CCTV Education
Part I –Video Surveillance Buyers Guide
This CCTV Buyers Guide provides a comprehensive overview of in deploying a successful video surveillance camera system. This guide contains information to design a system, select the products that best fit your CCTV system requirements, and help make key installation decisions that will save you time and money.

The information was derived from deploying 100's of CCTV systems and gathered from CCTV call centers who answer questions from commercial and residential customers. This guide combines the data from past CTV projects and gives the reader a head-start in the successful CCTV project

The first task in a successful CCTV project is to outline the key CCTV objectives.
♦ How many cameras are required?
♦ What are the key FoV (Field of View(s))?
♦ What are the recording requirements?
♦ What are the lighting conditions of each camera location?
♦ Where do I need live video monitoring or a second video monitor?
♦ How long do you need to retain the video files?

There are many details to consider when specifying the correct CCTV Camera System. Professional Video Surveillance is not a cheap endeavor and a budget should be outlined and the best possible system for the buck should be considered. This guide will help the novice CCTV buyer in reviewing camera and recording system for their CCTV and Video surveillance requirements.

Cameras
There are specific cameras that need to be selected based on the FoV, lighting conditions, and the mounting location of the camera. There is no such thing as a one-size fits all in the successful CCTV project. It is important to note each camera location and select the camera best suited for that location.
Answer these questions:
♦ Indoor or Outdoor?
♦ Lighting conditions (during day and night)?
♦ Mounting locations?

Indoor Dome Camera
The indoor dome camera is used in 90% of general indoor applications. It comes in a variety of configurations including standard color, Day/Night, and Infrared versions. It can be mounted on a horizontal or vertical surface but is typically ceiling mounted. Lens options on dome camera may restrict their use in certain applications such as requiring more than a 20mm video lens. Dome cameras are a primary choice in indoor camera locations.
Box Camera
A box camera is a standard camera that can be mounted alone or in an enclosure. The box camera uses a separate lens that screws on to the front surface and provides flexibility for different FoV requirements and is sold without a lens. An auto-iris lens will have a small cable that connects to the camera for iris control in various lighting conditions.
Outdoor Dome Cameras
Outdoor Dome Cameras are typically hard shell vandal-roof casings that offer the same versatility in a variety of lens options. Day/Night outdoor dome cameras are common in applications that have entry and exit points with limited lighting during the night.
Day/Night Camera
The Day/Night camera is the best choice for low-light conditions. The cameras are standard color during daylight conditions, the Day/Night camera switches either digitally of mechanically to a low-lux B/W mode.
Infrared Camera
During No-Light conditions, Infrared cameras provide infrared illumination of the FoF allowing monitoring of areas with no light available. Te IR LEDs are automatically illuminated and the camera switched to the B/W low-lux mode offering camera views in total darkness.
PTZ Camera
Pan-Tilt-Zoom camera offer the ability to view in all directions and optically zoom in as required. PTZ cameras also include standard color, Day/Night modes, and a few IR PTZ cameras have been introduced recently. The CCTV operator can set the PTZ cameras to automatically rotate to different FoVs. Options include Auto-tracking applications that dynamically track objects in defined areas.

About the Camera technology

Sony CCDs are predominate video element in security cameras today. Sony makes few cameras, but they own the CCD market. Do not think that Sony makes the camera touted as " Sony 1/3" Super HAD Camera" as many vendors advertise their cameras. The camera has a Sony CCD, however the camera is not from Sony and could be almost any brand camera out there. Important factors of lens quality, vari-focal and auto-iris ability, quality of camera housing or enclosure, and lens optics are the difference in a professional CCTV camera.

Facts about Cameras:

♦ If you buy an P4000 camera, you'll get an P4000 view.
♦ 480 TVL should be a minimum requirement in any professional CCTV project.
♦ Location of the camera and the correct lens are keys to quality video capture
♦ Cameras love light and thieves hate the light! Add lighting wherever possible

Camera Enclosure

Box cameras can be mounted in a variety of enclosures. Outdoor enclosures in cold climates should include a heater/blower that keeps frost and condensation from forming on the lens and camera. Heater/Blower are commonly 24VAC and should be considered when selecting the CCTV power supply system.

Camera Location

Camera mounting location is critical to the success of the CCTV project. Cameras should be mounted as close possible to the field of view required, and the closer the camera to the subject the better the identification of the subject will be. Proper lens selection relative to the camera location and the FoV required is essential to a quality picture.

Digital Video Recorders

DVRs are an important part of any successful CCTV project. Video resolution is getting larger, recording speeds are getting faster, and video data compression is reducing the video data file size. Terabyte storage capacity is becoming common in many CCTV applications. Network or remote monitoring of CCTV video is standard in all professional DVRs on the market in 2007 and video distribution across LANs, WANs, and the Web have given the DVR a new market outside of video security known as Business Systems Monitoring that allows management to monitor specified key business areas 24 hours a day. No longer just a security video recorder, the DVR has become a business tool for management with remote monitoring applications.

In order to choose the correct DVR for any application, the following questions need to be answered.

♦ How many channels (cameras)?
♦ What speed of recording is required?
♦ How long to retain video files (Hard Drive Size)?
♦ What features are important to the application?
♦ Where will DVR system be located?
♦ What are the Remote monitoring requirements?

In choosing the right DVR for your CCTV application, ensure that you are determining the quantity of cameras needed now and in the next 24 months. DVRs come in 4, 8, 9, and 16 channel increments and this selection is critical because adding cameras above the DVR channels available will require an additional DVR, not just additional channels. DVR systems in large installations are segmented into 16 channels units and are monitored and managed through a Central Management System.

The speed of recording is critical to many CCTV applications. 30 fps (frames per second) is considered real-time video, therefore to obtain 30 fps for the application, 480 fps for 16 channels and 240fps for 8 channels is required. Many CCTV applications will provide real-time (30 fps) live viewing of video channels and 7-15 fps for recorded files. It is acceptable to have 7-15 fps for recorded files in many applications, but technology in DVR systems has pushed real-time video for the masses and 30 fps recording will soon be the standard recording rates across all channels as available today.

Retention of video files is much easier and cost effective in 2007 than ever before. DVR storage at the Terabytes level is common and drives have become faster and more reliable. Retention of video data files can be managed by corporate IT departments as any business critical data and network drive archiving is common.

A critical component of any DVR system is the ability to access the video files. The software provided by DVR manufacturers is proprietary to the DVR unit and the ability to retrieve files chronologically or based on certain security events is vital to the DVR product.

PC-Based vs. Standalone DVRs

Standalone DVR systems were the majority of video recorders sold in the marketplace up until 2006. Computer-based DVRs have become increasingly popular due to the cost and features provide in the latest generation of DVR cards on the market in 2007. The Windows XP PC computer is providing the reliability and performance in today's DVR systems that are required for mission critical video security systems. The open architecture of PC-based DVR systems allow easy integration into corporate LANs and technology upgrades are at a component level. Software upgrades and hard drive storage additions are far less costly that proprietary DVR systems.

Standalone DVRs are imbedded recording systems usually operating under Linux OS. The standalone DVRs are widely used in retail security sites and provide reliable video recording for 4-16 channels. Most DVRs on the market offer network remote access and CD R/W archiving.

Computer-based DVR systems are reliable, fast, and have many advanced applications not found on standalone systems.

Video compression

MPEG4 and H.264 are the video compression of choice in 2007. In summary, MPEG4 is good and H.264 is better. The key to video compression is the resolution and the size of the video. High resolution video files are monster size files and video compression for storage and streaming is critical to any video application. Major advancements in video compression will be seen in 2007 and H.264 will be the codec of choice for DVR manufacturers.

H.264 uses the latest innovations in video compression technology to provide high resolution video quality from the smallest amount of video data required. Smaller files will save bandwidth and storage costs over previous generations of video codec's. H.264 delivers the same quality as MPEG-2 at a third to half the data rate and up to four times the frame size of MPEG-4 Part 2 at the same data rate. H.264 is used in the latest video devices for High Definition video devices, and should be considered for any professional CCTV project.

Network Access and Remote Viewing

Network access is the ability to remotely monitor a video server across the LAN, WAN, or internet. A very important application for any DVR system is the ability to monitor live and access to recordings through remote access.

Advanced DVR Features

Many CCTV systems are releasing advanced security and specialty software for security enhancements. These include:
♦ Object counting
♦ POS Integration
♦ PTZ Auto-Tracking
♦ Face Recognition
♦ Access Control Integration

CCTV Cabling and System Layout

DVR Location

In choosing the optimal location for the DVR system, consider the access of the area for centralized control and security of the area. The DVR is the heart of the CCTV system and should be protected as necessary to ensure it is safe from theft or damage. If the security breach includes theft of the DVR component, all evidence is carried off under the arm of the thief. And the thieves know this, so ensure that the DVR system is in a lock-box or an appropriate secure area.

Camera Power Supply

Each professional camera requires either 12VDC or 24VAC. Both power options are acceptable and many systems will require both.

Cable Options

Traditional video cable is RG59 coax cable. Siamese dual cable is commonly used that provides RG59u coax together with a pair of 18 gauge wire for the camera power requirements. The dual cable allows single cable runs to each camera for both video and power.

Cat-5 Options

UTP (twisted pair) cabling is becoming more popular with Cat-5e/Cat-6 cabling used in networks. CAT cabling is lighter and less expensive than coax cabling and requires balun connectors to match the impedance of the video signal. Coax and UTP connections up to1000' feet are acceptable. A balun is used to match the impedance on Cat-5 connections on the DVR and camera connections.

The Successful Video Surveillance Project
♦ Quality Plan
♦ Quality Cameras
♦ Quality DVR
♦ Quality Installation

Call us at 524-4454 / 524-4279 / 524-4465 / 536-7449. Or visit our website and see what we have to offer you.