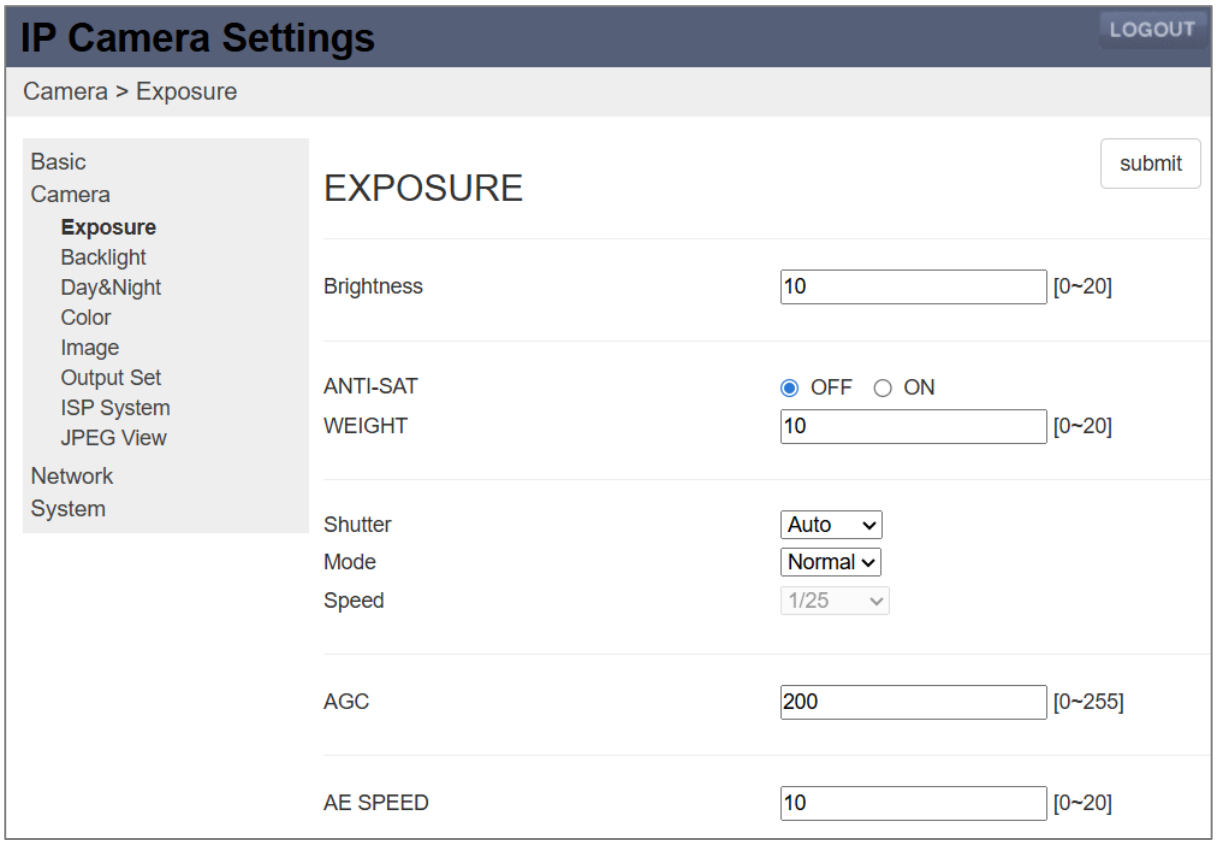
This page is used to configure the time settings on the IP camera. The camera does not have a battery powered clock so any settings made will be lost on the next power cycle. The http API can be used to remotely update the clock time when the camera is powered on.

Parameters	Options	Default
SNTP Enable	OFF, ON	ON
SNTP Server	Any ntp server	0.uk.pool.ntp.org
Repetition Period	>1	3600
Retry Time	>1	20
Retry Count	>0	2
Time Format	YYYY/MM/DD, DD/MM/YYYY, MM/DD/YYYY	DD/MM/YYYY
Time	Camera Time, PC Time	Camera Time
Summer Time	OFF, ON	OFF
Timezone	Various	(UTC 00:00) London, Lisbon
Time Stamp Overlay	ON, OFF	OFF

- Click on “GET PC Time” to set the same time as on your PC.
- You may need to rotate the video (using image flip setting - camera->image->Flip) to get the camera and OSD text orientation to match.

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → Exposure

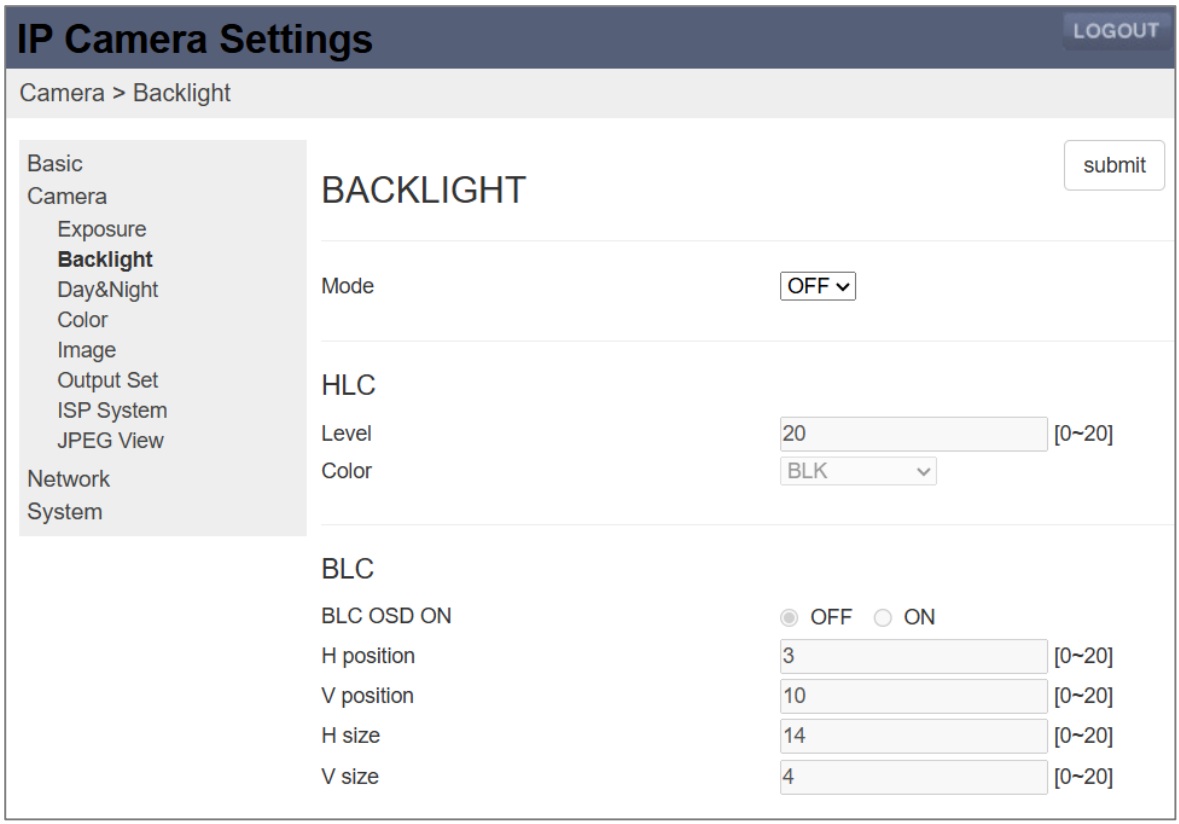


On this page the IP camera settings can be modified to alter the video quality as required.

Camera Parameters	Options	Default
Brightness	0 ~ 20	10
ANTI-SAT	OFF, ON	OFF
WEIGHT	0 ~ 20	10
Shutter	Auto, Manual, Flicker	Auto
Mode	Normal, Deblur	Normal
Speed	1/25-1/25,600, 1/30-1/30,000	1/25
AGC	0 ~ 255	200
AE SPEED	0 ~ 20	10

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → Backlight



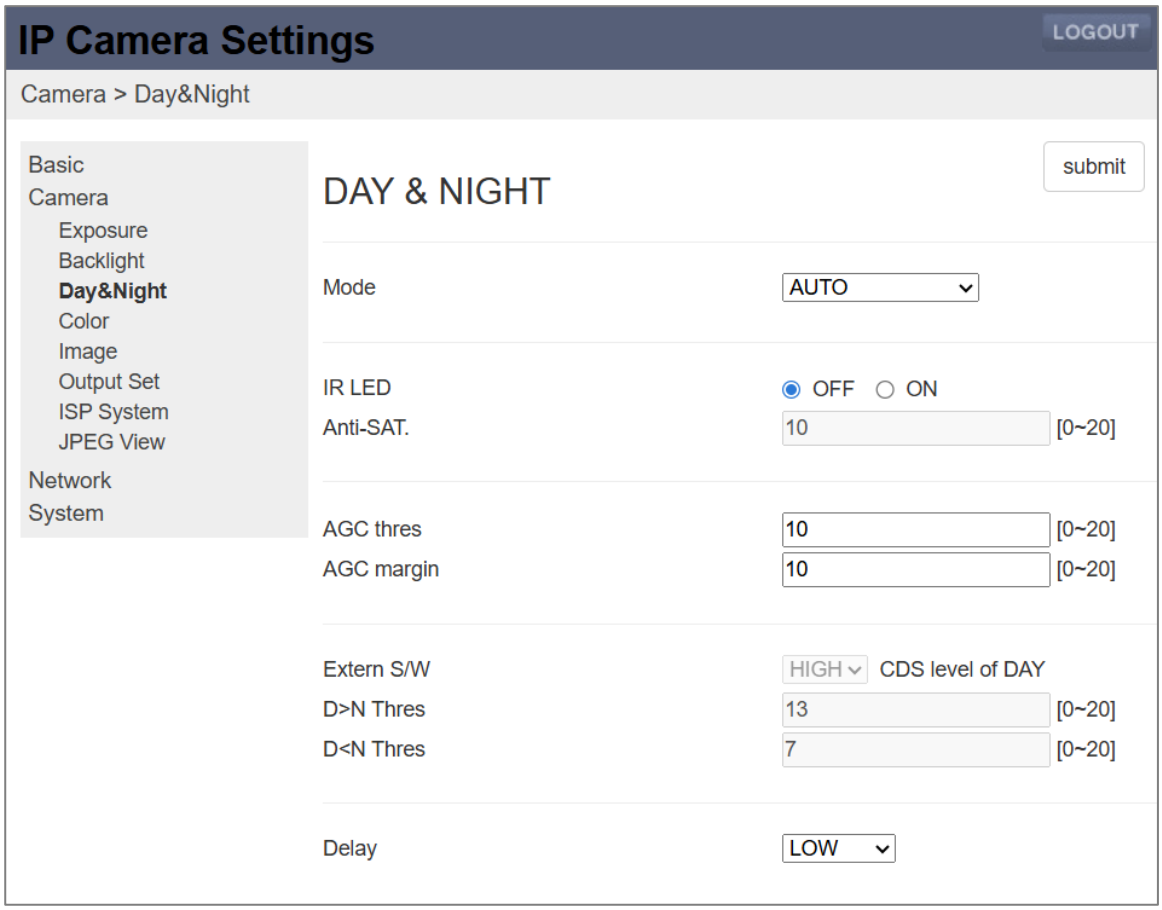
On this page more IP camera settings can be modified to alter the video quality (highlight compensation/backlight compensation.

Text Backlight Parameters	Options	Default
Mode	OFF, HLC, BLC	OFF
HLC Level	0~20	20
HLC Color	WHIT, YEL, CYN, GRN, MAG, RED, BLU, BLK, CUSTOMIZE	BLK
BLC OSD ON	OFF, ON	OFF
BLC H-Position	0~20	3
BLC V-Position	0~20	10
BLC H-Size	0~20	14
BLC V-Size	0~20	4

- Set HLC or BLC according to the scene/requirements.

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → Day & Night



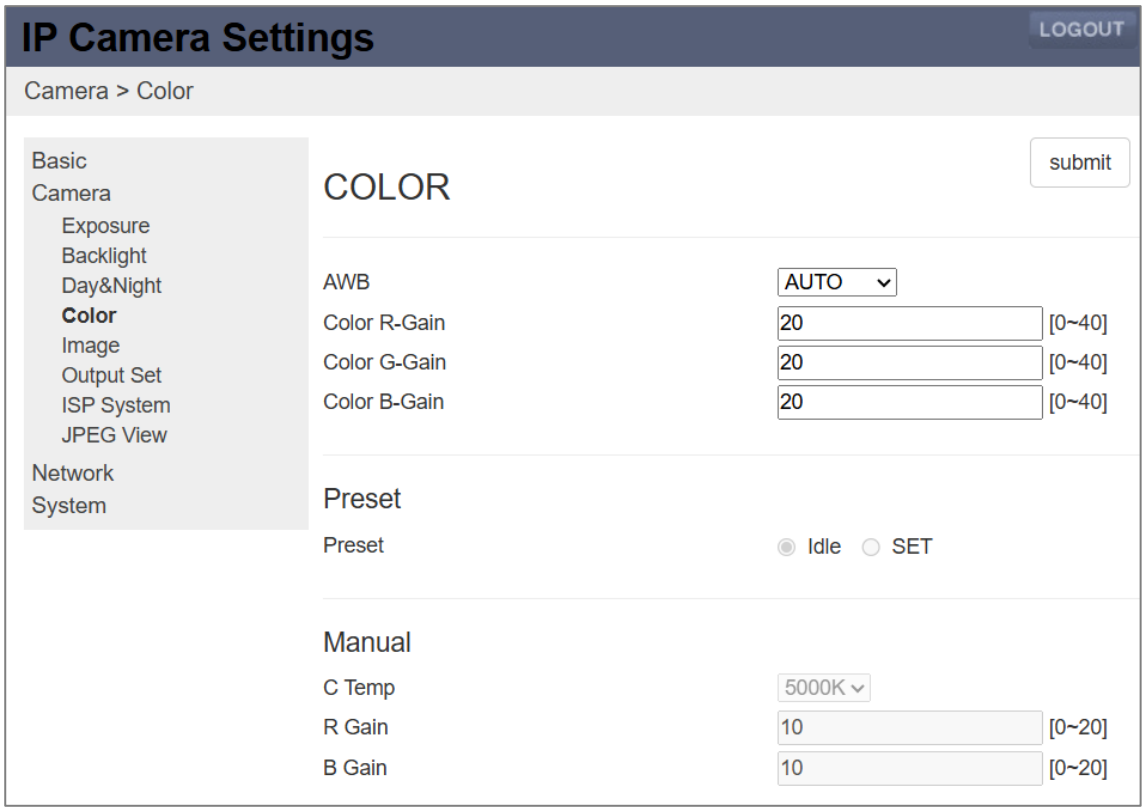
On this page the IP camera Day and Night mode, IR LED and AGC settings can be modified. The camera has black and white video in night mode.

Parameter	Options	Default
Mode	AUTO, COLOR, BLACK & WHITE, EXTERN	AUTO
IR LED	OFF, ON	OFF
Anti-SAT	0-20	10
AGC thres	0-20	10
AGC margin	0-20	10
Extern S/W	HIGH	HIGH
D>N Thres	0-20	13
D<N Thres	0-20	7
Delay	Low, Middle, High	Low

- D>N Thres / D<N Thres – Adjust day and night lux level.
- Delay – Adjust day and night delay time.

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → Color

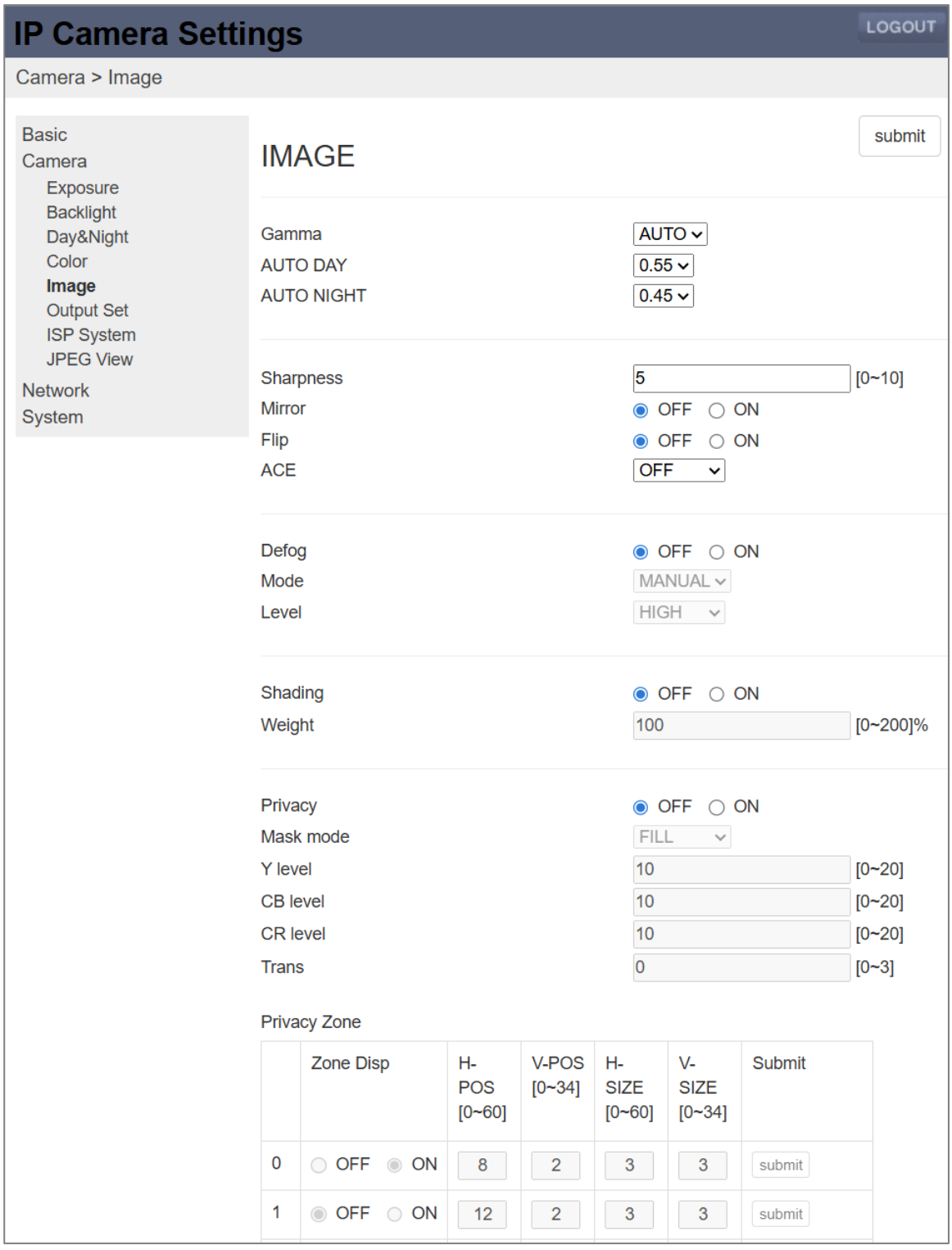


This is a page that adjusts the video white balance and color settings of the video.

Parameter	Options	Default
AWB	AUTO, AUTOext, PRESET, MANUAL	AUTO
Color R-Gain	0~40	20
Color G-Gain	0~40	20
Color B-Gain	0~40	20
Preset	Idle, SET	Idle
C Temp	3000/5000/8000K	5000k
R Gain	0-20	10
B Gain	0-20	10

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → Image

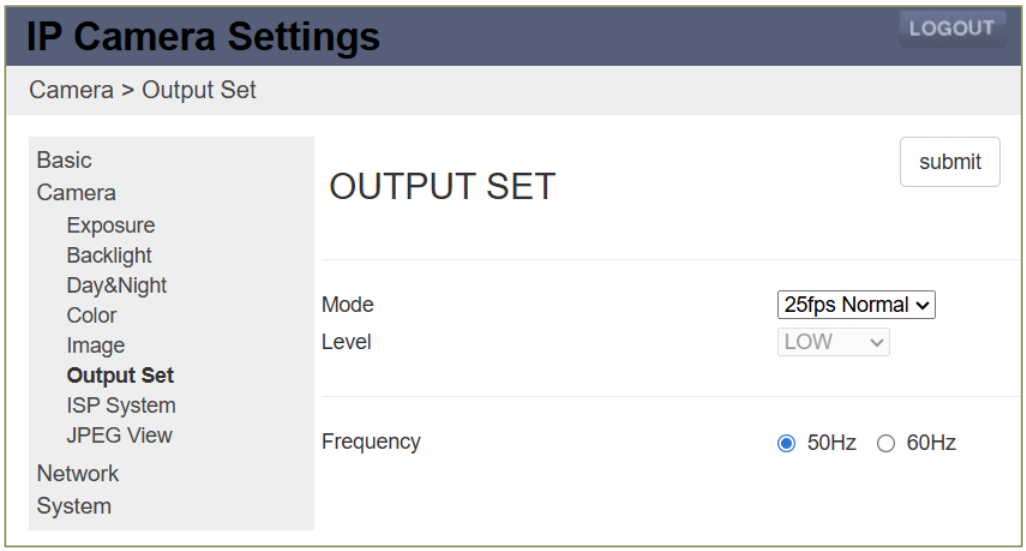


This page allows control of various camera settings including 16 sets of privacy mode settings.

Parameter	Options	Default
Gamma	AUTO, 0.75, 0.7, 0.65, 0.6, 0.55, 0.5, 0.45	AUTO
AUTO DAY	0.75, 0.7, 0.65, 0.6, 0.55, 0.5, 0.45	0.55
AUTO NIGHT	0.75, 0.7, 0.65, 0.6, 0.55, 0.5, 0.45	0.45
Sharpness	0-10	5
Mirror	OFF, ON	OFF
Flip	OFF, ON	OFF
ACE	OFF, ON	OFF
Defog	OFF, ON	ON
Mode	AUTO, MANUAL	MANUAL
Level	LOW, MIDDLE, HIGH	LOW
Shading	OFF, ON	OFF
Weight	0~200	100
Privacy	OFF, ON	OFF
Mask Mode	FILL, FORMAT	FILL
Y level	0-20	10
CB level	0-20	10
Cr leve	0-20	10
Transparency	0-20	0
Individual Privacy Zone	OFF, ON	OFF
Zone Size and Position	H POS: 0-60 V POS: 0-34 H SIZE: 0-60, V SIZE: 0-34	Various

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → OUTPUT SET

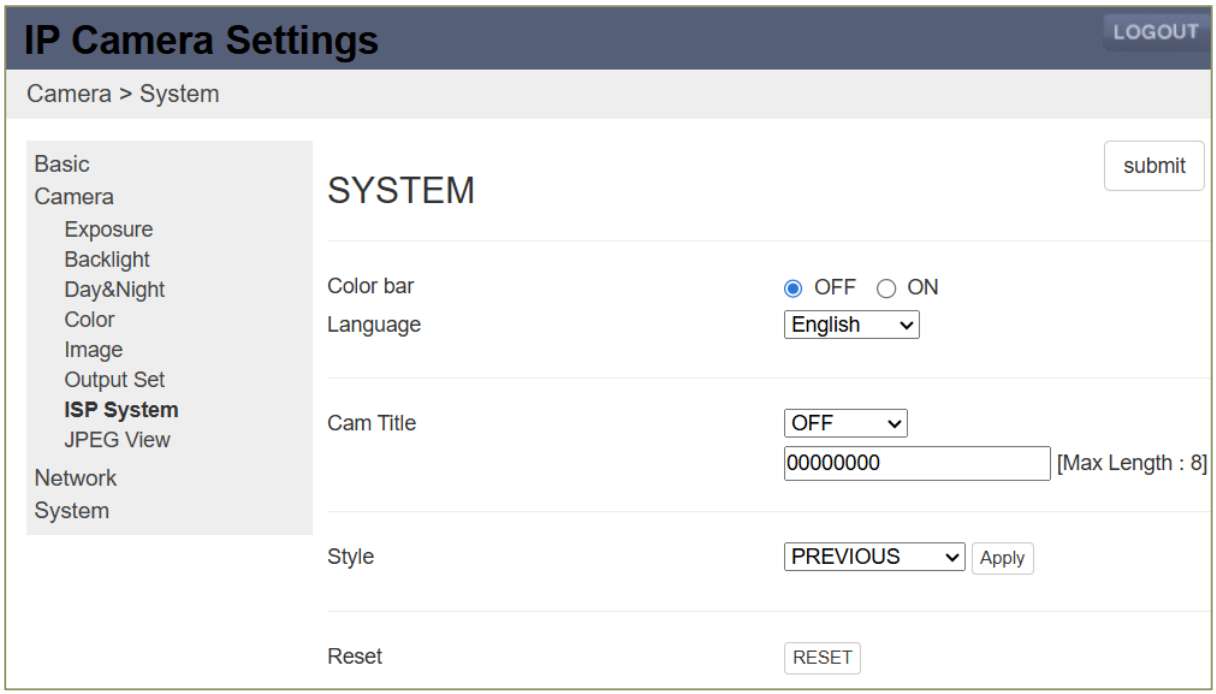


This page allows the frequency of the video output and DNR/WDR configuration to be set.

Parameter	Options	Default
Mode	50 fps Normal/DNR 25 fps Normal/WDR/DNR, 12 fps WDR 60 fps Normal/DNR 30 fps Normal/WDR/DNR, 15 fps WDR	25fps Normal Select frequency=60Hz to select 60/30/15Hz modes
Level (DNR/WDR)	LOW, MIDDLE, HIGH	MIDDLE
Frequency	50Hz, 60Hz	50Hz

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → ISP System



This page allows control of various on screen overlays added by the ISP.

Parameters	Options	Default
Color bar	OFF, ON	OFF
Language	English, Korean, Japen, Chinese[S], Chinese	English
Cam Title	OFF, Right up, Left down	OFF
	********	00000000
Style	PREVIOUS, IPC INDOOR, IPC OUTDOOR, CAR REC, ACTION REC, WDR, LOW BIT, CUSTOM	PREVIOUS
Reset	-	-

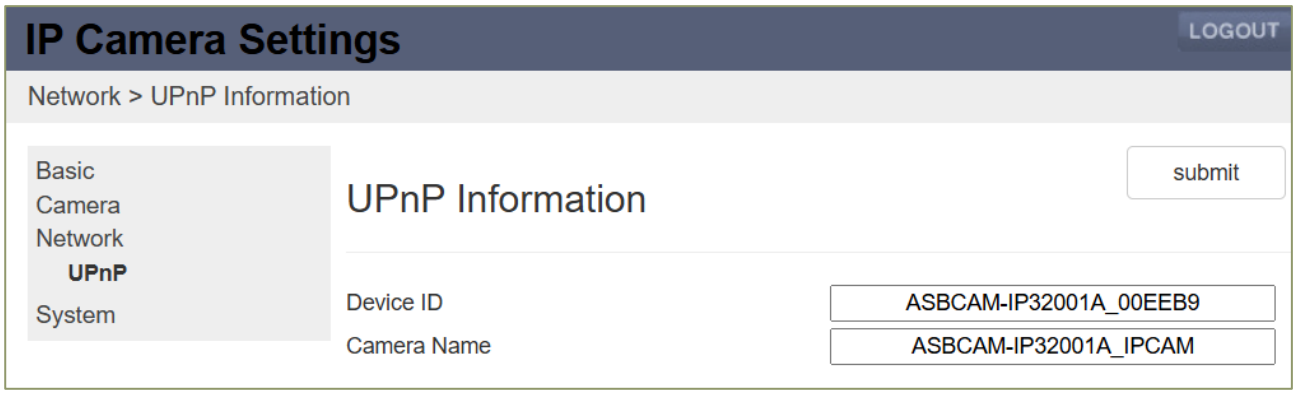
Note the overlay text may be in a different orientation to the camera video.
This can be worked around by setting the camera image flip setting (Camera->Image->Flip or Image Flip http API command).

To apply the new settings, you must click on “Submit” before leaving the page.

Camera → JPEG View

This page displays the view from the camera.

Network → UPnP



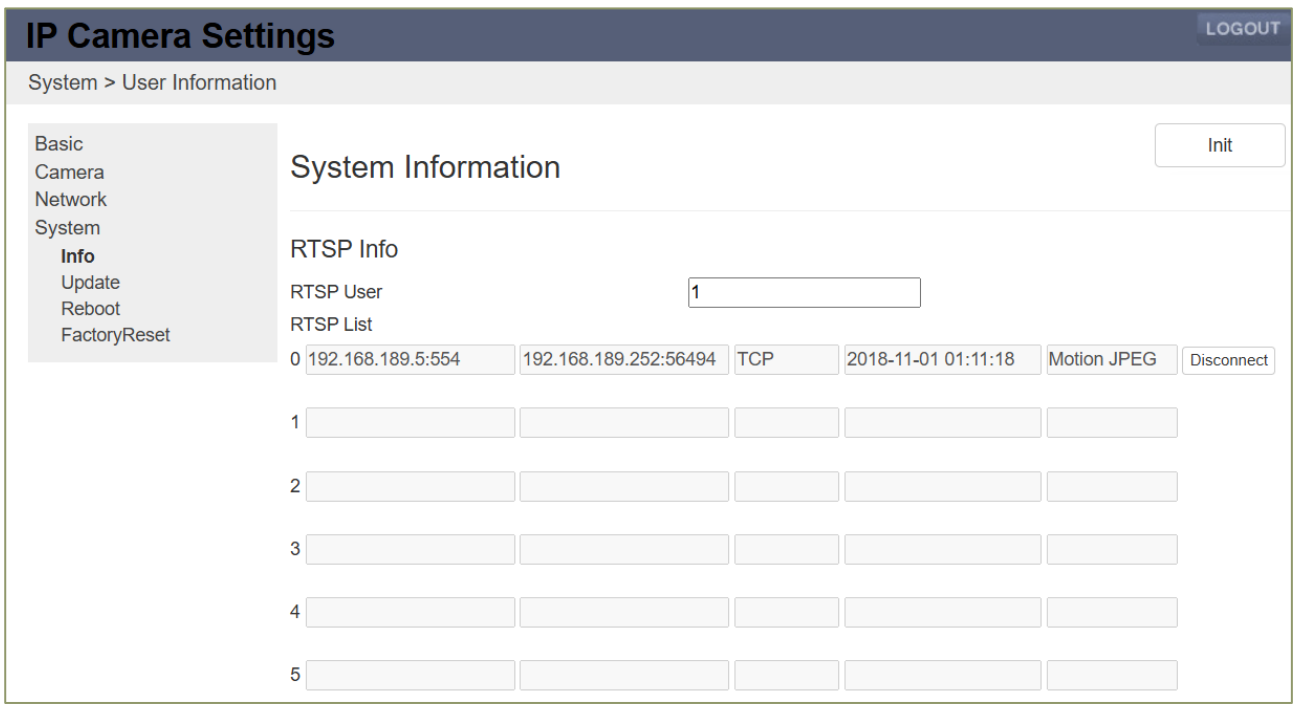
This page displays, and enables you to change, the device ID and name.

- Device ID: Enter the Device ID
- Camera Name: Enter the Camera Name

To apply the new settings, you must click on “Submit” before leaving the page.

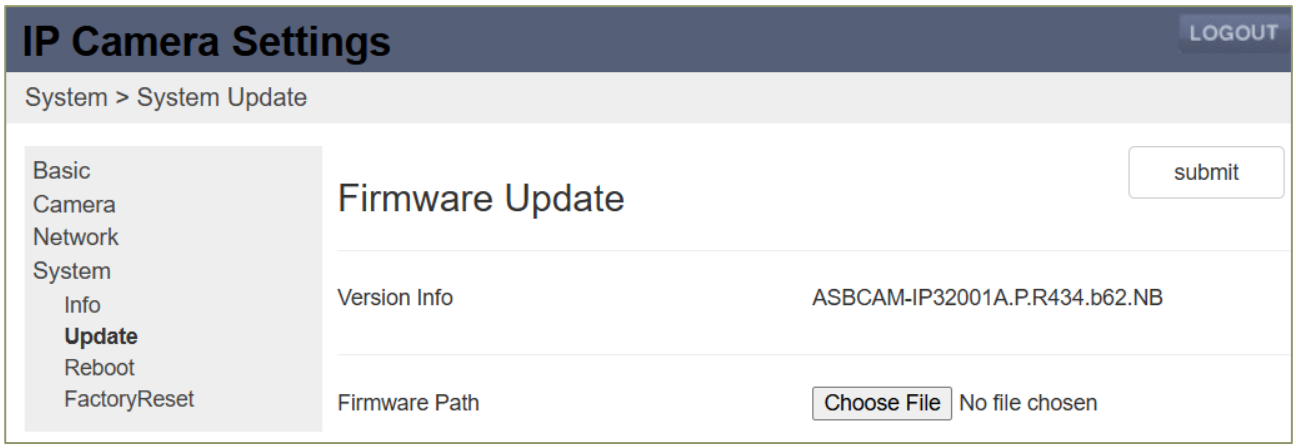
System → Info

.



This page displays host connections to the camera (5 max.).

System → Update



This page allows you to update the camera firmware by selecting a suitable programming file.

- Using a browse window, you can select a camera firmware file.
- To start the update, click on the “Submit” button.

System → Reboot

This page allows you to reboot the camera by clicking on the “Submit” button.

System → Reboot & Factory Reset

Clicking on the “Submit” button on this page changes all the camera settings back to the default settings.

HTTP API

Some of the IP camera settings can be modified using the HTTP API.
This is used by entering specific web addresses based on the IP address of the camera (shown as xxx.xxx.xxx.xxx below) into the browser address bar.

Adding a Time Stamp Overlay

- Off : http://xxx.xxx.xxx.xxx/appextra.cgi?time_overlay=0
- On : http://xxx.xxx.xxx.xxx/appextra.cgi?time_overlay=1

Note the overlay text may be in a different orientation to the camera video. This can be worked around by setting the camera image flip setting (camera->image->Flip).

Image Flip

- OFF : http://xxx.xxx.xxx.xxx/appextra.cgi?image_flip=0
- ON : http://xxx.xxx.xxx.xxx/appextra.cgi?image_flip=1

Image Mirror

- OFF : http://xxx.xxx.xxx.xxx/appextra.cgi?image_mirror=0
- ON : http://xxx.xxx.xxx.xxx/appextra.cgi?image_mirror=1

As these use the same base URI, these operations can be combined into one command line.
e.g.
http://xxx.xxx.xxx.xxx/appextra.cgi?time_ymd=20250630_152001&image_flip=1&time_overlay=1

Setting the Camera Clock/Time

- YYYYMMDD_hhmmss : http://xxx.xxx.xxx.xxx/appextra.cgi?time_ymd=20250630_152001
- DDMMYYYY_hhmmss : http://xxx.xxx.xxx.xxx/appextra.cgi?time_dmy=30062025_152001
- MMDDYYYY_hhmmss : http://xxx.xxx.xxx.xxx/appextra.cgi?time_mdy=06302025_152001

Defect / Spot pixels

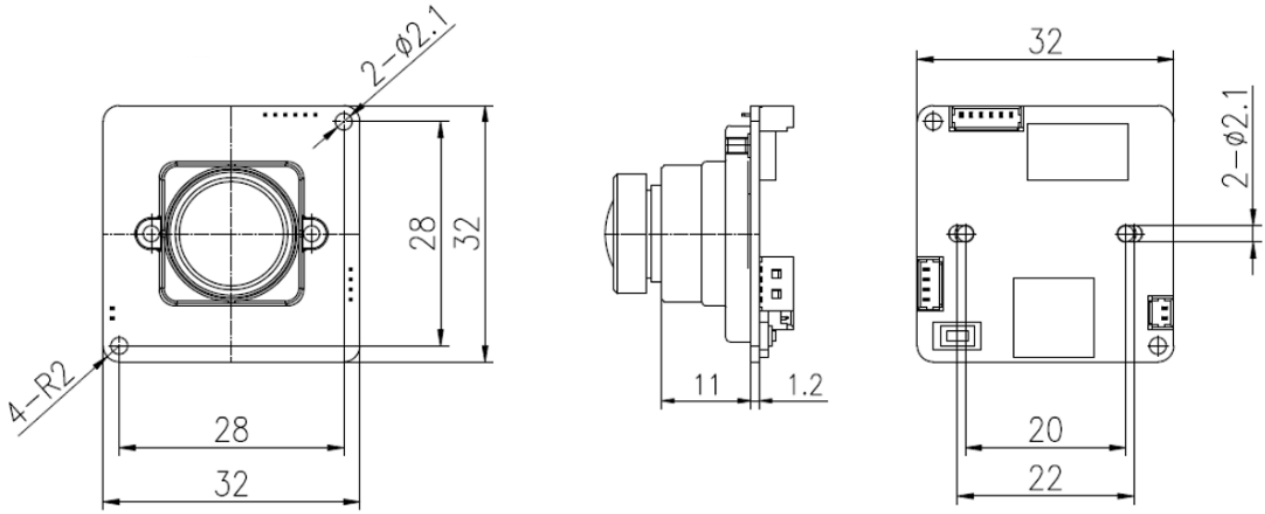
Spot pixels are caused by pixel sensors (on the image sensor) that have an output which does not accurately represent the incident light on the pixel area. This makes the affected pixel look different to the surrounding pixels. Regardless of the manufacturer, all CMOS image sensors have some spot pixels; they are caused by faults in the very small transistors in the pixel sensor. The smaller the transistor is, the more likely it is to have/develop an issue. Damage can be due to manufacturing issues, but often they are caused by particle radiation such as cosmic rays, etc.

Usually, these spot pixels look like pixel size (therefore small) white points seen in a dark image - in a normal scene they can be very difficult to see. Sometimes the damage is minor, and the pixel will 'misbehave' to different degrees depending on the temperature, shutter speed (integration time), gain and other factors. This can make the spot pixel flash or only appear under certain conditions. Unfortunately, with current CMOS image sensor technology it is not possible to prevent these spot pixels, and, over time as the sensor ages and accumulates damage from ambient radiation, the number of spot pixels will increase.

Due to this, manufacturers of standard image sensors do not warranty against spot pixel faults. Instead, they recommend that camera designers take measures to compensate for spot pixels. This involves identifying problem pixels and replacing the pixel output with a value that has been interpolated from the surrounding pixels. However, problem pixels can be difficult to identify accurately. For example, as the temperature of the sensor fluctuates, or the exposure changes, some pixels may fall in and out of line with their expected response. Also, sensors will develop new defects after the initial factory correction has taken place.

Therefore, Active Silicon cameras are only warrantied against major sensor faults (many pixels across) on first delivery of the camera.

CAMERA DIMENSIONS



APPROVALS

Active Silicon makes the following approval statements:	
CE	In accordance with the CE Marking regulations, the **Oriole HD-IP Board Camera** is not a finished product and is supplied for further integration into a finished product that will be CE marked by the final manufacturer/integrator. Therefore, no CE marking or Declaration of Conformity is required or allowed.
RoHS3	This product is compliant with the RoHS3 requirements (Directive 2015/863/EU).
REACH	Please contact Active Silicon for the latest formal REACH declaration (EC 1907/2006).
EMC	This product is designed to be compliant with the following requirements when housed in a suitable enclosure: • EN 55022:2010 (Class A) and EN 55024:2010 (EU Directive 2014/30/EU Electromagnetic Compatibility • FCC Rules for Class A digital devices

ORDERING INFORMATION

PART NUMBER	***DESCRIPTION***
AS-BCAM-IP32-001-A	Oriole HD-IP Board Camera; incl. Ethernet/power adapter
AS-PSU-416-254X	Multi-region 12V power supply

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