Active Silicon

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

# AS-BCAM-IP32-001-A

# Technical Reference Manual

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## Disclaimer

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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).

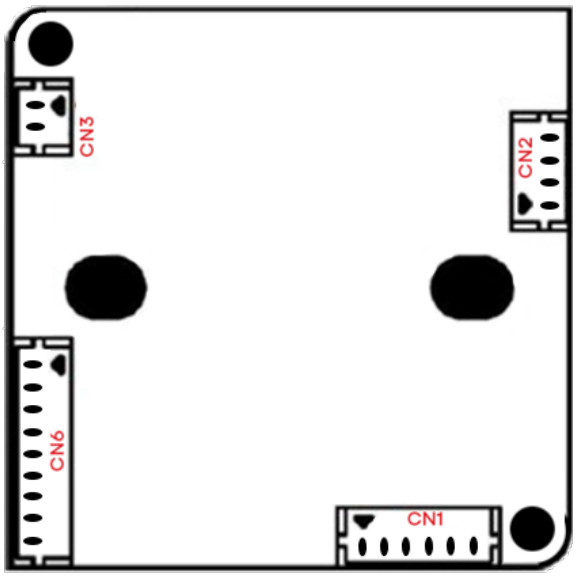
To clean the surface of the camera housing, use a soft, dry cloth. To remove severe stains, use a soft cloth dampened with a small quantity of neutral detergent, then wipe dry. Don't use volatile solvents such as benzine and thinners they can damage the surface finish.

## 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<br>Second: 640x360p 30/25fps, H.264<br>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% |

Note: Active Silicon Harrier Camera Products are warrantied for six months from the shipment date. 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).

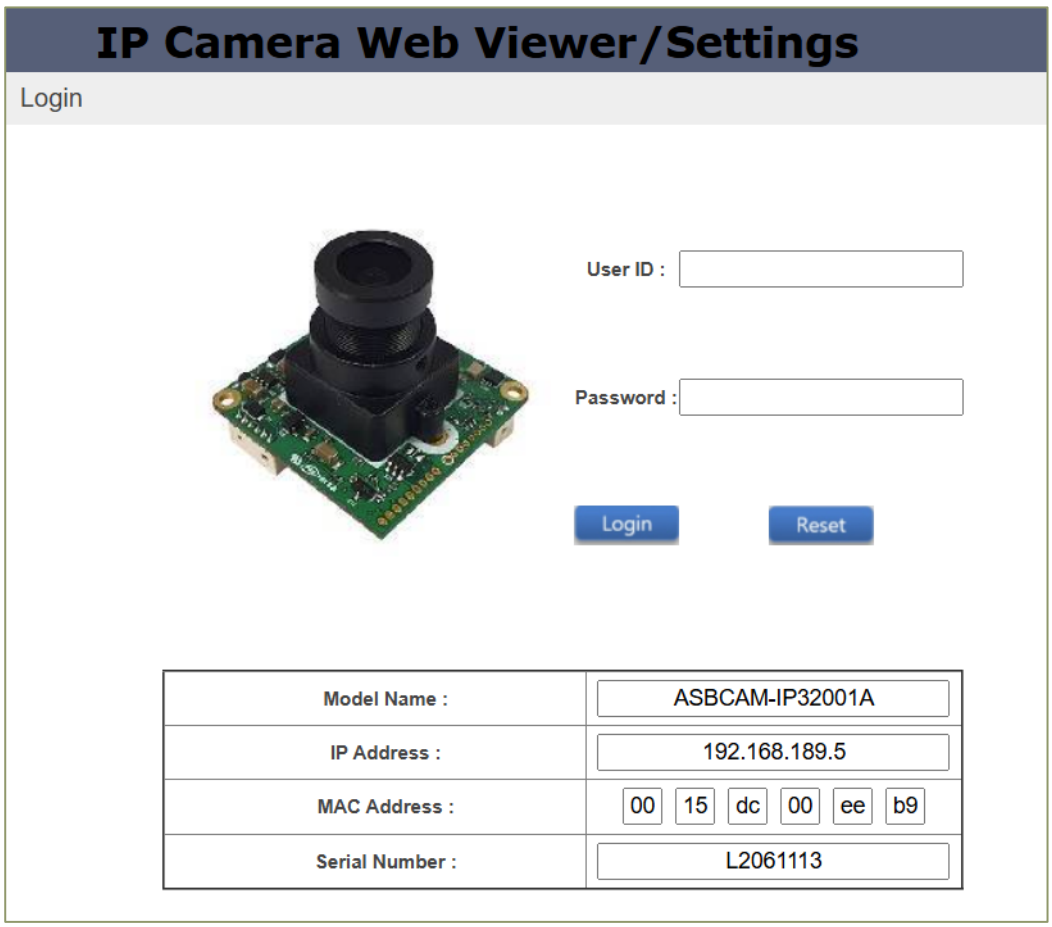


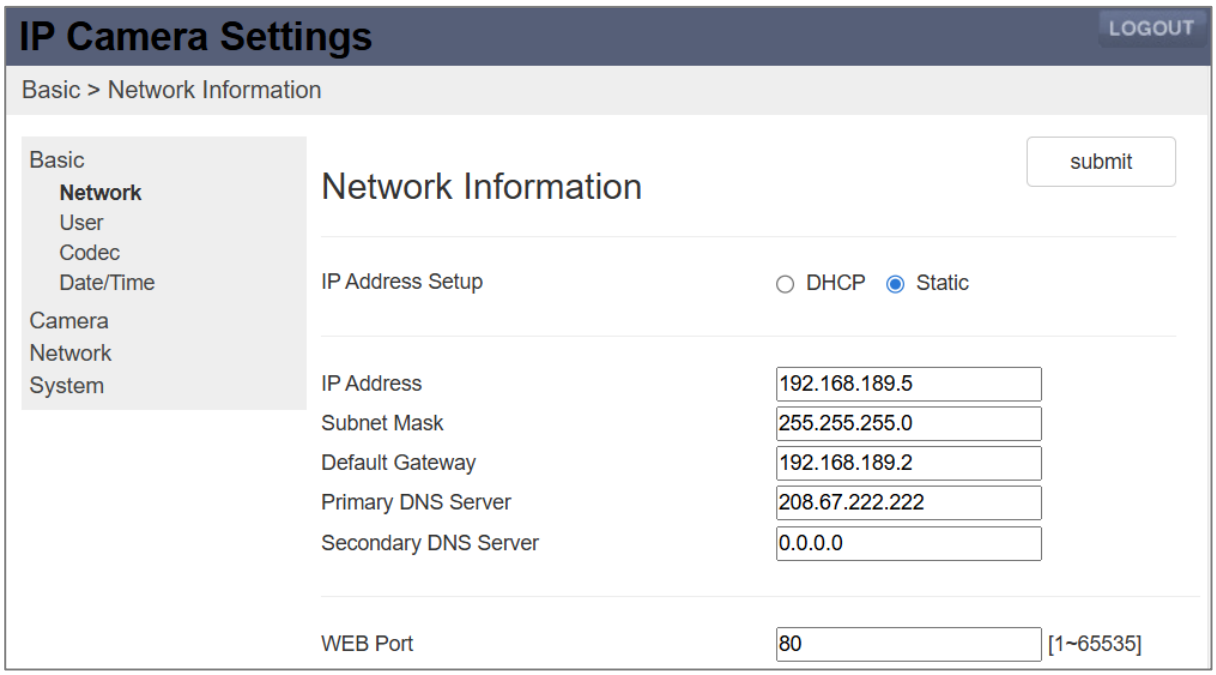

**Figure 1. Oriole HD-IP board camera login web page.**

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).

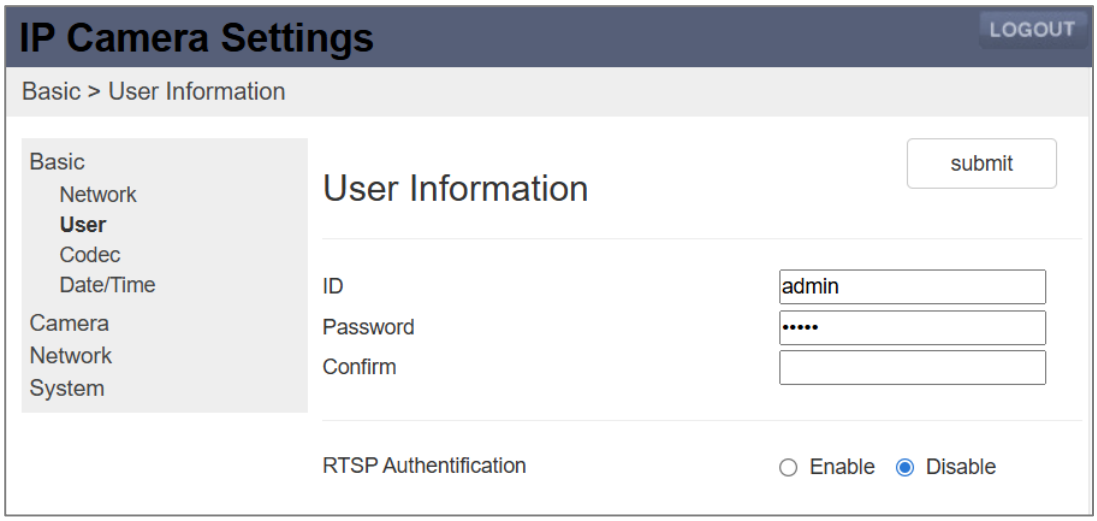
**Using DHCP**
Dynamic Host Configuration Protocol (DHCP) is a protocol that manages and automates the assignment of IP addresses on a network. The IP camera has DHCP enabled by default and your network must have a DHCP server running so that the camera will be assigned an IP address and can be contacted. 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.

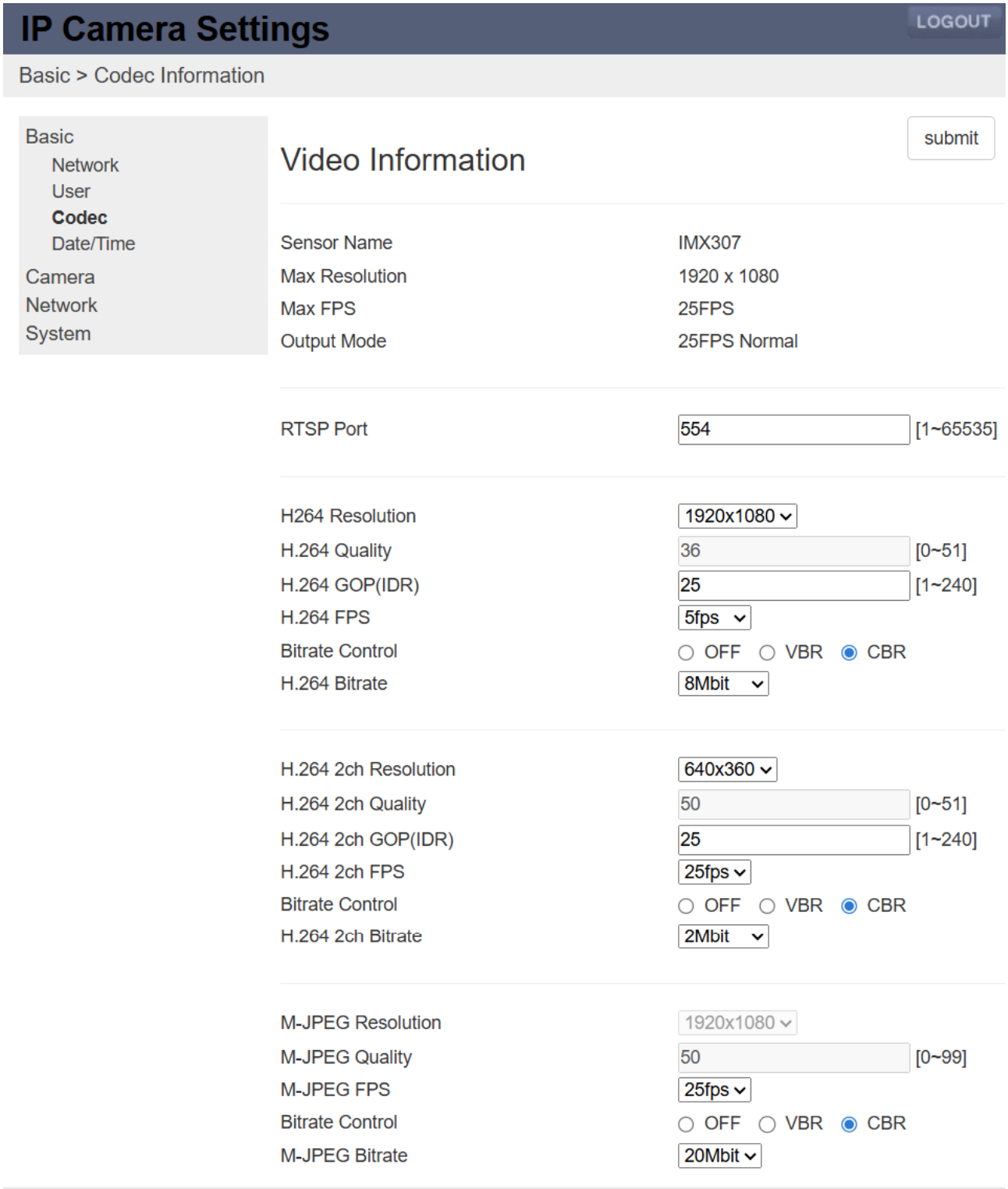
**Basic → Users page**




**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**



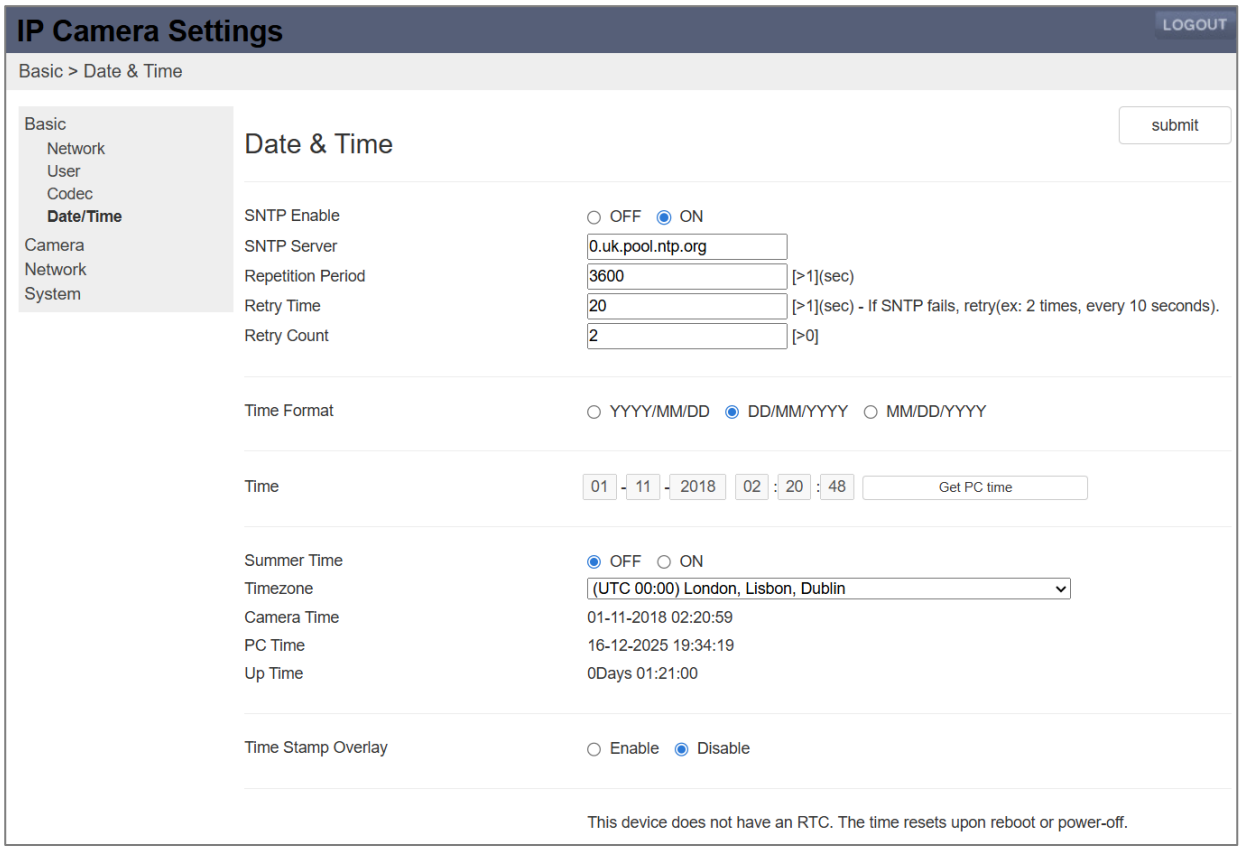

This page is used to configure the IP video output of the IP camera.

| 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



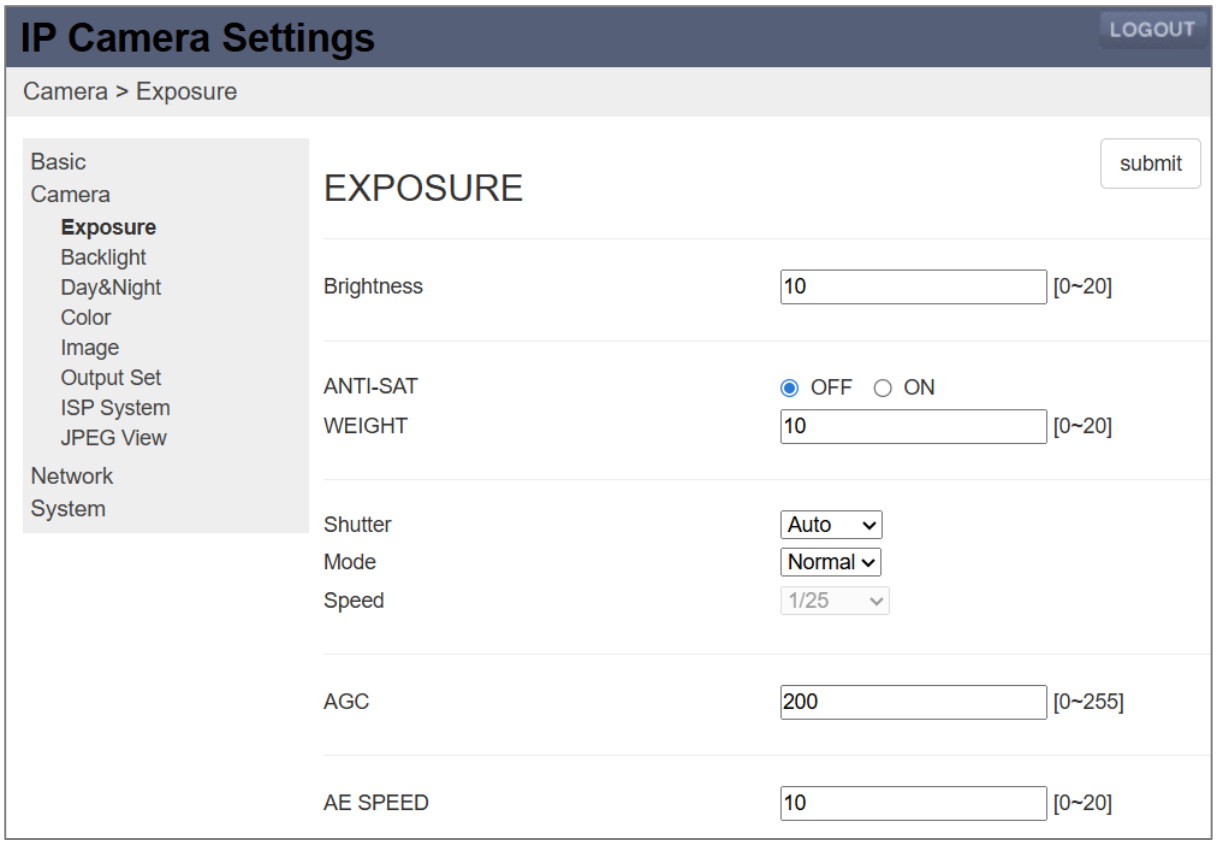

This page is used to configure the time settings on the IP camera. The camera does not have a battery powered clock so any settings made will be lost on the next power cycle. The http API can be used to remotely update the clock time when the camera is powered on.

| 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,<br>DD/MM/YYYY,<br>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**

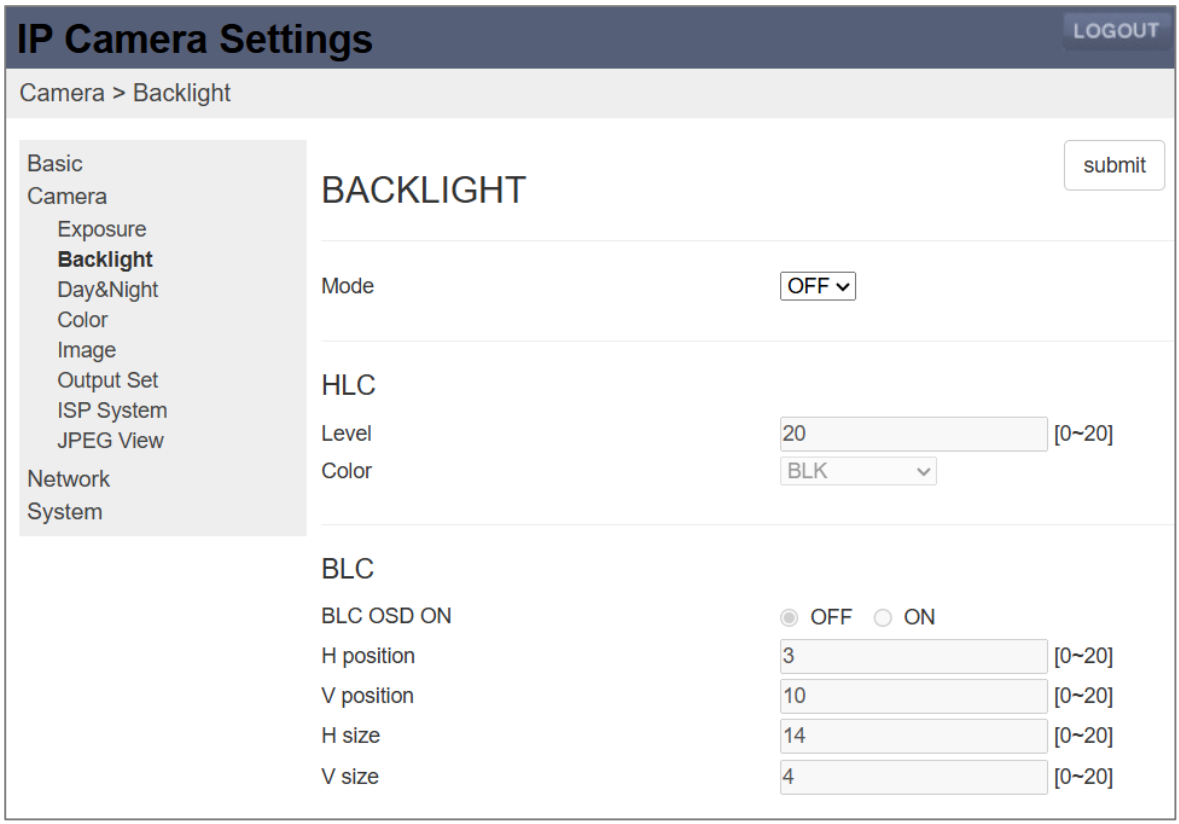



On this page the IP camera settings can be modified to alter the video quality as required.

| 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**



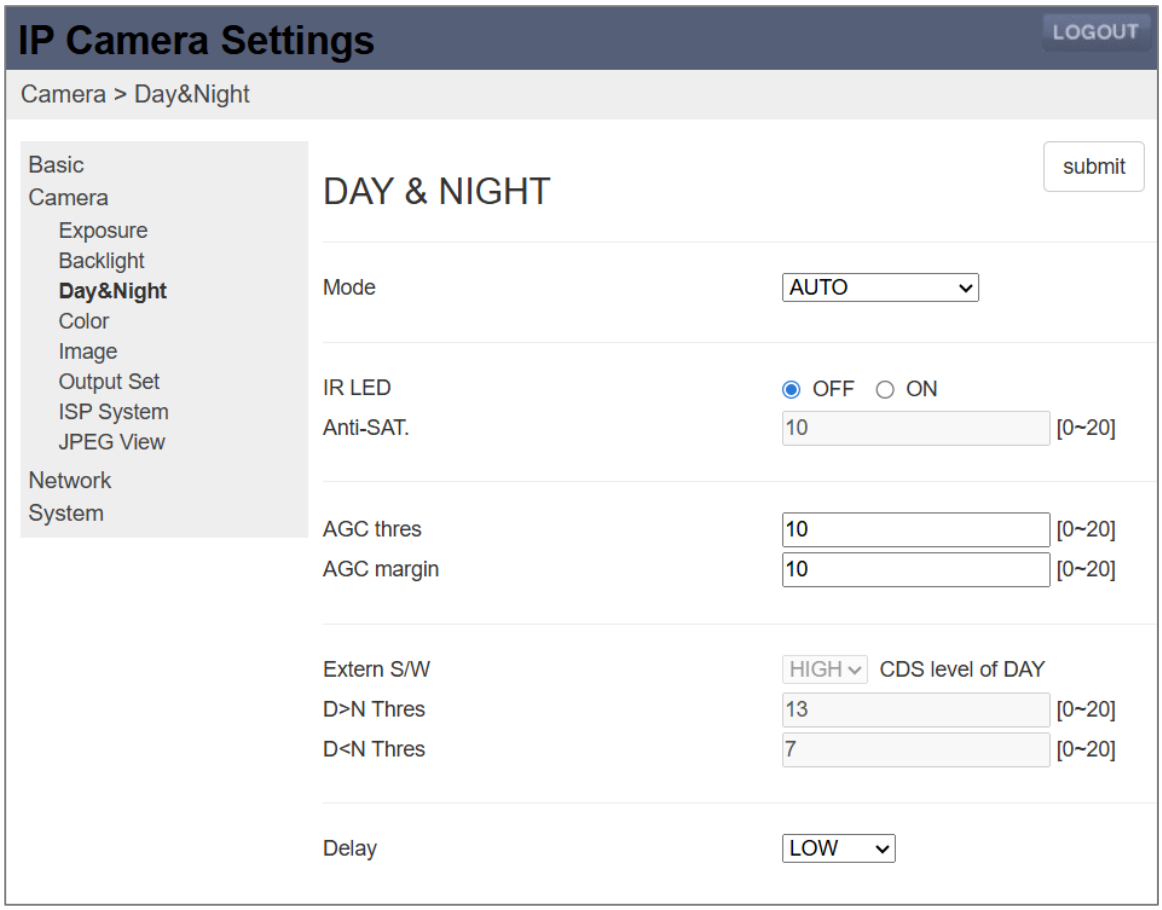

On this page more IP camera settings can be modified to alter the video quality (highlight compensation/backlight compensation.

| 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**



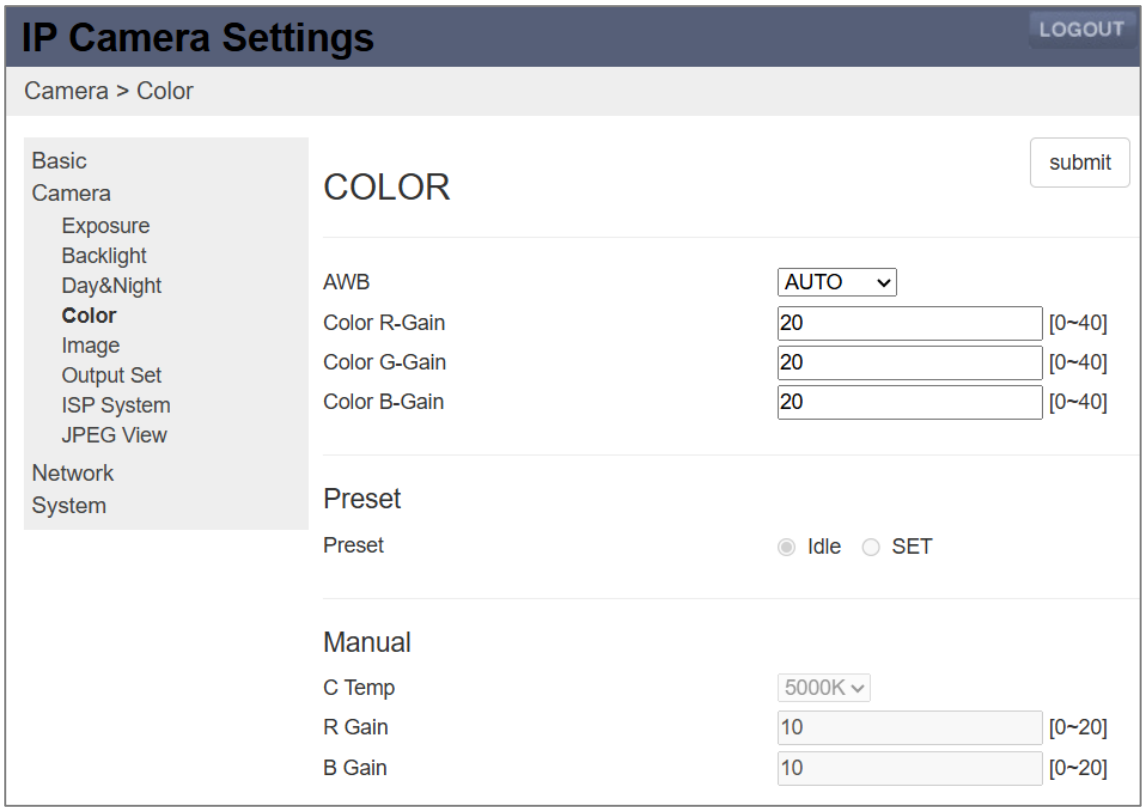

On this page the IP camera Day and Night mode, IR LED and AGC settings can be modified. The camera has black and white video in night mode.

| 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**

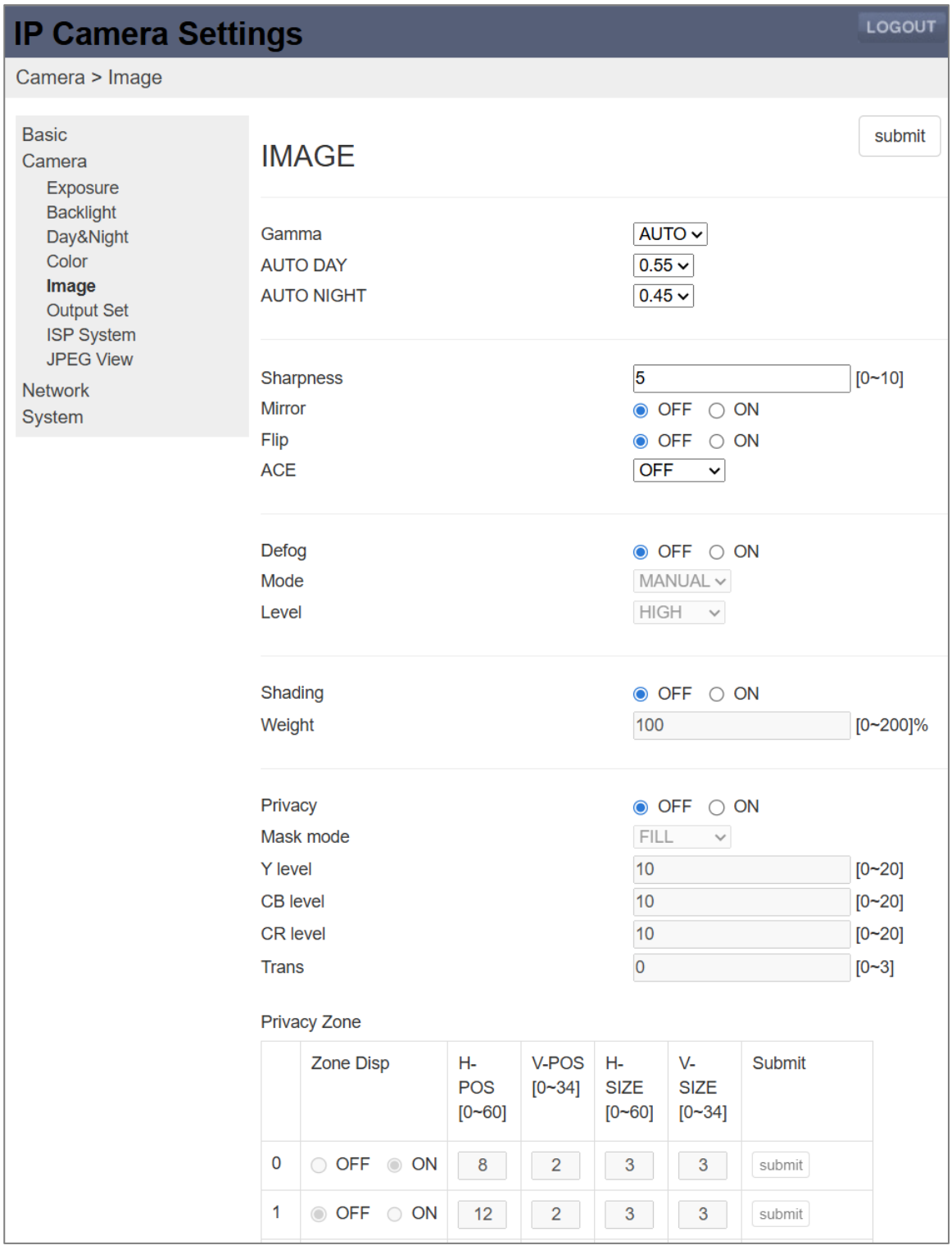



This is a page that adjusts the video white balance and color settings of the video.

| 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**

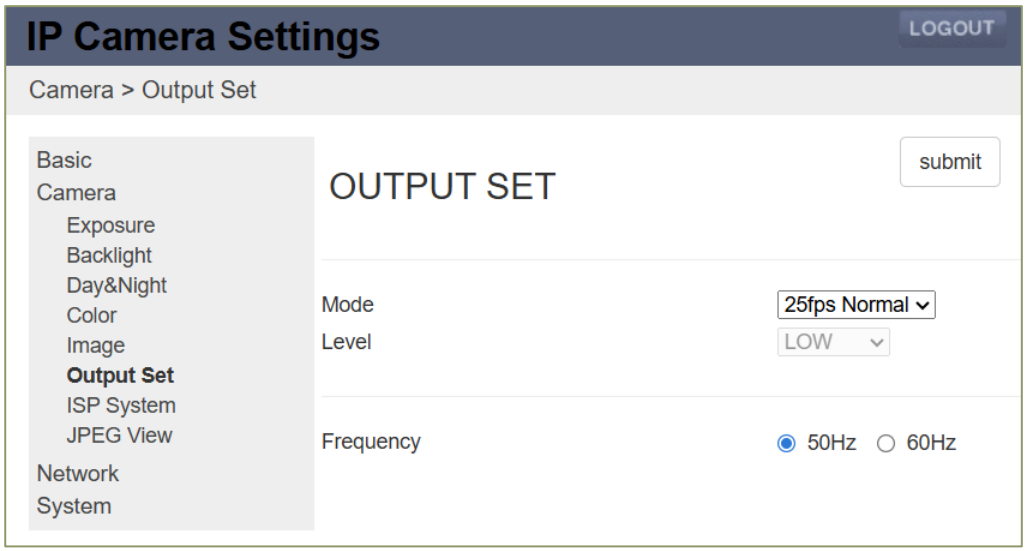



This page allows control of various camera settings including 16 sets of privacy mode settings.

| 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<br>V POS: 0-34<br>H SIZE: 0-60,<br>V SIZE: 0-34 | Various |

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

**Camera → OUTPUT SET**

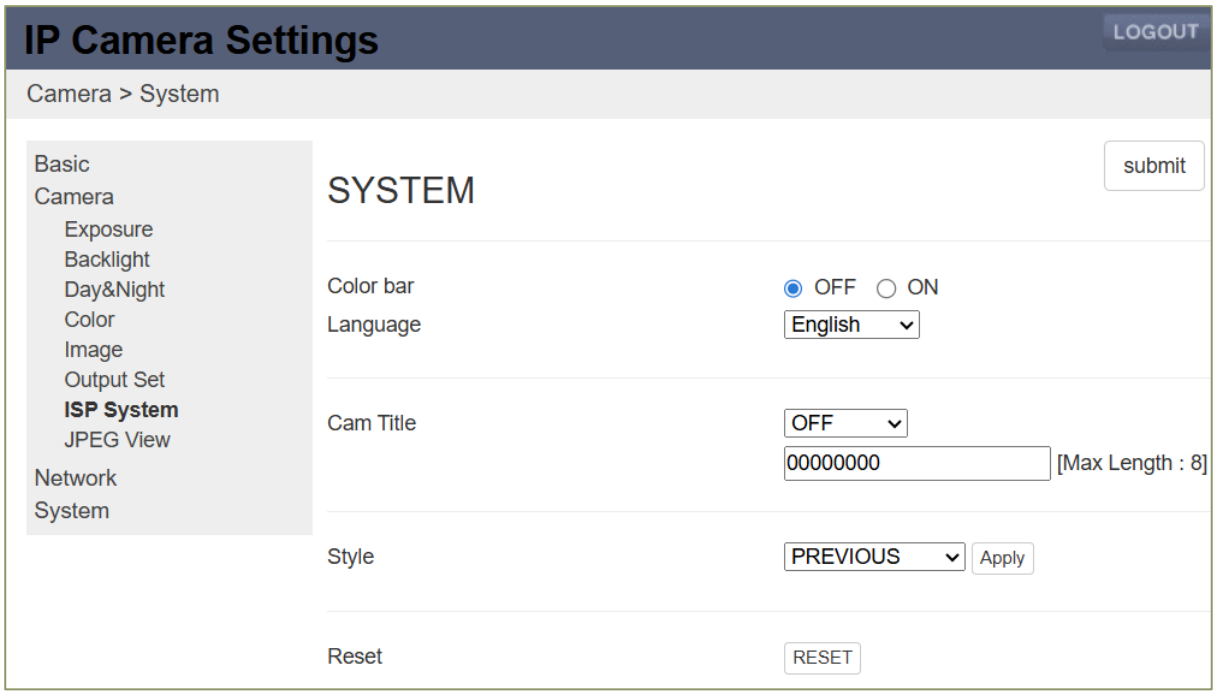



This page allows the frequency of the video output and DNR/WDR configuration to be set.

| Parameter | Options | Default |
|---|---|---|
| Mode | 50 fps Normal/DNR<br>25 fps Normal/WDR/DNR,<br>12 fps WDR<br>60 fps Normal/DNR<br>30 fps Normal/WDR/DNR,<br>15 fps WDR | 25fps Normal<br><br>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 | - | - |

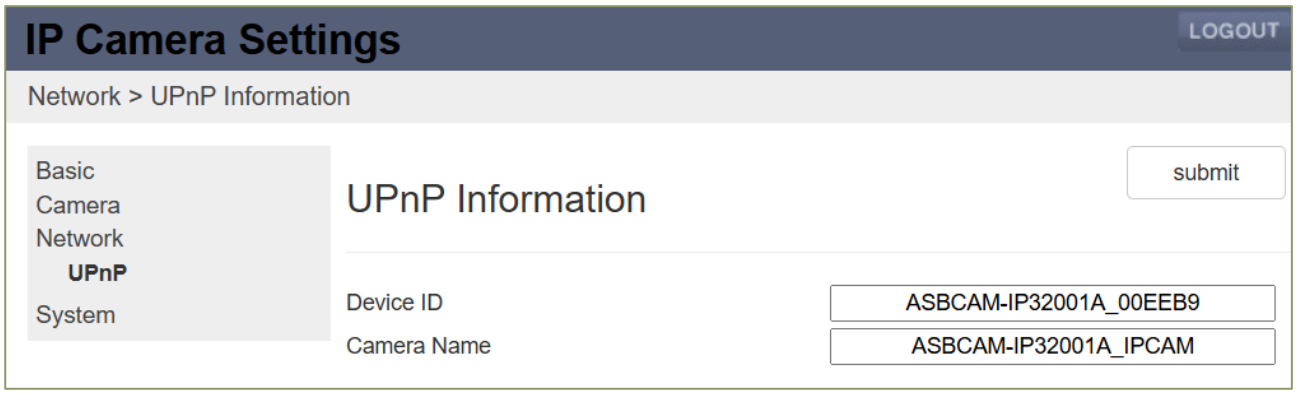
Note the overlay text may be in a different orientation to the camera video.
This can be worked around by setting the camera image flip setting (Camera->Image->Flip or Image Flip http API command).

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



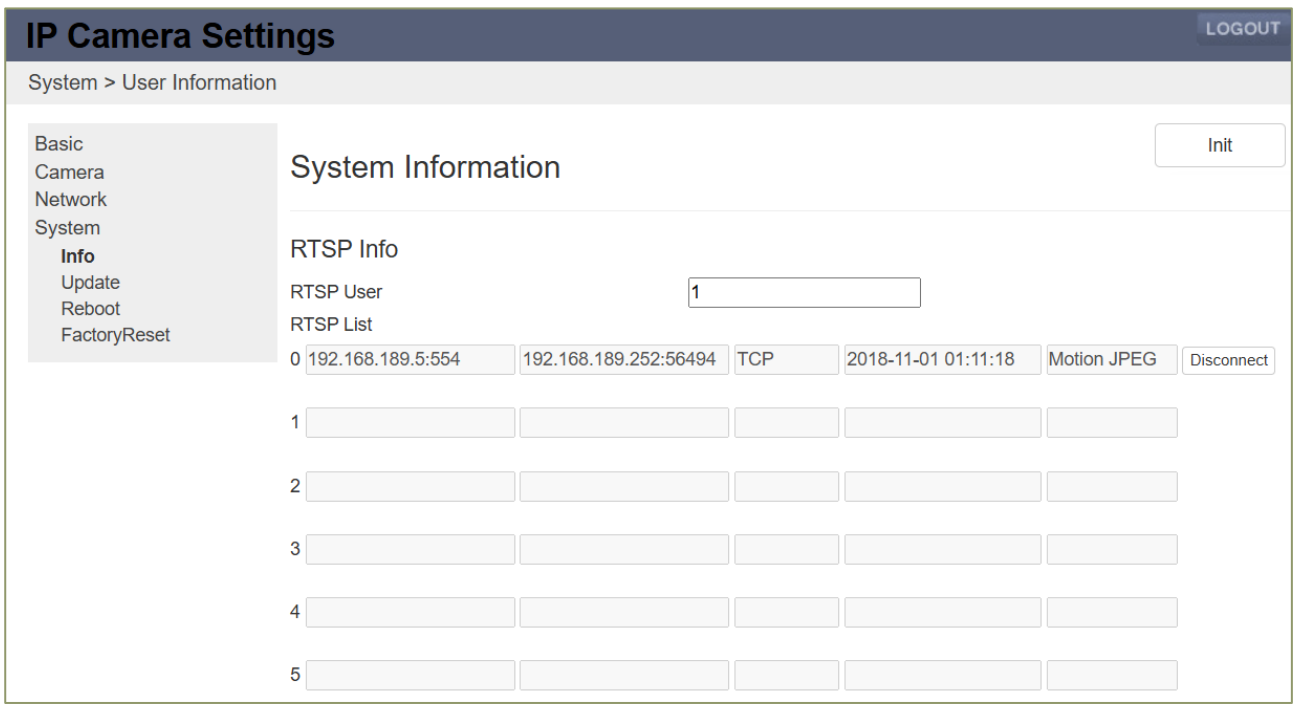

This page displays, and enables you to change, the device ID and name.

- 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.

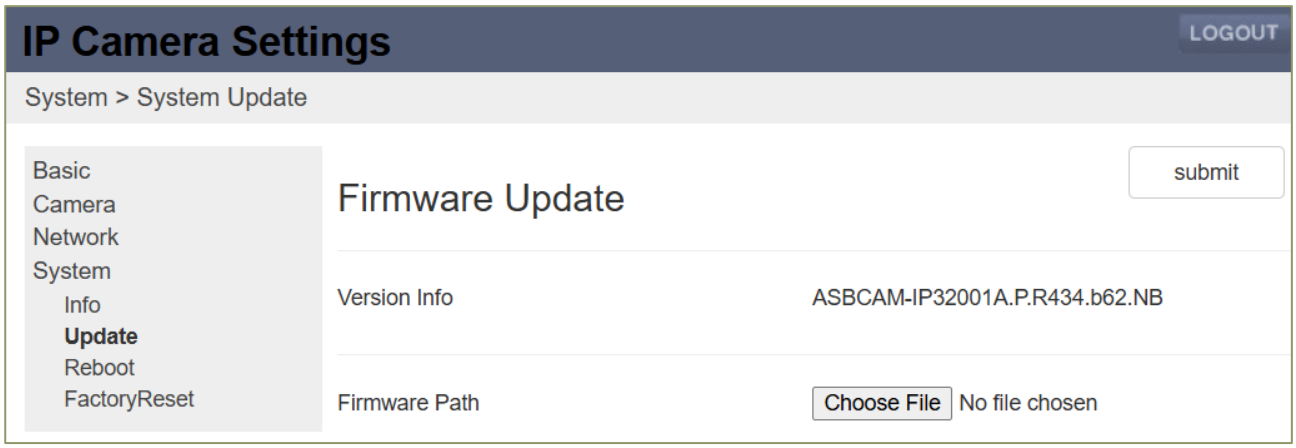
### System → Info

.




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

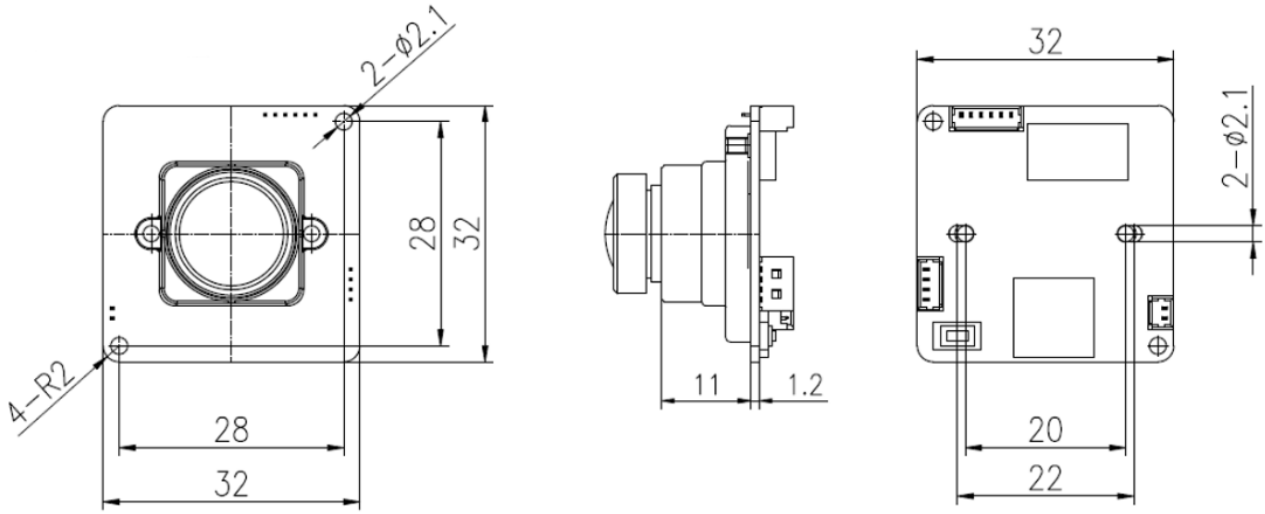
Spot pixels are caused by pixel sensors (on the image sensor) that have an output which does not accurately represent the incident light on the pixel area. This makes the affected pixel look different to the surrounding pixels. Regardless of the manufacturer, all CMOS image sensors have some spot pixels; 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.<br>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:<br>• EN 55022:2010 (Class A) and EN 55024:2010 (EU Directive 2014/30/EU Electromagnetic Compatibility<br>• 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 |

*Head Office:*

Active Silicon Ltd
1 Waterside Court, Waterside Drive,
Langley, Berks, SL3 6EZ, UK.

Tel: +44 (0)1753 650600
Email info@activesilicon.com
Website: www.activesilicon.com

*North America Office:*

Active Silicon, Inc.
479 Jumpers Hole Road, Suite 301,
Severna Park, MD 21146, USA.

Tel: +1 410-696-7642
Email: sales.us@activesilicon.com
Website: www.activesilicon.com

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