



Evolution 180 Camera Range



Installation & User Manual

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Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not immerse the Indoor model in water. Protect the connectors from moisture. (INDOOR ONLY)
6. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
7. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
8. The polarity of any connector attached to the product should be verified before connection.
9. Protect all cables from being crushed or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
10. Unplug or appropriately protect this apparatus during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped. (INDOOR ONLY)
13. The cameras are not suitable for installation in a ceiling void that is used as an air handling space.

WARNING



RISK OF EXPLOSION IF REPLACING A BATTERY WITH AN INCORRECT BATTERY TYPE

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1 Overview

The Oncam Evolution 180 Camera Range is innovative and uses a fisheye lens to create a 180° view with an extremely large area of coverage. The Evolution 180° may replace two or more conventional fixed cameras for seamless wall-mounted coverage of an entire scene with no gaps or blind spots. The ability to see in all directions at once makes Oncam 180° IP cameras ideally suited for total panoramic awareness.

The 12-megapixel sensor produces enough detail to allow digital pan/tilt/zoom (PTZ) operations over the entire Field of View (FoV). Unlike conventional PTZ cameras, Oncam 180° IP cameras only have one highly reliable solenoid driven cut filter, which means no motors or gears are prone to wear and failure, and aside for the occasional “click” from the solenoid when light levels change, it’s silent.

1.1 Views

The camera produces three types of view, each suited to a particular set of requirements.

1.1.1 Panoramic View

The high quality fisheye lens produces an image that is dewarped by software in the camera into a high-resolution 180° panoramic image. This is the default stream provided by the camera. Panoramic View is a special, high-performance type of VCam (see below) and up to two different-resolution Panoramic Views may be enabled at a time, using-up one of the four possible VCam Views each.

1.1.2 Fisheye View

The high quality fisheye lens produces a spherical image from which all other views are derived. The raw image appears warped around a central axis. Special dewarping software built into the camera and / or the recording system converts the spherical image into a flattened view that is more familiar to human viewers. When using video management software (VMS) to record a fisheye video stream, the entire image is preserved, making it possible to look in many directions at once, even ‘retrospectively’, regardless of the area(s) being viewed when video was recorded.

1.1.3 Virtual Camera Views (VCams)

The camera is capable of creating up to four user-controlled dewarped views derived from the main fisheye view. Using ONVIF or API commands from a compatible recording system, areas of interest in the fisheye image can be dewarped, zoomed and examined, in a view very similar to that of a traditional Pan, Tilt and Zoom (PTZ) camera. These camera views are available as separate ONVIF compatible-streams for recording and control on a compatible VMS/NVR system.

Note: VCam mode is enabled by default to allow creation of the default Panoramic view. VCam mode is disabled when enabling a secondary fisheye view.

1.2 Camera Range

The Evolution 180 camera range comprises of an indoor and outdoor model, both available in white.

EVO-180-WID - Evolution 180 Indoor Camera – White

EVO-180-WED Evolution 180 Outdoor Camera - White

1.3 Power Requirements

The camera can be powered using PoE or direct DC input.

- **PoE.** Connect power and data using an Ethernet cable plugged into the camera Ethernet port. The PoE supplied equipment must be compliant with IEEE 802.3AF.
- **Direct DC Input.** Use only a UL/CSA-approved LPS or NEC Class 2 power source with a 12 VDC 1A AC adapter (not supplied).

- 1.3.1 **CAUTION: Do not power the camera using 12 V and PoE at the same time. Doing so may damage the camera and void the warranty.**
- 1.3.2 See Section 10 for more information.

1.4 12-pin I/O Connector

The camera module has a number of input and output ports that support the following functions:

- Alarm In
- Alarm Out
- External IR Filter Control In
- Audio in/out (Microphone, Speaker)
- Power (12V, Ground)
- LED 1 & 2

- 1.4.1. See Section 10 for more information.

2 Camera Placement and Orientation

Camera placement is an important factor when planning any camera deployment. The Evolution 180 camera has an exceptionally wide viewing angle (187°). Consider the camera location for providing comprehensive coverage of a wide area. Mount the camera with an unobstructed view and consider scene optimization when one portion of the scene is bright and another dark.

The camera supports three different mounting orientations; Wall, Ceiling and Table, but the high-performance Panoramic Views give the best images when the camera is looking out towards the horizon, for example on a wall. Each of these orientations has corresponding settings in the Camera Web Interface. These camera settings ensure the correct dewarping algorithm is used when connecting to a compatible VMS or NVR system. In Wall mode, additional controls allow fine-tuning of the Panoramic View to frame and dewarp the scene perfectly.

Depending on the use case, a single 180° camera can cover a very large space. Mounting a camera high-up gives great situational awareness throughout a large room. When planning coverage, ensure there are no obstructions. Typical obstructions include pillars, high-sided furniture and any hanging objects near the camera such as signage or lighting installations.

Even though the Panoramic View can be adjusted up or down or directed anywhere in front of the lens, the sharpest images will be achieved when the Panorama is across the middle of the camera's view. It's therefore best to aim the lens at the general height of the areas of greatest interest. To facilitate this, mounting brackets are provided with the Indoor camera at three different fixed angles, allowing surface or conduit-mounting with various options for cable entry, conduit and connections. The Outdoor camera's integrated mounting bracket allows the camera to be tilted down at any angle from 0° to -45°, still being surface-mounted or screwed onto the end of a drop conduit.

Ceiling mounting is preferred when most of the action is occurring below the camera in a horizontal plane. When a person is directly below the camera though, the view captured is the top-of head. When the person moves away from the camera, more of their body becomes visible.

2.1 Coverage Area

The Evolution 180 cameras provide coverage for open areas where situational awareness of people and objects are required.

The higher the camera placement the larger the area that is covered. However, with higher camera placement a reduction in the pixel density is expected. Height impacts the image detail available, therefore ensure you consider image quality versus the mounting height.

Perform tests to ensure that the camera meets the system operational requirements and the required detail level is available.

Use a minimum height of 2 m (6.5 ft.) when ceiling mounting a camera for best results.

For multiple camera layouts, ensure the camera areas overlap for full coverage.

2.2 Overhead Viewing Angle

Ceiling-mounted cameras capture a top-of-head shot when the person is directly under the camera. Hats extend that top-of-head zone to some degree. Consider the viewing angle when requiring people identification or recognition.

2.3 Lighting

Avoid bright light sources pointing towards the camera lens. Always face lighting away from the camera or above the camera installation line (if ceiling mounted).

The auto-sensor adjusts the camera continuously to optimize the image by increasing exposure time. Furthermore, the maximum frame rate is reduced as exposure time increases. The image remains in full colour until below one Lux, after which it transitions to black and white for better contrast.

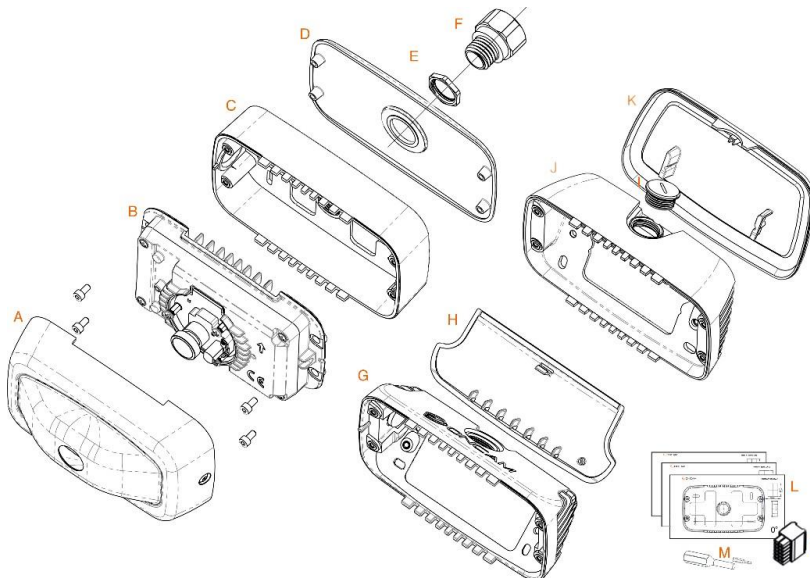
3 Indoor Camera

3.1 The Evolution 180 Indoor Camera

The Evolution 180 Indoor Camera is designed for mounting on flat surfaces such as walls and ceilings, or alternatively it may be screwed onto the bottom of a pendant cable conduit. The camera is supplied with three mounting brackets, angled at 0°, 25° and 45°. These allow the installer to tilt the highest-quality centre of the camera's fisheye image towards the plane of greatest interest in the scene. The camera firmware also allows fine adjustment up and down of the panoramic image to best capture the area of interest. See Scene Offset Angle, Section 6.2

Cabling may be routed through any of the conduit ports on the top or sides of the mounting brackets, or directly into the rear from the mounting surface for concealed cabling. The mounting brackets may also be used for pendant mounting, routing cables through their top conduit ports. Each bracket has a rear cover for this option. The 25° and 45° brackets may also be used for back-to-back mounting of two cameras if required, using two M4 x 12 mm screws provided (one with each camera). The 0° mounting bracket may also be used for ceiling-mount orientation, either surface-mounted or as a pendant mounting bracket with its rear cover fitted.

3.2 Camera components



3.3 Supplied parts

- | | |
|--------------------------------------|-------------------------------------|
| A. Front Cover | I. M20 Conduit Port Plug (fitted) |
| B. EVO-180 Camera module | J. 25° Mounting Bracket |
| C. 0° Mounting Bracket | K. Back cover -25° Mounting Bracket |
| D. Back cover - 0° Mounting Bracket | L. Drilling Templates |
| E. M20 Conduit Locking Nut | M. Screwdriver & Security Bit |
| F. ¾" NPT to M20 adapter | N. 12 pin I/O 12V Connector |
| G. 45° Mounting Bracket | O. Quick Start Guide |
| H. Back cover - 45° Mounting Bracket | |

Note: 4 Screws are supplied for mounting.

3.4 Camera Mounting Accessories

The three mounting brackets supplied with the Indoor camera allow for a wide variety of installation environments. Each of them may be surface-mounted, for example to a wall or ceiling, or screwed directly onto the bottom of a threaded pendant conduit. The conduit ports are threaded with a metric M20 x 1.5mm (L) thread, and an adapter (F) is supplied to allow use with 3/4" threaded conduits.

3.4.1 0° Mounting Bracket (C)

Flat wall-mounting at a low height is ideal for capturing people's activity and faces, but depending on the usage environment, consideration should be given to the risk of people interfering with a camera that is within easy reach.



Similar scenes may still be achieved at higher mounting heights using the Scene Offset Angle control to lower the view produced by the panorama. In the example above the camera is mounted flat to the wall at a height of 1.7 m (5 ft 7 in), and a Scene Offset Angle of -15° is used to show more of the floor area instead of less relevant ceiling. See Section 6.2.6.5 for details.

3.4.2 25° Mounting Bracket (J)

Wall-mounting the 25° Mounting Bracket allows a similar area to be captured to flat wall-mounting, but from a higher vantage point. This helps keep the camera out of reach while still producing a complete 180-degree view of a large area. With ordinary panoramic cameras, mounting at an angle in this way causes a bending effect to the image, making vertical objects tilt outwards towards the sides, but with Oncam Angle Compensation Technology, they are perfectly parallel:



Set the "Wall Mount Angle" control in the camera's Web interface. See Section 6.2.6 for details.

3.4.3 45° Mounting Bracket (G)

The 45° Mounting Bracket can be mounted on the ceiling or wall and is useful in long, narrow scenes like corridors, where having a degree of side view is beneficial. As with the 25° Mounting Bracket, Oncam Angle Compensation Technology can be used to straighten-out distortion caused by tilting the camera away from the horizon. See Section 6.2.6 for details.

3.5 Camera Installation

Do not remove the blue protection sticker from the lens until installation is complete and the camera is ready for testing.

The following instructions are provided for the installation of your Oncam Evolution 180 Indoor Camera. Refer to the Camera Web Interface on page 27 for configuration and details on features and functionality.

3.5.1 Prepare the camera module

1. Remove the two side screws holding the camera cover in place.



2. Separate the camera cover exposing the camera module.



3.5.2 Review the following prior to mounting the camera

3.5.2.1 Locating the MAC Address and Serial Number for the camera

Find the MAC address on a sticker on the side and rear of the camera module. Document the camera's MAC address, the serial number and its location, as they are needed for camera configuration and insurance purposes later.



3.5.2.2 Inserting an SD card

Insert the micro-SD card into the slot provided, ensuring the card is pushed home.

Note: Inserting a SD Card is optional dependent on if you wish to record the video footage via an SD card or using VMS software. See Section 7 for more details.

3.5.3 Option A: Surface Mounting

3.5.3.1 Using Mounting Brackets - 25° & 45° (J & G)

1. Remove the conduit plug from the mounting bracket.
2. Remove the back cover from the mounting bracket by sliding the cover towards the top.
3. Replace the conduit plug if the conduit entry is not to be used for cabling.



3.5.3.2 Using Mounting Bracket - 0°

1. Remove the conduit plug from the centre of the mounting bracket's back cover.
2. Remove the back cover from the mounting bracket.

3.5.3.3 Drill holes

1. Choose the drilling template (L) for your chosen mounting bracket. Ensure there is sufficient space around the mounting bracket, aligning the template and mounting bracket together.
2. Drill the mounting holes.
3. Mount the wall bracket onto the installation surface using screws appropriate for the surface type.

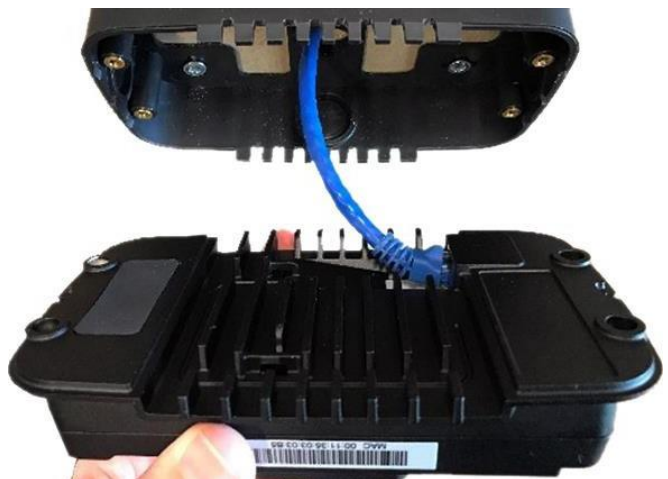


3.5.3.4 Route a cable through bracket

Route the cables through the M20 conduit holes or back, as required.

3.5.3.5 Connect and fix camera in place

4. If required, connect cables to the green 12-pin I/O plug supplied, referring to Section 10.1 for wiring details.
5. Connect the network cable to the camera module rear. When using a 12V power supply, connect the 12-pin I/O connector if PoE is not available. The cables may be attached to the camera body using the anchor points. Ensure the cables are routed inside the mounting bracket without sharp bends.
6. Check that the Power LED (left side) illuminates green after 2 seconds. If the network is also active, the network LED should illuminate green after about 40 seconds.
7. Ensure the arrow on the camera module is pointing up.



8. Attach the camera module to the bracket and secure with the four M4 x 12 mm hex head screws (provided).



9. Replace the camera cover with the two captive security side screws.



3.5.4 Option B: Pendant Mounting via a conduit

3.5.4.1 Prepare camera for pendant mounting

1. Remove the conduit plug from the chosen mounting bracket.
2. If using the M20 conduit secure with locking nut (item **F** in Camera components diagram, section 3.2)
3. If using $\frac{3}{4}$ inch NTP conduit use the adapter and locking nut (items **E & F** in Camera components diagram, section 3.2)

3.5.5 Connect and fix camera module in place

1. Ensure the arrow on the camera module is pointing up.

Connect the network cable to the camera module rear. Also connect the 12-pin I/O connector if required. The cables may be attached to the camera body using the anchor points. Ensure the cables are routed inside the mounting bracket without sharp bends.

Check a Micro SD Card is fitted if required.



2. Check that the Power LED (left side) illuminates green after 2 seconds. If the network is also active, the network LED should illuminate green after about 40 seconds.



3. Attach the camera module to the bracket and secure with the four M4 x 12 mm hex head screws (provided).



4. replace the camera cover with the two captive security side screws.



3.6 Testing the Installation

1. Check the camera and mountings are all secure.
2. Check that a Micro SD Card is properly installed, if required.
3. Check the front cover screws are secure using the supplied security driver.
4. Remove the screen protection film from the dome.
5. When power is applied to the camera, the power LED (left side) should illuminate green after 2 seconds. After about 40 seconds the LAN LED (right side) should illuminate if connected to a network. Within a few more seconds the camera should be available via the network.

3.7 Lens Handling and Cleaning

Do not remove the blue protection sticker from the lens until installation is complete and the camera is ready for testing. Clean the lens only when necessary. You should only handle the lens in a clean, low-dust environment while wearing powder-free acetone-impenetrable gloves.

Since oil, dust and debris from your hands, the environment or from used lens tissue can stain, scratch or damage the lens, do not touch the lens transmissive or reflective surfaces, and never reuse a lens tissue.

Inspect a lens for dust and stains by holding it near a bright visible-light source. Viewing the lens at different angles allows you to see scattering from dust and stains.

3.7.1 Clean-Air Duster

Always blow dust off your lens before cleaning. If the dusted lens has no visible stains after using the clean-air duster, no further actions are necessary. If the lens is not clean, properly use solvents or a lens tissue.

1. Compressed air or nitrogen must be filtered and oil-free. De-ionized gas is recommended.

Note: Commercially available chemical dusters are acceptable (such as those designed for electronics or keyboards).

2. Hold the can upright, otherwise the propellant can spray and permanently damage the lens.

3.7.2 Solvent and Lens Tissues

Always use lint-free tissue with a solvent.

3.5.4.2 CAUTION: Dry lens tissue can scratch optical surfaces.

A good solvent is a mixture of 60% acetone* with 40% methanol. Acetone alone dries too quickly. The methanol slows the evaporation time and also dissolves debris.

Always use acetone-impenetrable gloves when using acetone. Acetone is not recommended for plastic optics.

Isopropyl alcohol is safe and an effective alternative. However, it does evaporate more slowly and so can leave drying marks on the lens.

3.7.3 Cleaning Procedures

Clean the edge of the optic before cleaning the face (central area) to prevent dirt from being drawn up onto the face. Wipe slowly to allow the solvent to evaporate without streaking. Remember, slow and steady cleans the optic.

1. Make a lens-tissue brush by folding the lens tissue so that the fold is nearly as wide as the optic.
2. Do not touch any part of the tissue that will touch the optic. With tweezers, grip the folded tissue parallel to and near the fold.
3. Clean the edges of the exposed optic, tracing the inside edge of the mount in a slow circle.
4. Use caution to move slowly to allow the solvent to evaporate; do not double back over your path.
5. As you approach your starting point trace a decreasing radius circle until you reach the centre of the lens.
6. Lift the tissue slowly to prevent solvent from accumulating at the lens centre.

4 Outdoor Camera

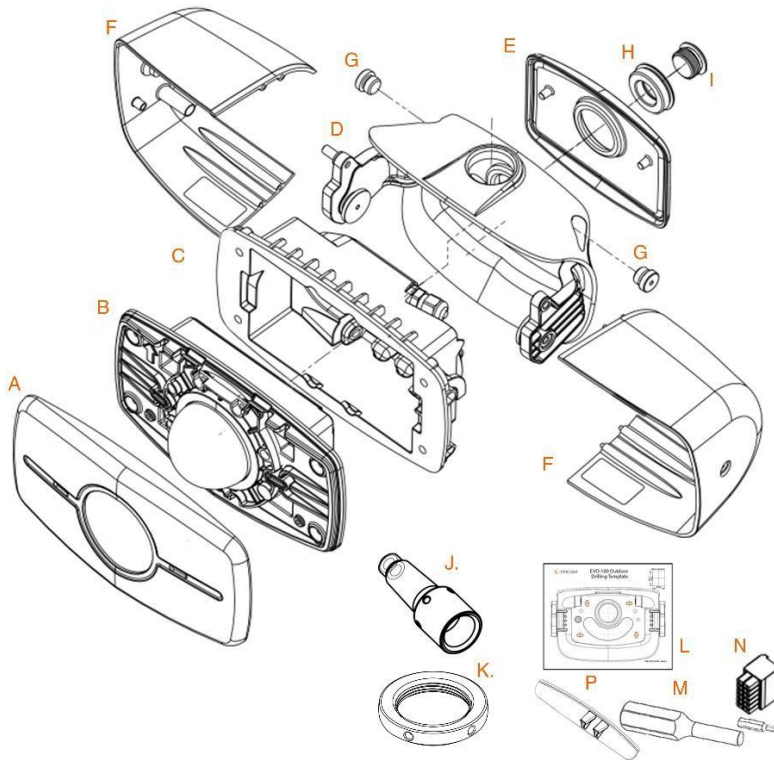
4.1 The Evolution 180 Outdoor camera

The Evolution 180 Outdoor camera is designed for installation on flat surfaces or pendants. The camera is supplied with a mount bracket that is used to fix the camera to the wall or alternatively it may be screwed onto the bottom of a pendant conduit of sufficient strength.

The mounting bracket has been designed to enable the camera to be tilted from horizontal to -45° which allows the installer to tilt the camera’s fisheye image towards the plane of greatest interest in the scene. The camera’s firmware also allows the panoramic image to be adjusted up and down to frame the area of interest.

Cabling may be routed through the top or side conduit ports on the mounting bracket, or directly into the rear from the mounting surface for concealed cabling.

4.2 Camera components



4.3 Supplied parts

- | | |
|-----------------------------------|-----------------------------------|
| A. Front Cover | I. M20 Conduit Port plug (fitted) |
| B. EVO-180 Camera module | J. M12 – M20 Adapter |
| C. Rear Enclosure | K. M32 Conduit Locking Nut |
| D. Mounting Bracket | L. Drilling template |
| E. Back cover | M. Screwdriver and security bit |
| F. Sun-shields x 2 | N. 12 pin I/O 12V Connector |
| G. Side Conduit plug x 2 (fitted) | O. Quick Start Guide |
| H. M32 – M20 Adapter (fitted) | P. Infil black cover (fitted) |

4.4 Camera Mounting Accessories

The Outdoor camera features an integrated bracket that allows the camera to be pointed anywhere from horizontal to 45° downwards with a continuously-variable mount angle. Using the two locking screws on the side, the camera can be securely fixed at the desired angle.

The bracket provides various cable entry ports, depending on how the bracket is mounted. From within the bracket, the cable is then passed through either of the two cable glands, into the camera's inner body, and then terminated with an RJ45 plug.

The integrated bracket allows two main mounting options:

4.4.1 Surface mounted

The bracket may be fixed to a wall or similar flat surface using four screws suited to the material.

Cable entry into the bracket in three ways:

- 1) Through the large slots in the rear of the bracket, directly from the mounting surface
- 2) Through one of the conduit ports on the sides of the bracket, via the M12 to M20 adapter supplied.
- 3) Through the top conduit port, optionally using the M32 to M20 adapter ring supplied

An M32 conduit plug is provided to seal the top conduit port and M20 plugs seal the side ports, when they are not used.

4.4.2 Pendant mounted

The mounting bracket may be screwed-onto the bottom of an M32x1.5 threaded drop-conduit. An M32x1.5 locking nut is included to secure the direction in which the camera pointing in the desired direction. It may alternatively be fitted to a camera mounting arm, available separately, if required.

Cable entry is via the pendant conduit or arm, directly into the mounting bracket. A rear cover is fitted to the back of the mounting bracket to cover the unused fixing holes and give the visible rear of the camera a tidy finish. The cover is fixed in place using the M32 conduit port plug from the top of the bracket.



A 1- 1/2" NPT to M32 adapter is not provided and will need to be sourced separately if necessary.

4.5 Camera Installation

Note:

Do not remove the clear screen protection film from the camera dome until installation is complete and the camera is ready for testing.

The following instructions are provided for the installation of your Oncam Evolution 180 Outdoor Camera presupposing that PoE will be used rather than the 12V supply. (Both power supplies must not be used simultaneously). If using a 12V supply please refer to Section 10.1.3 for further instructions regarding installation.

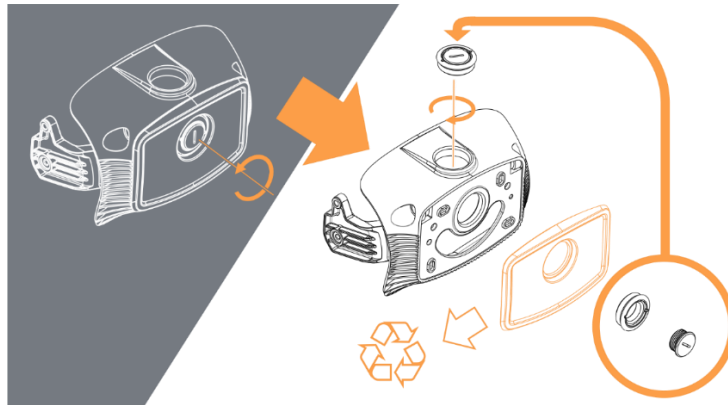
Refer to the Camera Web Interface on page 27 for configuration and details on features and functionality.

4.5.1 Option A: Surface Mounting

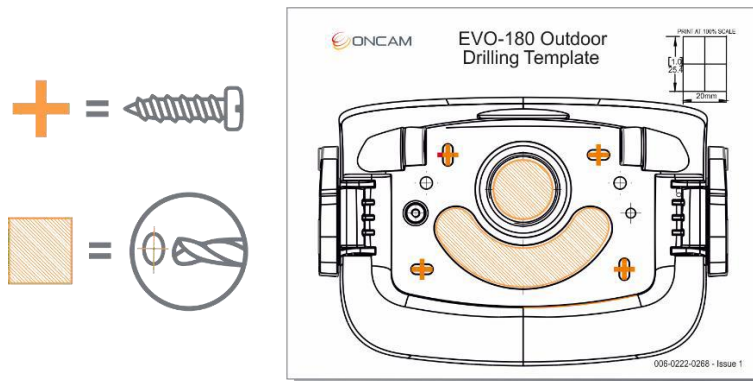
4.5.1.1 Prepare the bracket for surface mounting

Take the mounting bracket and remove the back cover by unscrewing the M20 plug and M32 to M20 adapter. Refit them into the unused port on the top of the bracket.

When deciding on the location of the camera, allowance must be made for the overall size of the assembled camera ensuring space is left for any rotation of the camera angle.



4.5.1.2 Drill holes



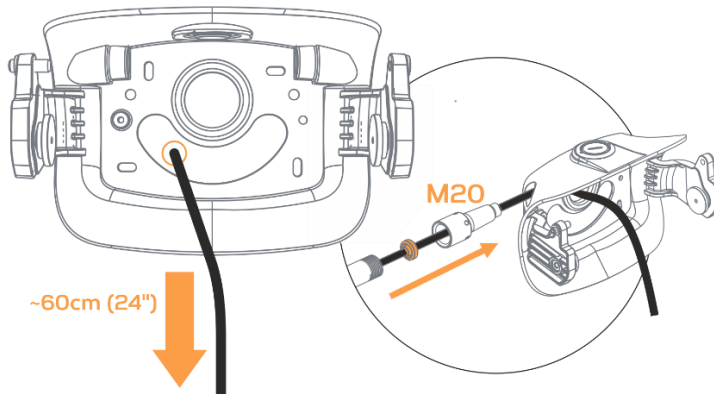
Take the drilling template and the mounting bracket, aligning the template with the mounting bracket in the required location. Ensuring there is enough clearance for the whole camera unit, take the drilling template, peel back the printed side from the backing and stick it to the area of the wall selected for fixing the camera. Drill the holes for mounting the bracket using the cross haired points for guidance for mounting holes. If the cable is going to be fed in from the rear of the bracket a cable hole will have to be drilled within the shaded area. (Allow additional spacing around the aperture to ensure there are no sharp bends in the cable).

4.5.1.3 Route a cable through bracket

For surface mounting, the cable or cables (12V power cable and LAN cable) can be routed through the mounting bracket in 2 different ways:

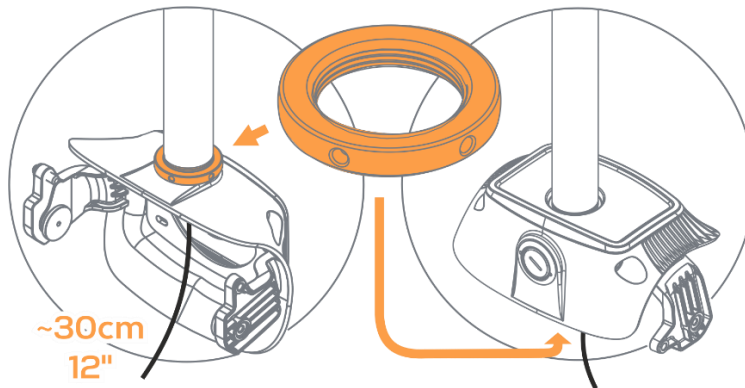
1. Rear entry of mounting bracket
2. Side entry via the M12 Conduit port using the M12 to M20 adapter (J). For side entry via a M12 conduit. Remove the conduit plugs and screw in the M12 adapter (J). Taking the cable protruding from the conduit, feed it through the red plastic grommet and pass it through the M12 adapter (J) into the mounting bracket.

Allow approximately 30cm of cable to be pulled through the bracket to enable fitting.



4.5.2 Option B: Pendant Mounting

For pendant mounting, the mounting bracket can be attached either from the top, or from the rear.



4.5.2.1 For pendant mounting from the top

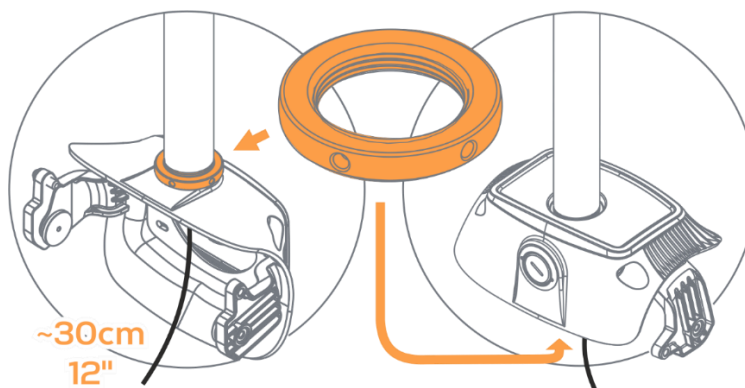
Screw the mount assembly onto the pendant and lock with the locking nut (K) on the outside of the bracket. The back cover is left in place.

4.5.2.2 For pendant mounting from the rear

Remove the back cover by unscrewing the M20 plug and the M32 to M20 adapter and fit them into the unused port on the top.

Attach the mounting bracket to the Conduit and lock the conduit in place using the locking nut.

An unterminated network cable is routed through the pendant mount hole protruding from the bracket. Please leave a minimum of 30cm of ethernet cable available for attaching to the camera module.



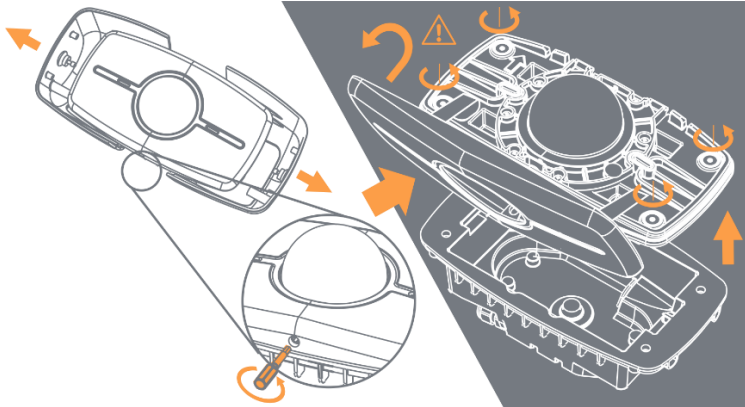
4.5.3 Completing the Installation

4.5.3.1 Remove the rear enclosure

Remove the two side screws holding the camera sun shields in place and separate the camera the two halves exposing the rear of the camera module and set them aside.

Undo the locking screw (turning it anticlockwise) on the underside of the front cover. Taking care of the glass dome, remove the front cover and set to one side.

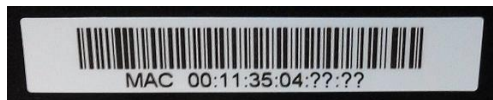
On the camera module undo the 4 security screws that connect the camera module to the rear enclosure.



4.5.3.2 Locating the MAC Address and Serial Number for the camera

MAC Address

- Find the MAC address on a sticker on the rear of the camera module and on the outside of the rear enclosure.
- Document this MAC address's unique reference number, its serial number and make a note of the camera's location as they will be needed for configuring the camera later and for any insurance purposes.

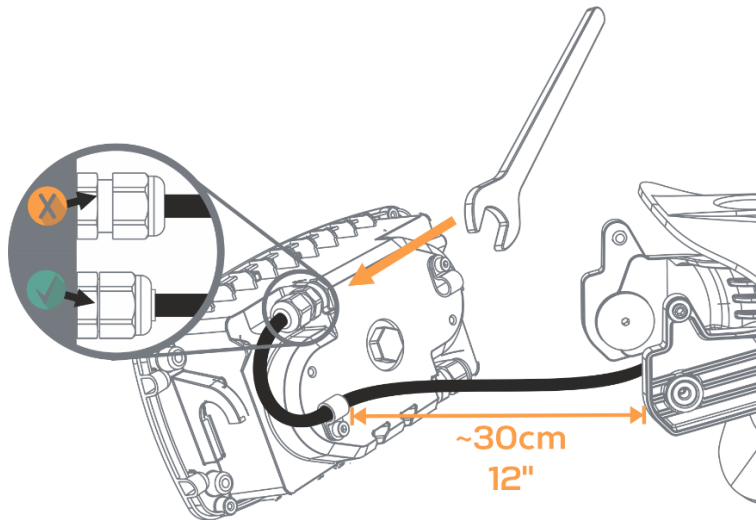


4.5.3.3 Route cable into the rear enclosure

Taking the rear enclosure, unscrew the cable gland removing the white grommet. Pass the network cable through the P-clip and thread the grey plastic nut taken off the gland, on to the cable. Push the cable through the cable gland and pull approximately 7-10cm of cable through the gland and tighten the grey nut so no screw thread can be seen.

Ensure there are no sharp bends in the cable as it is routed inside the rear enclosure. See diagram below.

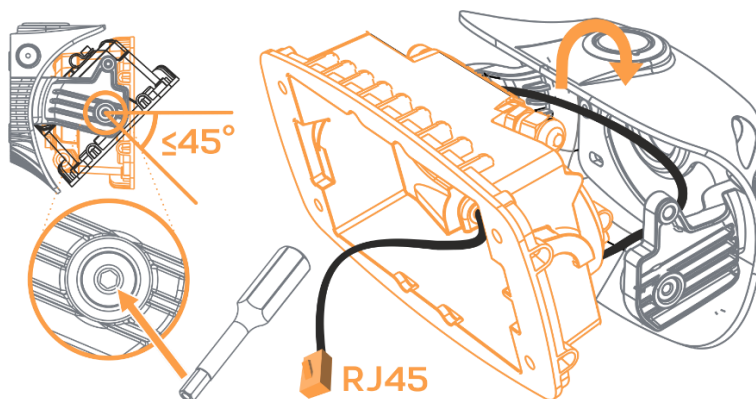
For using a 12V power supply. Pass the 12V cable through the rear enclosure using one of the cable glands and P clips and pass the LAN cable through the other cable gland using the 2nd P-clip.



4.5.3.4 Hook in rear enclosure and set mount angle

On the outside of the mounting bracket, loosen the pivot screws from either side of the bracket and hook the rear enclosure over the pivot discs, pulling it down until it locks in place. Terminate the cable with a RJ45 connector. (If using a 12V power supply as opposed to PoE then connect power cable to the I/O connector block). Rotate the rear enclosure at the angle required for the camera and tighten the pivot screws and the locking screws located adjacent to the pivot screws.

If the camera is to be tilted remove the black plastic infill (P) before rotating the camera.



4.5.3.5 Connect and fix camera module in enclosure

Insert the SD card (if required) into the slot located on the underside of the camera ensuring the card is pushed all the way in. (Take care when handling the SD card).

If powering the camera via 12V rather than via PoE, remove the foam padding from the I/O Connector on the rear of the camera module and plug in the I/O connector block.

Plug the RJ45 into the camera module and using the security screws, attach the camera module to the rear enclosure.

Remove the protective plastic film off the dome and with care replace the front cover, tightening up the locking screw.

Replace the sun shields either side of the mounting bracket and lock in place by tightening the side screws.

4.6 Testing the Installation

Check the camera and mountings are all secure.

Check that a Micro SD Card is properly installed, if required.

Remove the screen protection film from the dome.

If necessary, carefully polish the dome surface with a soft, lint-free, nonabrasive cloth to complete the installation. Contaminants left on the dome or lens degrade optical performance, causing poor focus, incorrect colour balance, lens flare and other undesirable effects. Ensure the dome surface is not damaged and the camera front panel is fitted properly.

Check the sun shield screws on each side of the camera are secure with the supplied security driver.

When power is applied to the camera, the power LED (left side) should illuminate green after 2 seconds. After about 40 seconds the LAN LED (right side) should illuminate if connected to a network. Within a few more seconds the camera should be available via the network.

4.7 Dome Handling and Cleaning – Outdoor model

Do not remove the clear screen protection film from the camera dome until installation is complete and the camera is ready for testing. The standard dome is made of a polymer. Take great care when handling or cleaning a dome to avoid scratching the surface.

- Always handle the dome by the outside edge of the camera housing assembly.
- The dome bubble is a key component of the optical system and is for factory replacement only.
- Remove heavy residue (spots, streaks, stains) or other contaminants from the dome surface with a solution of a mild liquid dish detergent or isopropyl alcohol and water. Only use lint free soft paper towels or a microfibre cloth. After cleaning the dome apply clean, dry air to complete drying and leave no dust.
- Scratches or other surface blemishes within the material of the dome may be removed by applying a non-abrasive wax (Meguiar's #18 or equivalent) with a microfibre cloth. After waxing, apply clean, dry air to complete drying and leave no dust.

4.7.1 NOTICE: The dome may become unusable due to excessive pressure or rubbing causing permanent scratches.

5 First Time Operation

The factory default configuration is DHCP. In order to use the camera you need the IP address. When a DHCP server is unavailable, the factory default IP address is 192.168.0.200.

Install the Camera Configuration Tool. Find the latest version at www.oncamgrandeye.com. Configure all camera IP addresses with the IP Configuration Tool.

5.1 DHCP

DHCP is the default camera configuration. Cameras acquire a unique IP address when connected to a network with a DHCP server. If you are using DHCP permanently for the camera's IP address, be sure to reserve that address with the DHCP server to ensure that the assigned IP address does not change. If a DHCP server is not found or DHCP is disabled, the camera will revert to its current static IP address.

5.2 Static IP Installation

For a multi-camera installation, always introduce the cameras one at a time and then re-address them to a non-conflicting static IP address. Use the Network Settings page in the Camera Web Interface or the IP Configuration Tool. The factory default IP address is 192.168.0.200.

5.2.1 SD card (Optional)

Configure a Micro SD card for recording alarm-triggered events. Remove the cover to access the SD card slot.

3.5.4.3 Compatible Micro SD cards

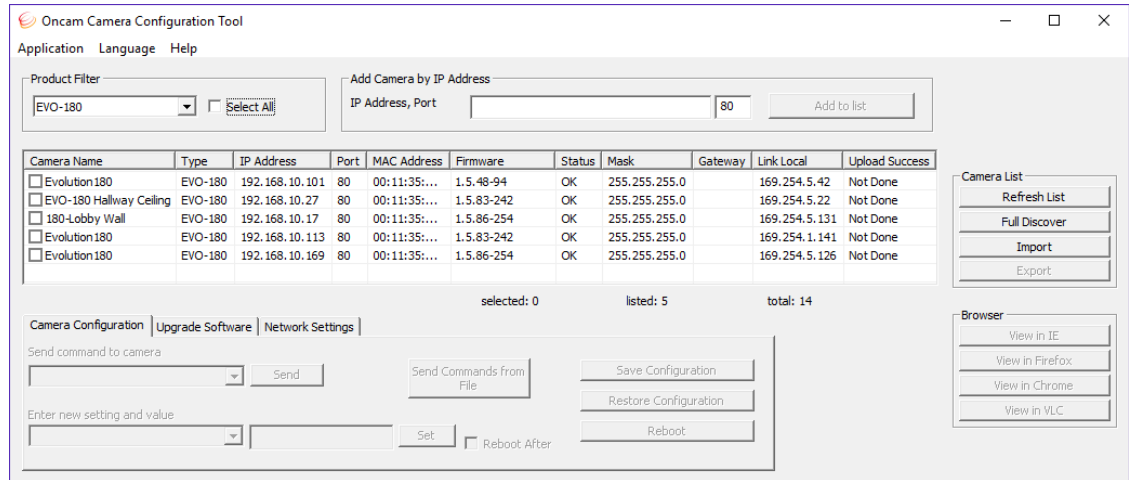
- SD, SDHC, SDXC
- Up to 256 GB capacity tested
- Speed of Class 10 or higher

The camera uses the format EXT3, while most SD cards use the format FAT32. Therefore, it is necessary to format the SD card to EXT3 prior to using the first time. This can be done using the Camera Web Interface. See Recordings, page 41.

Alternatively, you may use a computer to format several SD cards for an EXT3 file system. Although additional software is required, this method may be faster for multiple cards.

5.3 Finding Available Cameras

Use the Camera Configuration Tool to find the IP address of installed Oncam 180° IP cameras, whether or not they are addressable on your current sub-LAN.



1. Select the Camera Type.

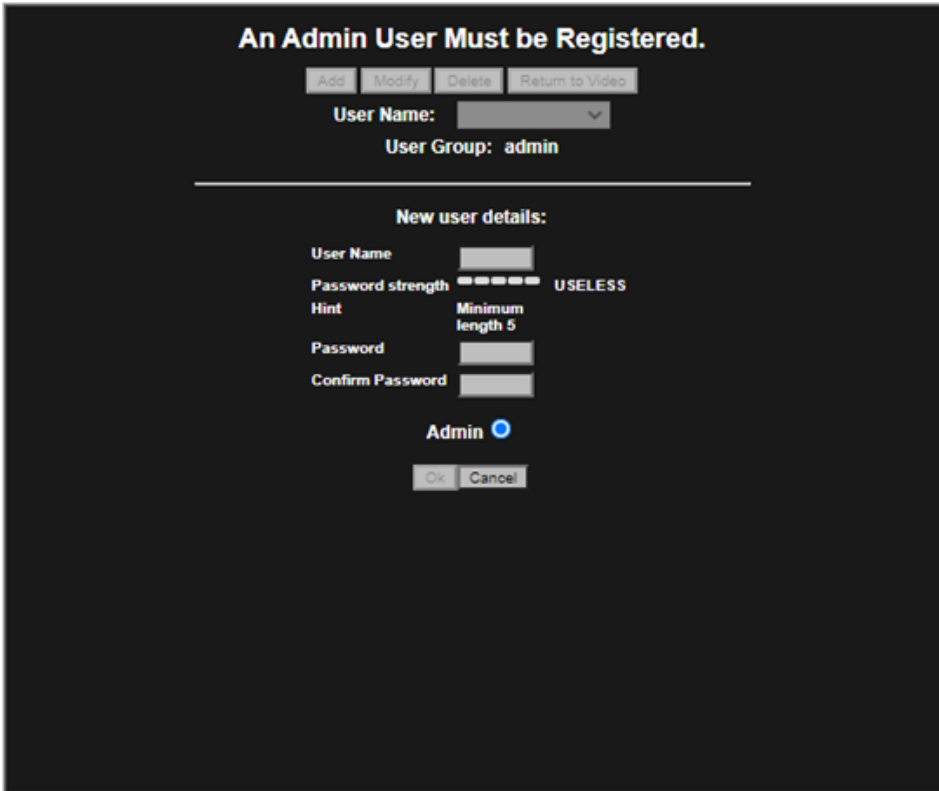
You can identify cameras by their MAC addresses. Find the MAC address printed on the camera label and packaging.

2. Press Refresh List or Full Discover to find new cameras, or update information on cameras already in the list.
3. Check the camera in the list whose address needs to be changed.
4. Select the Network Settings tab.
5. Click Get Network Settings to download current settings.
6. Click OK once the download complete.
7. Enter the new IP address, Subnet Mask and Gateway and disable DHCP.
8. Click Save Network Settings to upload new settings to the camera.

5.4 Connecting to the Camera

Connect to any camera on your network by entering the camera IP address into the address bar of a browser running on a PC on the same network. To access the Web interface, open a browser window (Internet Explorer, Firefox, Chrome) and enter the IP address of the camera. (For example, <http://192.168.0.200>).

The first response from the camera will be an authentication screen requesting the Primary Administrator to set up a Username and Password. For enhanced security, default usernames and passwords are not supported. Please follow the steps below to set up your login credentials.



5.4.1 Username

Set an easily identifiable and memorable username for the Primary Administrator. The name must be between 4 – 32 characters in length. The username can consist of uppercase letters (A-Z), lowercase letters (a-z) and numbers (0-9). Special characters are not supported.

5.4.2 Password

It is important to always set and use a secure password to access the camera:

- Minimum of 5 characters (required) and a maximum of 32
- It is recommended to create a strong password containing a combination of:
 - o Uppercase and lowercase characters (e.g., a-z and A-Z)
 - o Numbers (e.g. 1, 2, 3, 4, 5)
 - o Special symbol or punctuation characters. The following special characters are supported: (~!@#\$\$%^&* _-+=`|(){}[]:;'.?/).

5.4.3 Strength Indicator

For guidance, the strength of the password combination is displayed below the password. Use the combination of upper and lower case alphabetic, numeric, and special characters until the password strength is strong enough.

5.4.4 Confirm Password

Please retype your password to confirm it has been correctly entered, if the passwords do not match a notification will appear.



Minimum character limits are not enforced when credentials are created using ONVIF commands.

5.5 Media Player Requirements

Use the latest VLC media player for viewing video through the Internet Explorer 11 web browser.

Download the player from www.videolan.org > VLC > Download.

Not all browsers support the VLC plug-in; there may not be no live stream

6 Camera Web Interface

Access camera configuration through the camera Web interface.

- Open a browser window and enter the camera IP address.
- Enter the User name and Password for this camera. The Control Panel screen displays.

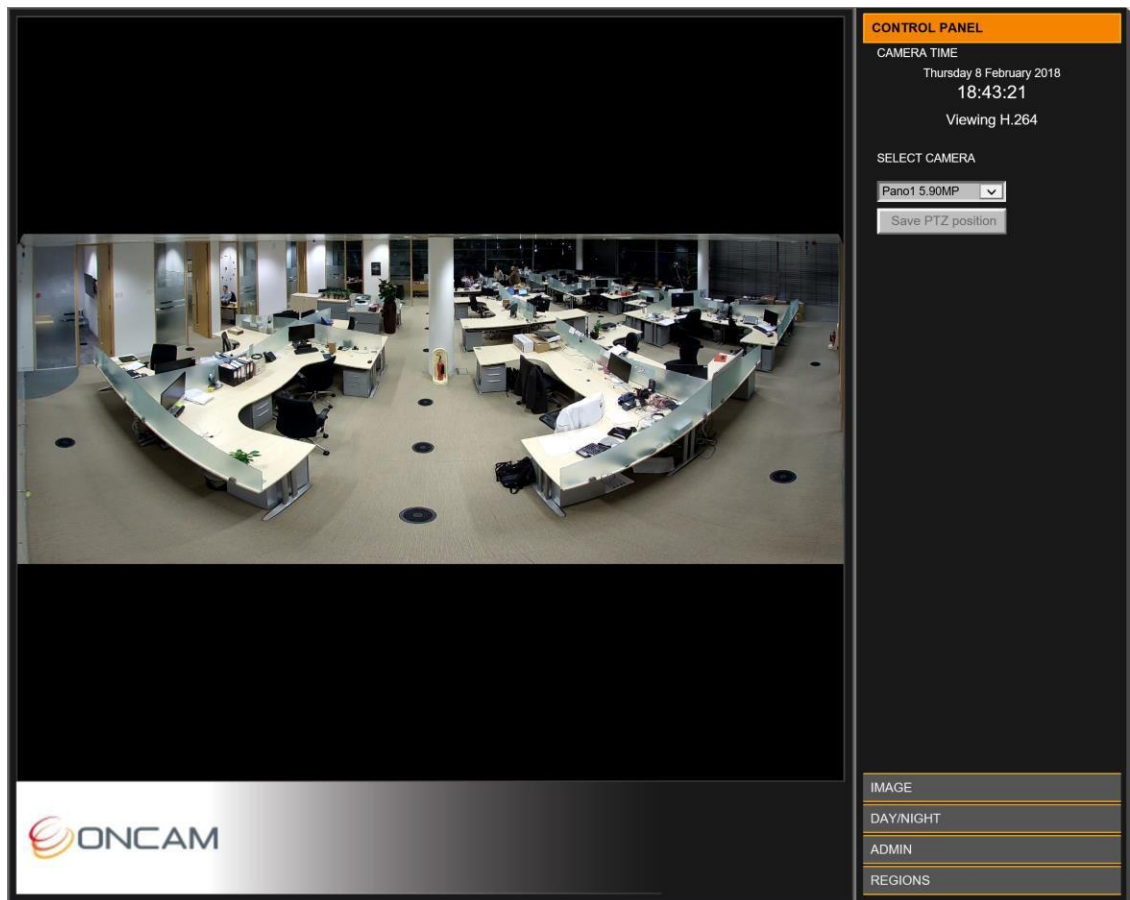
Note: Images in the following sections may vary based on the cameras installation and Web Interface setup.

The camera streams one panoramic dewarped image by default but may be configured to stream up to four dewarped images (up to two of which can be Panoramic images) and one fisheye image simultaneously. Alternatively, the camera may be configured to stream two fisheye images simultaneously, and no dewarped images. The complete list of possible stream combinations depends on their various resolutions and frame rates, and is detailed in section 14. Some combinations will have reduced frame rates, and not all combinations are possible.

The camera’s Web interface is divided on the right into five tabs, as follows:

6.1 Control Panel Tab

The camera produces a panoramic view that is a dewarped 180-degree image.



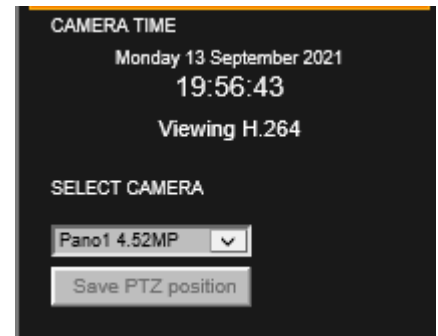
Shown in the right pane is the Control Panel that displays as default the camera date and time, and current image streaming.

Set the current date and time via the Admin > Clock tab.

By default only Panorama 1 displays in the Control Panel screen with the following options:

4.52 MP 3360 x 1344

Set the resolution and enable other streams from the Admin > Video Setup page. See Video, page 33.

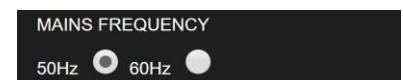


6.2 Image Tab

The Image tab includes lighting and orientation controls for the image sensor.

6.2.1 Mains Frequency

Select the mains frequency based on the camera location.



If you are unsure, contact your local power supplier to find the correct mains frequency for your location.

6.2.2 Image Controls

The camera has automatic imaging controls to provide the best image quality at all times though if lighting conditions are not good or better contrast or saturation is required then manual tuning is available though it is in practice rarely used.

Adjust the view using the image controls (Brightness / Contrast / Saturation).

Select the Defaults button to return the sliders to their default settings.

6.2.3 Sharpen

Increase or decrease the clarity and focus of an image. Using the Sharpen setting also emphasizes noise and increases data size.

6.2.4 EV Compensation

Increase or decrease the image exposure. Adjust the EV Compensation for unusual lighting conditions.

6.2.5 Wide Dynamic Range

“Wide Dynamic Range”. This increases the dynamic range in difficult lighting conditions. WDR particularly lightens dark areas without over brightening light areas.



“WDR Level”. After enabling WDR adjust the amount of WDR processing that is applied to the image. Higher settings further bring-out detail in shaded areas, in exchange for slightly lowering the overall contrast.

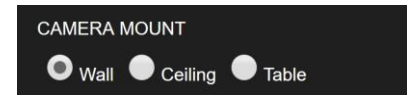
6.2.6 Image Time and Date Overlay

Overlay the current date and time onto the image outside of the fisheye circle so not obscuring the video. The scaled image and overlay appear small when viewed using a web browser. Settings are available to set the format of the date and time text. This setting does not display on the Panoramic or VCam dewarped views because the text could obscure objects in the scene.



6.2.7 Camera Mount

Set the Camera Mount to match the installation position of your camera. When viewing the camera using either the VCam streams or the Oncam SDK, this setting ensures that the scene is properly de-warped and the NVR PTZ operations work correctly.



6.2.8 Wall Mount Settings

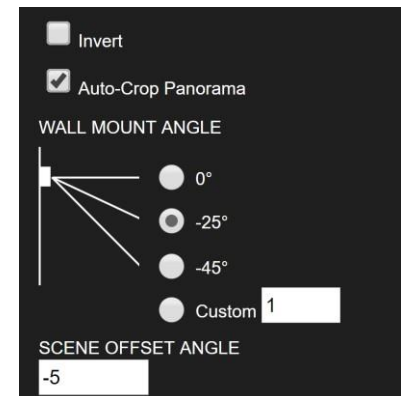
Several settings take effect only in Wall Mount mode, and appear only when the camera is set to this mode:

6.2.6.1 Invert

When wall mounting a camera, for routing cables the camera may need to be upside down. When configuring the Wall Mount option through the Web interface, use the “Invert” option to invert the video image if the camera is mounted upside down.

6.2.6.2 Auto-Crop Panorama

This setting automatically crops panoramic images to a scene that is 180° wide based on the Wall Mount Angle. When the camera is tilted downwards, clearing this setting will allow a wider view below the camera to be viewed, including the walls for example.



6.2.6.3 Wall Mount Angle

In Wall Mount mode, when the camera is tilted up or down from the horizon, the dewarped panoramic images may be adjusted using Oncam Angle Compensation Technology to correct vertical objects in the scene that would otherwise appear distorted. If this compensation is desired, select the Wall Mount Angle that matches the camera’s mounting angle. Alternatively, to fine-tune the “Custom” setting to give the most realistic-looking view as described in the following section.

6.2.6.4 Custom Angle Adjustment

The purpose of the Wall Mount Angle setting is to correct the image so that all vertical lines in the scene (such as door or window frames, pillars, lamp posts etc.) are shown vertical and parallel. When the camera is tilted downwards without this compensation, vertical objects towards the side appear to point outwards. The wall mount angle corrects this when set to the angle the camera is mounted. For example, if the camera is tilted down by 20°, the settings should be -20. If the camera angle is unknown, the correct value can be found easily by trial and error using these simple steps:

- 1) Take a guess at the angle, enter it in the Camera Mount Angle setting, and look at the panoramic image produced by the camera. (Remember that if the camera is pointing downwards, the Mount Angle is a *negative* number.)
- 2) If vertical lines in the scene are **leaning outwards** from the middle of the image, the Wall Mount Angle should be made **more negative**.
- 3) If vertical lines are **leaning inwards** towards the middle of the image, the Wall Mount Angle should be made **more positive**.
- 4) Keep refining your guess at the angle using this simple guide until you settle on the best number. Below is a worked example to help you:

- 1) This is the initial image with Wall mount Angle set to zero. We need a negative setting because the vertical lines are leaning outwards from the middle of the image. (This camera is installed tilted downwards.)



We guess the angle it's mounted at is -22° and enter that setting:

- 2) A setting of -22° gives us a better result, but the vertical lines of the doorways are still leaning outwards, so we need to make it more negative.



Now we guess it's -34° :

- 3) A setting of -34° gives an image where the vertical lines are now leaning inwards. We've gone too far and need a setting somewhere in between -34° and -22° .



This time we guess it's -25° :

- 4) A setting of -25° is almost right, but the door frames near the sides of the image are still leaning outwards slightly, and looking at the wall on either side of the camera, it also points outwards. We need a slightly more negative setting.



This time we guess it's -27° :

- 5) Perfect. All the vertical lines are nicely vertical, and the wall the camera is mounted on, can be seen on either side running parallel with the edge of the image. Now we know the camera is at an angle of -27° .



6.2.6.5 Scene Offset Angle

In Wall Mount position, the dewarped panoramic images are taken from the centre of the sensor by default, to give the best image quality. "Scene Offset Angle" allows the panoramic view to be adjusted up or down to precisely capture the desired scene. Although a wide range of angles are permitted, image quality is best if the offset is smaller. If a large angle is needed, consider physical angling the camera body to point it more directly at the desired scene.

6.3 Day/Night Tab

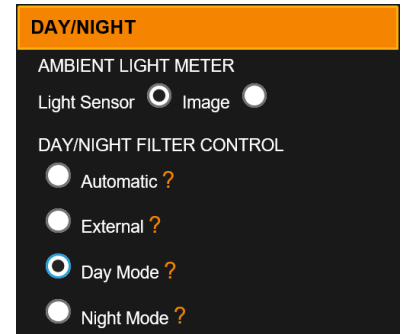
The camera features a high-reliability solenoid-controlled removable IR cut filter. There are several modes in which this can be controlled described below. When the camera is in Day mode, the IR filter removes all non-visible light to produce the best colour fidelity

6.3.1 Ambient Light Meter

The camera features an ambient light sensor to gauge the visible light available and control the IR Cut filter correctly. For test purposes and for certain lighting scenarios it is possible to ignore the light sensor.

Light sensor. The camera image *and* light sensor are used to determine the lux level in Day mode. In Night mode, only the Light sensor is used to determine the visible lux level, to avoid IR light fooling the camera into switching to Day mode when it is dark.

Image. The Light sensor is ignored and only the camera image is used to measure the lux level. This feature is used for testing and unusual lighting conditions. Do not use this setting unless instructed by Oncam Support. Otherwise keep the default setting; “Light sensor.”



6.3.2 Day/Night Filter Control Mode

Automatic. Switches to Night mode when the lux level is below the “Night” threshold set below. Switches to Day mode when the lux level is above the “Day” threshold set below. The state doesn’t change until the light level has remained beyond the threshold for a predefined delay.

External. The filter state is directly controlled by the external input ALM_IN_2 on the camera’s 12-pin I/O Connector. The filter’s normal state in this mode is defined by the “External Day/Night Control” setting described below.

Day Mode. The filter is permanently in Day mode regardless of lux level or external input. IR light will always be filtered out. Images are colour above 1 lux and fade progressively to monochrome for better contrast below that level.

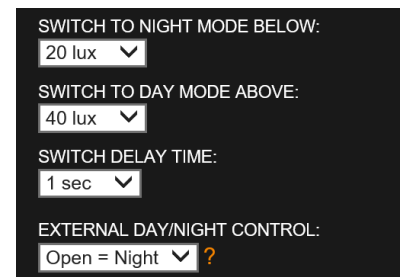
Night Mode. The filter is permanently in Night mode regardless of lux level or external input. IR light is always accepted and the camera images will always be monochrome.

6.3.3 Day/Night Thresholds

Switch To Night Mode Below. Lux threshold below which the camera switches to Night mode. The Lux level must remain below this threshold for the period set in “Switch Delay Time” before switching.

Switch To Day Mode Above. Lux threshold above which the camera switches to Day mode. The Lux level must remain above this threshold for the period set in “Switch Delay Time” before switching.

Switch Delay Time. The period for which the Lux level must remain beyond the thresholds before switching to the new state.



6.3.4 External Day/Night Control

Defines the camera’s Day/Night condition when “External” control mode is selected and the external input “EXT_IN_2” is open-circuit. The state is reversed when the input is connected to Ground. This is illustrated in the truth table below:

External Day/Night Control	EXT_IN_2 = Open-circuit	EXT_IN_2 = Ground
Open = Night (default)	Night mode	Day mode
Open = Day	Day mode	Night mode

6.4 Admin Tab

The Admin menu provides the camera firmware version and MAC address. Access all administrative camera parameters through the Admin sub-menus.

6.4.1 Network

Configure the different Network Settings as necessary.

3.5.4.4 NOTICE: If changes are made, click **Apply IP Settings** to save changes. Your Web Interface connection may be lost if the IP address changes to another subnet.

Camera Name. Host Name to use in DHCP registration, the Camera Configuration Tool, etc.

Domain Name. Domain Name to use in DHCP registration.

DHCP (Default = On). Enables the camera for DHCP. When enabled, find the camera’s IP address using the Camera Configuration Tool. Set to “Off” before trying to use static IP Address settings.

Static IP Address. Configure the camera with a free Static IP address if DHCP is not used.

Port. Network port used by the camera’s web server. Default is port 80.

NTP Server. Provides accurate time updates to the camera. Enable the setting and enter the DNS name or IP address of the required target NTP Server. Uses outbound UDP port 123.

UPnP. Enable the Universal Plug-and-Play feature to discover the camera from other UPnP compatible devices on the same network (for example Windows computers).

Network Mask. Network mask for the Static IP Address, if in use.

Gateway Address. Gateway Address to use with Static IP settings.

H.264 RTSP Port. Network port for Unicast streaming of H.264 images over RTSP.

MJPEG RTSP Port. Network port for Unicast streaming of MJPEG images over RTSP.

Multicast RTSP Port. RTSP port for receiving a multicast RTSP request from a client.

Multicast Address. IP Address of the Multicast Group for RTSP streaming. The multicast clients need this address value as well as the multicast RTP port to receive the video. Consult your network administrator.

Multicast RTP Port. RTP port for multicasting the video. The clients that receive the video use the Multicast RTP Port and Multicast Address values to receive the video. Consult your network administrator.

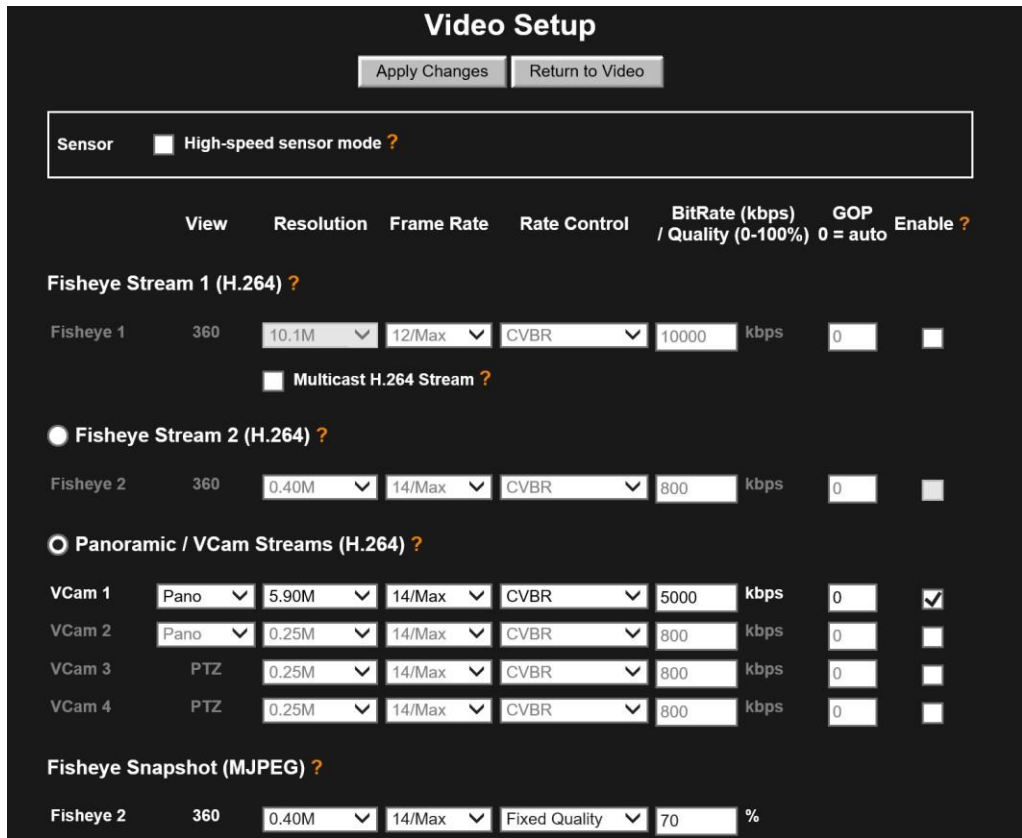
Time to Live. Sets the Time to Live value in your multicast IP packets. Consult your network administrator.

6.4.2 Video

The Video Setup page allows you to set the RTSP camera stream combinations and parameters for the individual camera streams. See Control Panel, page 27.

NOTICE: Configure ONVIF streams from your ONVIF-conformant third-party system within ONVIF Profile settings. The Video Setup settings are for the camera's regular RTSP streams when ONVIF is not used, and the two may interfere if both are used. The camera has 4 Panoramic / VCam streams, of which 2 can be configured as Panoramic streams. At the same time, the camera can also support 1 full-resolution Fisheye stream. Configuring a second Fisheye stream disables all Panoramic / VCam streams. However, there is a third MJPEG Fisheye stream always available in all combinations. This stream shares the resolution set for Fisheye2, but its other settings are independent.

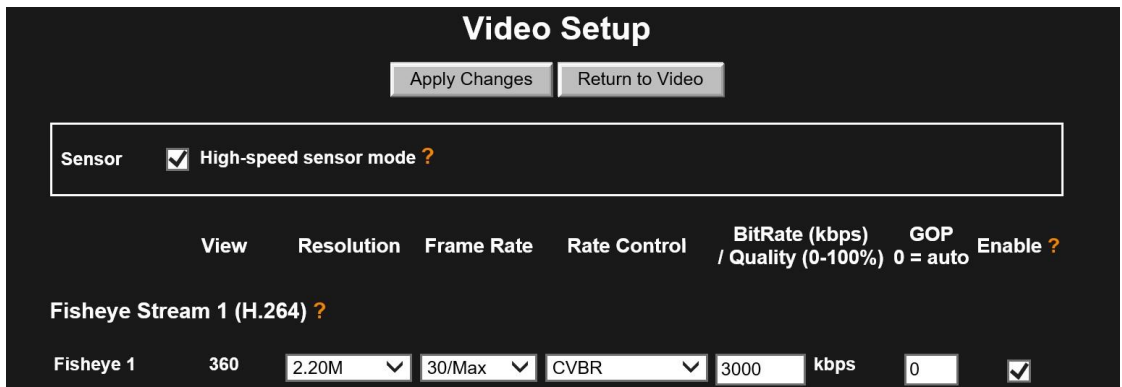
The full range of possible video stream combinations are detailed in Section 14




6.4.2.1 Sensor - High-Speed Sensor Mode

High-speed sensor mode is an advanced feature of the image sensor that merges square blocks of 2x2 pixels into one pixel. This increases the camera’s light sensitivity and increases the maximum frame rate to 30 FPS in exchange for a reduction in image resolution. This mode is particularly useful for very low-light conditions, or where faster shutter speeds are essential to capture fast-moving action. Use this feature if requiring frame rates greater than 14 FPS. Maximum resolution in this mode is 2.2 MP and the settings available on the page adapt to suit when selecting the setting.

When selecting the Sensor checkbox, the Fisheye1 resolution automatically changes to 2 MP and the Frame Rate range increases to 30/Max FPS.



Enabling high-speed sensor mode provides the maximum frame size shown. Panorama and VCam streams will also be reduced in resolution accordingly.

 In High Speed sensor mode, the frame rate range for the Panoramic / VCam modes do not automatically change to "30/max". To achieve a max frame rate of 30 fps, "14/Max" needs to be selected.

6.4.2.2 Stream Settings

Configure the following parameters for each enabled stream.

Resolution. Set resolution individually for VCam1-4 (including Pano) and Fisheye1.

Frame Rate. The Frame Rate is the maximum frames per second (FPS) sent by the camera.

Rate Control. Use Rate Control to control the network bandwidth.

CVBR
(Capped Variable Bit Rate)

The network bandwidth should not go above the Bit Rate value selected.

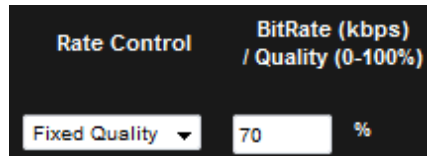


Maximum allowed setting is 10000 kbps* on Fisheye streams, and 5000 kbps* on Panorama and VCam streams.

Fixed Quality

Does not directly control network bandwidth.

When selecting this option, a Quality value may be selected instead of a Bit Rate.



Note: For 10.1Mp the maximum allowed setting is 70%*.

* = Bitrate and quality settings are limited to prevent excessive data usage, network bandwidth and camera workload.

GOP. This is an advanced feature and configures the Group of Pictures (GOP) and the number of frames. GOP specifies the number of frames between I-frames in the H.264 compressed video stream. A lower value means frequent I-frames for fidelity if recording the output. I-frames are complete-frame images, using more bits to encode. Therefore, more frequent I-frames increase the bit rate and hence storage required to store the video. A value of 0 means this value is set automatically by the camera.

GOP = 0 (automatic) configures the GOP in order to provide an I-frame every two seconds. This is equivalent to setting the GOP to double the frame rate setting.

For example, if the resolution is 6.45 MP and FPS is 0 (auto), and GOP is set to 0 (auto), the actual value for FPS = 14, and the value of the GOP will therefore be set to 2 x 14 = 28.

6.4.2.3 Fisheye Stream 1 (H.264)

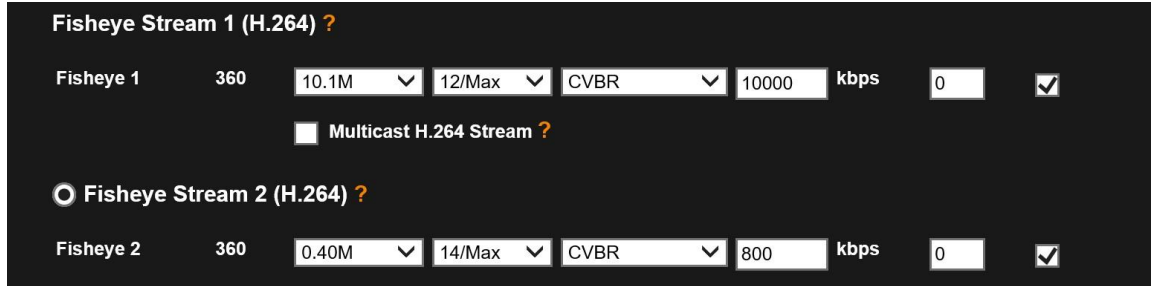
Fisheye Stream 1 (Fisheye 1) is always available because it is from this stream that all others are derived but is disabled by default to maximize performance of the default Panoramic stream. Configure the Primary Stream resolution, frame rate and compression parameters in this section, as described in section 6.4.2.2

Note. Lowering the resolution of this stream reduces the maximum resolution possible in all other streams.

Multicast H.264 Stream. When selecting this checkbox, the camera multicasts the main video stream (Fisheye 1) according to the multicast settings found on the Network Settings page (see Network, page 32). Deselecting this checkbox stops the multicast stream.

Fisheye1 may be streamed over RTSP using these URLs:

Fisheye 1 RTSP URL `rtsp://<ip address>:port/video.sdp`
Fisheye 1 RTSP URL `rtsp://<ip address>:port/video.sdp?name=FE1`



6.4.2.4 Fisheye Stream 2 (H.264)

In addition to Fisheye Stream 1, selecting Fisheye Stream 2 allows the configuration of the second Fisheye stream, Fisheye 2. If Fisheye 2 is enabled, then the maximum frame rate achievable for each stream is reduced. Only enable Fisheye 2 if required.

Fisheye 2 may be streamed over RTSP using this URL:

Fisheye 2 RTSP URL `rtsp://<ip-address>:<port>/video.sdp?name=FE2`

Note. It is not possible to use Fisheye2 and VCam streams at the same time.

6.4.2.5 Panoramic / VCam Streams (H.264)

The only stream enabled on the Evolution 180 cameras by default is the first Panoramic Stream, VCam 1. Without any other streams enabled, this produces a high-performance 180° Panoramic stream at up to 5.9 MP at the maximum 14 fps. Enabling other streams may reduce the frame rate.



A second, lower resolution Panoramic stream may also be enabled if required. The full 14 fps performance may still be obtained with two Panoramic streams at the resolutions of 4.52 MP and 0.25 MP.

In addition to Panoramic dewarped streams, the camera can also produce VCam dewarped streams using Oncam 3D dewarping. These are convenient when smaller or more square areas of interest should be streamed. VCam 1 and VCam 2 are Panoramic streams by default, but up to 4 VCam streams are possible if they are set to VCams instead.

VCams 1-4 may be streamed over RTSP using these URLs:

VCam 1 RTSP URL `rtsp://<ip-address>:<port>/video.sdp?name=VC1`
VCam 2 RTSP URL `rtsp://<ip-address>:<port>/video.sdp?name=VC2`
VCam 3 RTSP URL `rtsp://<ip-address>:<port>/video.sdp?name=VC3`
VCam 4 RTSP URL `rtsp://<ip-address>:<port>/video.sdp?name=VC4`

Note. It is not possible to use VCams and Fisheye 2 at the same time.

Switching between these modes requires a camera reboot for changing to the ONVIF source mode and defining different facilities in the camera's ONVIF streams.

You must select the Fisheye Stream 2 or VCam mode when connecting the camera to some systems using ONVIF profiles before adding the camera to the system.

When changing between modes later, remove the connections already defined in other systems and recreate with the camera in the required mode.

6.4.2.6 Fisheye Stream 3 (MJPEG)

The camera has a third, permanently available stream, compressed using MJPEG compression, whose resolution is the same as that used for Fisheye2. The other compression settings for this stream are independent.

The MJPEG image may be streamed over RTSP using this URL:

MJPEG RTSP URL `rtsp://<ip-address>:8555/video.sdp?name=MJPEG`

Note: The default network port for this stream is 8555 (not the standard 554). This port may be changed in the Network setup page.



Fisheye stream 3 is incorrectly labelled in the UI as Fisheye 2 under Fisheye snapshot (MJPEG)

6.4.3 User Management

There must be at least one Admin user in the system. On first use, or after a factory reset (see 6.4.9 Reset to Factory Defaults), it will be necessary to create a new base user.

Enter a Username and Password for each user. There are three different user profiles.

User

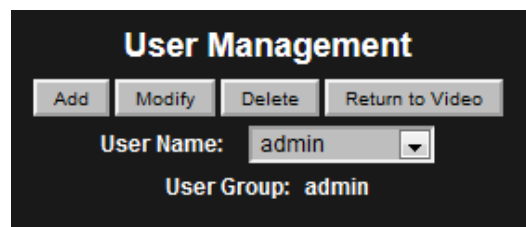
View image streams and camera configuration.

Operator

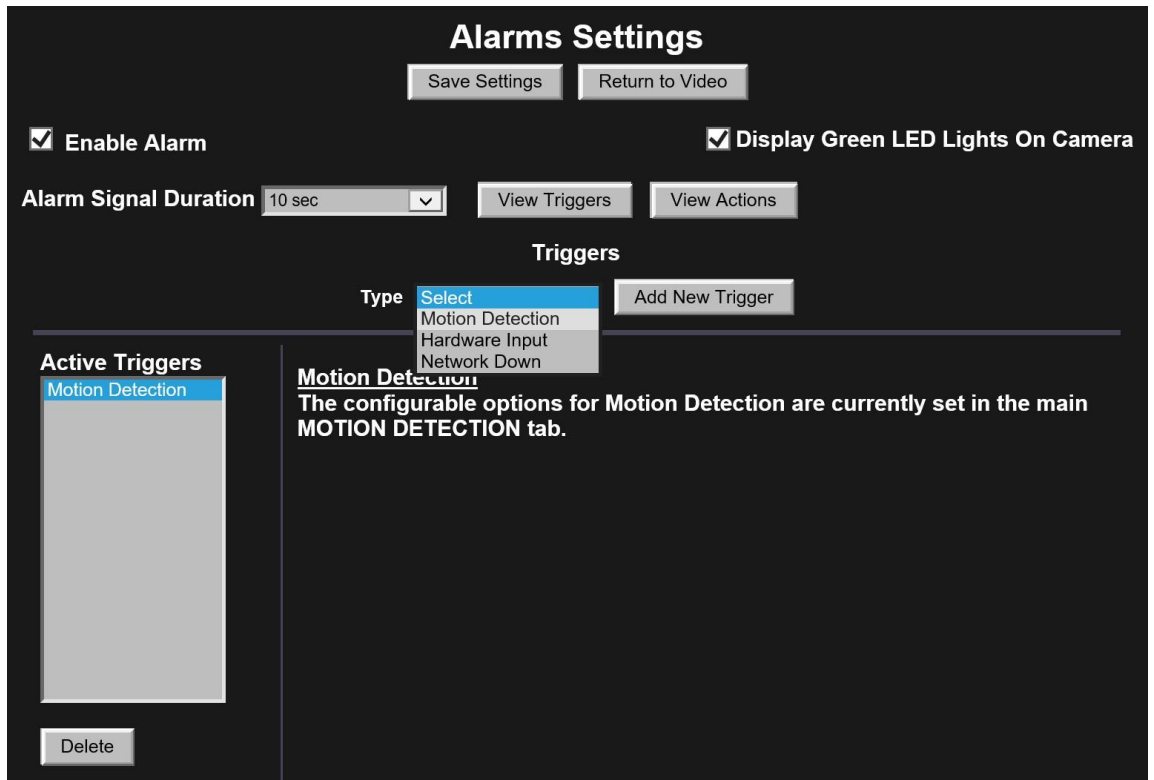
Change image and IP, motion registration alarm settings and administer a factory reset.

Administrator

Access all functions, including user configuration.



6.4.4 Alarms



Enable Alarm. Enable and disable the alarm system.

Display Green LED Lights On Camera. Un-check this to hide the camera’s front LEDs when the system is operating normally. While the LED state is anything other than both green, this setting has no effect: Red or orange LED states will always be displayed.

Alarm Signal Duration. The length of time that an alarm persists after the alarm is triggered.

View Triggers. Access a list of triggers that activate the alarm. As necessary, configure the Active Triggers list.

Add New Trigger. Select a trigger type from the drop-down list and press the “Add New Trigger” button to add that trigger to the “Active Triggers” list.

Available triggers include the following.

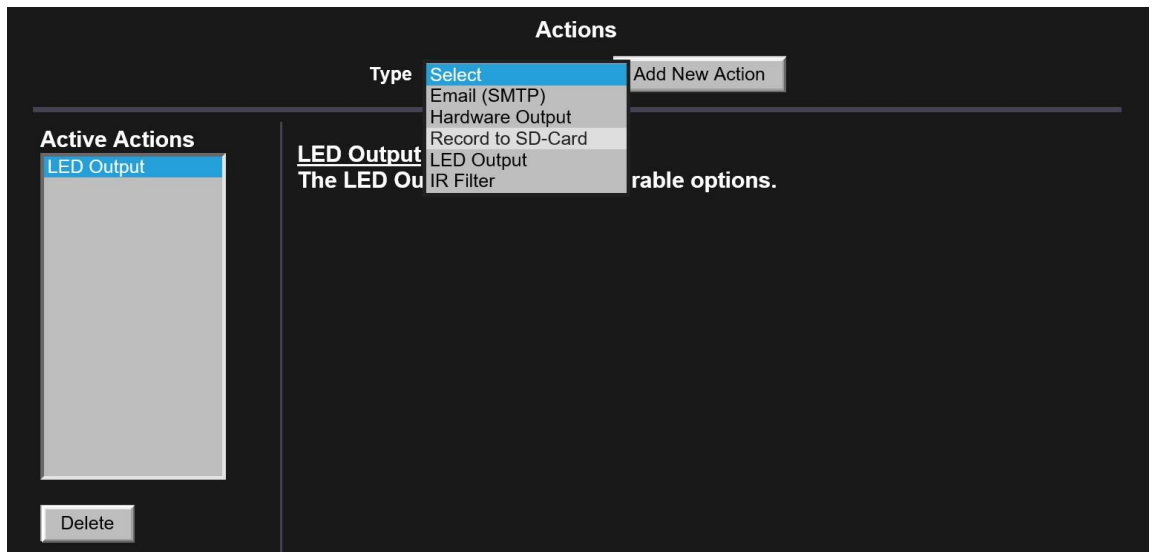
- Motion Detection – Movement detected in a defined region
- Hardware Input – A sensor or button attached to hardware I/O interface
- Network Down – The camera has lost its network connection

Use the Delete button to delete an unwanted trigger. By default a Motion Detection trigger is set to allow motion detection alerts to operate. To disable these, delete the trigger.

View Actions. Access a list of actions that the camera can perform in response to the alarm being triggered by selecting the “View Actions” button. Configure the active actions list after setting the active triggers. The active actions will be performed when any trigger has activated. You cannot set Triggers to individual specific Actions.

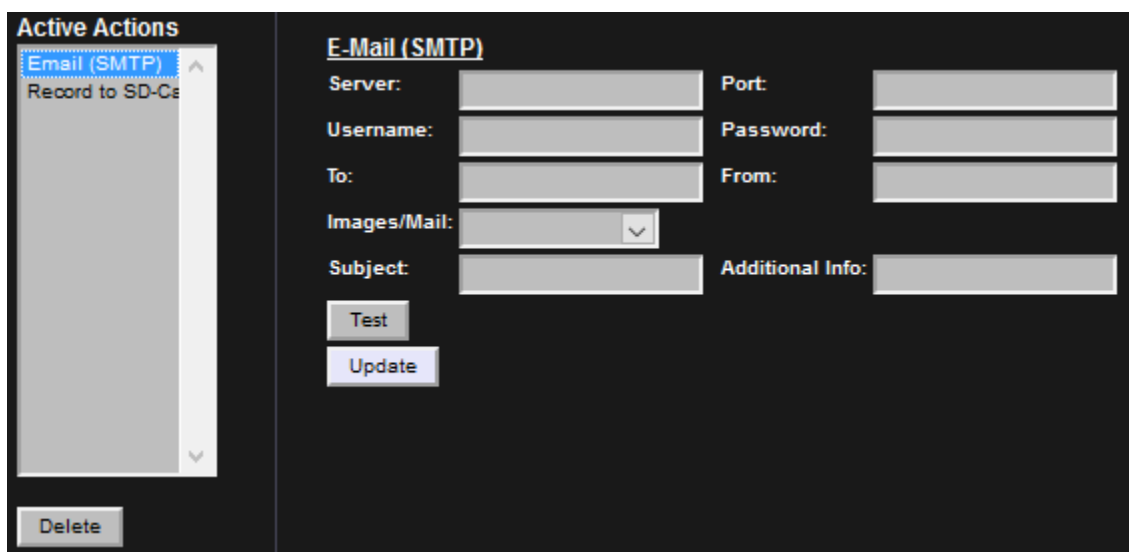
Available actions include the following.

- E-mail – Send a notifying e-mail
- Hardware output – A hardware device attached to the hardware I/O is activated.
- Record to SD Card – Video is recorded to the MicroSD Card for a period of time.
- LED Output – Light the camera’s two front LEDs red for the alarm duration.
- IR Filter – Switch the camera’s Day/Night mode state for the alarm duration.

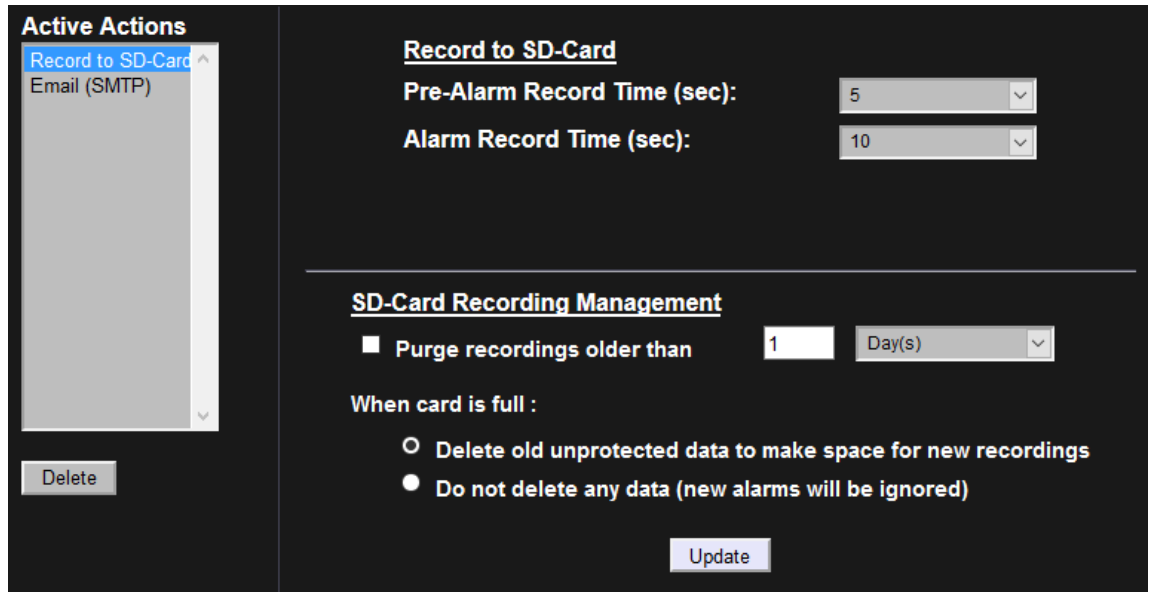


Some actions have configurable options. From the Active Actions list, select the action to configure.

Email (SMTP). Send an email in response to an alarm by configuring Email (SMTP).



Record to SD-Card. Setup an alarm for recording to the SD-Card.



The entire recording duration is the sum of the pre-alarm and alarm times.

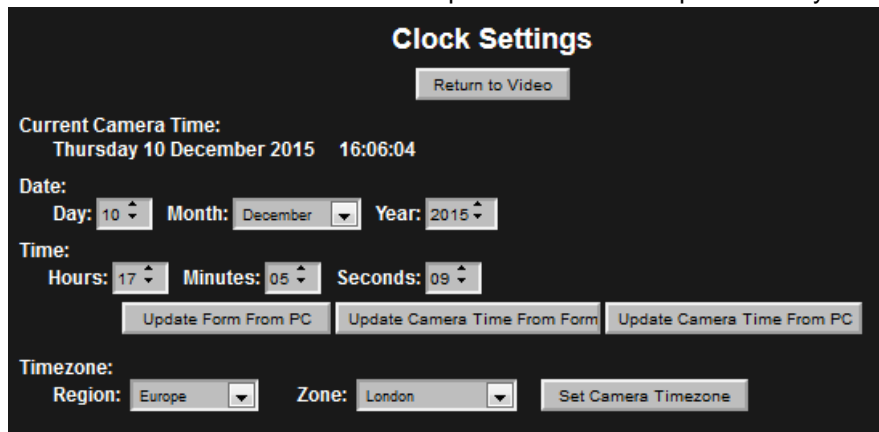
With Firmware v.1.5 you can only record from Fisheye Stream 1.

With Firmware v1.6 and higher you can only record from VCam 1 (panorama stream). Use the Delete button to delete an action.

6.4.5 Clock

Enter the Region and Zone and set the Camera Time Zone You can update the camera time directly from the PC or from the Date and Time fields on the Clock Settings page.

It is recommended to use NTP to keep the camera clock permanently accurate.

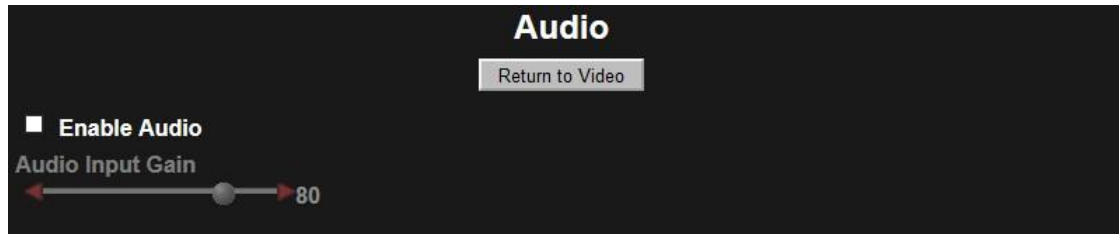


Note: Don't forget to set the correct time zone.

6.4.6 Audio

The Audio button accesses Audio configuration.

Using an electret microphone, enable Audio and set the Audio Input Gain to the desired level. The audio is included in any H.264 or MJPEG RTSP camera stream.

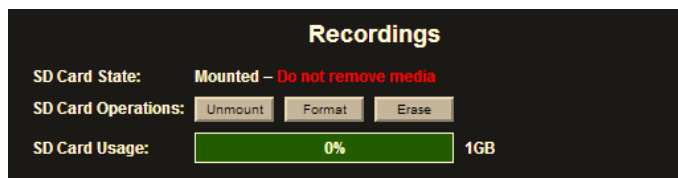


Note: RTSP streaming of audio occurs when using a stream request URL with the `rtsp://` prefix.

With audio enabled, when making an RTSP connection to the camera and viewing video, an additional mono audio channel streams to the player. The audio uses the G.711 mu-law codec. Audio is not recorded to SD Card.

6.4.7 Recordings

The Recordings dialog provides information and configuration options for the SD card.



SD Card State. Empty slot | Mounted | Unmounted or Formatting (if appropriate)

3.5.4.5 **NOTICE:** To avoid corrupting the data on the SD Card, it must be UNMOUNTED prior to removal.

3.5.4.6 SD Card Operations

- **Mount / Unmount.** Toggle between Mount and Unmount after inserting the SD Card or prior to removing the SD Card.
- **Format.** Use Format for formatting or reformatting the SD Card. Formatting the SD card erases all data.
- **Erase.** Click Erase to erase all content from the SD Card.

SD Card Usage. Shows the space remaining in the SD card.

6.4.8 Attributions

The Attributions section references open source libraries and technology used by the camera.

6.4.9 Reset to Factory Defaults

There are three ways to reset the camera to factory default settings: Using the camera’s recessed reset button, via the camera’s Web interface, or from the Camera Configuration Tool.

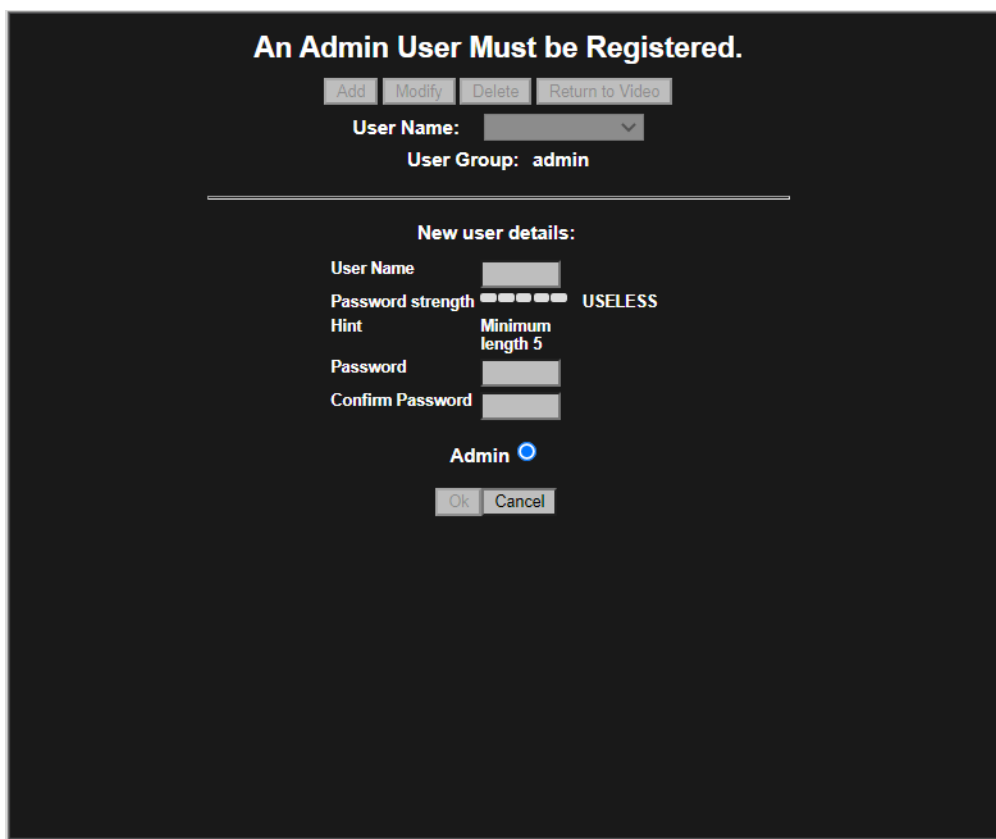
The following Factory Defaults are applied:

DHCP	Enabled
Static address	192.168.0.200
Regions (Privacy & Motion)	None
Image Settings	Default values

The above settings are all applied except in specific cases where the static IP settings are retained. This feature is useful when operating the camera through a routed network connection, where resetting the IP settings might make the camera unreachable due to incorrect port or gateway settings. The IP settings that are retained in this case are:

1. DHCP mode
2. Static IP Address and Mask
3. HTTP port
4. Default Gateway
5. DNS Address

Note that, from firmware release 1.8, **all** user accounts are removed when applying a factory reset and, once the process has completed, you will be presented with a page where a new Primary Administrator will need to be created. After factory reset, web browser may insist on displaying user login dialog repeatedly, it is suggested to restart web browser to get user management page.



For enhanced security, default usernames and passwords are not supported. Please follow the steps below to set up your login credentials.

3.5.4.7 Username

Set an easily identifiable and memorable username for the Primary Administrator. The name must be between 4 – 32 characters in length. The username can consist of uppercase letters (A-Z), lowercase letters (a-z) and numbers (0-9). Special characters are not supported.

3.5.4.8 Password

It is important to always set and use a secure password to access the camera:

- Minimum of 5 characters (required) and a maximum of 32
- It is recommended to create a strong password containing a combination of:
 - o Uppercase and lowercase characters (e.g., a-z and A-Z)

- Numbers (e.g. 1, 2, 3, 4, 5)
- Special symbol or punctuation characters. The following special characters are supported: (~!@#\$\$%^&* _-+=`|(){}[]:;'.?/).

3.5.4.9 Strength Indicator

For guidance, the strength of the password combination is displayed below the password. Use the combination of upper and lower case alphabetic, numeric, and special characters until the password strength is strong enough.

3.5.4.10 Confirm Password

Please retype your password to confirm it has been correctly entered, if the passwords do not match a notification will appear.

6.4.9.1 Recessed Reset Button

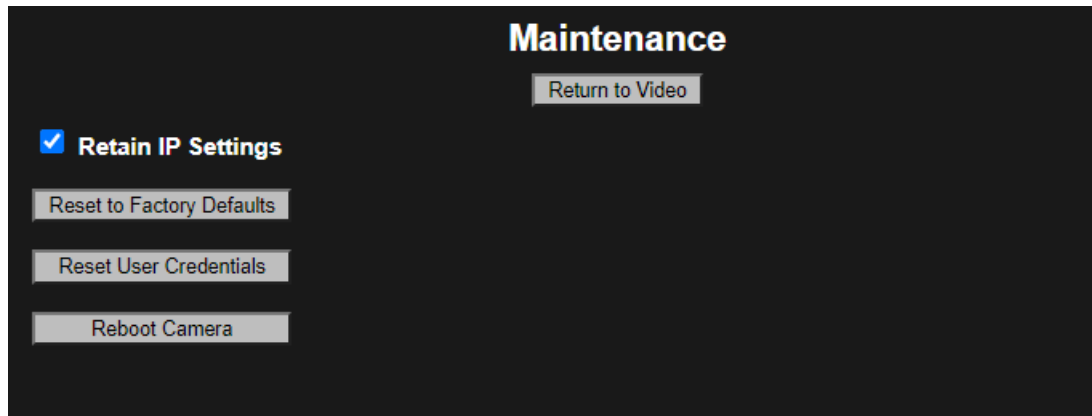
Remove the camera's top cover to access the recessed reset button next to the MicroSD Card slot on the side of the camera module. This may be pressed using a ballpoint pen.

With the **camera powered**, press and hold the Recessed Reset button as follows:

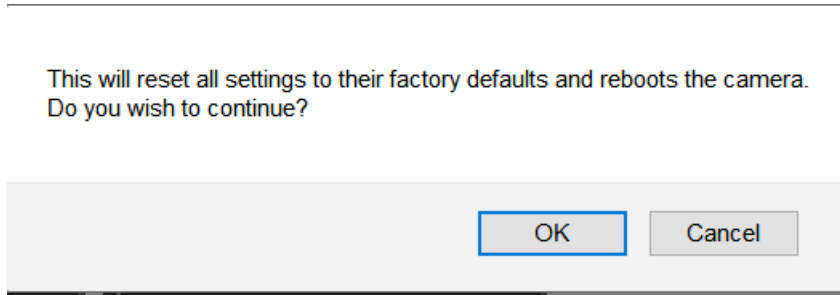
1. To clear all settings **except** the Static IP settings, hold the button for at least 6 seconds. After about 20 seconds the Network LED goes off and the camera reboots. (Do not hold the button longer than this.)
2. To clear all settings **including** the Static IP settings, hold the button for at least 40 seconds. The camera will reboot after about 20 seconds, though keep holding the button until the Network LED (right side) confirms the reset is complete by flashing rapidly red and green five times. This happens about 70 seconds after first pressing the button. After the camera restarts, all camera settings will have been reset to factory defaults.

6.4.9.2 Web Interface

Through the camera's Web Interface Admin pane, click the Maintenance button.



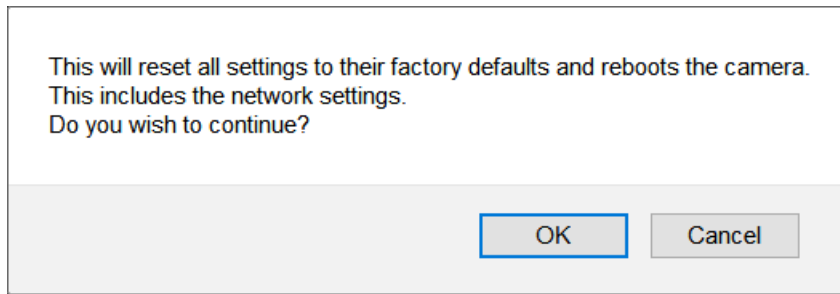
A warning message is presented after clicking the button.



Click “OK” if you want to reset the camera, but retain the IP settings

If you want to also clear all the IP Settings, deselect the “Retain IP Settings” checkbox. Beware though, that if using Static IP settings, remote access to the camera from routed networks will be lost if there is no DHCP server to reconfigure the camera’s IP address, mask and gateway when it reboots.

A warning message is presented after clicking the button.



Click “OK” if you want to reset the camera, including the IP settings.

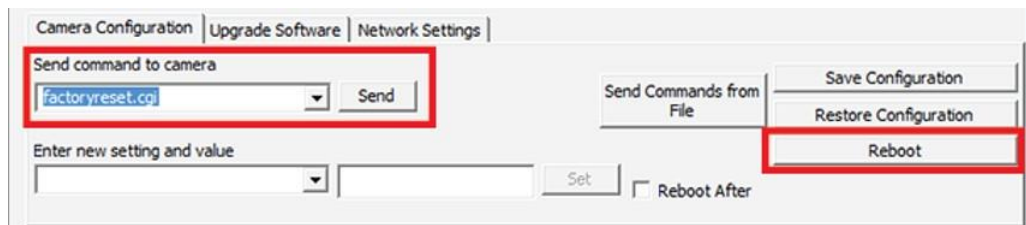
The “Reset User Credentials” button will remove all user accounts from the camera, but all other settings are retained. The “Retain IP Settings” checkbox does not apply and existing IP address will not be changed.

The “Reboot Camera” button simply reboots the camera.

6.4.9.3 Configuration Tool

Reset to factory defaults through the Camera Configuration tool.

1. Check the camera(s) that require a factory reset from the Camera Configuration tab.



2. Select “factoryreset.cgi” from the Send command to camera field drop-down menu.
3. Click Send.
4. The camera resets back to factory defaults, excluding static IP settings, and reboots automatically.

6.5 Regions Tab

Regions are user-defined zones in the image used to analyze an event, trigger an action, or

add security that covers part of the image.

Set-up and configure two types of regions

- Privacy regions (up to 10)
- Motion Detection regions (up to 8)

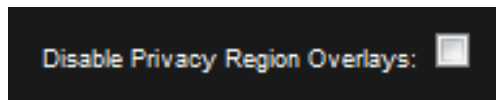
6.5.1 Privacy

Define a Privacy region using a video-embedded mask restricting the viewing of the video streams masked image portion.

1. Select a Region number (1 to 10).
2. Enter the region Name.
3. Click Draw (the image freezes while you are drawing the zone).
4. Click and hold to set your initial point and move the mouse to define the area. Release the left button once the area is defined. Click Clear to restart drawing the shape or cancel the current action.
5. Click Save to store the new region to the Region dropdown list.
6. Repeat as necessary for up to 10 regions.

3.5.4.11 Notes:

- When creating Privacy, Regions are automatically enabled when created. Disable them by checking the Disable Privacy Regions Overlay check box.



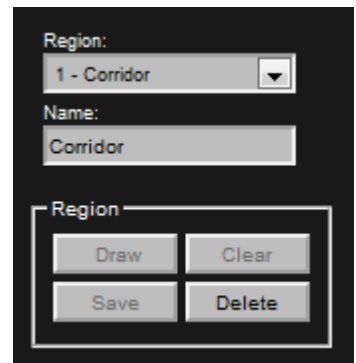
- Delete a region by selecting the region in the list and click Delete. This also deletes any saved name and returns the specific region number to default settings.

6.5.2 Motion Detection

By default the camera defines motion detection over the full scene.

Alternatively, it is possible to define a zone of the image where it is required to detect motion in order to analyze it, or trigger an action such as recording, as a result of that event.

1. Select a Region number (1 to 8).
2. Enter a Region Name.
3. Click Draw (the image shrinks slightly while you are drawing the zone).
4. Left-click to set the initial point. Click several times around the area until defining a suitable polygon. Click the starting point again to complete the region.



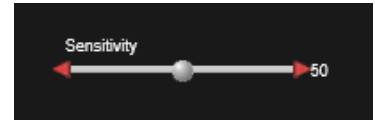
Click Clear to restart drawing the polygon or cancel the current action.

5. Click Save to store the region in the dropdown Region list. The motion detection appears in the image as a blue polygon outline.
6. Repeat as necessary for up to 8 regions.

3.5.4.12 Notes:

- To delete a region, select the region in the Region dropdown list and click Delete. This also deletes any saved name and returns the specific region number to default settings.
- Use the Alarm Settings to configure detected motion as an alarm trigger that activates an alarm action. See Alarms in Section 6.4.4.

Adjust the motion detection sensitivity by moving the slider left or right to the desired value on the Custom Sensitivity bar. Fine-adjust the value by clicking the red arrows at each end of the slider. Custom Sensitivity is applied to all motion detection regions.



The alarm bell symbol displays when you enable the Alarm Trigger Motion Detection and a Motion Detection event has triggered.

NOTE: Set up and test motion detection by setting the threshold above any natural motion that is occurring in the scene to eliminate false alarms. Set the threshold to a minimum and gradually raise the threshold until natural motion no longer triggers the alarm.

7 Recording the video footage

7.1 Using a Video Management System (VMS)

A VMS is part of a security camera system that collects video from cameras and other sources and records that footage in a storage device.

There are a number of partners that ONCAM works with to support a broad range of different VMS systems. For further information please refer to

<https://www.oncamgrandeye.com/partners/nvr-vms-compatibility/>.

8 Connecting through ONVIF Profile S

Use an Evolution camera with an ONVIF Conformant Device hardware driver when adding the camera hardware to your NVR System. Set the camera to the desired mode (Dual-Stream Mode or VCam Mode) before adding the camera to your NVR system.

Note: The ONVIF driver uses RTSP for transferring the video from the camera. The Evolution camera sends the MJPEG data using the MJPEG RTP standard RFC 2435. The RFC 2435 standard does not work using JPEG images with a width greater than 2040. This means RTSP does not transfer the larger MJPEG video streams from the camera. Stream any other MJPEG or any H.264 resolution using the ONVIF driver.

9 Connecting Directly to the Camera Streams

Connect directly to camera streams to acquire video streams.

Media streaming is implemented according to the ONVIF Streaming Specification.

URL Format: `rtsp://<servername>:<port>/video.sdp[?name=<source>]`

Send the RTSP request to the proper TCP port as defined for RTSP by the GetNetworkProtocols operation of the Device Management Service.

For devices that support tunneling, RTSP over HTTP, replace `rtsp` with `http`. Send the HTTP to the proper TCP port as defined for HTTP by the GetNetworkProtocols operation.

The server name is the IP address or hostname of the EVO-180 camera.

Changing the name parameter selects the stream configured in the fixed Media Profile.

3.5.4.13 Media Profile Name Examples:

FE1	Streams the 360 degree fisheye view using the main fisheye Media Profile settings
FE2	Streams the 360 degree fisheye view using the secondary fisheye Media Profile settings

- MJPEG** Streams the 360 degree fisheye view using the snapshot Media Profile settings
- VC1** Streams the dewarped view of VCam 1 using the VCam 1 Media Profile settings
- VC2** Streams the dewarped view of VCam 2 using the VCam 2 Media Profile settings
- VC3** Streams the dewarped view of VCam 3 using the VCam 3 Media Profile settings
- VC4** Streams the dewarped view of VCam 4 using the VCam 4 Media Profile settings

If no name parameter is provided, VC1 is selected.

Streaming with RTSP or HTTP only supports HTTP Digest authentication.

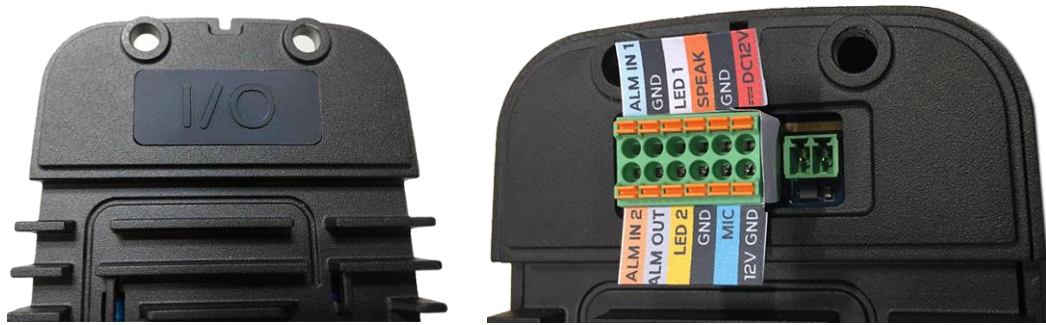
URL Example: `rtsp://192.168.10.30/video.sdp?name=FE1`

10 Camera Connections

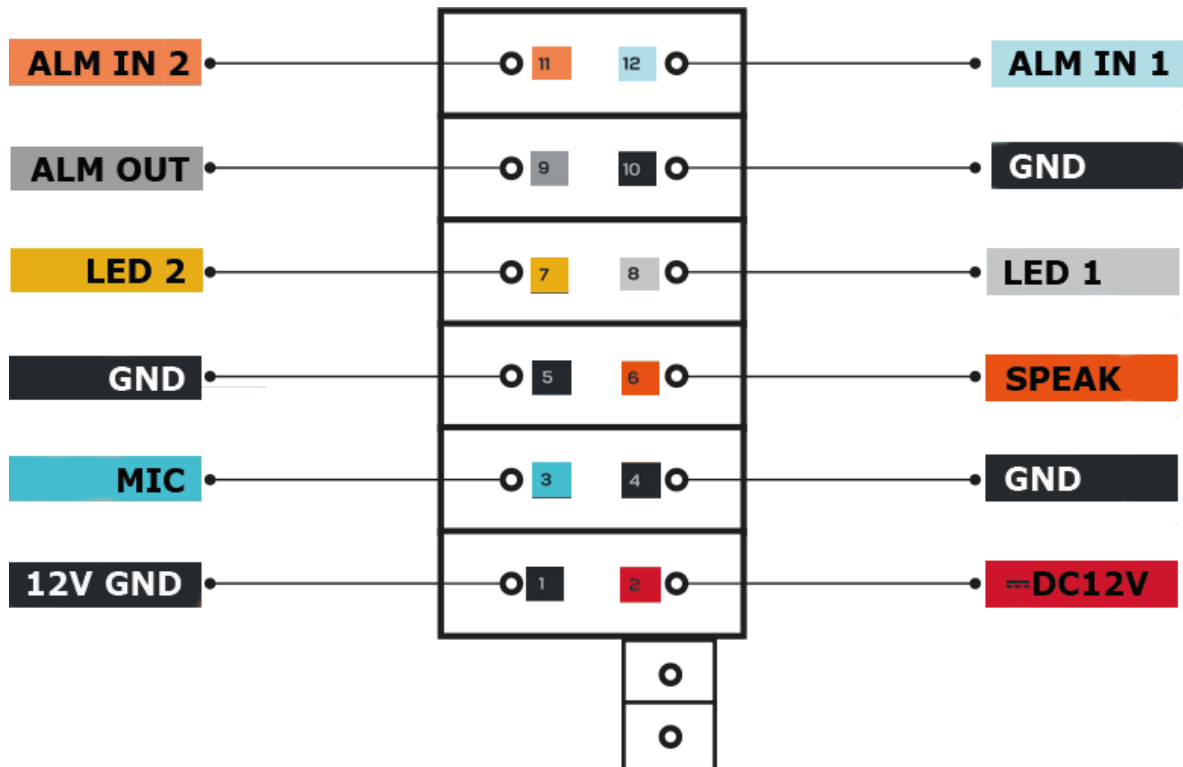
10.1 I/O Connector

Access I/O ports by removing the rubber cover on the rear of the camera module. The Indoor camera must be removed from its mounting bracket. The Outdoor camera module must be removed from the camera housing.

The 12-pin I/O connector under the rear cover provides all user I/O and power connections.



The green, labelled tool-less mating half for this 12-pin I/O connector is supplied with the camera. The other green two-pin socket under the cover (on the right in the photo above) is a data port for programming the camera in the factory and is not for operator use.



Programming port
– not for operator use.

10.1.1 Alarms in/out

ALM IN 1 is Alarm in: 1 which provides external control input to the user.

ALM IN 2 is Alarm in: 2 which provides external control input to the user.

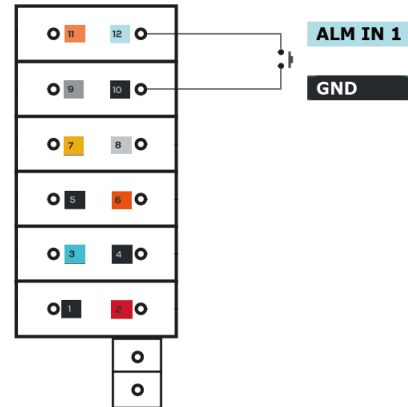
ALM OUT which enables the camera to output a signal to control an external source.

While using alarm inputs/output, select the ground connection adjacent to the ALM IN/ALM OUT (not the ground labelled 12V GND).

10.1.1.1 Alarm In

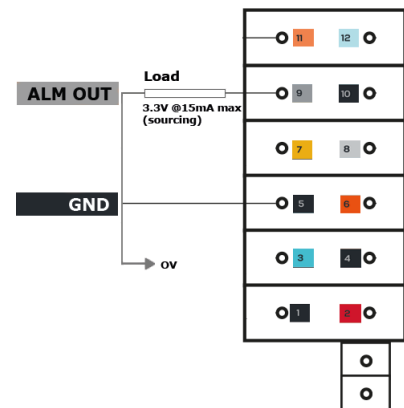
Alarm input is provided from the camera’s 12-pin I/O connector, found under the cover on the back of the camera module. When Alarm IN shorts to GND, the camera’s internal alarm triggers. Through the Camera Web Interface, specify the time duration. Options are 10, 30, 60, 300 or 600 seconds.

After the specified amount of time has passed, the internal alarm clears.



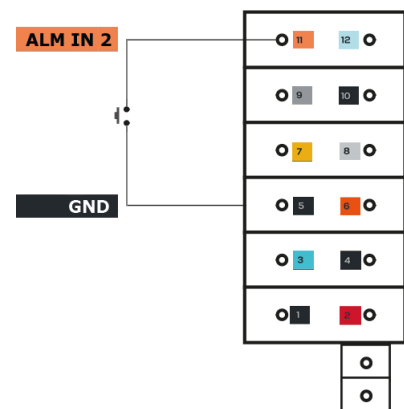
10.1.1.2 Alarm Out

Alarm output is provided from the 12-pin I/O connector found under the cover on the back of the camera module. When an event occurs triggering an external alarm on the camera, the Alarm OUT pin outputs a signal (High to Low). Use this signal to drive the external alarm circuit (known as sourcing). The High signal is 3.3VDC at 15 mA (max).



10.1.1.3 External IR Filter Control In

External control of the camera’s Day/Night mode and IR Cut Filter is provided from ALM_IN_2 input of the camera’s 12-pin I/O connector, found under the cover on the back of the camera module.



10.1.2 Audio in/out (Microphone, Speaker)

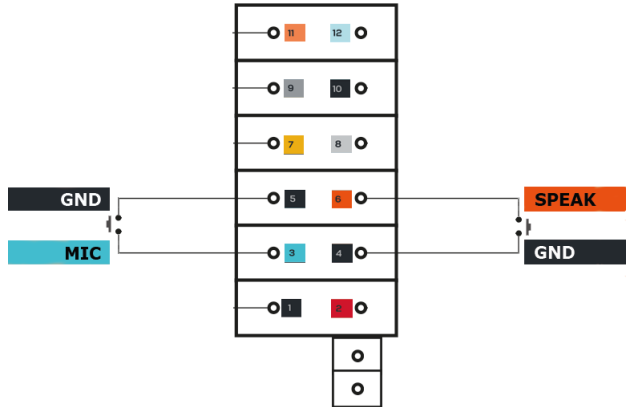
The camera mic input is provided from the 12-pin I/O connector found under the removable silicon cover on the back of the camera module. It is designed to work with an ordinary Electret microphone in close proximity to the enclosure. The electret microphone and the connecting cable must be electrically floating to prevent noise and hum from ground loops.

MIC or SPEAK relays sound in real-time over the data stream.

While using audio input, select the ground connection adjacent to the MIC/SPEAK (not the ground labelled 12V GND).

Suggested cable length is 1 metre or less. A much longer cable may result in noise interference with the audio.

Audio cannot be recorded on the Micro SD card.



10.1.3 Power (12V, Ground)

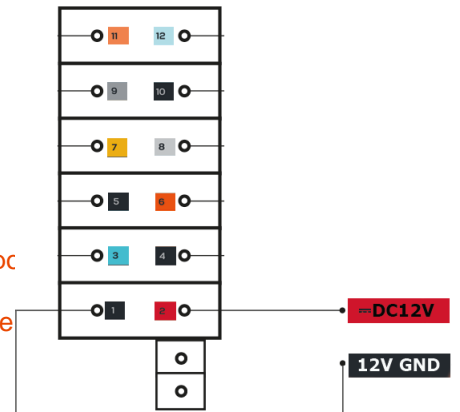
The camera can be powered by using PoE or via a 12V input supply using the 12-pin I/O Connector.

The power source must be wired to pins 11 and 12 of the camera's 12-pin I/O connector, **taking care to use the correct polarity.**

When using the 12V input in place of the PoE, the 12V ground (GND) must be used.

3.5.4.14 CAUTION: Do not use an excess of 15 VDC from an external pc the camera and void the warranty.

3.5.4.15 CAUTION: Do not power the camera using 12 V and PoE at the the camera and void the warranty.



10.1.4 LED 1 & 2

Currently the LED functionality is not supported.

10.2 RJ45 Ethernet Socket

3.5.4.16 CAUTION: Do not use an excess of 15 VDC from an external power supply, and do not power the camera using 12 V and PoE at the same time. Doing so may damage the camera and void the warranty.

10.2.1 Indoor Camera RJ45 socket

Two loops are provided for cable ties in the rear structure of the camera body. These may be used to secure the cables for extra security and strain relief on their connectors.



10.2.2 Outdoor Camera RJ45 socket

The RJ45 socket is in the dry wiring box formed between the camera module and the camera housing.



11 Troubleshooting and Technical Support

Use the following guide to ensure all components of the system are properly working.

Web Interface unavailable in browser	Use the Camera Configuration Tool to confirm that you are using the correct address and there are no IP address conflicts. Check your own network settings to ensure the camera is on the same subnet as your computer or is accessible by routing.
Web Interface fails to show a live image	Check your browser security settings. Note: Only internet explorer (with VLC plugin) will stream live video.
Motion detection is not working properly	There must be at least one motion detection region defined and in use. Check the size and sensitivity controls to ensure that movement is detected.
Camera image stops or drops frames	This is commonly due to a network connectivity or bandwidth issues, especially for cameras connected to wireless networks or the public Internet. Try adjusting the video settings from the camera web interface.
One portion of the image is over or under-exposed	Set the Brightness or use an EV setting which will add over or under exposure to the scene light.
There are bright or dark areas in the scene and no detail can be seen	Enable the WDR feature. This increases the contrast in darker and brighter areas of the scene. Adjust the WDR setting depending on the light differences to obtain the best image. See Wide Dynamic Range, page 28. Enhance the image by adjusting the EV settings so the bright areas are not over-exposed and the dark areas are sufficiently exposed. In most lighting conditions, the WDR setting should not be required.

11.1 Contact

Send an email to support@oncamgrandeye.com.

Include in your email the following.

- Problems detailed description
- Camera model numbers
- Relevant configuration information

11.2 Revision History

Date	Revision	Description
2018-02-09	1.0	Initial Draft
2018-04-04	1.1	Added Outdoor sections
17-05-2018	1.2	Approved version
2020-06-15	1.3	Corrected Alarm Out to High to Low
2022-04-11	1.4	Updated with new user name and password credential restrictions.

12 Copyright and Legal Notices

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13 Additional Online Resources

13.1 Technical Specifications

Oncam is constantly working on new features and functionalities for its Evolution camera range. For the latest Technical Specifications, go to the Oncam website (oncamgrandeye.com) and download the latest product specification.

13.2 ONVU360 Pro Mobile Application (iOS and Android)

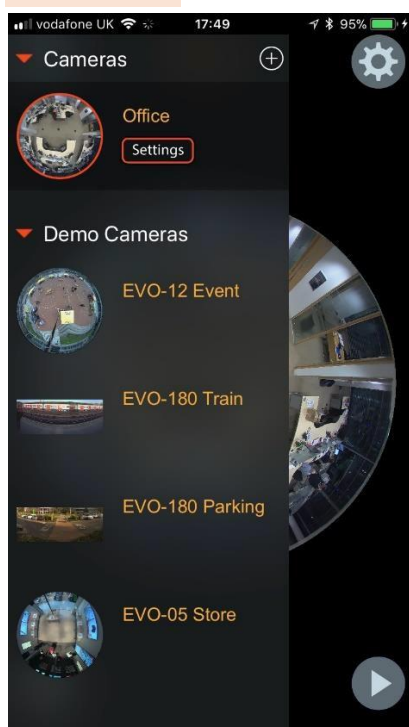
ONVU360 Pro for mobiles enables users to experience surveillance through 360 degrees in the palm of your hand. The ONVU360 Pro gives you the ability to monitor your Evolution cameras in real-time with access to both live and recorded images.

Use the pinch to zoom features to Navigate 360-degree video (like iOS or Android device).

The ONVU360 Pro app streams up to 10.1 MP, streaming over Wi-Fi, 3G and 4G/LTE networks.

Take a snapshot to save precious data when using over a cellular-data network.

- Android** From the Google Play Store > Search ONVU360 Pro
- iOS** From the iTunes Store > Search ONVU360 Pro



14 Frame Rate, Resolution & Storage Requirements

14.1 Indicative Frame Rates with Different Resolutions

14.1.1 Frame Rates in Normal Sensor Mode

When enabling the Fisheye1 stream or a combination of Fisheye1 and any other, listed are the maximum frame rates.

3.5.4.17 **NOTICE:** Frames per Second (FPS) achieved may differ depending on light level, network performance, available computer power and which other streams are enabled.

Table 1 Indicative Frame Rates for Common Stream and Resolution Combinations

Single stream	
Panorama	FPS
5.90 MP	14 FPS
4.52 MP	14 FPS
2.60 MP	14 FPS
1.47 MP	14 FPS
0.66 MP	14 FPS
0.25 MP	14 FPS

Single stream	
Fisheye 1	FPS
10.1 MP	12 FPS
6.45 MP	14 FPS
4.48 MP	14 FPS
2.20 MP	14 FPS

Dual stream: Panorama 1 plus Panorama 2 (Frame rate for all other panorama combinations is 14 FPS for both streams)			
Panorama 1	FPS	Panorama 2	FPS
5.90 MP	12 FPS	1.47 MP	12 FPS
4.52 MP	13 FPS	1.47 MP	13 FPS
4.52 MP	14 FPS	0.66 MP	14 FPS

Dual stream: Panorama 1 plus Fisheye 1			
Panorama 1	FPS	Fisheye 1	FPS
5.90 MP	7 FPS	10.1 MP	7 FPS
4.52 MP	7 FPS	10.1 MP	7 FPS
2.60 MP	11 FPS	6.45 MP	13 FPS
1.47 MP	14 FPS	4.48 MP	14 FPS
0.66 MP	14 FPS	2.2 MP	14 FPS

Triple stream: Panorama 1 plus Panorama 2 and Fisheye 1					
Panorama 1	FPS	Panorama 2	FPS	Fisheye 1	FPS
5.90 MP	6.5 FPS	1.47 MP	6.5 FPS	10.1 MP	6.5 FPS
4.52 MP	7.5 FPS	0.25 MP	7.5 FPS	10.1 MP	7.5 FPS

14.2 Indicative Storage Requirements

H.264 Default Settings Panorama					
5.90 MP	(3840 x 1536)	14 FPS	Constant bit rate settings	5 Mbps	24hrs = 54 GB*
4.52 MP	(3360 x 1344)	14 FPS	Constant bit rate settings	5 Mbps	24hrs = 54 GB*
2.60 MP	(2560 x 1024)	14 FPS	Constant bit rate settings	3 Mbps	24hrs = 40 GB*
1.47 MP	(1920 x 768)	14 FPS	Constant bit rate settings	1.5 Mbps	24hrs = 16 GB*
0.66 MP	(1280 x 512)	14 FPS	Constant bit rate settings	0.8 Mbps	24hrs = 8 GB*
0.25 MP	(800 x 320)	14 FPS	Constant bit rate settings	0.8 Mbps	24hrs = 4 GB*

* Based on the same scene, with constant average light conditions

H.264 Default Settings Fisheye					
10.1 MP	(3360 x 3000)	12 FPS	Constant bit rate settings	10 Mbps	24hrs = 108 GB*
6.45 MP	(2688 x 2400)	15 FPS	Constant bit rate settings	7 Mbps	24hrs = 76 GB
4.48 MP	(2240 x 2000)	15 FPS	Constant bit rate settings	5 Mbps	24hrs = 54 GB*
2.20 MP	(1568 x 1400)	15 FPS	Constant bit rate settings	3 Mbps	24hrs = 40 GB*
1.12 MP	(1120 x 1000)	15 FPS	Constant bit rate settings	1.5 Mbps	24hrs = 16 GB*
0.40 MP	(672 x 600)	15 FPS	Constant bit rate settings	0.8 Mbps	24hrs = 4.3 GB*

* Based on the same scene, with constant average light conditions

3.5.4.18 Notes:

Values for frame rate, size, and bandwidth are approximate and influenced by compression, quality settings, number of simultaneous viewers, and the amount of detail and movement in a scene.

Additional CGI commands are available. Software developers requiring the full API interface should contact support@oncamgrandeye.com for additional details.