

Protecting Your Business With IP Video Surveillance

A Buyer's Guide For Implementing Grandstream IP-based Solutions




Innovative IP Voice & Video

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IP video surveillance offers affordability, lower total cost of ownership, scalability (use existing equipment and grow as you can) and abundant features.

Introduction

With advancement comes opportunity. This is particularly true with technology and how its continual evolution opens up a world of opportunity for businesses seeking out ways to compete in the marketplace. A common thread that we -- Grandstream Networks -- believe is that regardless of size (based on number of employees or revenue), all businesses deserve access to the same productivity and customer service enhancing solutions.

One area of growing business importance is the more proactive approach to the safety and security of its people and assets. With declining prices and rapid technology advancement, IP video surveillance is experiencing remarkable growth. Contrary to closed circuit television (CCTV) systems that require a dedicated network and cannot be integrated with other solutions, IP video surveillance can be integrated with an existing IP/Ethernet network. This makes all IP video surveillance solutions extremely easy to install and manage while allowing for the addition of endpoints for scalability and future expansion. Best yet, because IP video surveillance can be integrated onto existing IP/Ethernet networks, no new network infrastructure is needed and businesses can combine their IP video surveillance network together with other voice, video, data and mobility solutions for one easy-to-manage communications network.

The possibilities for IP surveillance system design are nearly endless with a wide range of available HD cameras and numerous options for recording, viewing and managing video—including access via mobile devices. The potentially crippling effects of not placing importance on surveillance and security such as lawsuits, injury, theft, loss of life and more are simply not worth the risk. Video surveillance networking has evolved where it's no longer complicated or expensive to build, maintain and use a comprehensive surveillance solution. In most cases, IP surveillance can simply be implemented with the infrastructure a business already has. IP video applications are placed onto the same network as the VoIP phone system which allows businesses to unify all communications on one integrated network that can be easily managed. IP cameras are easy to install and future-proof allowing companies to add cameras anywhere in the world onto a single unified network for real-time monitoring and review and allows them to send and access video feeds from any device with an Internet connection. IP-based NVRs allow businesses to record and monitor feeds from any camera in the world as long as it's on





What is IP Video Surveillance?

IP surveillance is a digitized and networked version of closed-circuit television (CCTV). With an IP surveillance system, the camera records video footage and the resulting content is distributed over an IP network. Digitization offers a number of benefits over traditional analog CCTV, including improved search capability, greater ease of use, better quality images/no degradation of content over time, the ability to record/play simultaneously, the ability to compress content for improved storage and the ability to connect to email and other communications systems so that alerts can be sent automatically.

Source: www.whatis.techtarget.com

an IP network – offering a great solution for recording/monitoring cameras in multiple locations.

This buyer's guide is for business owners, executives and employees formulating a security and surveillance plan to monitor and record activities via cameras and NVRs for real-time or later review. The guide offers a simple 5-step process for choosing, installing and implementing a new IP video surveillance network and outlines the cameras, NVRs and encoders/decoders that Grandstream offers to enable you to make the best choice of video endpoints for your business.

Why IP Network Video Technology?

IP is transforming the security industry. It has simplified solutions and made it easier and affordable for the masses – businesses and consumers – to implement a security solution. The movement towards High Definition (HD) video products has played a significant role in the growth of IP-based network video surveillance vs. traditional CCTV solutions. In addition to the image clarity boost achieved from HD cameras, businesses also gain economies of scale by leveraging the current IP/Ethernet network for voice, video and data rather than paying for and maintaining a separate video network.

While the list of benefits is long, IP video surveillance offers affordability, lower total cost of ownership, analog equipment investment protection, scalability, crystal clear imaging and mobility.

Benefits of IP-Based Video Surveillance

- **Real-time monitoring and control** - control and monitor live video feeds from multiple cameras on any Internet connected device, at multiple locations at one time and/or at a central or remote location.
- **Flexibility** – cameras can be viewed on a PC, Grandstream's GXV3240 and GXV3275 IP videophones, tablets or mobile phones.
- **Anytime, anywhere access** - Ability to easily access, remotely configure and monitor live or recorded clear images from a central or remote location anywhere in the world.
- **Interoperability** – Open standards-based IP equipment ensures product compatibility throughout the network.
- **Investment Protection** – Using a Grandstream IP decoder/encoder, investment in older analog cameras is protected.
- **Crystal clear HD images** – Superior resolution of a 1.3 Megapixel IP camera is nearly 4 times the resolution of full D1 analog; better digital image quality reduces number of cameras needed



Reasons For Adopting IP Surveillance Programs

- **Employee monitoring/theft**
- **Protection of physical assets**
- **Protection of employees and customers**
- **Entry identification**
- **Monitoring of entrances/exits**
- **Monitor money transaction areas**
- **Improve employee productivity**
- **Compliance monitoring**
- **Increase during work/after hours property surveillance**
- **Decrease risk of theft/shoplifting**
- **Verification and evidence of events**

for surveillance coverage. Additionally, the progressive scan feature provides clarity of rapidly moving objects.

- **Lower Total Cost of Ownership (TCO)** – With the elimination of dual networks, affordability of IP video equipment, reduced installation and maintenance costs and other related costs savings and efficiency gains, the TCO of an IP video surveillance solution is quite impactful.
- **Reduced Cabling** – With power over Ethernet (PoE) capability, external power supplies or extensive cabling is eliminated.
- **Better image storage** – Network video recorders store digital images and recordings and eliminate bulky, obsolete DVR tapes that require physical storage.
- **Locate video quickly and easily with faster, smarter search capabilities**
- **Increased recording time**
- **Easy installation and system upgrades** – No technical degree is needed to install IP cameras with one-step auto provisioning.
- **Scalability** – Adding new cameras or locations as business needs fluctuate is easily achieved.
- **Encryption & authentication** – Secure data transmission through encryption and authentication methods such as video watermark, HTTPS and password protection.

Five (5) Steps to Building an IP Surveillance Solution

Grandstream has developed a simple 5-step process to help you build a comprehensive IP video surveillance solution to protect your business, your employees, your home and more. These 5-steps cover everything from where to place cameras, how to select the right camera, where to install the cameras, how to set up the network as well as how to integrate various other devices with your surveillance network to extend the life and value of the solution. Areas we'll discuss include:

1. **Identifying areas needing surveillance**
2. **Choosing the right cameras**
3. **Installing cameras**
4. **Using an NVR for recording and monitoring**
5. **Integrating your surveillance solution with IP PBXs and other devices including 3rd party alarms, intercoms and more**

Step 1: Identifying Areas in Need of Video Surveillance

The Importance of Video Surveillance

Businesses and government entities are heavily investing in, and implementing, surveillance for benefits like gaining operational efficiencies, but partly because the ramifications of not having surveillance can be crippling from a human life perspective as well as prolonged and expensive financial and legal consequences.

- Protects and monitors access to buildings, physical assets, employees and customers
- Prevents criminal action
- Monitors and deters activity
- Investigates a crime

Fortunately, today's technology-driven environment offers businesses, of any size, to affordably and easily add sophisticated video security into their network arsenal. Companies like Grandstream have a wide selection of video surveillance equipment giving businesses access to better equipment, like HD cameras, at an affordable price.

Popular Locations for Installing Cameras

Before selecting the type of camera required for effective surveillance, identifying where cameras are needed and what type of image comes first. Common areas where businesses choose to install security cameras include:

Building entrances and exits – Garnering facial images and recording people coming and going from an establishment is a great way to identify and discourage criminal activity when cameras are visible.

Inside buildings, warehouses, etc. – Whether it's to monitor if a product on a manufacturing production line is being made to compliance standards to monitoring employee productivity or recording criminals who vandalize or steal company property, video surveillance cameras are crucial providing solid evidence.

Customer transaction areas – Financial transaction areas such as kiosks, cash registers and ATMs are mandatory locations where security cameras have to be installed.

Secluded areas – For employee safety, deterring or investigating criminal activity like vandalism or theft in parking lots, garages and alleys, setting up cameras in these areas provide a solid record of evidence for authorities. Cameras also provide customers and employees frequenting your business added assurance they will reach their vehicles safely.

What is IP surveillance?

IP surveillance is a digitized and networked version of closed-circuit television (CCTV). With an IP surveillance system, the camera records video footage and the resulting content is distributed over an IP network. Digitization offers a number of benefits over traditional analog CCTV, including:

- Improved search capability
- Greater ease of use
- Better quality images and no degradation of content over time
- The ability to record and play simultaneously
- The ability to compress content for improved storage
- The ability to connect to email and other communications systems so that alerts can be sent automatically

* Source: www.whatis.techtarget.com

Product development using open standards that discourages proprietary offerings has helped to reduce costs and place more technology solutions within businesses reach.

Step 2: Choosing the Right IP Cameras

Outlining business surveillance goals and determining where cameras need to be placed is a crucial step to complete prior to selecting and purchasing any camera. Cameras are available in many combinations including indoor, outdoor, infrared, vari-focal, fixed, day/night, vandal proof and more. The flexibility of selecting IP surveillance cameras mean they can be easily added or relocated with no infrastructure changes so starting small and later increasing capabilities is supported.

ONVIF Standards for IP Video

The growth and acceptance of IP technology for video security and surveillance prompted the need for standards in the industry. ONVIF was created to outline minimum requirements to ensure interoperability between manufacturer products. The ONVIF specification defines a common protocol for the exchange of information between network video devices including automatic device discovery, video streaming and intelligence metadata.

Because Grandstream IP video products comply with ONVIF standards, integration of cameras and recorders are easily integrated with other security applications like PAS, door access systems, mobile phone monitoring applications, etc.



Types of Cameras

Indoor Cameras – Grandstream’s indoor cameras range from box cameras to dome cameras. All cameras include built-in PoE for easy installation, many feature IR-Cut for dark/low-light recording and feature varying degrees of lens’ to offer a model that is ideal for each surveillance setting. An advantage of Grandstream’s indoor cameras is that many offer the ability to integrate 3rd party sensors, intercoms, speakers, microphones, sirens, etc.

Outdoor Cameras – Grandstream outdoor cameras all consist of IP66 certified weatherproof casings to allow these cameras to be used in nearly any outdoor environment regardless of the weather and temperature. These cameras, which also offer great options for indoor use, feature built-in Infrared sensors to allow the cameras to achieve the same high-quality video quality regardless of the lighting conditions. Like indoor cameras, all Grandstream outdoor cameras include built-in PoE.

4 Questions for Choosing the Right Camera

1. What are you trying to monitor? (Helps determine mm lens type)

- a. **Close-Proximity/Closed Proximity** - If you're looking to monitor an area nearby to where the camera will be mounted or a small area such as a lobby, a camera with a mm (millimeter) level below 4-5mm is needed.
- b. **In the distance** – For monitoring a large area or something in the distance away from the camera, a camera with mm level above 6-7mm is required.

2. Where is the location of the camera?

- a. **Indoors** – These cameras are smaller, less heavy and less expensive than outdoor models. However, outdoor models can also be used indoors.
- b. **Outdoors** – A weatherproof IP66 casing model camera is required because wind, rain, UV rays and contaminants can all affect surveillance. Outdoor cameras are also built to withstand vandal attacks.

3. Will there be bright light or low light?

- a. If the video surveillance camera is placed in a bright, well-lit area, most cameras will have ample light for capturing clear images.
- b. In dim lighting conditions, select a camera built for that application with a light sensitivity rating of 1 Lux or below – it will either be labeled as a Day and Night camera, or will list low-light compatibility among their specifications. Day/night video cameras offer most flexibility, as they allow you to consistently monitor a given space, even if light levels continually fluctuate.
- c. In low light or no light conditions, it's important to invest in an Infrared camera that can shoot images in darkness.

4. Is the camera ONVIF-compliant?

Grandstream IP Video Surveillance Solutions

Grandstream's heritage is entrenched on delivering affordable, feature-rich IP-based business solutions that increase productivity, enhance security, improve customer service and reduce costs. There are few, if any other, companies in the marketplace that manufacture both communications (telephony) and video surveillance solutions ensuring product compatibility. This allows Grandstream to have a better understanding than any other company on the market as to how these products can all work together to create a unified communications solution that is easy to install and manage. The quality, affordability and industry compliance of Grandstream's IP video cameras along with the financial savings of an IP-network solution presents an attractive alternative for businesses seeking a comprehensive security and physical surveillance initiative while cognizant of bottom line financial implications.

With an array of cameras (Indoor & Outdoor), encoders/decoder, NVR and a video management system, Grandstream offers all the equipment options a business needs to quickly and cost-effectively implement a sophisticated IP video surveillance solution including:

- **GXV3550 Network Video Recorder (NVR)**
- **GXV36xx Family of IP Cameras**
- **GXV35xx IP Video Encoders/Decoders**
- **GSurf Pro V2 Video Management System (VMS)**

What Sets GXV36xx IP Cameras Apart?

Once the decision to add video surveillance is made, the next step is to outline how the cameras will be applied to determine what type of equipment is needed. Whether the camera is needed to monitor access to the main entrance, the outside parking lot or employees handling money in the back office, Grandstream video cameras offer these benefits:

- **SIP-based video equipment** – Surveillance equipment runs on the existing VoIP network infrastructure for a single, integrated network consisting of voice, data video surveillance and conferencing apps for significant human and network cost efficiencies
- **Extensive list of features at a low cost**
- **No external wires or cables required**
- **Automatic discovery of cameras** – non-technical installation required
- **Alarms and Alerts** – receive notification of suspicious activity via alarms and alerts sent by the camera it detects motion (or missing object detection, camera occlusion, foreign object detection, etc.)



GXV36xx cameras dramatically reduce the time and cost and time of installing surveillance systems while offering greater functionality, increased flexibility for remote video monitoring/control and 2-way VoIP/SIP audio. VoIP/SIP capability is unique because it enables seamless convergence between video surveillance and Voice-Video-over-IP communication applications and essentially turns the GXV36xx cameras into smart camera phones not just for video monitoring but for 2-way audio intercom/monitoring.

- **2-way audio** – conduct a two-way conversation using camera’s Audio_In port
- **Integrated PoE** – eliminates external power supply
- **Free VMS** – any Grandstream camera purchase comes with a free copy of GSurf Pro video management system
- **ONVIF compliant** – meets industry standards ensuring compatibility with other ONVIF certified IP cameras and network accessory equipment
- **Intercom system integration** – connect intercom systems into the audio port on camera
- **Remote or local real-time streaming of video feeds to both videophones (i.e. GXV3275 IP Multimedia Phone) and mobile smartphones**
- **One-step provisioning of cameras with Grandstream’s IP PBX Appliances** for a total voice and video IP solution (Refer to section titled “Adding Surveillance to the UCM6100 series/UCM6510 IP PBXs”)
- **Dual-Streaming capability** – Grandstream cameras can send video feeds to multiple locations, allowing you to record/monitor a camera using the GVR3550 while also being able to make/receive video calls from the cameras when an alarm is triggered

GXV36xx IP Video Camera Models

Depending on the location of the camera and what image quality is required, Grandstream has a family of IP surveillance cameras to choose from including indoor box, indoor mini-dome, outdoor tube and outdoor dome cameras. All cameras are SIP-based -- suitable for use on the IP open network -- and are ONVIF-complaint to ensure compatibility with other industry certified equipment brands.

Outdoor/Indoor Cameras

GXV3674 series

The GXV3674 series are two (2) powerful HD IP cameras with IR sensors and IP66 certified casing making them ideal for outdoor use where weather and light conditions are a concern. The vari-focal lens lets businesses adjust the lens from 2.8mm (close angle monitoring at 115 degree angle) to 12mm (long distance at a 30 degree angle) to monitor nearby areas like building entrances and distant focuses such as a parking lot.



NVR Purchase Considerations

- **Cameras supported**
- **Frames per second**
- **Compression record resolutions**
- **Motion detection, schedule, ability to save video and audio for backup**

- **GXV3674_HD_VF:** 1.2 Megapixel Progressive Scan CMOS image sensor, 720p resolution
- **GXV3674_FHD_VF:** 3.1 Megapixel Progressive Scan CMOS image sensor, 1080p resolution

Additional Features:

- Full HD with vari-focal lens
- Multi-streaming rate real-time H.264
- IR-Cut for advanced day/night/low-light video recording
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- Integrated PoE, ONVIF compliancy, advanced security and flexible HTTP API

GXV3672 series

The four (4) models that comprise the GXV3672 series are day/night weatherproof, bullet-style IP cameras with vibrant HD color and IR sensors critical for settings where there is a range of light and weather conditions. Two lens options are available: an 8mm lens (GXV3672_HD, GXV3672_FHD) excellent for monitoring warehouses, parking lots, retail floors, or areas within an office building from a distance, and a 3.6mm lens (GXV3672_HD_36 and GXV3672_FHD_36) for wide angles at a close proximity such as building entrances, hallways and receptionist areas.



- **GXV3672_FHD_36:** 3.1 Megapixel Progressive Scan CMOS image sensor, 1080p resolution, 3.6mm lens for wider-angle monitoring up to 10 meters
- **GXV3672_HD_36:** 1.2 Megapixel Progressive Scan CMOS image sensor, 720p resolution, 3.6mm lens for wider-angle monitoring up to 10 meters
- **GXV3672_FHD:** 3.1 Megapixel Progressive Scan CMOS image sensor, 1080p resolution, 8mm lens for medium distances at a 30° angle
- **GXV3672_HD:** 1.2 Megapixel Progressive Scan CMOS image sensor, 720p resolution, 8mm lens for medium distances at a 30° angle





Live video feeds from Grandstream's surveillance cameras can be routed through Grandstream's UCM6100 series or UCM6510 IP PBX Appliances and streamed onto Grandstream's IP GXV3240 and GXV3275 IP videophones.

Additional Features:

- Multi-streaming rate real-time H.264
- IR-Cut for advanced day/night/low-light video recording
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- Integrated PoE, IP66 certified casing, ONVIF compliancy, advanced security and flexible HTTP API

GXV3662 series

The GXV3662 series consists of two (2) fixed dome IP camera models available in a weatherproof, vandal-resistant and tamper-proof casing to withstand harsh weather conditions or tampering in settings like banks, retail and more. The **vari-focal lens** is manually adjustable from **3.3mm to 12mm** making this camera series suitable for any indoor or outdoor monitoring situation – whether it is an area in the distance or area in close-proximity to the camera.



- **GXV3662_FHD:** 3.1 Megapixel Progressive Scan CMOS image sensor, 1080p resolution, day/night mode suitable for a wide range of light environments
- **GXV3662_HD:** 1.2 Megapixel Progressive Scan CMOS image sensor, 720p resolution, day/night mode suitable for a wide range of light environments

Additional Features:

- Multi-streaming rate real-time H.264
- IR-Cut for advanced day/night/low-light video recording; color or black & white
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- IP66 certified casing, integrated heater and fan, integrated PoE, ONVIF compliancy, advanced security and flexible HTTP API



GXV3610 series

With excellent picture quality critical for securing premises in a variety of weather and light conditions, the GXV3610 series includes two (2) powerful fixed dome HD IP cameras with IR capability in an IP66 certified casing. The 3.6mm lens provides wide-angle monitoring of nearby subjects in banks, hotels, retail stores, warehouse and building entrances.

- **GXV3610_FHD**: 3.1 Megapixel Progressive Scan CMOS image sensor, 1080p resolution
- **GXV3610_HD**: 1.2 Megapixel Progressive Scan CMOS image sensor, 720p resolution

Additional Features:

- Day/night fixed dome camera with 3.6mm lens for wider-angle monitoring up to 10 meters
- Multi-streaming rate real-time H.264
- IR capability for advanced nighttime and low light surveillance recording
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- Integrated PoE, ONVIF compliancy, advanced security protection and flexible HTTP API for easy integration with other monitoring systems



Indoor Cameras

GXV3651_FHD

A powerful 5-Megapixel indoor camera for wide area surveillance application requiring superior resolutions and sharp imaging details under various light conditions, the GXV3651_FHD is great for monitoring in close proximity or in the distance at malls, warehouses, universities, government, hospitals, casinos, parking areas, street traffic, etc.



- Full HD IP camera with IR-Cut to monitor/record in low light or dark indoor settings
- 1/2" 5 Megapixel Progressive Scan CMOS image sensor
- Vari-focal lens manually adjusts from 4.5mm to 10mm
- Multi-bit-rate H.264 at 1080p resolution
- IR-Cut for advanced day/night/low-light video recording
- All-in-one monitoring and recording with built-in slot for SD card and USB drive
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- Integrated PoE, ONVIF compliancy, advanced security and flexible HTTP API

GXV3601_HD

The GXV3610_HD is a reliable HD IP camera with vari-focal lens for monitoring of a variety of indoor settings including nearby or in the distance.

- HD picture quality IP camera
- 1/3" 2 Megapixel Aptina CMOS image sensor
- Vari-focal lens manually adjusts from 2.8mm to 12mm
- Advanced multi-bit-rate H.264 at 720p resolution
- All-in-one monitoring and recording with built-in slot for SD card and USB drive
- SIP/VoIP for 2-way audio and video streaming to mobile and videophones
- Integrated PoE, ONVIF compliancy, advanced security and flexible HTTP API



GXV3611_HD IP Dome Camera

Suitable for advanced indoor surveillance applications, the GXV3611_HD is a dome camera offering 720p recording and a built-in microphone and speaker so users can have a two-way audio conversation through the camera, for example, with someone at the entrance to an office or warehouse.

- 1/3" 2 Megapixel advanced Aptina CMOS image sensor
- 2.8mm lens which makes it ideal for monitoring subject in close proximity to the camera at a wide angle
- HD (720p) with integrated microphone, speaker and smoke detector for maximum and out-of-the-box video + audio + smoke monitoring using industry standard SIP & VoIP technology
- Motion Detection and Alert Notification
- 2-way audio paging and SIP/VoIP
- Integrated Power-over-Ethernet (802.3af)
- Video watermark support for security authentication
- 24MB pre-/post-event recording buffer

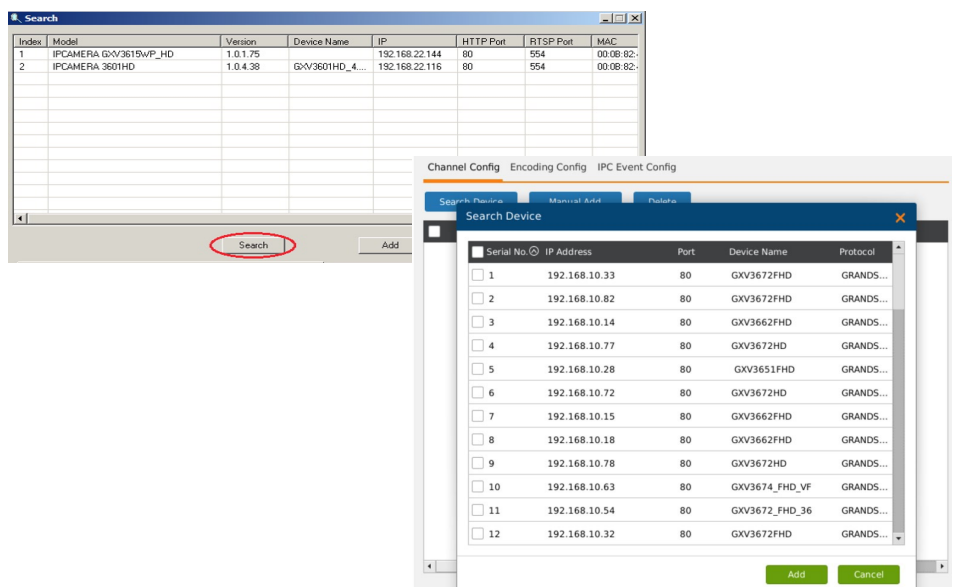


Step 3: Installing IP Cameras

Once the areas of surveillance are pinpointed and the cameras are selected, it's time to install the cameras in their proper locations and connect them to the network. When the cameras are connected, you can then access each and every one remotely, pair each camera with GSurf Pro or any video management software and/or pair the cameras with the GVR3550 NVR.

What Makes Grandstream Cameras Easy to Install?

- **PoE** – GXV36xx cameras feature built-in Power-over-Ethernet, enabling them to be connected to a network and powered with one Ethernet cable connected back to a PoE switch.
- **Mounting Kits/Brackets included** – No extra parts are needed to install the cameras. Everything you need, including the screws, is included.
- **SIP** – Grandstream SIP-based cameras allow you to view cameras on any network from anywhere with an Internet connection as long as there's an IP address for the camera(s). This also supports connecting cameras on outside networks back to the GVR3550 or GSurf Pro VMS.
- **Web User Interface** – All Grandstream cameras, GVR3550 and GSurf Pro have simple web user interfaces to configure the features you want running on these devices with a few mouse clicks, including motion detection and alarm events (what the camera does when it senses an alarm).
- **GS_Search** – This free tool automatically finds any IP camera on the network.
- **Auto-Discovery** – The GVR3550 features auto-discovery, which allows it to automatically detect any IP camera on the same network as the GVR3550.



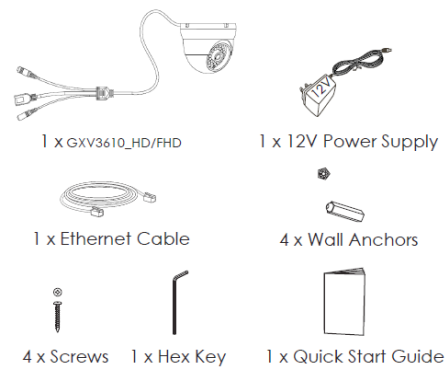
4-Step Installation Process

GXV36xx camera installation is completed in 4 easy steps:

1. Mount/install camera in the desired location. All Grandstream cameras come with mounting kits (screws included) or have a mounting kit built into the camera. Dome Cameras – Made for ceiling mounting. Other mounting kits are available for our most powerful dome camera – the GXV3662 – to allow this dome camera to be mounted on a wall or mounted flush into a wall or ceiling.

Box Cameras – Available with an adjustable tripod-like device for mounting on a wall or on a ceiling simply changing the angle of the tripod mount.

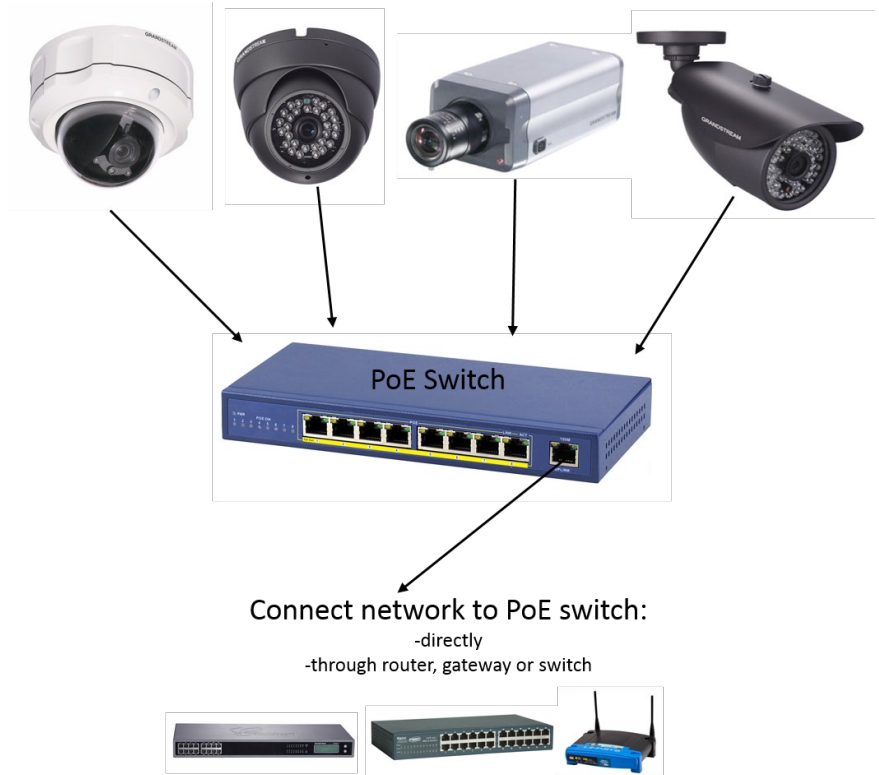
GXV3674 series – This camera is made primarily for wall mounting.



2. Connect cameras to your network – Several options are available for connecting cameras back to the network. Make sure to allow for an Ethernet cable to run to the camera where it's mounted for power/network connection.

a. Connect cameras to a PoE switch – This is the most common installation method because it's the easiest installation method. All Grandstream cameras feature built-in PoE which means an Ethernet cable can deliver both a network connection and power if connected back to a PoE switch. Make sure all PoE switches are network connected either through a direct connection or connecting the switch to a router or gateway.

- i. A PoE switch could be centrally located centrally somewhere in an office. In this case, run all of the cables back to that PoE switch, or connect the Ethernet ports on the walls of the office back to the PoE switch so that all you need to do is plug cameras into existing wall outlets.*
- ii. Another option is to deploy multiple 2-4 port PoE switches near cameras in remote areas and connect the switches together through the network.*



b. Connect cameras to a router, switch or gateway – This type of installation uses the routers and switches you may already have, however, it requires each camera to also have access to a separate power source. Make sure the routers and/or switches are all connected back to the main network directly or through other routers/gateways/switches. Routers that feature DHCP networks can be used to create an internal network of cameras without needing an outside Internet connection. These DHCP routers will assign each camera an IP address. In this case, any device needed to view the camera feed will also need to be connected to the DHCP router.

3. Download GS_Search and log into camera's web user interface to setup each camera – Now that the cameras are network connected, they'll be given an IP address. Go to <http://www.grandstream.com/support/tools> and download the GS_Search tool to identify all of the cameras on the network and the IP addresses of those cameras. These IP addresses are used to tap into each camera's web user interface. Just type the IP address into the browser, and enter "admin" as both the user name and password. You can change this username and password upon login.



The screenshot displays the 'GXV3610_HD Administration Interface' with a sidebar menu on the left containing: Home, Basic Settings, System, Video & Audio, CMOS Settings, Networking, DDNS, SIP, Status, and Advanced Settings. The main content area is divided into three sections: 'Current System Time' showing Date: 2013-06-07 and Time: 00:56:30; 'Set the System Time' with a dropdown for Time Zone set to 'Using self-defined Time Zone', a Self Defined Time Zone field set to 'EST+5EDT+4,M3.2.0,M11.1.0', and radio buttons for 'Update via NTP Server', 'Synchronize with Local Computer', 'Set the Time Manually', and 'Keep Current Date and Time' (which is selected); and 'OSD Date Format' with a dropdown set to 'MM/DD/YYYY'. Below these is a 'Device Name Setting' section with a text field containing 'GXV3610_HD'. Each section has a 'Save' button.

4. Log into NVR/GSurf Pro to add cameras – Grandstream GVR3550 NVR features auto-discovery built-in to its user interface. This allows the GVR3550 to automatically detect and notify you of all the cameras on the same network. To add a camera to the GVR3550 for full recording and monitoring all that is needed is to select the cameras to integrate with the GVR3550. (More information in the next section.)

Step 4: Recording and Monitoring with a NVR and VMS

Grandstream offers two great options for recording and monitoring groups of live video feeds. For those looking for a dedicated and centralized recording and monitoring solution that avoids exporting video feeds to servers on your network, the GVR3550 NVR is available. The GVR3550 is extremely easy to setup, featuring auto-discovery of IP cameras, and features best in class recording capacity with up to 16TB of storage from 4 hard drive slots. For those looking to integrate their IP surveillance solution with PCs and existing servers on your network, GSurf Pro V2 is free video management software that can monitor and record up to 72 Grandstream cameras.



GVR3550 NVR

Best-in-Class Surveillance Recording

With IP video surveillance systems, recording, storage and retrieval of video is quickly and easily achieved with a NVR. Grandstream's GXV3550 NVR is a dedicated surveillance recording and live monitoring product that can be located anywhere in the network. It captures, records and playbacks high-resolution imagery from megapixel GXV IP cameras unlike older digital video recorder (DVR) solutions.

Easy Installation – Auto-Discovery of Cameras and Web UI Setup of Recording Schedules

The SIP-based GXV3550 NVR with auto-discovery ca-



pability locates all cameras on

the network and allows users to simply click on the cameras needing to be recorded or monitored. Complicated surveillance networks that export recordings to PC-based servers, and slow down the network are eliminated.

In order to set up and customize the recording schedules for any camera you have paired to the GVR3550, simply use the GVR3550's interface or web user interface. You can choose:

- Time/schedule based recording
- Continuous 24 hour recording
- Event triggered recording (i.e. motion detection triggered recording)
- Manual recording (you can login to the cameras interface or the GVR3550 interface at any time and start recording)

You can set recording schedules per camera, for all cameras, or for groups of cameras simply by clicking the boxes that correspond to the times you want the camera(s) to be recording.

Recording Features

- Large storage capacity – more built-in memory than any NVR in its class with 16TB and 4 hard drives (hard drives sold separately)
- Video recording capability of up to 24 cameras (720p) or up to 12 cameras (1080p)
- Advanced system efficiency or redundancy (RAID)
- Fully customizable recording schedules (manual, event triggered, scheduled or continuous)

NVR Purchase Considerations

- **Cameras supported**
- **Frames per second**
- **Compression record resolutions**
- **Hard drive space, network connections/remote viewing capabilities**
- **Motion detection, schedule, ability to save video and audio for backup**

- Integrate with remote IP cameras; auto discovery of IP cameras
- RAID 0 & 1 compliant for storage efficiency and redundancy
- Intelligent search of recorded video (date & time, missing object, camera occlusion, foreign object or motion)

Monitoring Features

- Simultaneous live feed viewing of up to 16 cameras at VGA resolution
- Supports GXV36xx cameras and ONVIF-compliant IP cameras
- Integrates with third-party intercoms, alarms, sirens, speakers, motion sensors, etc.
- Advanced alerts and notifications from cameras
- Notifications send via video calls to IP video phone or smartphone, voice call alerts or email screenshot

GSurf Pro V2 VMS

Video management software (VMS) is used to monitor, manage, search and record live digital video. Grandstream's GSurf_Pro V2 video monitoring/recording software centralizes management of multi-site IP cameras and encoders/decoders and is provided at no charge with any Grandstream IP camera purchase. Video data from up to 72 cameras can be simultaneously managed, either locally or remotely, via GSurf Pro's controlled server with Client/Server architecture. The Client-Server architecture connects all IP cameras directly to a server so users can immediately view/control the cameras by running GSurf on any computer within the server's network.

With GSurf Pro, users can easily setup, view and manage the entire network of video cameras and have access to these advanced features:



Key Features

- Multi-point viewing of the same live video
- Record File Sharing Server allows remote clients to download and replay local server records
- Scheduled or Alarm triggered primary stream recording for different cameras
- Re-open previously closed video streams
- Select a view panel layout
- Zoom in on selected areas

- Adjust video quality
- Convert recorded H.264 video to AVI format for convenient video portability
- Multi-screen display support with manual switch or automatic patrolling camera viewing
- Respond to pre-programmed commands such as motion detection, audio detection, alarms, etc.
- Two-way audio/video monitoring and alarming
- Replay up to 4 recorded local or remote videos simultaneously
- Client/Server architecture with e-Map support
- Real-time systems status reporting (CPU and network usage, etc.)
- e-PTZ on Chrome, Firefox and Internet Explorer

Monitor Video Anytime, Anywhere

Ensuring the safety and security of business physical and human assets is a 24x7 activity. A huge boost for video surveillance using IP is it offers mobility. Business owners, executives and employees who are traveling out of the office, on vacation or working at home can monitor and manage live or recorded video streams from a central location or from anywhere in the world with a smartphone, video-phone or client/server computer. Should an event occur requiring additional investigation, video footage can be immediately located and forwarded other security personnel or law enforcement.

Event Notification Using Alarms and Alerts

GSurf Pro recognizes alerts and alarms sent by the camera when the camera detects motion (or missing object detection, camera occlusion, foreign object detection, etc.). Once the alarm features are set up and enabled on the camera, GSurf Pro then provides alerts using a pre-set method such as an alarm has been signaled, it has started recording when an alarm was received, and that document within the recordings and recording maps that an alarm was signaled, and what type of alarm it is. Alerts are sent via video call to IP video phone or smartphone, voice call alerts or email screenshots.

Adaptable to meet the unique needs of businesses, GSurf Pro offers all the key tools necessary to effectively and efficiently monitor, manage and investigate security activity.



Step 5: Integrating Cameras with IP PBXs and Other Devices

The UCM6100 series and UCM6510 IP PBXs

All Grandstream products, including the GXV36xx IP cameras and associated surveillance equipment, support SIP open standards. This makes adding video surveillance to the voice communications network extremely easily with one-step provisioning of cameras on either the UCM6100 series or UCM6510 IP PBX Appliance. Cameras are simply registered on the network like phones. This allows IP phones/video phones to call cameras by dialing an extension while also letting the cameras make voice/video calls to phones when an alert is triggered. There are few companies in the marketplace like Grandstream that manufacturer and market both IP PBX and video surveillance for a truly seamless solution.



An IP PBX Appliance For Voice, Data, Video and Mobility Apps

Available in several models to target the specific needs of businesses, the UCM is an open source, licensing-free IP PBX for delivering secure and reliable voice, video, data and mobility apps. Powered by an advanced hardware platform based on Asterisk®, the UCM IP PBX Appliances help businesses to affordably use VoIP to increase productivity, provide better customer service, unify communications on a single platform and save money on communications costs. Open source systems ensure compliancy to SIP-based protocols meaning the IP PBX can work with a range of desktop SIP endpoints (IP phones, video cameras, etc.) as well as popular service providers, SIP trunk providers and other SIP hardware. Open source solutions also provide flexibility to easily develop and customize applications to fit business integration, interoperability and communications needs.

UCM6100 series IP PBX

The UCM6100 series IP PBX supports up to 500 users. Based on anticipated call volume/business industry/line size requirements, there are four (4) model sizes to choose from:

| Model Types | # of Concurrent Calls |
|------------------------|-----------------------|
| UCM6102 (2 FXO ports) | 30 |
| UCM6104 (4 FXO ports) | 45 |
| UCM6108 (8 FXO ports) | 60 |
| UCM6116 (16 FXO ports) | 60 |

UCM6100 series/UCM6510 IP PBX Video Surveillance

- **Create a comprehensive solution to view, monitor and receive alerts from IP cameras**
- **Register IP cameras to the PBX**
 - **Make video calls to IP cameras to view live feeds**
 - **Speak through cameras with 2-way audio & video (i.e. door entry application)**
 - **IP cameras can be set to automatically call the video phone when alert is triggered**
 - **Receive alerts from anywhere in the world**
- **Supports all major video codecs**
 - **H.263**
 - **H.263p**
 - **H.264**

UCM6510 IP PBX

The UCM6510 has the same communications features, capabilities, installation and management as the UCM6100 series, however, it handles up to 2000 users, 200 concurrent call and supports E1, T1 and J1 networks.

Key UCM IP PBX Features



- **IP PBX With Robust Features**

For SMBs and Enterprise - Often entry-level IP PBXs include popular calling features like Caller ID, Call Hold, Call Forward, voicemail, etc., but require additional license fees for more advanced features like auto attendant and IVR. IVR capability comes standard and is not sold as an add-on module as with other vendor offerings. This provides a significant savings of up to several thousands of dollars.

- **No Licensing or Recurring Fees/Includes Lifetime Firmware Updates** - Most IP PBX vendors charge annual license fees for advanced features like IVR. These additional fees are often the determining factor on whether an SMB can afford an on-site PBX. There are no licensing or recurring fees - a key differentiation factor against other marketplace solutions. All hardware, software features and functions are included. When Grandstream releases firmware updates for the UCM IP PBX, those updates are available at no charge for the life of the system.
- **Auto Discovery of SIP Endpoints & Zero-Configuration Provisioning** - IP PBX installation is handled with a few clicks of the mouse and minimal manual operation. With no advanced technology degree required, this plug and play phone system incorporates Auto Discovery of SIP endpoints (ATAs, video phones, IP phones, video cameras etc.) that once the device is connected, the system automatically registers the device. Zero-configuration provisioning means adding phones, cameras or office locations after initial installation is simply handled using the intuitive Web user Interface (UI). For ongoing maintenance and administration, those duties can be handled either internally by staff members or remotely by a systems integrator partner without having to physically visit the office location.
- **Video Calling and Physical Surveillance Applications** - Save time, improve decision-making and reduce travel expenses with real-time video calling. As easy as making a phone call, use a desktop video phone to communicate visually with your customers and employees. For physical security applications, the UCM integrates and registers any SIP-compliant door access or video surveillance camera for a comprehensive surveillance solution that sends alerts and can be monitored from anywhere.

- **Low Capital Investment and Ongoing Operating Costs** - Purchasing an on-site IP PBX can be a more cost-effective solution over time. As a business grows and adds users or applications like video surveillance, all that is required is the purchase of SIP phones and cameras. Overall, using an IP PBX with SIP Trunking helps to reduce monthly phone bills, especially long distance charges, by allowing businesses to connect with lower cost VoIP providers.

Existing Analog Cameras

It's incredibly easy to integrate existing analog cameras with your IP video surveillance network using 2 different IP video encoders/decoders -- one of which even integrate the existing intercom system with the IP video surveillance network.



GXV3504 IP Video Encoder

IP video encoders are used when businesses with analog CCTV video surveillance cameras want to integrate that equipment with newer IP-based network video equipment. The GXV3504 IP video encoder extends the life and investment of analog video cameras by converting analog video signals into digital video streams that are sent over a wired or wireless IP-based network.

Key Features

- H.264 real time video compression (D1 resolution) to maximize video quality on analog stream/sharp image clarity at low-modest bandwidth
- ONVIF-compliant 4-channel device
- 2-way audio paging and SIP/VoIP and video streaming to mobile phones and videophones (GXV3275 IP Video Phone)
- Integrated PoE
- Embedded video analytics including motion detection and large pre-/post-event recording buffer
- Advanced security protection
- Managed using GSurf Pro, Grandstream's intuitive video management software that controls up to 36 cameras simultaneously

GXV3500 IP Video Encoder + Decoder + PAS Device

To help preserve investment in traditional CCTV analog cameras, Grandstream also offers the GXV3500 -- a unique 3-in-1 device -- that combines a H.264 ONVIF compliant single channel IP video encoder + decoder with a built-in public announcement system (PAS). It's a necessary device that decodes IP video streams to analog video

in order to allow IP cameras to be used on an analog network and encodes analog video to allow analog cameras to be used in an IP network.

To use the public announcement system function, the GXV3500 simply connects with microphone, IP phones, or IP video-phones on the network. Users can speak from an attached external microphone, or call into the device from a SIP IP phone to make voice announcements or supply digital background music to public areas through an external loudspeaker (with integrated power amplifier), or call into the device from a SIP video phone to make live video announcement or video advertisement on a TV connected with the GXV3500 from anywhere in the world.



Key Features

- Combines advanced single channel H.264 real-time video compression or decompression functions at up to D1 resolution and up to 30fps in a single box
- Video decoding for displaying live video on a TV
- Use as a voice/video PAS over an IP network office floors, lobbies, shopping malls, warehouses, waiting rooms, supermarkets, public transportation stations, etc.
- Support for 2-way audio conversations using SIP/VoIP
- ONVIF compliant with integrated PoE
- Includes serial port for PTZ camera control, microphone input, audio/video output, alarm inputs & outputs, pre- and post-event recording buffer, as well as advanced encryption for security protection
- Managed using GSurf Pro, Grandstream's FREE video management software that controls up to 36 cameras simultaneously

3rd Party Intercoms, Sirens, Door Sensors, Alarms and More

Are there any existing security sirens, alarms or sensors to integrate with the IP video surveillance solution? What about an existing intercom/speaker? Are you considering adding any of these devices in the future? If the answer is yes, then Grandstream IP surveillance products offer the ideal solution for creating a future proof solution when integrating 3rd party devices.

Integration Directly with IP Cameras

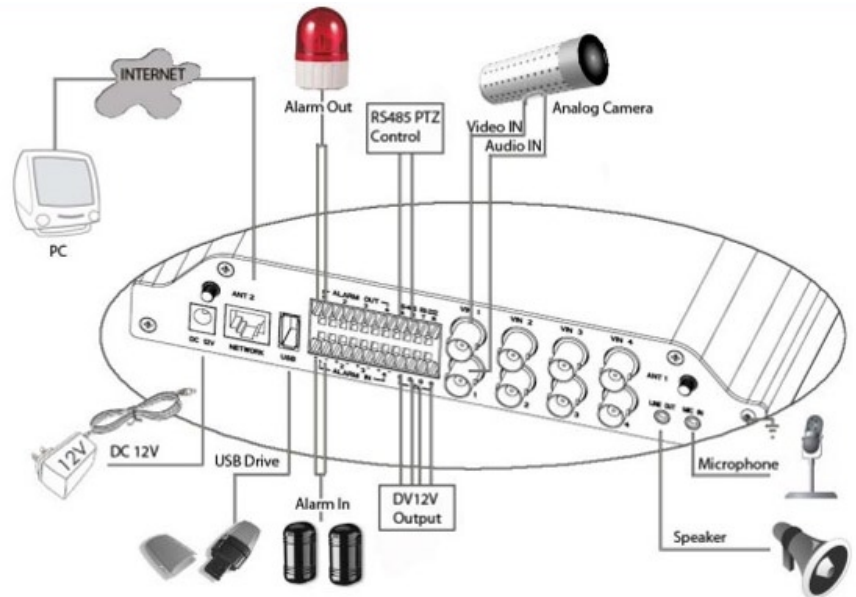


All Grandstream cameras support audio output (the ability to call a camera and have the audio played through an external speaker connected to the camera). Additionally, many of Grandstream's indoor cameras feature not only audio output but also audio input (to speakers) and alarm inputs and outputs. The ports for these functions are found directly on the cameras themselves and let you:

- Connect existing security sirens to the alarm outputs of the cameras so that when a camera triggers an alarm, it notifies the siren and the siren goes off.
- Connect existing motion or door sensors to the alarm inputs of the camera so that if the motion/door sensor goes off, the camera is notified and triggers its own alarms and alarm notifications.
- Connect existing intercoms microphones to the audio input of a camera to allow the audio to be played through the camera's speaker or to a speaker connected to the camera.
- Connect speakers to the audio output of the camera so you can call the camera's extension and talk through the speaker, for example.

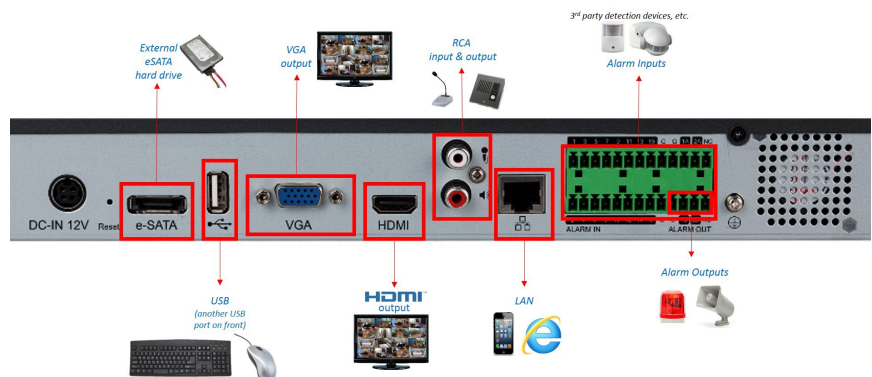
Once these devices are connected to the cameras, users will need to login to that camera's web user interface in order to tell the camera what to do when it senses an alarm, and what to do when it's told an alarm triggered by a 3rd party device. The Alarm Action section of the Web UI is where these features are setup. Make sure a camera's alarm schedule is set to record all day for 24/7 alarm possibilities.

Integration with IP Encoders/Decoders



Like Grandstream's cameras, the GXV3504 and GXV3500 offer audio inputs/outputs as well as alarm inputs/outputs to integrate with existing sirens, alarms, intercoms, speakers, microphones, etc. Like the cameras, simply connect the devices to utilize to the GXV3504 or GXV3500, then login to the product's web user interface to tell the device what to do when an alarm is triggered.

Integration with the GVR3550



The GVR3550 are able to support these devices when connected directly to a camera or encoder/decoder that is being recorded/monitored by the GVR3550, but they can also be integrated/connected directly to the GVR3550 using the ports on the back of the device. This makes the GVR3550 a great option for security offices/security guards as they can simply integrate their existing intercom system with the GVR3550 by plugging it into the back of the GVR3550 right there in the security office. Many dedicated security offices have all of the alarms, sirens and intercoms routed back to the security office, in which case all you have to do is connect those devices to the back of the GVR3550.

- Connect existing security sirens to the alarm outputs so that when a camera paired to the GVR3550 triggers an alarm, it notifies the siren and the siren goes off
- Connect existing motion or door sensors to the alarm inputs so that if the motion/door sensor goes off, the GVR3550 can trigger its other alarms and alarm notifications
- Connect existing intercoms microphones to the audio input to allow the audio to be played through connected speakers, through the speaker on a camera or to a speaker connected to the camera
- Connect speakers to the audio output

Once these devices are connected to the GVR3550, users need to login to the product's user interface to tell the GVR3550 what to do when an alarm is triggered by a 3rd party device. The Alarm Action section of the Web UI is where these features would be setup.

Conclusion

Protecting physical assets and people using video surveillance will continue to play out in boardrooms and conference rooms as business owners and executives assess risk management strategies and other programs aimed at detecting intrusion, preventing loss, reducing theft, etc. With declining prices and rapid technology advancement, the adoption of IP video surveillance over analog CCTV is experiencing tremendous growth within large enterprise and SMBs alike. IP's open source platform allows businesses to easily add and run video surveillance applications onto the existing VoIP/SIP network for reduced costs, productivity and customer service enhancing solutions.

Grandstream is one of the few providers in the marketplace that, in addition to offering a complete portfolio of voice solutions like IP PBXs, desktop phones and videophones, also markets an extensive line of indoor and outdoor HD cameras, decoders/encoders, VMS and NVR products. Everything a business needs to migrate existing video cameras or add newer HD cameras to the business mix for a sophisticated physical security/video surveillance solution.

It's no longer complicated or necessary to hire an outside consultant to recommend, install, monitor and maintain video surveillance. Cost-effective, high quality HD imagery IP cameras from Grandstream are available for capturing, recording, viewing and managing video wherever and whenever is necessary. Real-time or recorded monitoring of camera video feeds at any location in the network world-wide can be viewed 24x7 via mobile devices and videophones for complete mobility.



Grandstream Networks

A Complete SIP Business Communications Provider

An advocate of all things IP, Grandstream Networks believes that every business is unique and that 'no size fits all.' From its inception selling ATA's to customers wanting to migrate to IP while using their older, analog telephones, Grandstream has consistently worked to introduce products to help businesses, of all sizes, around the globe implement VoIP solutions that positively impact productivity and the bottom-line. A decade later, Grandstream has expanded its product set from ATAs to also include SIP-based telephones used in a variety of on-premise or hosted environments to IP Multimedia Phones for desktop video calling and Internet applications to IP video surveillance cameras for physical security monitoring. Grandstream helps bring the business value of VoIP to the desktop.

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