

Solution Summary

PureActiv™ is an automated outdoor surveillance solution that addresses critical security threats to safeguard lives, facilities, and other high-value assets. While there are some similarities to more traditional Digital Video Recorders (DVRs), the PureActiv solution provides security professionals with accurate and reliable real-time alarms and video of suspicious activity in outdoor and remote environments while minimizing nuisance alarms. By incorporating PureTech's innovative geographic map presentation, advanced object detection and tracking, fence intrusion detection, automated camera steering, scalable video distribution, and automated security policy response, the PureActiv solution provides world-class situational awareness and proactive management of outdoor security threats to lives, critical facilities and assets.

- Innovative Geographic Map Presentation
- Advanced Object Detection and Tracking
- Fence Intrusion Detection
- Automated Camera Steering
- Scalable Video Distribution
- Automated Security Policy Response

Geographical Map Presentation

Because remote sites and perimeters are distributed over wide geographic areas, the PureActiv solution uses geographic mapping technology to locate and position devices, cameras, and alarms right on the map, which provides a "real world" perspective of the site under surveillance.

PureActiv associates latitude and longitude coordinates with every object it detects and alarm it manages. This allows PureActiv to produce map displays with the location of devices, cameras, and alarms clearly identified. The system incorporates industry standard Graphical Information Systems (GIS) maps, such as aerial photographs, street names, and critical building locations right into the user interface display. Users can zoom and pan maps to any level, and they can control any device represented on the map. For example, clicking on a camera icon will immediately cause live video to be displayed from that camera. These capabilities allow the operator to spatially associate video and alarm data and their locations in an intuitive manner, without requiring any special user interface programming.

Providing world-class situational awareness and proactive management of outdoor security threats to lives, critical facilities and assets.





Pure**Activ**

Automated Outdoor Surveillance Solutions



Addresses critical security threats to safeguards lives, facilities, and other high-value assets.

Advanced Object Detection and Tracking

The PureActiv object detection and tracking module detects moving objects of significance while ignoring motion due to changes in lighting and weather conditions. After an object is detected, the software is able to track the object automatically with a Pan-Tilt-Zoom (PTZ) camera. Unlike many manufacturers, PureTech developed its advanced video image processing and motion detection algorithms from the beginning to operate in these challenging outdoor environments. These smart algorithms automatically adapt to changes in lighting and irrelevant motion such as the movement of trees or waves in the ocean.

The PureActiv object detection and tracking module can be configured to detect objects of a user-specified size, speed, and direction, while ignoring objects that do not meet the specified criteria. The PureActiv system accommodates multiple object detection configurations per camera to provide operators flexibility in deploying object detection depending on the time of day, alarm conditions and external system inputs or a combination of these parameters.

The PureActiv object detection module works equally well with many types of video cameras including day, night, monochrome, color and infrared cameras. PureActiv incorporates advanced image stabilization technology to correct for camera motion induced by wind or vibrations. A camera on a 30-foot pole can move six inches or more in a moderate wind. PureActiv image stabilization is able to remove the wind-induced motion to provide a steady video to the operator and object detection algorithms.



Fence Intrusion Detection

The PureActiv solution incorporates a powerful integration with Southwest Microwave's INTREPID™ MicroPoint™ fence intrusion sensor system. This combination provides customers with a seamless perimeter intrusion detection and assessment solution.

The INTREPID™ MicroPoint™ sensor is more cost effective to install than other fence sensors, and more importantly, can report the location of a fence intrusion to within three meters.

When combined with the PureActiv GIS mapping and automated camera steering features, PureActiv can automatically position one or more PTZ cameras to look at the point of intrusion for a preset period of time without the need for camera presets. The system is configured entirely by presenting PureActiv a drawing defining the relationship between the cameras and the fence. Once the geographic coordinate is known, cameras assigned to monitor the corresponding section of the fence automatically move to view that location. Optionally, the PureActiv video motion detection can be used to watch for additional motion and display the detected object right on the map.

Employing this solution can save system integrators significant time by eliminating the need to assign fence zones and program camera presets when installing or reconfiguring a system.



Automated Camera Steering

A significant advantage of the PureActiv solution is that it automatically relates the source of the event to the geographic location of the event on a map and to the live video of the event. For example, because the PureActiv system has an understanding of where each camera is geographically located and can determine the specific location of a fence intrusion alarm or object detection alarm, it can automatically position PTZ cameras to look directly at the point of intrusion, without requiring any camera preset programming or relay contacts between the camera and the sensor. In the case of large perimeters, this capability can save thousands of hours of system integrator set-up time. The entire automated video surveillance response along a perimeter can be configured from a simple drawing that takes just a few hours to produce.



Scalable Video Distribution

The PureActiv solution provides centralized access to all remote video camera feeds through a central server, eliminating the need for operators to determine which remote device requires assessment to view live or recorded video from a camera. The PureActiv system distributes video using standard IP networking protocols. This allows operators to view video from any device that has an IP network connection, including web browsers and handheld devices. This capability can be important during a manned response to an alarm by enabling the responder to assess the situation by quickly viewing live and recorded video of the scene and to take control of a PTZ camera before entering the site.

PureActiv uses standard MJPEG compression technology to reduce the bandwidth required to transmit high-quality live video. Furthermore, because MJPEG compression does not compress information between video frames, there is no latency in the live video stream due to compression. Minimizing latency allows operators to view live video more effectively since it reduces the chances of overshooting the camera position while controlling a PTZ camera.

Automated Security Policy Response

The PureActiv solution incorporates an automated security policy response feature. This feature allows security managers to easily configure the PureActiv system to execute their security policies, including automated responses to particular events. This assures that the security operator and any systems integrated with the PureActiv solution take the proper course of action in response to an alarm.

The PureActiv system distributes alarm notification to individuals and other systems according to the configured policies. At the lowest level, the PureActiv solution allows other systems to receive alarm information through industry standard interfaces to database hooks and message queues. In addition, the plug-in architecture allows systems integrators to configure the PureActiv system to interface directly to existing alarm annunciation systems.

At the highest level, out-of-the-box, the PureActiv solution provides an easy to use alarm notification feature through e-mail, pagers, and voice telephone calls with touch-tone acknowledgement. In addition, an optional graphical map-based console provides operators with an intuitive view of a PureActiv system by incorporating aerial photographs and other geographical contexts for alarms and video display.

The alarm notification feature allows security managers to define a contact hierarchy. Each contact person can have defined methods of contact and a schedule for contact. The methods for contact may include e-mail, pager, voice telephone call, or any other contact method plug-in the system integrator supplies. The contact schedule specifies rules for when each contact method may be used, along with exceptions to those rules. Contacts can subscribe to different alarms, either globally, or on a per site basis. More than one contact may subscribe to the same alarm. Each level in the hierarchy has a defined emergency contact that will be used if a designated contact for an alarm does not successfully acknowledge the alarm. Each action taken by a contact in response to an alarm is logged in the system, along with an indication of acknowledgement.

In addition to alarm notifications, the PureActiv system can be configured to take specific actions such as turn lights on or off, lock doors or gates, sound an audible alarm, dial 911 or run a user developed program.



Video Authentication

To ensure that recorded video is unaltered, PureActiv uses a state-of-the-art algorithm to generate a secure digital signature for every frame of video. The digital signature for the frame of video is then embedded into the corresponding frame of recorded video. If the original video frame is subsequently altered, the digital signature of the altered frame will either be missing, or will not match the original digital signature. The digital signature is based on HMACSHA1 (Hash-based Message Authentication Code using the industry standard SHA1 hash algorithm). See Federal Information Processing Standards Publication 198 at <http://csrc.nist.gov/publications/fips/fips198/fips-198a.pdf> for further details and analysis of the algorithm.

System Health Monitoring

PureActiv provides the ability to automatically monitor and report system operational status. The operational status of both hardware and software components can be automatically reported to PureTech's monitoring center or to personnel responsible for maintaining the system. If any critical system components need service the user is notified and a service technician can be automatically dispatched. System Health Monitoring assures maximum system availability with minimal effort.

User-friendly Configuration and Operation

PureActiv provides a centralized graphical network configuration tool which can be used to configure the operation of the entire system from any desktop location. Whenever appropriate, devices can be configured just by clicking on their icons on a map display. In addition, the alarm notification system can be configured through a web browser with a connection to the PureActiv system.

All configuration tools utilize login names, passwords, and security groups to ensure that only authorized persons can make system changes. In addition, the security groups and user names may be synchronized with a Windows network domain so that users do not need to remember multiple logins and passwords.

Robust Open System Architecture

PureActiv was designed to be integrated easily and effectively with other systems.

PureActiv provides standard interfaces to integrate with third party devices through dry-contact relay I/O, RS-232/RS-422/RS-485 serial communications, and Ethernet. The information provided by these devices can be used to generate alarm conditions, turn on certain camera motion detection configurations, move one or more cameras to specified locations, or send a control signal to another type of device. For example, PureActiv can be configured to turn on lighting based on the state of a photocell, or to move a camera in response to a fence intrusion alarm.

PureActiv provides ActiveX, Java, and .NET controls that can be embedded in other applications. These controls allow operators to easily view and control remote cameras from within a single user interface designed by the system integrator or third-party. In addition, industry standard web service interfaces allow third party systems to easily integrate with PureActiv to send and receive alarm and system configuration information over secured network channels.

**For more information about PureActiv,
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