

Operational Requirements Specification

Architectural and Engineering Specification | Supported by the Viseum IMC

The Viseum Intelligent Moving camera (IMC) is revolutionising outdoor open space CCTV with its well proven track record of producing at least 25 times more court quality evidence than any other manned or unmanned camera. Viseum IMCs point the right way when incidents occur and ensure constant contextual view evidence of any close-up event. Its effectiveness as a crime deterrent and evidential tool is enhanced by its ease of re-deployment to other crime areas, to encourage regular re-deployment to follow crime whenever and wherever it occurs, thus clearing up crime on a larger scale, faster than any other crime reduction initiative.

Scheme Design

Overall Camera Requirements

- A modular hardware configured multiple camera unit to simplify temporary or permanent camera deployment options, suitable for the following environments and applications:
 - Populated public open space, or
 - Non populated multiple or single attack intruder environments, in
 - Large open space, or
 - Close proximity areas
- Camera solution to operate as an unmanned stand-alone camera using Intelligent Moving Camera (IMC) auto-tracking and to be integrated for operator override with:
 - Manned central control rooms, and
 - Mobile observation posts

Coverage required per Camera

- Each multiple camera unit to be easily configured with the relevant number of fixed cameras to cover from 400m² up to 67,800m² simultaneously with effective automated line-of-sight CCTV monitoring.
- Each multiple camera unit to automatically capture close-up evidence of events to UK Home Office CCTV identification and recognition zoom level guidelines:
 - Daylight monitoring range from 2m up to 200m constantly in any direction from the camera.
 - Recognition evidence from 2m up to 147m constantly in any direction from the camera.
 - Identification evidence from 2m up to 61m constantly in any direction from the camera.
 - Night monitoring range from 2m up to 100m constantly in any direction, or
 - 50m in any direction using black IR.

Certain solutions have the following coverage issues:

- High specification PTZ cameras without IMC technology are unsuitable for intermittently manned or standalone CCTV schemes because they:
 - Do not cover an entire area simultaneously.
 - Pre-set tours are proven to miss evidence.
- High specification fixed cameras without IMC technology are unsuitable for standalone CCTV schemes because:
 - The number of high resolution fixed cameras required to cover the minimum required coverage area would be at least 10
 - The number of cameras required to cover the maximum required coverage area would be at least 135.
- High specification auto-tracking speed domes are only suitable for close proximity, non populated, single intruder environments, but also encompass complex and lengthy installation and down time maintenance procedures and the resulting high costs of engineers' return visits.
- High specification megapixel cameras are unsuitable for covering the specified area because they:
 - Provide up to only 60m recognition evidence with only a 20 degree field of view in well lit areas.
 - Requiring 18 cameras to achieve 360 degree coverage, with associated low light, high bandwidth video transmission and high capacity storage problems.

Optical Requirements

- Multiple camera unit to be capable of using any specified PTZ and various high specification fixed contextual view detection cameras to suit specified environments and applications.
- Camera solutions automated zoom levels to be easily adjusted in real-time or pre-programmed for suspect identification, recognition or situation awareness.

Re-deployable or Re-locatable

- Plug and play camera solution must give flexibility to relocate the entire camera system or parts of it easily without additional new equipment or communications, to follow crime & disorder hot spots whenever and wherever they appear by:
 - Rapidly deploying new camera installations, or
 - Enhancing other existing PTZ camera installations with IMC modules.

Other Considerations

Deterrent

- Solution must perform as though it is constantly “manned” with the PTZ moving intelligently, to provide reassurance to communities of constant protection and a visual long term deterrent to would-be offenders.
- Criminals must see that mechanical pre-set tours are not used and therefore cannot pre-empt the PTZ’s position.
- Criminals must see that fixed contextual view cameras will foil any attempts on diversion/distraction tactics.

Resilience

- Effectiveness of CCTV surveillance must not be affected if there is an equipment or communications fault at the central control room or remote observation post.
 - CCTV surveillance to remain operational if there is a fault on the CCTV network preventing video or telemetry transmission.
 - All cameras to continue to be recorded locally.

Data Protection

- The privacy of individuals to be maintained:
 - Targets to be selected for close-up recording automatically triggered by specific behaviour.
 - Audit trail showing when an operator and when the machine is targeting people.

Environmental

- Multiple camera unit equipment must be small and light enough to secure onto standard street lighting columns.
- Solution supports environmental solutions by minimising number of cameras, street furniture and cabling installed.
- If required area of coverage is greater than what can be covered using 1 or 2 off-the-shelf box cameras, or if size, weight, wind load and cantilever restrictions, prevent the use of such cameras, then fixed cameras should be engineered as a practical, aesthetic and cost effective design.

Operational

Auto-tracking capabilities

- When the camera is not being operated manually, events to be automatically detected and captured to close-up evidential quality:
 - Automation to be pre-programmed with surveillance profile schedules to take account of local knowledge of the areas and times of day or week at which crime usually occurs, but also continues to monitor areas where other crimes could occur.
- Automated Multiple Event Management
 - The PTZ camera to automatically switch between specified numbers of particular events if they occur at the same time, and must continue to track all suspects' locations no matter if suspects speed up, slow down or change direction.
 - Easily programmed with any number of 1-3 levels of surveillance priorities for close up evidence from the PTZ camera, based upon particular activities and locations.

Certain solutions have the following cautions:

If the high specification speed dome auto-tracking camera or the highly trained operator is already following an event, any other activity outside of the PTZ's field of view will be missed.

Locally Stored Recordings

- There must be an option for video from all cameras to be digitally recorded locally to the camera for both primary use and central control room backup storage. All recordings must be:
 - Recorded to the recognised UK Home Office approved digital format - Time-stamped, water-marked and encrypted to ensure authentication and data privacy.
 - Interrogate the locally stored digital video rapidly using X264 real-time IP video streaming
 - Download locally stored video using all non proprietary digital formats including the UK Home Office approved court evidence digital viewer SiraView.

Camera Maintenance

- Camera solution to encompass low maintenance downtimes due to automated software-to-software watchdog services with simple hardware swap out processes.
- Camera installations and central control room to receive immediate and direct 3rd line support from manufacturers via secure encrypted high speed broadband internet connectivity, with dual connection for resilience. This connectivity to be securely enabled and disabled under the control of the end user.

Manual Override

Mobile Observation Post

- On occasions there will be need to manage these camera installations outside of the central control room. For example, during intelligence gathering or emergencies.
 - Using wireless 3G, WiFi or local LAN access.
 - Https TCP/IP secure web browsers to watch all live contextual view cameras, control the PTZ, interrogate recordings local to the camera, schedule surveillance profiles, and prioritise crime hot spots.
 - Using multichannel COFDM.
 - In addition to the above TCP/IP working, all live cameras must be viewed and recorded at real-time 12 frames per second.

Integration with Central Control Room

- **Scheme Design**
 - Camera solution must be compatible with all major brands of central control room equipment using any recognised communications medium. E.g. Fibre, WiFi, COFDM, etc
 - Cameras solutions internal processor to be used as a multichannel codec to avoid purchasing additional single, or multichannel, or PTZ data control codecs, so delivering a more cost effective product which is easier to install and relocate.;
- **Operational**
 - Central control room CCTV operator must be able to take control of the PTZ in a standard way at any time.
 - Operator must have the ability to manage each PTZ with OSC in the normal way but also have the ability to easily modify/schedule IMC surveillance profiles.
 - At the same time the CCTV operator is following a live event with the PTZ camera they must have the option to also watch and record any one of the multiple camera units contextual view cameras to see what else is happening in the whole area.
- **Evidential**
 - In addition to central control room recording, all evidence (both wide contextual view and PTZ close-up) to be stored locally to the camera, but be accessible by the central control room equipment using its familiar user interface and digital IP transmission, thus:
 - Reducing the need to store contextual evidence centrally, so reducing communication costs, or
 - Providing backup storage in addition to central control room.
 - A “Smart Search” capability to significantly reduce post-event video interrogation time, i.e. using contextual wide-view camera images to locate specific areas where close-up evidence is required.
 - Once Viseum's locally stored recordings have been identified as evidence, it is to be stored in the central control room evidence locker
- **Further advanced options**
 - Maximising the video wall performance by switching to show only cameras with events of interest.
 - Providing automated audio/visual alerts for event detection based upon activity and location.