

Glossary

3D-DNR (3D Digital Noise Reduction) Produces less noise and more color at night.

A

AC Power The common power cables used to provide power to electric devices, used to power analog cameras, DVRs, PCs, and NVRs

ADC (Analog to Digital Conversion) This is usually the very first stage of an electronic device that processes signals into digital format. The signal can be video, audio, control output and similar.

ADSL Asymmetric Digital Subscriber Line: Modems attached to twisted pair copper wiring that transmit up to 8 Mbps downstream (to the subscriber) and up to 1Mbps upstream (from the subscriber), depending on line distance, loop plant condition, electrical noise, and technology and implementation options. It is known as Asymmetric because of the different data rates upstream and downstream.

Alarm Recording A feature that changes recording quality depending on the monitoring situation. It is used to reduce storage capacity requirements of big surveillance recorders. Images are stored at low quality until an irregular event occurs. Then, the recorder switches to high quality mode and captures images of decisive moments at a high frame rate.

Analog A signal that is represented by changes in voltage level. An analog camera utilizes a CCD sensor and then digitizes the image for processing. It transmits the image to a DVR via physical cables.

Angle of View The range of the image that is captured by the camera. It can be measured by the angle between the center axis of the lens to the edges of the image in the horizontal, vertical and diagonal directions.

Aperture The size of the lens's opening that determines the amount of light directed to the camera's imager.

Aspect Ratio The ratio of the horizontal and vertical monitor screen dimensions. For CCTV, the aspect ratio is 4:3.

AGC (Automatic Gain Control) Amplifier circuit that automatically changes its gain as the input signal level varies to maintain a constant output signal level.

Auto Iris Changes in light input level result in changes in signal amplitude that are in turn used to adjust the iris to compensate. Auto Iris detects the amount of light entering the lens and automatically opens/closes the iris to maintain appropriate exposure.

ALC (Automatic Level Control) A circuit that maintains a constant output signal level despite large changes in input signal level. In CCTV, such a circuit may be used to control the lens iris.

ATW (Auto Tracing White Balance) ATW continuously adjusts the camera color balance in accordance with any change in color temperature.

AWB (Auto White Balance) The AWB is used to guarantee that an image will always remain the same white color regardless of changes in the light source. Once the camera is adjusted to reproduce white correctly, all other colors are also reproduced as they should be.

B

BLC (Back Light Compensation) BLC works by enhancing specific zones in the picture which usually contains the subject of interest. WDR is more effective alternative to BLC when the image lacks a subject of interest in a specific zone. Feature in a camera that causes the iris circuit to ignore the bright areas of the image and to open up sufficiently to allow the darker areas to be visible – albeit at the expense of the light areas.

Back Focus A procedure of adjusting the physical position of the CCD-chip/lens to achieve the correct focus for all focal length settings (especially critical with zoom lenses).

Balanced Signal In CCTV this refers to a type of video signal transmission (or data transmission) through a twisted pair cable. It is called balanced because the signal travels through both wires in anti-phase, with no reference to Earth, thus being equally exposed to the external interference, common mode interference is cancelled out. It needs a differential receiver.

Bandwidth A term used to define the range of frequencies between the upper and lower cut-off points of a transmission system. In CCTV, there is a direct relationship between bandwidth and picture resolution.

Baud Unit of measurement of the data rate in a digital system, usually in bits per second (bps).

BIT Derived from the term *Binary digIT*. This is a single piece of data at either logic 0 or logic 1.

BMP (Bitmap) A pixel-by-pixel description of an image. Each pixel is a separate element. Also a computer file format for pictures.

Bit Rate Bps = Bytes per second, bps = bits per second. The digital equivalent of bandwidth, bit rate is measured in bits per second. It is used to express the rate at which the compressed bitstream is transmitted. The higher the bit rate, the more information that can be carried.

BNC Bayonet-Neil-Councilman. A co-axial cable connector commonly employed in CCTV installations.

Brightness In PAL and NTSC video signals, the brightness is conveyed by the corresponding instantaneous DC level of active video. Brightness control is an adjustment of setup (black level, black reference).

Byte Term used to define a group of 8 bits (binary digits) in a digital system. The term was derived because the earliest computers used only 8-bit words for communication, whereas modern processors commonly communicate using 32-bit words.

C

CCD (Charge coupled device) A solid-state device that is capable of storing small electrical charges. Originally intended for use as a digital store for computing applications, it has been adapted to store the output voltages from the photo diodes in a camera pick-up prior to them being passed on to the signal processing stages.

The CCD is a silicon device that can store an electrical charge. A chip containing a number of these in an array can be used to store samples of analog video or audio signals where they can be manipulated. A typical imaging chip used in a CCTV camera contains many thousands of CCDs arrayed in a rectangular pattern. The voltages from the cells are integrated to create individual *pixels*. For a CCD image device, the picture resolution is determined by the number of cells in the chip and the density of the cells.

CCD Iris The CCD Iris is an automatic exposure control function that can compensate for situations with intense light source. It discards excessive signal charges causing over-exposure, and allows video signals with intense highlights to be clearly reproduced.

CCTV Closed Circuit Television. A television system that is not broadcast to air and therefore its images can only be accessed by persons with a connection to that system.

CIF (Common Intermediate Format) A type of picture resolution (352X288 pixels) used in surveillance cameras, mobile phones and video conferences.

CMOS (Complementary Metal Oxide Semiconductor) The second of the two commonly used sensors to transmit to compress and transfer images from the video recorder to a storage device or a monitor. Used in IP cameras only.

C-Mount Lens

The distance between the image device and the back of the lens is 17.5mm. the C-Mount system is used for cameras with relatively larger imagers (1/2'-2/3'). A C-Mount camera can only accommodate C-Mount type lenses.

Compression

Compression is all about removing any data from a digitized video signal that we know can be restored following 'replay' from the storage device. With respect to digitized video signals, this refers to the removal of binary data containing information relating to the signal that is considered, for one reason or another, to be redundant. Compression is required to overcome the need for the large amounts of digital storage capacity associated with digitized video signals.

CO-axial Cable An unbalanced cable comprising of a core surrounded by a braided or solid screen. The two conductors are separated by an insulating material that is designed to act as a capacitive dielectric. It is designed to meet the unique requirements of radio frequency signals, offering constant impedance over a range of frequencies and some protection against unwanted noise pick-up. Most common co-axial cables are the BNC

Composite Video Signal containing the luminance, chrominance, sync, and color burst components.

Color Temperature Describes different spectrums of light. Cameras do not automatically adapt to different spectrums of light emitted from different light source types. The color temperature is used as a reference to describe the spectral distribution of light emitted from a light source. With the color temperature, the camera's color balance can be adjusted to match the light source used.

CS-Mount The most common lens mounting type used in CCTV. It has a distance of 12.5mm between the image device and the back of the lens. CS-Mount system is used for small imagers cameras (1/3'-1/4'). A CS mount lens cannot be used with a C mount camera, but a CS-Mount camera can support both systems using a mechanical ring adaptor.

D

D1 A type of picture resolution (720X480 or 720X576 pixels) used in NTSC Videos, DVDs, and PAL Videos. D1 resolution has the same pixels as 4CIF, however, it is also used for DVD resolution, while 4CIF has only PAL/NTSC videos.

Data Cable This is a cable used for the transmission of digital signals. The cable type is typically twisted pair but may be coaxial.

dB (decibel) Logarithmic unit used to define the ratio between two signal amplitudes. A change of 3dB represents a doubling or halving of electrical power; a change of 6dB represents a halving or doubling of electrical voltage.

DC (Direct Current) Voltage Current that flows in only one direction, as opposed to AC.

D/N A day and night camera is designed to be used in outdoor installations or in indoor environments with poor lighting. A day and night, color network camera delivers color images during the day. As light diminishes below a certain level, the camera can automatically switch to night mode to make use of near infrared (IR) light to deliver high quality, black and white images.

DDNS (Dynamic DNS) A method/protocol/network service that provides the capability for a networked device, such as a router or computer system, to notify a Domain Name System (DNS) name server to change, in real time, the active DNS configuration of its configured hostnames, addresses or other information.

DDNS offer a software client program that automates the discovery and registration of client's public IP addresses. It connects to the service provider's systems and causes those systems to link the discovered IP address of the home network with a hostname in the domain name system. An example is residential users who wish to access their personal computer at home while traveling. If the home computer has a fixed static IP address, the user can connect directly using this address, but many provider networks force frequent changes to the IP address configured in their customers' equipment. With dynamic DNS, the home computer can automatically associate its current IP address with a domain name.

Depth of Field The range (in distance) in front of the lens where objects remain in focus. The depth of field indicates the distance between the closest and furthest points that come into focus under the same focus adjustment. This decreases when:

1. The longer focal length
2. The smaller the iris F-number/F-stop
3. The closer the distance between the camera and the object.

Digital Signal Describes any system based on discontinuous data or events. Computers are digital machines because at their most basic level they can distinguish between just two values, 0 and 1, or off and on. Digital representations are approximations of analog events, they are useful because they are relatively easy to store and manipulate electronically.

Digital Zoom The action of zooming into a picture is performed electrically within the camera. Digital zoom electrically crops a part of the image and magnifies it. The picture quality is much lower compared to optical zoom.

DIS (Digital Image Stabilizer) DIS removes jitters caused by movement or vibrations and reduces the amount of HDD space needed to store recorded data.

DRC (Dynamic Range Compressor) DRC is an advanced light compensation technology that improves camera dynamic range. In high contrast scenes, DRC automatically selects and enhances the areas that are extremely dark or bright. With DRC technology, dark spots in images particularly become more visible without overexposing the bright spots to create the one perfect image.

DSP (Digital Signal Processor) A DSP is a specialized microprocessor with an architecture optimized for the fast operational needs of digital signal processing. It transforms the analog images into digital signals that can be immune to noise and are more flexible and easier to manipulate.

DSV (Digital Signature Verification) Digital signatures can be used to authenticate the source of messages. When ownership of a digital signature secret key is bound to a specific user, a valid signature shows that the message was sent by that user. It insures by means of verification and validation that the user is whom he/she claims to be.

DVD-RW (DVD Rewritable) DVD-RW discs may be written to about 1,000 times before needing replacement. DVD-RW discs are commonly used to store data in a non-volatile format, such as when creating backups or collections of files.

DVI-I Output (Digital Visual Interface) The DVI is a video interface standard covering the transmission of video between a source device and a display device. DVI is designed to carry uncompressed digital video data to a display. It is partially compatible with the High-Definition Multimedia Interface (HDMI) standard in digital mode (DVI-D), and VGA in analog mode (DVI-A). DVI-I contains both the digital and analog connections.

Dynamic Range Dynamic range indicates the difference or ratio of the smallest and largest amount of light that can generate a video signal.

E

Encoder A device that superimposes electronic signal information on other electronic signals.

Encryption The rearrangement of the bit stream of a previously digitally encoded signal in a systematic fashion to make the information unrecognizable until restored on receipt of the necessary authorization key. This technique is used for securing information transmitted over a communication channel with the intent of excluding all other than authorized receivers from interpreting the message. Can be used for voice, video and other communications signals.

Electronic Shutter By activating the electronic shutter, video cameras can capture objects moving at high speeds without picture blur.

Ethernet Ethernet is a standard communications protocol intended for building a local area network (LAN). basic hard-wired LAN consists of the following components:

- Two or more computers to be linked together, or networked.
- A network interface card (NIC) in each computer.
- Ethernet cable to connect to each computer.
- A networking switch or networking hub to direct network traffic.
- Networking software.

Ethernet networking creates a communications system that allows the sharing of data and resources, including printers, fax machines and scanners. Ethernet networks can also be wireless.

EWDR (Electronic Wide Dynamic Range) Enables the camera to capture perfect images in both bright and dark environments simultaneously.

F

Fiber Optics A technology designed to transmit signals in the form of light. A Fiber Optic system uses Optical Fibers. Optical Fiber cable is noted for its properties of electrical isolation and resistance to electrostatic and electromagnetic interference.

Field This contains one half of the video information in a television frame. The CCIR Standard has 50 fields per second, each field containing 312 1/2 lines. The EIA Standard has 60 fields per second, each field containing 262.5 lines

Field of View The area that may be viewed through a lens. It is determined by the relationship between the angle of view and the distance between the object and the lens.

Fixed Focal Lens The fixed focal lens has a focal length that doesn't provide the zoom function. This allows a simple lens structure for a reasonable price. These cameras are suitable for situations where the camera is always focused on the same angle of view and it doesn't require to zoom in/out from the object.

F-Number F-Number describes how bright a lens is or the maximum amount of light a lens can direct to the camera's image sensor.

Focal Length The distance from the secondary principal point in the lens to the final focal point at the image device. A short focal length produces a wide angle of view.

Frame One complete television picture made up from 625 (525 NTSC) line of information over two interlaced fields. The frame rate is 25 (30 NTSC) per second.

Frame Rate Also known as **frame frequency** is the frequency (rate) at which an imaging device produces unique consecutive frames. Frame rate is most often expressed in frames per second (FPS), and is expressed in progressive scan monitors as hertz (Hz).

FPS (Frames Per Second) Units used to measure frame rate.

Frequency Measurement of the number of times in one second that a cycle repeats itself. The unit of measurement is Hertz (Hz) or, in the USA, cycles.

G

Gamma Correction Modification to the shape of a luminance signal in a camera made in order to correct for non-linearity in a CRT phosphor response. In many CCTV cameras, this is adjustable to compensate for differing monitors or lighting conditions.

GB A Giga Byte is a multiple of the unit byte for digital information storage. The prefix *Giga* means 10^9 in the International System of Units (SI). Therefore 1 *gigabyte* = 1,000,000,000bytes.

GIF (Graphic Interchange Format) Another graphic format supported by the Web. The GIF format is a lossless compression technique and it supports only 256 colors. GIF is better than JPG for images with only a few distinct colors, such as line drawings, black and white images and small text that is only a few pixels high. GIF also supports transparency, where the background color can be set to transparent in order to let the color on the underlying Web page to show through.

GUI (Graphical User Interface) A computer type display giving system status information it may also include touch screen control.

H

H.264 H.264 is a standard for video compression, and is currently one of the most commonly used formats for the recording, compression, and distribution of high definition video. H.264 is also widely used by streaming internet sources and Blu-Ray discs.

HDD (Hard Drive Disk) A storage device. Can be internal, part of a computer or a DVR, or can be a remote backup device.

Hz (Hertz) Cycles per second. The unit by which frequency is measured.

HDMI (High-Definition Multimedia Interface) HDMI is the first industry-supported uncompressed, all-digital audio/video interface. It is a single cable and user-friendly connector. HDMI provides an interface between any audio/video sources over a single cable. HDMI supports standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable. HDMI can also carry any compressed audio format such as Dolby or DTS. HDMI has the capacity to support existing high-definition video formats such as 720p, 1080i, and 1080p, along with support of enhanced definition formats like 480p, as well as standard definition formats such as NTSC or PAL.

HD (High Definition) HD video refers to any video system of higher resolution than standard-definition (SD) video, and most commonly involves display resolutions of 1,280×720 pixels (720p) or 1,920×1,080 pixels (1080i/1080p).

High definition video is defined, by:

- The number of lines in the vertical display resolution. HDTV resolution is 1,080 or 720 lines.
- The scanning system:
 - Progressive scanning (p)-redraws an image frame (all of its lines) when refreshing each image
 - Interlaced scanning (i)- draws the image field every other line in the first image refresh and then draws the remaining lines during a second refreshing.
Interlaced scanning yields greater image resolution in static environments, but loses up to half of the resolution when subject is moving.
- The number of frames per second (Hz)

HME (Highlight Masking Exposure) Masks overly exposed light to product a true video image of any environment.

Horizontal Resolution The maximum number of individual picture elements that can be distinguished in a one scanning line.

Hue This term refers to the frequency of a light source, e.g. red, green, blue, etc.

I

Illumination Measurement of light coming from a secondary source. The unit of measurement is the lux.

Imaging Device A device that is able to convert light energy into electrical energy. In modern CCTV cameras, this will be a charge coupled device (CCD) chip.

Imager The imager sensor is the core camera device that captures the image and converts it into a video signal. The imager is the key device that determines the quality of a camera's picture. The larger the imager, the better the quality of the image will be.

Internal Sync Horizontal and vertical synchronizing pulses that are produced by the camera internally.

IP (Ingress Protection) Rating A rating system that is used to describe the environmental protection of electrical equipment. Its standards are established by the CENELEC (European Committee for Electrotechnical Standardization). The first number indicates protection against the ingress of solid objects. The second number indicates protection against the ingress of liquids. The larger the value of each number, the greater the protection becomes. Most cameras comply with IP66, which provides total protection against dust and high-pressure water jets from any direction.

IP (Internet Protocol) IP specifies the format of packets, *datagrams*, and the addressing scheme. The IP is combined with a higher-level protocol to establish a virtual connection between a destination and a source. IP by itself is something like the postal system. It allows you to address a package and drop it in the system, but there is no direct link between you and the recipient. TCP/IP, on the other hand, establishes a connection between two hosts so that they can send messages back and forth for a period.

IP Address An identifier for a computer or device on a TCP/IP network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 1.160.10.240 could be an IP address.

IP addresses can be assigned at random as long as each one is unique only within an isolated network. Connecting a private network to the Internet requires using registered IP addresses (called Internet addresses) to avoid duplicates. The four numbers in an IP address identify a particular network and a host on that network. The number of unassigned Internet addresses is running out, so a new classless scheme called CIDR is gradually replacing the system based on classes A, B, and C and is tied to adoption of IPv6.

IRIS The adjustable opening through which the light can pass and be regulated. Manual Iris is a lens with a manual adjustment to set the iris opening in a fixed position. Auto Iris is a lens in which the aperture automatically opens or closes to maintain proper light levels on the camera's pickup device.

IR (Infrared) Frequency of light just below visible light; wavelengths between 700nm to 10mm. All CCD image chips are sensitive to these frequencies and in many cases, this can be used to an advantage Infra-red.

IR Pass Filter A filter that only allows infrared light frequencies to pass through. Such filters are placed in front of white light sources in the manufacture of IR lighting units.

IR Illuminator In situations where the environment cannot be lightened and visible lights are not a visible solution, IR capable cameras allow black and white images to be captures by using IR Illuminators. These illuminators allow operation even in complete darkness without being noticed by the human eye.

IR Lens IR Lenses offer the ability to handle both visible light and IR night by the same camera. IR lenses use low refraction glass to minimize the focus shift between visible light and IR light.

J

JPG/JPEG (Joint Photographic Expert Group) The original name of the committee that wrote the standard. JPG is one of the image file formats supported on the Web. JPG is a compression technique that is designed to compress color and grayscale continuous-tone images. JPG images support 16 million colors and are best suited for photographs and complex graphics. The user typically has to compromise on either the quality of the image or the size of the file.

L

LAN (Local Area Network) Term used to describe a data communications network within a defined area, usually a single site.

LED (Light Emitting Diode) Light emitting diode. IR LEDs are ideal for locations where white lighting is undesirable or unavailable (night) Using such LEDs will result in a high infrared illumination of the cover area, but the lamps will be invisible to the eye.

Lens The lens has the task of processing the light that is reflected off the surface of the target. If the lens fails to focus a true image onto the camera pick-up device, the rest of the system will have no chance of producing faithful and useful images. In CCTV, this term usually refers to a lens assembly, which is an array of lenses with an iris mechanism. Its function is to gather light and focus it onto the pick-up device.

LCD (Liquid Crystal Display) A screen for displaying text/graphics based on a technology called liquid crystal, where minute currents change the reflection levels or transparency of the by changing the polarization angle. The advantages of LCD screens are very small power consumption (can be easily battery driven) and low price of mass-produced units. The disadvantages are narrow viewing angle, slow response, invisibility in the dark unless the display is backlit, and difficulties displaying true colors with color LCD displays.

Line Locked Synchronization pulses produced by each camera and are referenced to the A.C mains frequency.

Linux OS Linux is the software on a computer that enables applications and the computer operator to access the devices on the computer to perform desired functions. As an open operating system, Linux is developed collaboratively. Companies participating in the Linux economy share research and development costs with their partners and competitors.

Looping A term indicating that a high impedance device has been permanently connected in a parallel to a video source. Individual balanced video outputs for each video input.

Luminance (Y) Monochrome or black and white content of a video signal.

Lux Unit of measurement of light.

M

Megapixel One million pixels. The term is used in reference to the resolution of a graphics device, such as a scanner, digital camera or monitor.

MPEG (Motion JPEG) An ISO group of experts that has recommended manipulation of digital motion images. Today there are a couple of MPEG recommendations, of which the most well known are MPEG-1 and MPEG-2. The latter one is widely accepted for high definition digital television, as well as multimedia presentation. **MPEG-1** stands for compressing progressive scanned images with audio. Bit rate is from 1.5 Mbps up to 3.5 Mbps. **MPEG-2** is the standard for compression of progressive scanned and interlaced video signals with high quality audio over a large range of compression rates with a range of bit rates from 1.5 to 100 Mbps. Accepted as a HDTV and DVD standard of video/audio encoding.

MPEG4 The Digital CCTV standard recording compression format.

MOD (Minimum Object Distance) The closest distance a given lens will be able to focus upon an object. This is measured from the vertex (front) of the lens to the object. Wide-angle lenses generally have a smaller M.O.D. than large focal length lenses.

Modem (Modular Demodulator) A modem is a device or program that enables a computer to transmit data over telephone or cable lines. Computer information is stored digitally, whereas information transmitted over telephone lines is transmitted in the form of analog waves. A modem converts between these two forms. There is one standard interface for connecting external modems to computers called *RS-232*.

Motion Detection Motion detection has a higher accuracy than activity detection. It detects motion by comparing luminance level changes between two adjacent picture frames. To detect the motion, the image is divided into blocks called "macro blocks". Motion is determined by evaluating the movement within each block on a frame-by-frame basis.

Multiplexer A device that allows multiple camera sources to be displayed on a single monitor. It also allows multiple sources to be recorded to a single recorder. This effectively reduces the number of required monitors and recorders, resulting in a large reduction in system cost and installation space.

N

NAS (Network Attached Storage) NAS is file-level computer data storage connected to a computer network providing data access to multiple clients. NAS is often made as a computer appliance – a specialized computer built from the ground up for storing and serving files – rather than simply a general purpose computer being used for the role. NAS systems are a convenient method of sharing files among multiple computers. Potential benefits of network-attached storage, compared to file servers, include faster data access, easier administration, and simple configuration.

NAT (Network Address Translation) Traversal A general term for techniques that establish and maintain Internet protocol connections traversing network address translation (NAT) gateways. Network address translation breaks end-to-end connectivity. Intercepting and modifying traffic can be done transparently in the absence of secure encryption and authentication. NAT traversal techniques are typically required for client-to-client networking applications. Most NAT behavior-based techniques bypass enterprise security policies.

NTP (Network Time Protocol) NTP is a protocol and software implementation for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks.

Noise Electrical interference on the video signal. Usually manifest as grain (speckles) over the picture.

NTSC (National Television System Committee) The NTSC is responsible for setting television and video standards in the United States. The NTSC standard for television defines a composite video signal with a refresh rate of 60 half-frames (interlaced) per second. Each frame contains 525 lines and can contain 16 million different colors. The NTSC standard is incompatible with most computer video standards, which generally use *RGB* video signals. However, you can insert special video adapters into your computer that convert NTSC signals into computer video signals and vice versa.

NVR (Network Video Recorder) An NVR is a network recorder that enables simultaneous recording and remote access to both live views and recorded images. The NVR is used in conjunction with network cameras that capture images and then transmit compressed video over the network. NVRs can be used on a standard IP network

O

ONVIF ONVIF is an open industry forum for the development of a global standard for the interface of network video products. The ONVIF specification ensures interoperability between network video products regardless of manufacturer. 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.

Optical Zoom Optical zoom is performed within the camera lens. Optical zoom changes the area of the image that is directed to the imager, and therefore, it doesn't have issues of image quality degradation.

P

PAL (Phase Alternate Line) PAL is the dominant television standard in Europe. It refers to the scan rate in which the camera transmits the image to a monitor. PAL delivers 625 lines at 50 half-frames per second. PAL is the most common system for the transmission of analog color television signals. The system maintains correct color reproduction by cancelling out the effects of signal phase errors that occur during transmission. Many video adapters that enable computer monitors to be used as television screens support both NTSC and PAL signals.

Privacy Zone Masking Used to protect personal privacy by concealing private areas in the camera's field of view. In IP Networked video surveillance applications, the capability should be set from within the camera since images are delivered over a network and can be accessed by hackers.

Pixel (Picture Elements) Pixel is derived from Picture Elements. A pixel is a single element of picture information – the greater the number of pixels, the greater the picture resolution. Graphics monitors display pictures by dividing the display screen into thousands (or millions) of pixels, arranged in rows and columns. The pixels are so close together that they appear connected. The number of bits used to represent each pixel determines how many colors or shades of gray can be displayed. For example, in 8-bit color mode, the color monitor uses 8 bits for each pixel, making it possible to display 2 to the 8th power (256) different colors or shades of gray. On color monitors, each pixel is actually composed of three dots -- a red, a blue, and a green one. The quality of a display system depends on its resolution and how many bits are used to represent each pixel. VGA systems display 640 by 480, or about 300,000 pixels. SVGA systems display 800 by 600, or 480,000 pixels. True Color systems use 24 bits per pixel, allowing them to display more than 16 million different colors.

PoE (Power over Ethernet) Enables both power and video/audio transmissions through a single Ethernet cable. Reduced cabling requirements make installation easier and more cost effective.

Port Number A port is an application or process-specific software construct serving as a communications endpoint in a computer's host operating system. A port is associated with the IP address of the host. A 16-bit number, commonly known as the port number, identifies a port for each address and protocol. The port number completes the destination address for a communications session. Thus, different IP addresses may use the same port number for communication. Port numbers are used to provide multiplex services that network clients connect to.

POS (Point-of-Sale) Refers to a checkout location where a transaction occurs. Recent technology developments have connected surveillance cameras with POS actions.

Protocol A specific set of rules, procedures or conventions relating to format and timing of data transmission between two devices. Two data devices need to accept a protocol and use it to understand each other. The protocols for data communications cover such things as framing, error handling, transparency and line control.

PTZ (Pan Tilt Zoom) A PTZ Camera is a CCTV camera with remote directional and zoom control. These systems can be remotely controlled by automation systems. PTZ as an acronym for pan, tilt, and zoom may refer merely to features of specific surveillance cameras. Moreover, PTZ Camera may also be used to describe an entire category of devices where a combination of sound and/or motion and/or change in heat signature may enable the camera to activate, focus and track suspected changes in the video field.

Q

Quad Abbreviation for a unit that enables four camera signals to be displayed simultaneously on a monitor

R

RAID (Redundant Array of Inexpensive Disks) This a technology of connecting a number of hard drives into one mass storage device, which can be used, among other things, for digital recording of video images.

Reflected Light Area illumination multiplied by reflectance.

Resolution The resolution is the line density where the camera is no longer able to reproduce individual lines. For this reason, resolution is expressed in terms of TV lines (TVL). The higher the number is, the better the picture. **Resolution** In relation to the definition of a television picture, this is a measure of the smallest detail that may be discerned. The most common unit of measurement is TVL (television lines).

RS Port Standard input/output connectors used for data communications. Common standards are RS232, RS422, and RS 485.

RS-232 A format of digital communication using a three wire unbalanced presentation. The RS-232 standard defines the presentation and voltages for asynchronous communications, but it does not define how the data should be represented by the

bits, i.e., it does not define the overall message format and protocol. It is very often used in computers, CCTV and communications between keyboards and matrix switchers.

RS-422 This is an advanced format of digital communication when compared to RS-232. A major difference is that the presentation is balanced line and the signaling is differential. In simple terms, the signal transmitted is read at the receiving end as the difference between the two wires without a reference to earth. So if there is common mode noise induced along the line, it will be cancelled out. RS-422 can drive lines of up to 1200m and distribute data on to up to 10 receivers.

RS-485 This is an advanced format of digital communications compared to RS-232. It is a balanced line transmission system. The major improvement over RS422 is in the number of receivers that can be driven with this format, up to 32. It is classically a half duplex 2 wire presentation.

S

SATA (Serial Advanced Technology Attachment) SATA is a computer bus interface for connecting host bus adapters to mass storage devices such as hard disk drives and optical drives. Serial ATA was designed to replace the older parallel ATA (PATA) standard, offering several advantages over the older interface: reduced cable size and cost, native hot swapping, faster data transfer through higher signaling rates, and more efficient transfer.

SATA host-adapters and devices communicate via a high-speed serial cable over two pairs of conductors.

Sensitivity The sensitivity of a camera indicates its ability to shoot in low-light areas without noise being introduced. It defines the camera's raw response to light. The higher a camera's F-number is, the more sensitive it is to light.

Signal-to-Noise (S/N) Ratio Measurement of the amount of noise in a signal, expressed in decibels (dB). For video signals, any figure less than 40 dB will result in unacceptable amounts of noise (grain) in the picture.

Schedule Recording A timer recording function that specifies the beginning/stop time of the recording. Recording schedules can be set by normal recording mode, alarm recording mode, and motion detection mode.

Smart IR The Smart IR technology delivers the best night videos. The breakdown of the video image into five zones allows for the camera to adjust the illumination in all areas, giving it a clear night vision. When a subject enters one of the five zones, the lens' iris is automatically adjusted to the zone to provide a clear identification of the subject.

Smear Vertical smear occurs when a bright object or light source is shot. The smear is usually a vertical streak above and below the light source. Smear is caused by incoming light leaking directly into the vertical shift register. The amount of smear is proportional to the brightness of the light source.

Spot Out Monitor Spot Out displays the camera channels in sequence to a different monitor. This is useful for public view. You can use the spot out monitor to make people aware that they are being watched..

Streaming A one-way video transmission over a data network. Unlike movie files that are played after the entire file has been downloaded and stored, streaming video is played shortly after only a small amount is received. The data are often not stored permanently in the destination computer. If the streaming video is broadcast live, then it may be called "real-time video".

SVGA (Super Video Graphics Array) A type of picture resolution (800X600 pixels) used in computer displays.

SPG (Sync Pulse Generator) Device that generates synchronizing pulses needed by video source equipment to provide proper equipment video signal timing. Pulses typically produced by a sync generator could be sub-carrier, burst flag, sync, blanking, H and V drives and color black. Most commonly used in CCTV are H and V drives.

T

TB (Terabyte) The **terabyte** is a multiple of the unit byte for digital information. The prefix *Tera* means 10^{12} in the International System of Units (SI), and therefore one terabyte=1,000,000,000,000 bytes, or 1000 gigabytes.

TCP/IP (Transmission Control Protocol Internet Protocol) TCP/IP is the suite of communications protocols used to connect hosts on the Internet. TCP/IP is built into the operating system and is used by the Internet, making it the de facto standard for transmitting data over networks.

TDN (True Day and Night) A true day/night camera will produce high-quality color images during the day and infrared sensitive black and white images in periods of low-light or in complete darkness (with infrared illumination). The way it achieves this is by using an IR cut filter.

Twisted Pair Type of cable having two wires that are twisted together, producing a balanced effect whereby electrical interference signals are cancelled out. Capable of much greater transmission distances than coaxial cable types. In some cases the cable may have an outer screen.

U

UPnP (Universal Plug and Play) UPnP is a set of networking protocols that permits networked devices to discover each other's presence on the network and establish functional network services for data sharing, communications, and entertainment. UPnP devices are "plug-and-play" in that when connected to a network they automatically establish working configurations with other devices.

UPS (Uninterruptible Power Supply) These are power supplies used in the majority of high security systems, whose purpose is to back-up the system for at least 10 minutes without mains power. The duration of this depends on the size of the UPS, usually expressed in VA, and the current consumption of the system itself.

UTP (Unshielded Twisted Pair) A cable medium with one or more pairs of twisted insulated copper conductors bound in a single sheath. Now the most common method of bringing telephone and data to the desktop. Twisted pair cable type having no outer screen (see **twisted pair**).

V

Varifocal Lens having a manually adjustable focal length, giving a degree of choice over the field of view. A Varifocal lens offer zoom capabilities, they are compact like fixed focal lenses, and they can extend the focal length by 2-3 times. However, they require focus adjustment every time the focal length or zoom value change.

VGA (Video Graphics Array) VGA is a graphics display system for PCs developed by IBM. In text mode, VGA systems provide a resolution of 720 by 400 pixels. In graphics mode, the resolution is either 640 by 480 (with 16 colors) or 320 by 200 (with 256 colors). The total palette of colors is 262,144.

Unlike earlier graphics standards for PCs, VGA uses analog signals rather than digital signals. Consequently, a monitor designed for one of the older standards will not be able to use VGA.

Video Servo Auto Iris One of the two types of Auto Iris lenses available. In the Video Servo Auto Iris Lenses, the video signal is received from the camera, the amplitude is detected and analyzed, and then the iris control signal is generated internally. It is considered more expensive than the alternative DC Servo Auto Iris Lens.

VMD (Video Motion Detection) An alarm detection facility whereby the picture content from a camera is analyzed to look for evidence of change (movement). Originally, analogue, modern equipment employs digital analysis techniques.

VMS (Video Management Software) Video management software running on a Windows or Unix/Linux server, supplies the basis for video monitoring, analysis, and recording. It offers live viewing, storing and retrieving of video sequences as well as simultaneous live viewing and recording, multiple search functions, control PTZ cameras and remote access via a web browser.

VoIP (Voice over IP) VoIP is a family of technologies, methodologies, communication protocols, and transmission techniques for the delivery of voice communications and multimedia sessions over the Internet.

W

Wavelength A measurement (in meters) of the propagation distance of one cycle of an electromagnetic wave. It is taken between any two adjacent points in a wave shape. It relates directly to the signal frequency.

WDR (Wide Dynamic Range) WDR helps to get detailed information from the dark part of the image without saturation from the bright part. It combines two fields which are high shutter speed exposure in bright areas and low shutter speed exposure in dark areas into one composite image.

White Balance An electronic process used in video cameras to retain true colors. It is performed electronically and is set on the basis of a white object in the picture.

White Level This part of the video signal electronically represents the white part of an image. It is a voltage of 1V peak to peak (assuming a sync of 0.3V) or 100 IRE whereas the black level is 0.3V peak to peak or 0 IRE.