Protecting Critical Infrastructure

Volume One - Enterprise Class Video Surveillance

TechSmart

Every industry has unique challenges. As part of TechSmart™, Wave Representatives is providing application specific recommendations to make it easier to deploy proven solutions.

Wave Representatives has worked with many Federal, State and private sector entities that fall under critical infrastructure, helping them safeguard their facilities from threats. In this issue, we'll touch on some of the elements that are addressed by Enterprise Class Video Surveillance.

Definition

Critical infrastructure is a term used by governments to describe assets that are essential for the functioning of a society and economy, including fuel, agriculture, water supply, public health, transportation, security services, electricity generation, telecommunications, and financial services. All being center for maintaining health, safety or economic well-being of a nation and its citizens.

These systems and assets are of such a vital importance that their disruption or destruction would cause serious issues to national security. Therefore, as security professionals, we're tasked with securing these critical assets along with protecting the people who work to maintain these important elements from potential threats.

Threats to Critical Infrastructure

The types of threats to physical assets include natural occurrences such as; of earthquakes, floods, hurricanes and fire. We have seen frequent threats from natural elements and see physical security playing a vital role in preventing bad actors from taking advantage of these phenomena. Security measures should therefore be resilient and able to operate under extreme conditions. Power is always a serious consideration and should be calculated into the equation due to power outage during natural disasters.

In addition, man made events are an active threat to critical infrastructure including; political instability, terrorism, war and cyber threats, mitigating security threats has never been more important to ensuring health, safety and economic well being of citizens and sustaining national security.

Volume 1: Enterprise Class Video Surveillance

Conventional video surveillance often falls short of providing video footage that meets the forensic requirements of *mission critical facilities*.

Wave Representatives sought out an Enterprise Class system designed to address these issues and provide unparalleled panoramic images at *200 megapixel resolution* and efficient IR lighting for night periods. These solutions also work together with PID sensors and offers Video Content Analysis (VCA) to minimize false alarms.

An Enterprise solution can augment additional layers of security by effectively covering critical areas that are of great importance. Our recommended solutions can cover expansive areas, creating a more secure and controllable environment.

What are some of the key components?

- 20 Megapixel Single Sensor Cameras.
- 200 Megapixel Multi-Sensor Panoramic camera.
- 3D microwave radar.
- 6 Megapixel PTZ camera.
- 3 Mile 2 Megapixel Long Range PTZ camera.
- Specialized Network Video Recorder Hardware.
- Specialized Video Management Software.

200 MP Logipix Panorama camera

The stitched images of the 200 megapixel panoramic are recorded at 20 FPS. They are synchronized, white balanced and quick to scan through using a high performance video processing compression.

Logipix Outdoor NVR

A Panoramic camera can work in tandem with other cameras; 20 MP single sensor cameras. The Long Range PTZ and the 6 MP PTZ, allowing all areas can be covered with the highest resolution.

The cameras provide full coverage even at a long distance, and without installing hundreds of conventional security cameras. *Wave Representatives has found camera reduction can be accomplished while increasing PPF across the facility.*

The cameras have precise IR laser illuminators, therefore they are able to provide stunning images at night and also allow the automatic Video Content Analysis (VCA) to function effectively in areas with no lighting. The 3D microwave radar helps in the monitoring of internal roads and footpaths by detecting speeding. In some specific environments it even aids perimeter protection.

The Specialized Network Video Recorder hardware has a 7 gigabit per second recording speed and a storage capacity of 160 TB that can be further expanded with external storages, reaching a total 480 TB capacity. This makes the device ideal for recording and storing high-resolution images. *Logipix enables device specific encryption taking cybersecurity to the necessary level for critical infrastructure.*

Logipix created enterprise class hardware and software components and automatic surveillance technologies that together form an efficient system.

3 mile, 2 MP Logipix Long Range PTZ camera

6 MP Logipix PTZ camera

20 MP Logipix ONE

Logipix Network Video Recorder

Logipix 3D microwave radar

Logipix IR Laser Flash 500 W

Advanced Video Content Analysis

VCA is able to detect objects automatically that pose a threat for normal operation in specific areas of the facilities. This includes for instance the detection of fire, animal, human or vehicle presence where it is not allowed.

VCA relies on a Multidimensional Gaussian Background Model to continuously adapt to the background and help to avoid any false alarms usually generated by the moving parts of the background objects for example, plants blown by the wind.

Multi-Level Detection

An Enterprise Class Video Surveillance solution provides multi-level, automatic intrusion detection functions.

Certain areas within the facility can be armed or disarmed individually. In armed state, different areas can provide alarms with different severity levels around the monitored objects in case of a detected motion.
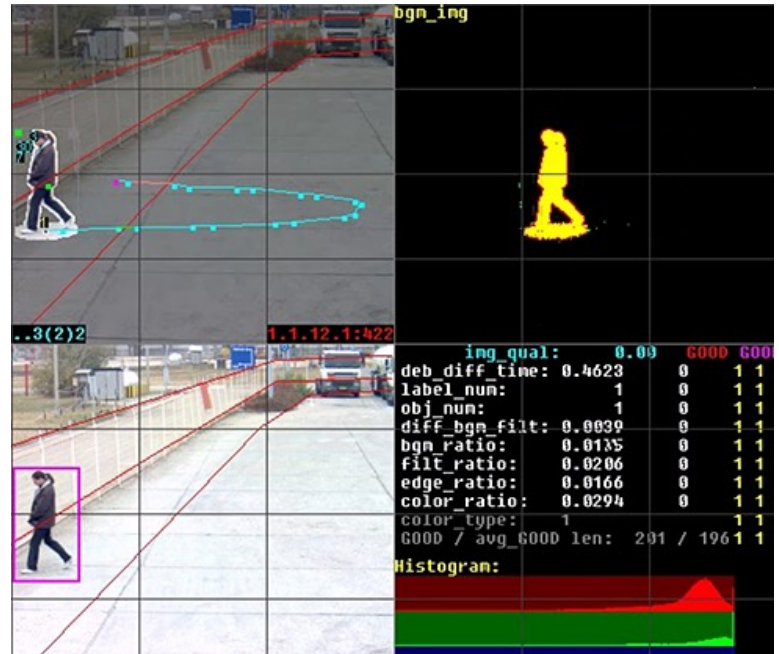
Accurate, automatic VCA based detection system

Perimeter Intrusion Detection

Logipix created two different camera arrangements to protect the perimeter area of critical infrastructure facilities. It can be fully covered by placing individual Logipix cameras alongside the fence, or it is also possible to monitor this area using a few Panoramic and PTZ cameras. Either case, the Logipix Video Content Analysis (VCA) can rely on these quality images and detect any movement near the fence. There are different levels of alarm for operators to make preparations and only to react to actual incidents for efficient prevention.

Enterprise Class Panoramic Features

The Logipix panoramic technology makes it possible to geometrically stitch individual images together. As a result of the synchronized images, there are no glitches or missing objects on the panoramic image. There is also white balance correction between the images. The reason for using only one large picture, instead of many individual ones, is to facilitate the everyday monitoring procedures. As operators do not have to look through dozens of images.

200 MP Logipix Panorama camera

Panoramic image without image synchronization

The Logipix panoramic image with image synchronization

High Performance Live and Archive Video Retrieval

The Control Center not only displays live images, but it also makes it easy to find an archived event with the help of the thumbnail images of the interval. The archived pictures are presented in the same way as the live images, can be zoomed in and arranged at will. These pictures can also be displayed simultaneously with the live ones.

Traffic management

In order to have effective monitoring of internal roads and footpaths the system allows the detection of speeding vehicles and wrong-way driving. It is also possible to detect the leaving of designated paths, thus making the reaction even faster.

The Strengths of Enterprise Class Video Surveillance

Combining high-resolution, high frame-rate images and Logipix Video Content Analysis (VCA), it is possible to detect common incidents, including malfunction, damage, sabotage, loitering, and the presence of drones, fire, smoke, birds, other animals, vehicles or humans where they are not allowed.

Logipix cameras provide impressive panoramic images with a resolution and frame rate high enough for facial recognition.

It is of vital importance that the sharp and clear footage can act as a basis for prevention and as irrefutable evidence in law enforcement procedures.

The Logipix solution can help detect intrusion or other potential threats, and make critical infrastructure sites safer through live preventative monitoring capabilities.

The lower false alarms corresponds to better and more efficient security operations, enabling personnel to react faster to real incidents with high confidence.

Control Center

The Logipix Control Center, Video Management Software, has several specially developed functions that facilitate video surveillance for large enterprise customers. Operators do not have to split their attention between several individual image streams, they can monitor the entire area easily, watching large panoramic images. Operators can retrieve minute-details of certain situations by using the PTZ cameras with their several automatic and manual control functions.

The Logipix Control Center allows an operator to assign two camera images, one inside the other, providing the PPF expansion function. This way a certain area within the panoramic image can be observed with much higher resolution. The software also provides ePTZ functionality, ensuring automatic zoom on the panoramic image to a preconfigured area if a trigger event happens.

The VMS it is also possible to make an automatic alternation of monitor profiles once alarms arrive to its interface. In addition, archive footage can be displayed on the monitor profile alongside with the live images.

Conclusion

The protection of critical infrastructures can be greatly enhanced, as multiple severity levels of detection makes it possible to have efficient control over the whole area. An Enterprise Class Video Solution makes quick reaction possible, which is essential in critical areas.

About Us

Wave Representatives specializes in embedded design and sales support for security manufacturers, ensuring end users and systems integrators have relevant product information and guidance.