



GSP America Video Surveillance
Buyers Guide
Version 1.0

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Contents

Introduction to Video Surveillance

Chapter 1: [What type of cameras should I use?](#)

Chapter 2: [How should I connect cameras to video management systems?](#)

Chapter 3: [What type of video management system should I use?](#)

Chapter 4: [What type of storage should I use?](#)

Chapter 5: [What type of video analytics should I use?](#)

Chapter 6: [How should I view my surveillance video?](#)

Chapter 7: [How should I integrate video with my other systems?](#)

System configuration examples

Preface

Who is this Book for?

This book is designed for anyone looking to use video surveillance/CCTV systems. The book's goal is to help you understand the basics of video surveillance and guide you in making decisions about specific GSP America products.

Can I Share this Book with Others?

Yes. This is a free and “open source” book. You can share and copy the book as long as you attribute the source (Peter Brissette, GSP America and John Honovich, IPVideoMarket.info) and do not restrict other's ability to share the book. This is technically called a “Creative Commons Attribution-Share Alike 3.0 Unported License.”

Email me at peter@gspamerica.com with any questions.

Will this Book be Updated?

Yes, this book will be updated 2 to 3 times per year and is designed to be a living book that reflects ongoing developments in video surveillance.

Can I Suggest Improvements or New Topics for the Book?

Yes, I strongly encourage you to suggest improvements or new topics. Please email me at peter@gspamerica.com.

About GSP America

GSP America is a manufacturer of high quality video security cameras, DVRs, and system equipment. GSP originally was offered through OEM partners into the US for over eight years and the decision was made to brand GSP America directly two years ago. Since then we have been building a network of distributors around the country with the help of many loyal customers and large network of manufacturer reps.

Expert Help

Whether you are new to video security or not GSP America is able to assist you in developing video security as a successful part of your business model. We have developed an extensive amount of training that will allow you to quickly get up to speed on products and understanding of basic CCTV systems.

About the Author

Peter Brissette is the National Sales and Marketing Manager for GSP America. He works extensively creating training and marketing materials for distributors, manufacturing reps, integrators and end users. Prior to GSP America Peter has worked with a variety of technology companies focused on developing their sales and marketing teams in various industries. Much of the focus has been developing the marketing and sales systems for small businesses from the ground up.

How the guide is structured

This guide is built around the 7 fundamental questions to answer when designing a video surveillance system. John Honovich with IPvideomarket.info is the author of the seven questions. His comments will appear in bold type.

I have added to his comments and provide more in depth information in particular on camera options and selection. You will find this document to be very informative on everything related to Video Security today. I will also make specific product recommendations through out the document to help guide you in choices specifically related to GSP Americas product offering. In addition I provide several links to more in depth training and information so that you can dig a little deeper if you want to.

Introduction

How to Design Video Surveillance Solutions

Designing a video surveillance solution requires decisions on 7 fundamental questions. This tutorial walks the reader through each issue explaining the basic options and the rationale for selecting different options.

This is a survey to help those new to video surveillance. Its goal is to quickly identify the key aspects of video surveillance design, not to examine the many details and edge cases in such designs.

The 7 fundamental questions are:

- What type of cameras should I use?**
- How should I connect cameras to video management systems?**
- What type of video management system should I use?**
- What type of storage should I use?**
- What type of video analytics should I use?**
- How should I view my surveillance video?**
- How should I integrate video with my other systems?**

Chapter 1: What type of cameras should I use?

Cameras are literally the eyes of a video surveillance system. Cameras should be deployed in critical areas to capture relevant video.

One of the first things you can do is sketch out the building to help you determine camera placements and distances and areas to be covered.

Field of View – Determining the Correct Lens

This is probably the first biggest question you will have to answer. It is all about what the camera will see and thus what the user is going to be able to see. You need to look at distances and think about what information it is you are trying to capture. You can take pictures with a digital camera that will help in making determinations.

For more information on how to determine field of view and the correct lens options visit my [training video by clicking here](#).

Here is a quick chart to give you a basic idea of the horizontal field of view at a given length with various lens options.

1/3" CCD image
device

Size of Lens	FOV Horizontal Degrees	FOV@ 25 ft	FOV @50 ft	FOV @100 ft
50mm	5.5	2.4	4.8	9.6
35mm	7.85	3.4	6.9	13.7
25mm	10.97	4.8	9.6	19.2
16mm	17.06	7.5	15	27.5
12mm	22.62	10	20	40
8mm	33.4	15	30	60
6mm	43.6	20	40	80
4mm	61.93	30	60	120
2.6mm	85.42	46.2	92.3	184.6

Another quick way to determine the correct lens is to take your distance and divide by width of the scene and then multiply by 4.8. (4.8mm is the standard width of a 1/3" image sensor) So if you have a distance of 50 feet with a 10 foot wide scene its then 5 times 4.8 which equals 24. So you would need to have a camera with at least a 24mm lens on it.

Then you have the two basic principles of camera deployment which are (1) use chokepoints and (2) cover assets.

Chokepoints are areas where people or vehicles must pass to enter a certain area. Examples include doorways, hallways and driveways. Placing cameras at chokepoints is a very cost-effective way to document who entered a facility.

Assets are the specific objects or areas that need security. Examples of assets include physical objects such as safes and merchandise areas as well as areas where important activity occurs such as cash registers, parking spots or lobbies. What is defined as an asset is relative to the needs and priorities of your organization.

Once you determine what areas you want to cover, there are 4 camera characteristics to decide on:

1.Fixed vs PTZ: A camera can be fixed to only look at one specific view or it can be movable through the use of panning, tilting and zooming (i.e., moving left and right, up and down, closer and farther away). Most cameras used in surveillance are fixed. PTZ cameras are generally used to cover wider fields of views and should generally only be used if you expect a monitor to actively use the cameras on a daily basis. A key reason fixed cameras are generally used is that they cost 5 -8 times less than PTZs (fixed cameras average \$200 - \$500 USD whereas PTZ cameras can be over \$2,000 USD).

2.Color vs Infrared vs Thermal: In TV, a video can be color or black and white. In video surveillance today, the only time producing a black and white image makes sense is when lighting is very low (e.g., night time). In those conditions, black and white images are produced by infrared or thermal cameras. Infrared cameras require special lamps (infrared illuminators) are fairly inexpensive for producing clear image in the dark. Thermal cameras require no lighting but product only outlines of objects and are very expensive (\$5,000 - \$20,000 on average) In day time or lighted areas, color cameras are the obvious choice as the premium for color over black and white is trivial.

3.Standard Definition vs. Megapixel: This choice is similar to that of TVs. Just like in the consumer world, historically everyone used standard definition cameras but now users are shifting into high definition cameras. While high definition TV maxes out at 3 MP, surveillance cameras can provide up to 16 MP resolution. In 2008, megapixel cameras only represent about 4% of total cameras sold but they are expanding very rapidly.

4.IP vs Analog: The largest trend in video surveillance today is the move from analog cameras to IP cameras. While all surveillance cameras are digitized to view and record on computers, only IP cameras digitize the video inside the camera. While most infrared and thermal cameras are still only available as analog cameras, you can only use megapixel resolution in IP cameras.

Additional considerations on choosing Cameras

Light Levels

The lighting of any given scene is another determining factor for choosing the correct camera. Below is a chart that talks about Lux ratings. A standard camera spec that you will see is the Lux rating. The smaller the number the lower light the camera should be able to handle. An Infrared camera can actually be used in scenes where there is no light at all. In fact this is the best application of an Infrared camera. There are also other camera types that can handle very low light. Those include Intensifier cameras that use what's called a "sense-up" technology and also WDR cameras using Pixims Digital Image Sensor that work very well in low light and high contrasting light situations.

Lux Ratings

Type of Light	Foot Candle	LUX
Direct Sunlight	10000	100000
Full Daylight	1000	10000
Overcast Day	100	1000
Dusk	10	100
Twilight	1	10
Deep Twilight	-1	1
Full Moon	-0.01	0.1
Quarter Moon	-0.001	0.01
Moonless Night	-0.0001	0.001
Overcast Night	-0.00001	0.0001

	Foot Candle	Lux
Manufacturing- Rough	20	200
Manufacturing- Fine	100	1000
Retail	50	500
Banks Lobby	20	200
Banks Tellers	50	500
Hospital - Operating Room	1800	18000
Offices - General	30	300

A minimum Lux rating for a decent low light camera is .5 Lux. Much better would be a camera with .05 lux. You will see infrared cameras with a lower lux rating than even that.

Outdoor cameras

If you are putting cameras outdoors you need to be aware of the IP rating. IP in this case stands for Ingress Protection. It's a European standard for rating how waterproof and weather resistant the camera will be. A minimum rating would be IP 65.

Here is a chart of the IP standards.

First Digit	Protection from solid objects	Second Digit	Protection from moisture
0	No Protection	0	No Protection
1	Protection against objects >50mm	1	Protection against vertically dripping water
2	Protection against objects >12.5mm	2	Protection against spraying water ± 15° from vertical
3	Protection against objects >2.5mm	3	Protection against spraying water ± 60° from vertical
4	Protection against objects >1.0mm	4	Protection against spraying water ± 90° from vertical
5	Dust Protected (limited ingress)	5	Protection against low pressure jetting water
6	Dust Tight Protection	6	Protection against high pressure jetting water
7	N/A	7	Protection against temporary immersion (15cm and 1m)
8	N/A	8	Protection against continuous immersion under pressure

Full Body cameras can be placed inside an outdoor housing in order to place a camera outside. Full Body cameras can typically use a lens with a much longer focal length. Other outdoor cameras include Vandal Domes, Outdoor PTZs, and Enviro or “bullet” cameras.

Wide Dynamic Cameras

WDR cameras use a different type of image sensor in order to be able to work much better in difficult lighting situations. GSP America uses Pixim's Digital Image sensor in our WDR cameras to offer better solutions in high contrast and changing light conditions. Some examples would be cameras looking at cars, cameras in lobby areas where there are windows and doors that open to the outside. For more details on the GSP America cameras with Pixim Digital Technology visit this site by [click here](#).

Camera Specifications

Some of the key specifications that you can look for in cameras include how many lines of resolution the camera has. Typical that you might see is 540 TVL (TV Lines) for a higher resolution camera. Other resolutions are 480 and 380 TVL. Sometimes you will even see 420 TVL but you typically want to shy away from cameras with that specification since most of those are coming from low cost manufacturers and are not typically good quality cameras.

For detailed understanding of basic camera specs [view my training videos by click here](#).

Most organizations will mix and match a number of different camera types. For instance, an organization may use infrared fixed analog cameras around a perimeter with an analog PTZ overlooking the parking lot. On the inside, they may

have a fixed megapixel camera covering the warehouse and a number of fixed IP cameras covering the entrance and hallways.

[Click here to read about possible system configurations.](#)

For detailed video training information please click on the links below.

[PTZ Cameras](#)

[Dome Cameras](#)

[WDR Cameras](#)

[Intensifier Cameras](#)

[IP Cameras](#)

Chapter 2: How should I connect (and power) cameras to video management systems?

In professional video surveillance, cameras are almost always connected to video management systems for the purpose of recording and managing access to video. There are two main characteristics to decide on for connectivity.

●**IP vs. Analog: Video can be transmitted over your computer network (IP) or it can be sent as native analog video. Today, most video feeds are sent using analog but migration to IP transmission is rapidly occurring. Both IP cameras and analog cameras can be transmitted over IP. IP cameras can connect directly to an IP network (just like your PC). Analog cameras cannot directly connect to an IP network. However, you can install an encoder to transmit analog feeds over IP. The encoder has an input for an analog camera video feed and outputs a digital stream for transmission over an IP network.**

●**Wired vs Wireless: Video can be sent over cables or through the air, whether you are using IP or analog video. Over 90% of video is sent over cables as this is generally the cheapest and most reliable way of sending video. However, wireless is an important option for transmitting video as deploying wires can be cost-prohibitive for certain applications such as parking lots, fence lines, remote buildings. Learn more about when and how to use wireless video surveillance.**

Here is some additional information on the cabling options for a typical analog system.

There are basically three cable methods for a standard analog system.

1. Coax
2. UTP (Unshielded Twisted Pair)
3. Fiber Optic

Coax

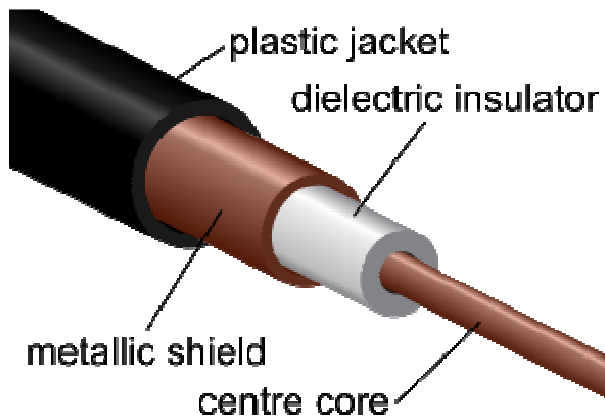
*Minimum cable requirements:

75 ohm impedance

All-copper center conductor

All-copper braided shield with 95% braid coverage

Cable Type*	Maximum Distance
RG-59/U	750 ft
RG-6/U	1,000 ft
RG-11/U	1,500 ft



Coax is the most frequently used method used to connect analog video security systems. It is fairly easy to work with and provides excellent image quality. It is connected using BNC connectors. You only need a crimping tool and a coax wire stripper to prepare the connections. You do need to be careful of how much you bend the cable and watch out for interference from power lines and machinery.



UTP – Unshielded Twisted Pair

You can convert a 100-ohm balanced 24 gauge network type cable (Cat 2 to 6) unshielded to a 75-ohm unbalanced video signal. It is used in conjunction with video baluns (passive or active) in order to convert the signal. UTP has noise immunity and can be placed close to power lines with little or not interference. It can be used in up to 1000 ft distances in a passive system. (6000 ft or more with active system.)

Fiber Optic Cable

This is another method used when working with very long distances and when video quality is a strong determining factor. It is much more expensive and requires special handling.

Power Options

Most cameras can be powered by 12 Volt DC or 24 Volt AC. The power can come from local power from a transformer or you can use a Multi-Camera power supply, sometimes called a PDU (power distribution unit). There are many manufacturers of power supplies but we recommend Stealth Labs.

A multi-camera power supply is able to provide power to multiple cameras. Typically comes in 4, 8, 16 and 32 channel options. They can be AC, DC or both.

Reasons to use a multi-camera power supply

- Usually have some type of fuse options built in as well
- Ties up only one power outlet
- Cameras cannot be accidentally unplugged
- Provides a much cleaner and professional installation

Distance Concerns

DC and AC are very different. DC power can only typically only go about 300 feet. AC power will typically be able to run the same distances as standard video cable runs. We have detailed distance and power charts available if you need them. You can see more detailed [information by viewing our training video by clicking here.](#)

For outdoor PTZs

Always have a separate power supply as close as possible to the camera that will provide 24 Volt AC power for the camera. It will also provide power for the housing for heaters and blowers. The recommended power supply would be the Stealth Labs PS2420E

Chapter 3: What type of video management system should I use?

Video management systems are the hub of video surveillance solutions, accepting video from cameras, storing the video and managing distribution of video to viewers. There are 4 fundamental options in video management systems. Most organizations choose 1 of the 4. However, companies may have multiple types when they transition between one and another.

•DVRs are purpose built computers that combine software, hardware and video storage all in one. By definition, they only accept analog camera feeds. Almost all DVRs today support remote viewing over the Internet. DVRs are very simple to install but they significantly limit your flexibility in expansion and hardware changes. DVRs are still today the most common option amongst professional buyers. However, DVRs have definitely fallen out of favor and the trend is to move to one of the 3 categories below.

•HDVRs or hybrid DVRs are DVRs that support IP cameras. They have all the functionality of a DVR listed above plus they add support for IP and megapixel cameras. Most DVRs can be software upgraded to become HDVRs. Such upgrades are certainly a significant trend and is attractive because of the low migration cost (supports analog and IP cameras directly). Learn more about the value and issues in selecting HDVRs.

•NVRs are like DVRs in all ways except for camera support. Whereas a DVR only supports analog cameras, an NVR only supports IP cameras. To support analog cameras with an NVR, an encoder must be used.

•IP Video Surveillance Software is a software application, like Word or Excel. Unlike DVRs or NVRs, IP Video Surveillance Software does not come with any hardware or storage. The user must load and set up the PC/Server for the software. This provides much greater freedom and potentially lower cost than using DVR/NVR appliances. However, it comes with significant more complexity and time to set up and optimize the system. IP Video Surveillance Software is the hottest trend in video management systems currently and is the most frequent choice for very large camera counts (hundreds or more).

Key options to choose

- Number of channels
- Method of display
- Duration of recording time
- Maximum frame rate
- Motion detection
- Remote setup and viewing
- Transferring recorded images

What does GSP America offer:

Standalone Embedded DVRs

They come in 4, 6, 8 and 16 channel options. They can be configured with a variety of hard drives to provide the needed storage time required. Our DVRs come with software that will work exclusively with the DVRs to make it easy to manage, view, record, playback and backup your video data.

For detailed information on the features available you can view [our DVR overview](#) and [how to calculate HDD storage times](#) by clicking the links.

PC Based DVR Hybrid (Embedded Windows XP)

The line of PC based DVRs work as hybrid models. They are able to pull in both analog and IP cameras to provide a complete solutions especially for any one migrating from analog over to IP. Our PC DVR will work with any IP cameras in the market today. Client based software is included as a part of the cost of the PC DVRs. Please contact us for a more in depth demonstration and additional details to the many capabilities of the PC DVR line.

PC Based NVR (Embedded Windows XP)

This is the IP version of the DVR mentioned above. It will only work with IP cameras.

CMS Software

GSP America has software that will work with our IP cameras, DVRs (standalone embedded) and Network Video Servers (a device that will accept up to 4 analog inputs and allow you to put those over the network, essentially making them IP cameras). It is software that can be installed on any pc and will allow you to record, playback, remotely access DVRs, make backups etc. It comes in 32, 64 and unlimited version. Currently the 32 channel version is being offered at no additional cost with the purchase of any of our IP cameras. For a short [demonstration of the CMS software version please click here.](#)

Chapter 4: What type of storage should I use?

Surveillance video is almost always stored for later retrieval and review. The average storage duration is between 30 and 90 days. However, a small percentage of organization store video for much shorter (7 days) or for much longer (some for a few years).

The two most important drivers for determining storage duration is the cost of storage and the security threats an organization faces.

While storage is always getting cheaper, video surveillance demands huge amount of storage. For comparison, Google's email service offer about 7 GB/s of free email storage. This is considered to be an enormous amount for email. However, a single camera could consume that much storage in a day. It is fairly common for video surveillance systems to require multiple TBs of storage even with only a few dozen cameras. Because storage is such a significant cost, numerous techniques exist to optimize the use of storage.

The type of security threats also impact determining storage duration. For instance, a major threat at banks is the report of fraudulent investigations. These incidents are often not reported by affected customers until 60 or 90 days after the incident. As such, banks have great need for longer term storage. By contrast, casinos usually know about issues right away and if a problem is to arise they learn about it in the same week. Casinos then, very frequently, use much shorter storage duration (a few weeks is common).

Three fundamental types of storage may be selected:

1. Internal storage is the hard drives that are built inside of a DVR, NVR or server. This today is still the most common form of storage. With hard drives of up to 1 TB common today, internal storage can provide total storage of 2TB to 4TB. Internal storage is the cheapest option but tends to be less reliable and scalable than the other options. Nonetheless, it is used the most frequently in video surveillance.

2. Directly Attached storage is when hard drives are located outside of the DVR, NVR or server. Storage appliances such as NAS or SANs are used to manage hard drives. This usually provides greater scalability, flexibility and redundancy. However, the cost per TB is usually more than internal storage. Attached storage is most often used in large camera count applications.

3. Storage Clusters are IP based 'pools' of storage specialized in storing video from large numbers of cameras. Multiple DVRs, NVRs or servers can stream video to these storage clusters. They provide efficient, flexible and scalable storage for very large camera counts. Storage clusters are the most important emerging trend in video surveillance storage. Learn more about storage clusters for video surveillance.



Please contact us for storage recommendations on any of our products. You can also view the training videos under the DVR section for more details on storage capacity.

Chapter 5: What type of video analytics should I use?

Video analytics scan incoming video feeds to (1) optimize storage or (2) to identify threatening/interesting events.

Storage optimization is the most commonly used application of video analytics. In its simplest form, video analytics examines video feeds to identify changes in motion. Based on the presence or absence of motion, the video management system can decide not to store video or store video at a lower frame rate or resolution. Because surveillance video captures long periods of inactivity (like hallways and staircases, buildings when they are closed, etc.), using motion analytics can reduce storage consumption by 60% - 80% relative to continuously recording.

Using video analytics to identify threatening/interesting events is the more 'exciting' form of video analytics. Indeed, generally when industry people talk of video analytics, this is their intended reference. Common examples of this are perimeter violation, abandoned object, people counting and license plate recognition. The goal of these types of video analytics is to pro-actively identify security incidents and to stop them in progress (e.g., perimeter violation spots a thief jumping your fence so that you can stop them in real time, license plate recognition identifies a vehicle belonging to a wanted criminal so you can apprehend him).

These video analytics have been generally viewed as a disappointment. While many observers believe that video analytics will improve, the video analytics market is currently contracting (in response to its issues and the recession). Learn more about the challenges of video analytics.

We have basic analytics available for storage optimization in our standard DVR line and can provide more advanced analytics in our PC DVR systems. Please contact us for more details.

Chapter 6: How should I view my surveillance video?

Surveillance video is ultimately viewed by human beings. Most surveillance video is never viewed. Of the video that is viewed, the most common use is for historical investigations. Some surveillance video is viewed live continuously, generally in retail (to spot shoplifters) and in public surveillance (to identify criminal threats. Most live video surveillance is done periodically in response to a 'called-in' threat or to check up on the status of a remote facility.

4 fundamental options exist for viewing video.

- **Local Viewing directly from the DVR, NVR or servers is ideal for monitoring small facilities on site. This lets the video management system double as a viewing station, saving you the cost of setting up or using a PC. This approach is most common in retailers, banks and small businesses.**
- **Remote PC Viewing is the most common way of viewing surveillance video. In this approach, standard PCs are used to view live and recorded video. Either a proprietary application is installed on the PC or a web browser is used. Most remote PC viewing is done with an installed application as it provides the greatest functionality. However, as web applications mature, more providers are offering powerful web viewing. The advantage of watching surveillance video using a web browser is that you do not have to install nor worry about upgrading a client.**
- **Mobile Viewing allows security operators in the field to immediately check surveillance video. As responders and roving guards are common in security, mobile viewing has great potential. Though mobile clients have been available for at least 5 years, they have never become mainstream due to implementation challenges with PDAs/phones. Renewed interest and optimism has emerged with the introduction of the Apple iPhone.**
- **Video Wall Viewing is ideal for large security operation centers that have hundreds or thousands of cameras under their jurisdiction. Video walls provide very large screens so that a group of people can simultaneously watch. This is especially critical when dealing with emergencies. Video walls generally have abilities to switch between feeds and to automatically display feeds from locations where alarms have been triggered.**

We have many of these options mentioned above available as standard features as a part of the GSP America product line. You can view more detailed training referenced in many of the links above that discuss these options further.

Chapter 7: How should I integrate video with my other systems?

Many organizations use surveillance video by itself, simply pulling up the video management systems' client application to watch applications. However, for larger organizations and those with more significant security concerns, this is an inefficient and poor manner to perform security operations. Instead, these organizations prefer an approach similar to the military's common operational picture (COP) where numerous security systems all display on a singular interface. Three ways exist to deliver such integration with video surveillance:

- **Access Control as Hub: Most organizations have electronic/IP access control systems. These systems have been designed for many years to integrate with other security systems such as intrusion detection and video surveillance. This is the most way to integrate video surveillance and relatively inexpensive (\$10,000 - \$50,000 USD). However, access control systems are often limited in the number and depth of integration they support.**

- **PSIM as Hub: In the last few years, manufacturers now provide specialized applications whose sole purpose is to aggregate information from security systems (like video surveillance) and provide the most relevant information and optimal response policies. These applications tend to be far more expensive ((\$100,000 - \$1,000,000 USD) yet support a far wider range of security manufacturers and offer more sophisticated features.**

- **Video Management System as Hub: Increasingly, video management systems are adding in support for other security systems and security management features. If you only need limited integration, your existing video management system may provide an inexpensive (yet limited) solution.**

Many of the GSP America products can make use of sensor inputs to enhance video security. Things like motion sensors, door alarms and glass breakage sensors can be integrated into our DVRs, PTZs and IP Cameras to provide an extra measure of security to make sure the images needed are being recorded.

Other System Configuration Options

I would like to talk about another option to help those who may already have analog cameras and DVRs but would like to move into the IP world. Lets say you currently have 4 analog cameras and would like to add an IP camera to the mix. You can take and replace the DVR with one of our four channel Network Video Servers. (GNS-400) and connect all of your analog cameras to it. Then you can purchase one of our many IP cameras and connect it to your network as well. You can then install our 32 Channel CMS software, that is included at no extra cost, on any PC in your office that has some available hard drive space to record too. You can set up the software to record on motion detection just like on your DVR and you will be able to view, record and play back all five cameras very easily. You will also be able to access them remotely via a web browser.

Another common scenario is situations where clients have IP cameras, and possibly even some megapixel cameras but they are very unhappy with the results from their software solution. We have provided excellent solutions for easier management and use of these type of systems with our PC DVR/NVR line of systems. We feel a hardware/software solution is much more of a robust and solid option to what is out there today. By making use of our PC DVR/NVR products customers are finding that they have a much easier time of managing their video data and getting the results they are looking for but so far have not been able to find.

Possible System Examples

Here are some specific recommendations on an 8 camera installation. So lets assume that there are 8 cameras total for an installation. 4 outside and 4 inside. In this case lets assume they just want to use analog cameras with standard definition. The four cameras outside can be placed on the building and there are lights in the parking area providing a decent amount of light. You could use our WDR cameras in a vandal dome with 540 TV Lines of resolution. Model number would be GPX-V704DS. A typical lens choice would be a 4-9mm varifocal lens. The 4 cameras inside are covering door ways and some warehouse space and a computer room. For the lobby door since there is day light coming in through windows it would be best to use a WDR camera there as well. A standard 4" dome would work well in that case with 540 TV lines of resolution. Model number GPX-4D704DS with a 4-9mm varifocal. The remaining cameras could be standard CCD cameras and you could use our standard 4" indoor domes. Model number would be GSP-4D54S. 2 of them would be with a 4-9mm lens but one of them is covering a larger warehouse area so you could go with a 2.6-6mm lens that would give you a much wider angle to able to cover everything. Since they are analog cameras you would be recording to a DVR. (more on that later)

Given the same scenario if you did it as an IP option.

4 outdoor cameras would be model GPX-IPV802DS with 4-9mm lens
Indoor cameras would be GPX-IP4D802DS with 4-9mm lens for the lobby camera.



Then GSP-IP4D54S for the remaining with 2 of them using 4-9mm lens and the last with a 2.6-6mm lens. Recording could be done with included CMS software on a local pc. Or you could use a NVR to record to as well. (more on both of those later)

If any of the outdoor areas in this case had extremely low light areas you could replace the vandal dome WDRs with one of our Enviro bullet cameras with infrared.

The Pro Enviro models have an effective infrared distance of around 80 feet. The Mini Enviro models are effective around 30ft and the Mini Lites are effective to around 15ft. So you will definitely need to know the distance you are trying to cover.

If you have any questions at all about camera selection please call us and we will be glad to assist you. 1-800-298-0470