

OBSERVANT PATROL CAMERA

Features

The PATROL camera is a 360 panoramic surveillance camera

- 360 degree panoramic imagery: one camera provides continuous video streaming and recording, captures everything, in all directions, all of the time. Designed to be mounted on vehicles.
- Hi-resolution 18 MP video & still imagery.
- Ruggedized, IP67 form factor. Built to withstand tough environmental and usage conditions.
- Simple integration with 'open' camera management systems
- No image distortion or 'stitching'

Low Light visibility

The Patrol 18 camera features the AR1820HS CMOS Digital Image Sensor from ON Semiconductor. The AR1820HS is an 18 megapixel, 1/2.3-inch format, 1.25 um pixel sensor using ON Semiconductor's A-PixHS™ BSI technology. A-PixHS™ technology provides high quantum efficiency, low noise, and low power consumption. The BSI pixel maximizes the efficiency with which the light is captured by inverting the sensor to put the photo sensitive region closer to the lens. The sensor is able to perform at its best in daylight or in artificial urban lighting conditions. Colour photography is maintained throughout its operating envelope.

Capability: The PATROL camera offers both day and night performance. At night time, urban ambient lighting conditions offered by street and building lighting and vehicle headlights create good conditions for surveillance.

Streaming

The Patrol Streaming software provides an RTSP stream of H264 encoded content for remote viewing. Multiple instances of the STREAM application are able to run concurrently, and to provide several simultaneous virtual PTZ feeds.

Observant Innovations' implementation plan is for Patrol 18 to be made fully ONVIF Profile S compliant. Currently the essential sub-set of ONVIF has been developed specifically to cover Patrol camera requirements.

This includes discoverability, device capabilities and PTZ control. This level of coverage is sufficient to ease connection to mainstream VMS platforms, with minor manual configuration steps.

In-house at Observant Innovations, Milestone is being used as the primary host for VMS connectivity testing. With Milestone, each virtual camera becomes a new hardware instance in the management console, with individual control over streaming and PTZ.

When full compliance has been achieved, Patrol 18 will be submitted to the Technology Alliance Programs of a number of leading VMS suppliers for formal acceptance on to their 'supported devices' lists. The priority list will be influenced by the VMS incumbents in our early adopter customers; but Milestone, Genetec, and Wavestore are expected to rank high on the list.

The Observant ONVIF based framework has been designed and built to provide for multiple streams., Though the initial release supports a single stream, the roll-out will be quickly followed by a release providing for two or more streams.

The initial release of Patrol Streaming software has the ability to stream a single feed containing two combined 180 degree 2D panoramic views set as an HD1080 format; or a single 3D spherical (conventional vPTZ SVGA 800x600) feed (see images below).

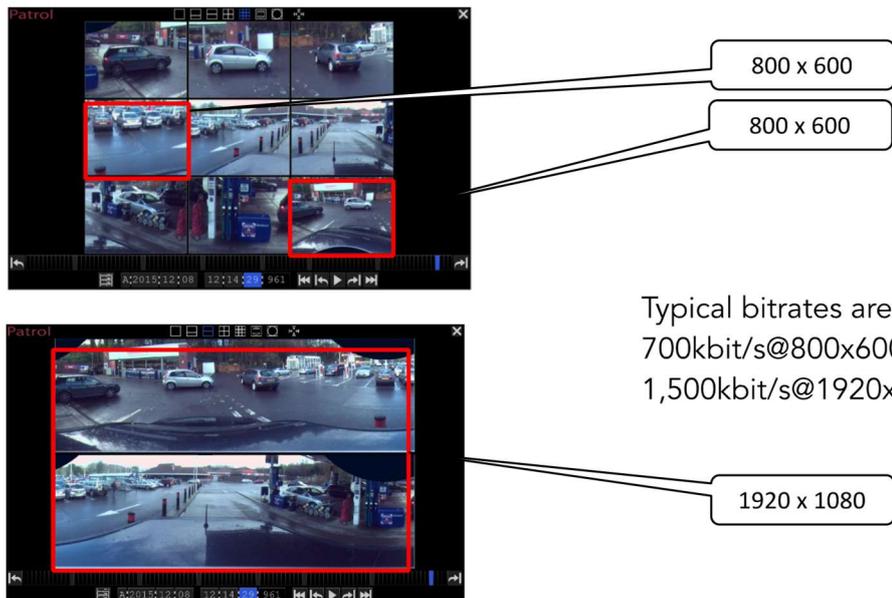
Other options and formats will be made available in response to defined operational requirements.

Bandwidth

The streaming functionality of the Patrol camera is completely under software control. This gives exceptional flexibility when it comes to configuring to meet a customer's operational requirements. For example, the full 2D panoramic image (2 x 180 degree views) can be streamed as a full 1920x1080 HD feed at an average bitrate of 1,500Kb/s; while individual vPTZ (800x600) feeds can each occupy an average bitrate of 700Kb/s. The number of feeds that can be streamed will eventually be limited by the power and size of the vehicle PC, and the communications bandwidth is the aggregated sum of the individual feeds. In the example given, the total bandwidth requirement would be 2,100Kbit/s.

PATROL 'video' can
be streamed for
live monitoring and
use in native video
management
systems

Examples of separate patrol streams:



Typical bitrates are
700kbit/s@800x600 vPTZ,
1,500kbit/s@1920x1080.

The diagram shows examples of the images that can be streamed from the PATROL PC to a remote VMS. The output can look like a static display (such as the image below or one or a number of virtual pan, tilt and zoom cameras (vPTZ) camera feeds.

Virtual Pan-Tilt-Zoom

The Patrol camera does not have any physical moving parts., It provides a high resolution image that allows software enabled PTZ functionality where the camera digitally zooms and pans into portions of the image.

The high resolution of the AR1820HS 18-megapixel sensor captures a single panoramic annular image. This image can be unwrapped so as to display a complete 2D panoramic image (or 2 x 180 degree images). It can also be unwrapped, then dewarped and transformed, to display 3D panoramic views of part of the source single panoramic annular image. These image transformations are carried out in real-time by the Patrol Camera application.

These 3D panoramic views are controlled by the digitally functional equivalent of pan, tilt and zoom. These views are used to provide the feeds for Patrol's Virtual PTZ (vPTZ) cameras.

The practical limit to image magnification is reached when increasing the digital zoom factor no longer reveals further useful detail in a vPTZ image. For typical viewing conditions, Patrol software provides up to 10x digital zoom, allowing image detail to be more closely viewed.

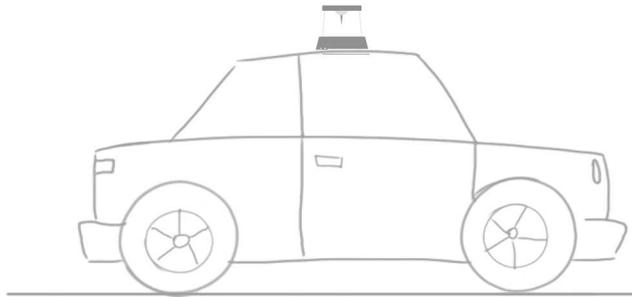
Different lighting conditions will require different exposure control by a Patrol camera, and may possibly affect perceived image quality (e.g. bright light conditions will affect contrast, dark lighting conditions such

as interiors or night will increase noise). In exceptional circumstances with optimal exposure conditions, as much 15x digital zoom can be useful, whereas using maximum zoom in low light conditions reveals the image noise inherent in these circumstances.

Deployment Modes

Standalone

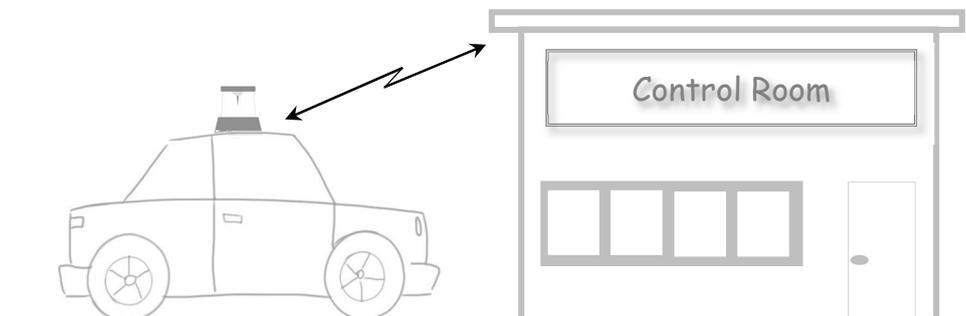
In this use case, the PATROL camera archives direct to the in-vehicle PC. There is no network connectivity and REVIEW is conducted either onboard the vehicle via a monitor or post patrol.



'LIVE' STREAMING

The set up for STREAMING is exactly the same as for STANDALONE.

In the case of streaming, the STREAM application provides an RTSP stream of H264 encoded content for remote viewing via a communications medium.



Patrol Camera Applications

PATROL is supplied with the following software applications as standard:



Camera



Record



Review



Stream

Use CAMERA to configure the camera and for local live monitoring

Camera is used to set-up and control the Patrol camera. It provides for the interactive "live" setup, and for choosing an exposure light mode, scene brightness and frame rate. It also provides a graphical user interface with various different types of 360°panoramic views so that the setup can be previewed. Optionally, CAMERA continues to run if live streaming is required.

It provides operators with an ideal interface to set up the PATROL and can also be used to start and stop recording as well as view 'live' image capture.

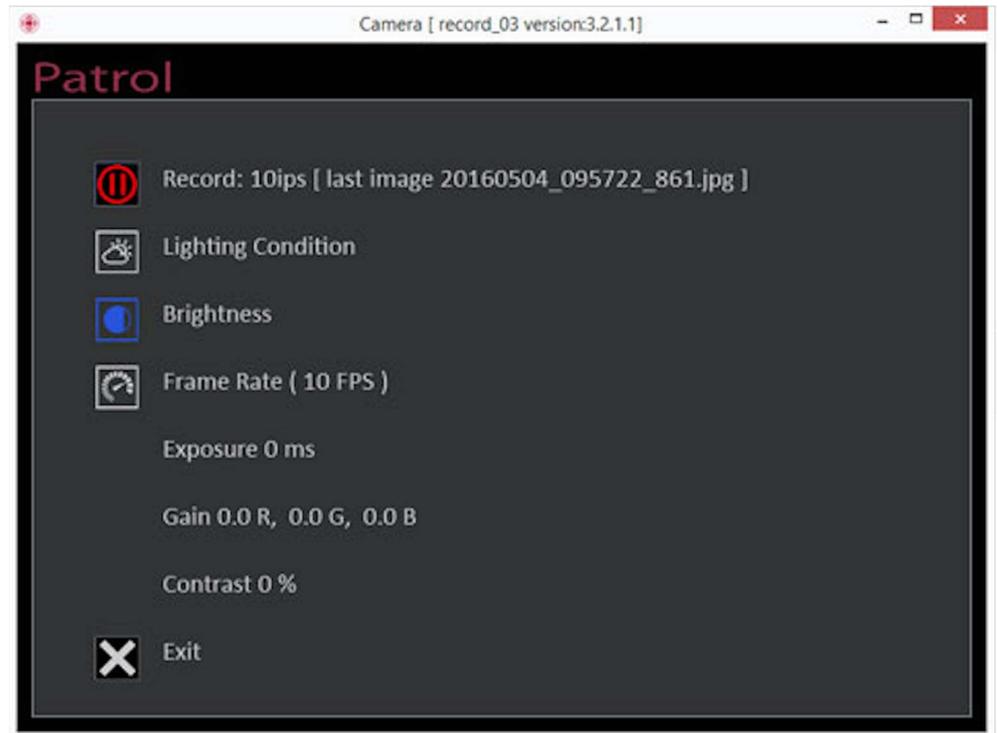


The diagram is a screenshot of the CAMERA applications. This window displays the camera set up tools allowing operators to adjust core settings for exposure, lighting and frame rate. Settings can be saved for ease of operation.

The RECORD application activates PATROL and initiates recording

Record

RECORD uses the camera configuration set up in CAMERA. RECORD appears as a simple on-screen dialog box allowing users to start and stop recording manually. RECORD also provides a summary of the camera set up parameters as described in CAMERA



The diagram is a screenshot of the RECORD application. This application is a single window enabling operators to start and stop recording using camera configurations set up in the CAMERA Application.

REVIEW is used to retrieve and playback archived imagery

Review

REVIEW provides for the playback of an archive. The REVIEW interface is very similar to that of CAMERA, but with the addition of an interactive time navigation tool bar.

REVIEW is a proprietary software application designed for optimum playback of archived PATROL 360 images. It enables the reviewer to Pan Tilt and Zoom within the archive material exactly as can be done on the live feed, allowing forensic examination of the recorded footage.

Key features include:

- Powerful search and archive retrieval
- Optimal 360 visualization
- Multiple screen layouts offering 1, 2, 4 or 9 screen layout as standard



The diagram is a screenshot of the REVIEW application. This application is optimized for swift effective archive search and retrieval and for the playback of 360 panoramic imagery.

Stream

STREAM takes images from CAMERA and provides an RTSP stream of H264 encoded content for remote viewing. Multiple instances of STREAM are able to run concurrently, and to provide several simultaneous virtual PTZ feeds.

Each instance of STREAM represents a selected Field of View (FoV) from a PATROL camera. Each STREAM will 'look' and behave like a PTZ camera to a VMS system.

Because it is possible to generate numerous separate virtual PTZ cameras/selected FoVs from each PATROL camera the STREAM application allows for several simultaneous feeds.