RISCO GROUP

Creating Security Solutions. With Care.

Net DVR

CCTV
IP Surveillance
& Video

Glossary

Date: January 22, 2009
Version: 1.0

Aperture of a lens on a video camera controls the amount of light which is allowed to reach the image sensor. Aperture is listed in terms of an F-stop number. As the F-stop number increases (i.e. F/1.4, F/1.8, F/2.8), the amount of light permitted to reach the image sensor decreases.

Auto Iris (AI) is an electronic circuit that acts as an iris on CCD cameras by electronically shuttering the CCD sensor. Or an automatic method of varying the size of a lens opening in response to changes in scene illumination.

BNC is the type of connector plug commonly found on CCTV devices for video and audio input/output connections. BNC is the choice for broadcast video and security video professionals because of its locking design. BNC plugs are easily adapted to standard consumer RCA connectors using a simple one-piece plug adapter.

Balance Light Control (BLC) is a method to compensate for bright spots in the picture. It is also important to consider whether there are bright spots in the picture such as car headlights which can make identification of the vehicle registration or model impossible. This can also be a major problem where it is necessary to identify a person who is moving from bright daylight into artificial daylight. This could result in the subject becoming an unidentifiable silhouette.

Bandwidth indicates the complete range of frequencies over which a circuit or electronic system can function with minimal signal loss. In effect, bandwidth indicates the amount of information and its complexity which can be carried over a signal. More complex information requires more bandwidth for an effective signal. (I.e. color video bandwidth is greater than monochrome video bandwidth, which is greater than the bandwidth for one channel of audio).

Bit rate (in kbit/s or Mbit/s) is often referred to as speed, but actually defines the number of bits/time unit and not distance/time unit.

CCD stands for charged coupled device. This is a solid-state semiconductor element which uses hundreds of thousands of tiny pixel elements to accept light and translate that information into a vivid, visible picture image. A CCD is one type of camera image sensor. CCDs produce MUCH higher resolution, lower light sensitivity, and better overall video quality than CMOS imagers (also commonly found in CCTV industry cameras).

CCTV stands for closed circuit television: a video system which will only be monitored in a closed environment (as opposed to public broadcast). The realm of video security and surveillance is also referred to as CCTV

CIF (Common Intermediate Format) CIF refers to the analog video resolutions 352x288 pixels (PAL) and 352x240 pixels (NTSC). See also Resolution.

CMOS stands for charged metal oxide semiconductor. This is one type of camera image sensor which uses a charged metal surface to detect light and create a video image. CMOS technology is often smaller than CCD chips are currently capable of, so these cameras can often be quite miniature. Even the highest resolution CMOS cameras cannot compete with newer CCD imagers in resolution, sharpness, and low light performance.

Coaxial Cable is the most common type of cable used for transmitting a video signal through copper wire. This type of wiring has a coaxial cross-section where an outer shielding protects the actual interior

signal conductor from electromagnetic interference. In the CCTV industry, the term "coax" usually refers to RG-59 cable with BNC-type plug ends.

Codec refers to an internal computer component which processes analog information (like a video or audio signal) into a digital format such as MJPEG, MPEG-4, etc. for electronic storage on digital recording media. Without a codec in place to compress and digitize video, digital video recording to a hard disk drive would not be possible.

Composite Video is the standard type of analog video signal utilized by most CCTV video cameras. This signal is plug and play compatible with most consumer television and VCR equipment. However, this type of video should not be confused with digital "component" inputs which may ALSO found on newer televisions and other home video equipment. A composite video signal has the correct phase rate, luminance, and chrominance information to be compatible with a particular video format such as NTSC, PAL, EIA, CCIR, etc.

Compression Method refers to the computer software technique the codec in a DVR video recorder or IP Camera uses to convert the video signal to digital information so it can be compressed and stored on digital media like a hard disk drive, DVD, or CD. Uncompressed video would require massive processing power and nearly unlimited storage capacity and is, therefore, completely out of the question in the real world. MPEG (M-JPEG) is the most common type of compressed digital video, but there are variants of these in addition to other proprietary formats. MPEG-1 and MPEG-2 typically offer the highest quality recording (DVDs use MPEG-2), but smaller file sizes can be obtained by using a lower resolution, more efficient compression method like MPEG-4 and H.264 which utilize 30% less bandwidth and storage than MPEG-4

Digital Video Recorder (DVR) - This device is capable of accepting one or more video (and sometimes audio) input signals for recording onto digital storage media. A DVR is basically a computer specifically designed to gather and compress video into a digital video format for storage on a hard disk drive or other form of digital media

DHCP (Dynamic Host Configuration Protocol) DHCP is a protocol that lets network administrators automate and centrally manage the assignment of Internet Protocol (IP) addresses to network devices in a network. DHCP also supports static addresses for e.g. computers running web servers, which need a permanent IP address.

DNS (Domain Name System) DNS is used to locate and translate Internet domain names into IP (Internet Protocol) addresses. A domain name is a meaningful and easy-to-remember name for an Internet address. For example the domain name www.example.com is much easier to remember than 192.0.34.166. The translation tables for domain names are contained in Domain name servers.

Domain server Domains can also be used by organizations that wish to centralize the management of their (Windows) computers. Each user within a domain has an account that usually allows them to log in to and use any computer in the domain, although restrictions may also apply. The domain server is the server that authenticates the users on the network.

Effective Pixels concerns the operation of a camera's CCD image sensor. A CCD is comprised of hundreds of thousands of tiny pixel elements which translate light to a visible video image. But effective pixels must be distinguished from total pixels. Of the total number of pixels contained on a CCD image chip, some are not used for video imaging whatsoever. The number of effective pixels indicates exactly how many of the pixels are actively at work to deliver video. A higher number of effective pixels tend to indicate a higher resolution camera, though this number may not always describe actual video quality in the important categories of sharpness, color saturation and vividness, as well as low light performance.

Focal Length - the distance from the surface of the lens and its focal point.

Frame - a full frame of video is the combination of two image fields interlaced together. A frame is one basic screen capture taken by a camera. 30 frames are displayed in one second of real time video for NTSC format. PAL format is phased at a rate of 25 frames per second for real time.

Frames per Second (FPS) describes the number of full video frames displayed or recorded within one second. True real time video consists of 30 frames/sec. for NTSC format and 25 frames / sec. for PAL format. Be sure not to confuse frames per second with "fields per second" or "images per second". A complete frame of video is compiled of two separate images (or fields), so the number of fields in one second is always twice the number of frames per second.

FPS Record Rate describes exactly how many frames per second a video recorder can actually capture. Analog recorders like VCRs can easily record in real time (30 frames / sec. for standard NTSC) or time lapse (fewer than 30 frames/sec. for NTSC). Many digital DVR recorders, however, cannot record actual real time video. For most situations, recording rate is the spec to pay attention to. (Specifications for digital video equipment are not the only numbers to rely on. In fact, many DVR recorders outperform their specifications upon real world testing while other low quality units often record at a much slower rate than their specs claim).

Frequency is the number of competed cycles of an electronic signal that occur in a given length of time. Frequency is usually measured in cycles per second (Hertz, Hz). For most CCTV industry equipment, frequency is used to describe the RF radio frequency at which wireless equipment operates. Frequency can also be used to describe the cycles of electrical current for the signal system.

GHz (gigahertz) is a measure of frequency. 1 GHz = 1000 MHz = 10,000 KHz = 100,000 Hz.

Hard Disk Drive (HDD) is a magnetic media storage device for recording digital information (like that used by computers or digital DVR video recorders).

HDD Capacity indicates the amount of information which can be stored on hard disk drive. This figure is measured in bytes.
1 GB = 1016 MB = 1032256 KB = 1048772000 bytes.

HDD Speed indicates the speed at which a hard disk drive is capable of encoding information.

Hz (hertz) is a measure of frequency (indicates cycles per second in an electronic or RF signal).
1 GHz = 1000 MHz = 10,000 KHz = 100,000 Hz.

Image Sensor indicates the type of semiconductor which handles video processing inside of a camera. Older CCTV cameras used tubes to process light information. CMOS and CCD image sensors are the most widely available for security cameras in today's market. CCD cameras provide by far the highest quality video of any type of image sensor.

IP Video Surveillance – A video surveillance system that allows analog and/or IP cameras, operating over a standard IP network, to transmit real-time video feeds over the internet. The video footage is processed and recorded digitally onto an NVR (Network Video Recorder) where it can be accessed remotely by any PC connected to the network

IR Infra Red Light is a frequency of light which is lower than the human eye's visible spectrum (in the range of 850 ~ 950 nanometers). Color cameras can't use infrared light. However, this special band of light can be detected by most any monochrome CCD camera. Therefore, a black and white video camera in combination with infra red lighting can see in pitch dark conditions where the human eye is unable to distinguish anything. An infra red light source appears just the same as any visible light source on a black and white camera image. Infra red lighting for monochrome cameras should in no way be confused with new FLIR (forward-looking infra red) spotting scopes or cameras which produce a grainy, green-tinted picture and do not require additional infra red lighting sources.

IR Infra Red Wavelength indicates the specific frequency of light (measured in nm - nanometers) an infra red illuminator emits

KHz (kilohertz) is a measure of frequency. 1 GHz = 1000 MHz = 10,000 KHz = 100,000 Hz.

Lens - A lens is an optical device which bends light, focusing it on onto a image sensor to create a distinct, visible image. All video cameras (and still cameras) need lenses in order to obtain a clear picture.

Lenses come in a variety of focal lengths. The focal length of a lens, in combination with the size of the imager, will determine its field of view.

Linux is a computer operating system platform upon which the software for many high quality standalone/network DVR video recorders is based. Due to reliability concerns and software glitches associated with Windows® as an operating system platform, using a PC-based video recorder for security or surveillance purposes isn't recommended.

Low Light (or low lux) Sensitivity refers to a camera's performance under low lighting conditions. Although many camera distributors flash very low light "lux" numbers, these numbers often times have nothing to do with real world performance. Specifications offered by CCD manufacturers list the absolute lowest light level at which some pixels will be altered. However, a human being looking at that recorded video will never be able to distinguish anything under the lowest lighting conditions (near pitch black). (The latest Sony 1/3 " CCD chip sets have the best low light performance of any such other CCTV cameras on the market today).

MHz (megahertz) is a measure of frequency. 1 GHz = 1000 MHz = 10,000 KHz = 100,000 Hz.

Multicast - Bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients. See also Unicast**.**

NVR (Network Video Recorder) – A hardware box that receives digital video streams and images over a network and records them onto a hard disk in digital format. Recording and playback is controlled remotely via a network PC.

Network DVR – The same as an NVR, a network DVR is a digital video recorder equipped to allow remote access for viewing, playback, and management over the Internet.

NTSC is the standard color video format used in North America, Japan, and some other places in the world. Black and white EIA video products are also generally referred to as NTSC because nearly all NTSC equipment can also handle black and white EIA video.

Operating System (OS) indicates the basic computer platform a DVR video recorder operates with. DVRs with the Linux Operating System are considered much more stable and reliable for obtaining important video evidence than competing Windows®-based DVR systems.

On Screen Display (OSD) is a method of displaying set-up information or instructions on to a display monitor.

PAL is the standard color video format used in most of Europe, Asia, Israel, and many other places in the world. Black and white CCIR products are also generally referred to as PAL because all PAL equipment can also handle black and white CCIR video.

Pan/Tilt/Zoom (PTZ) indicates equipment with the ability to pan, tilt, and zoom, usually by remote user control. Much of PTZ equipment is completely integrated, meaning there is only one controller necessary to operate all three features.

Pixel - A camera's CCD image sensor consists of thousands of tiny sensor elements known as pixels. These sensors detect information about light and colors and translate that information into a viewable video image through digital signal processing. Of the total pixels on a CCD imager, some are constantly dormant while others are effective and actively work to create an image.

Power Consumption refers to the amount of electrical current an electrical devices requires for operation, usually measured in amps (A) per hour (often seen in mA milliamps, 1 amp = 1000 milliamps). For example, a miniature video camera which draws 100 mA per hour will consume 1 ampere hour for every ten hours of continuous operation.

Quad Processor is a video switching device that accepts video input from four cameras and converts them to all display on one monitor and/or video recorder. When using multiple cameras, quads and multiplexers help to cut down on the amount of additional equipment needed for a dedicated surveillance system. Digital Video Recorders with multiple video inputs are quickly replacing quads and multiplexers.

RCA is a common connector plug for standard consumer video and audio equipment. This type of connector plug may also be described as a "phono" plug. RCA jacks are found on all VCRs and televisions equipped to handle a composite video input. In most cases, RCA jacks are color coded yellow, white, and red. BNC plugs are easily adapted to standard consumer RCA connectors using a simple one-piece plug adapter.

Recording Media refers to the magnetic storage device used to store recorded video. For many analog recorders this is a tape cassette, but DVR recorders use HDD hard disk drives. CDs and DVDs can also be types of media used to record digital video.

Remote Playback is a feature of many DVR video recorders. This allows users to play back recorded video over the internet from virtually any computer in the world.

Remote Viewing is a feature of many DVR video recorders. This allows users to monitor CCTV cameras over the internet from virtually any computer in the world.

Remote Zoom indicates the ability to adjust a camera's field of view by remote control. Remote zoom may also be described as powered zoom.

Resolution (TV lines) refers to the maximum number of vertical lines/pixel elements (horizontal resolution) a video camera is capable of displaying on a monitor or registering with a video recording device. Horizontal resolution indicates the number of pixel elements placed horizontally across each scanning line of resolution (vertical resolution). Horizontal resolution varies based on the abilities of each different camera and each different monitor. The more lines of resolution per picture, the better the clarity of the overall picture will be. Although the number of TV lines of horizontal resolution is generally considered a measure of a camera's level of detail and sharpness, this specification does not always indicate true end video quality. When choosing a home security camera system, you must consider the resolution of each individual component (camera, monitor, recording device) comprising your home security camera system so you can select components with similar resolution.

Resolution (Scanning lines) refers to something quite a bit different from what is generally considered to be resolution. Scan lines (also referred to as "vertical resolution") of video are equivalent for each different video format, but every device must comply with these standards. Horizontal resolution, on the other hand, indicates the number of pixel elements contained horizontally across these scanning lines. Horizontal resolution varies based on the abilities of each different camera and each different monitor. Video display on a monitor requires the image to be constantly shifting (scanning) in order to display in real time. For instance, NTSC format video is based on a 525 scanning lines operating at a frequency of 60 Hz (PAL format is 625 lines, 50 Hz) for transmission and display of video images. This is an interlaced system in which each frame is scanned in two fields of 262 lines, which is then combined to display a complete frame of video with 525 scan lines.
NTSC Standards CIF = (352 pixels x 240 lines), 2CIF (704x240), 4CIF (704x480), D1 (720x480)
PAL Standards CIF = (352 pixels x 288 lines), 2CIF (704x288), 4CIF (704x576), VGA (640x480)

RTP (Real-Time Transport Protocol) - RTP is an Internet protocol for the transport of real-time data, e.g. audio and video. It can be used for media-on-demand as well as interactive services such as Internet telephony.

RTSP (Real Time Streaming Protocol) - RTSP is a control protocol, and a starting point for negotiating transports such as RTP, multicast and Unicast, and for negotiating codecs. RTSP can be considered a “remote control” for controlling the media stream delivered by a media server. RTSP servers typically use RTP as the protocol for the actual transport of audio/video data.

Router - A device that determines the next network point to which a packet should be forwarded on its way to its final destination. A router creates and/or maintains a special routing table that stores information on how best to reach certain destinations. A router is sometimes included as part of a network switch. See also Switch.

S/N (Signal-to-Noise) Ratio indicates the ratio of noise to actual total signal (in a video or audio signal generally speaking). The S/N number measure how much higher the signal level is to the level of background electronic noise, so a higher number means a clearer and crisper picture. Signal-to-noise ratio is expressed in decibels (dB).

Simplex, Duplex, and Triplex concern the operation of video recorders and multiple camera video processors like quads and multiplexers. Simplex, duplex, or triplex capability reveals the number of device capacities which can be used simultaneously. For instance, a simplex device is only capable of performing one type of task at a time, whether that is recording or playback. A duplex device can perform two simultaneous functions like record and configure the monitor display for a certain close up view. Triplex devices are capable of three tasks at the same time (usually record, playback, and zoom or other display functions).

Total Pixels concerns the operation of a camera's CCD image sensor. This number measures the complete count of pixel elements on a camera's CCD image sensor. This number should not be confused with effective pixels, which can provide a more telling description of a camera's resolution.

Video Motion Detection (VMD) is an advanced software feature of DVRs which can detect motion in a camera's field of view and begin recording based on this motion detection. This is an advanced software feature which can detect motion in a camera's field of view and begin recording based on this motion detection. This type of detection can in most cases be adjusted in sensitivity. As well, a user can select and deselect areas in each camera's view for motion detection function.

Video Management System (VMS) - manage, access, and control the video surveillance environment.

Video Output Type refers to the type of video a camera or other device will output for display, recording, etc. on another device. The majority of consumer video equipment is made for compatibility with composite video. For use with S-Video, RGB component video, VGA, or other specialized/digital video formats, an adapter or converter may be required.

Video Output Plug indicates the plug size and configuration used for a device's video output. The most common types of plugs for composite video are BNC, RCA and 1/8" mini.

Watts (W) are used to measure electrical energy. In some cases, this measure RF radio frequency energy output. In this circumstance, "watts" is most commonly applied to the RF output power of wireless A/V transmitters. For these types of devices, a higher number of milliwatts of output power indicates a more powerful (and usually further broadcasting) transmitter. However, "watts" can also be used to measure electrical power consumption. In order to calculate watts, simply multiply the number of volts a device uses by the number of amps it consumes. 1 amp (A) = 1000 milliamps (mA).

Weatherproof equipment has been specifically designed for safe use in most outdoor weather conditions. However, weatherproof equipment should not be considered waterproof because it is never intended for submersion under water. At the same time, there may also be extreme weather conditions which even standard weatherproof video equipment cannot function properly.

Wireless Camera is a term used too frequently in the CCTV, and especially miniature camera, industry. Any product touted as a "wireless camera" is simply a camera integrated with a wireless transmitter.

Zero Lux Operation refers to video imaging in pitch black (0.0 lux) lighting conditions. Monochrome CCD cameras can use IR infra red lighting to yield crisp and distinguishable video images when absolutely no visible light is available