

## Closed Circuit Television (CCTV) Systems – Glossary of Terms

An understanding of common terminology used in connection with CCTV systems will enable you to better discuss your requirements with prospective installers and judge competing quotations. To help convey a picture of where these terms are usually encountered this glossary is arranged in the approximate order in which the items would be found within a CCTV system, i.e., from the point where images are captured through to the end user.

Note: Rapid and ongoing technological developments mean that system components are increasingly found in combination with each other.

**Masts/Brackets** - Fittings used to secure cameras in place.

**Housings** - Casings that protect cameras from environmental conditions (e.g., they can be heated, have screen washers or wipers, or be vandal or bullet resistant).

**Pan/Tilt Units** - Motorised devices which allow a camera to move horizontally (pan), vertically (tilt) or in both directions (pan and tilt). When used to adjust the lens too, they are called pan, tilt and zoom (PTZ) units.

**Domes** - Camera housings with a transparent hemispherical cover. Good for pan and tilt coverage of large areas, allowing rapid viewing of an uninterrupted 360° field of view.

**Lux** - A measurement of light levels. CCTV systems are classified according to their ability to operate in certain light levels, as follows: Daylight; Lowlight; Moonlight; Starlight; Infrared. Monochrome cameras are generally better able to operate in poorer light conditions and with infrared, than colour cameras.

**IR Illuminators** - Devices providing infra-red 'lighting' for dusk/night viewing cameras.

**Presets** - Camera positions that are pre-programmed into the camera PTZ system (e.g., to match an area of alarm sensor coverage).

**Cameras** - Devices to capture an image and change it to an electronic signal for transmission. Cameras can be monochrome (black and white) or colour and have an infrared (heat image) capability. Two types exist:

- a. Tube cameras - older technology and infrequently used now.
- b. CCD cameras - (Charge Coupled Device) current technology, versatile and reliable.

**Resolution** - A way of describing the quality of pictures in terms of the number of lines of television data transmitted. For monochrome and colour cameras of comparable quality, monochrome has better resolution and therefore can produce more detailed pictures.

**Lenses** - Used to determine the size of image captured by the camera. Careful selection of lenses can have a major effect on picture quality. Lenses can be of the zoom, fixed, wide angle or varifocal type.

**Mounts** - Used to position the lens correctly in the camera. Two types are used, a C mount and CS mount.

**Iris** - Device used to control the amount of light able to enter the camera. The iris can be of the fixed or auto-iris type, the latter able to adjust themselves to changing light levels.

**Transmission System** - Used to carry the picture from the camera(s) to the site viewing/recording location(s). Cables are the most commonly used local transmission medium, with coaxial (Coax) cable most frequently used. Twisted pair and fibre-optic cables, or microwave transmission links, can also be used.

**Switchers** - Devices that allow different cameras to be selected and viewed.

**Quads** - Devices that allow several different pictures to be displayed on a monitor simultaneously.

**Monitors** - Television devices used to view the transmitted pictures. Monochrome and colour monitors are available.

**Matrix Systems** - Devices that allow pictures to be switched or shared between different monitors. Control can be automatic or manual.

**Multiplexers** - Devices used to combine the outputs from more than one camera, for onward transmission to recording equipment and/or another location; and to otherwise act as the local system controller. According to the number of simultaneous functions a multiplexer can perform (e.g., can you view pictures while still recording?) they are referred to as Simplex (1 function) or Duplex (2 function) etc, machines.

**Video/Digital Motion Detection VMD/DMD** - Automatic system activation in response to an electronically detected movement within a camera pictures fixed field of view.

**Image Recorders** - Used to capture and retain pictures transmitted by cameras. Pictures can be recorded in real time, i.e., as they occur, or in time-lapse, i.e., at preset time intervals. The most common recorders are VHS video tape recorders. Super VHS gives much better picture quality, but only when used with super VHS tapes. As an alternative to tape, Digital recording devices are available. Their main advantage lies in the amount of data that can be stored in minimal space, and the speed of retrieval of stored pictures.

**Picture Tagging** - The process of electronically marking each image with the time and date of recording.

**Real Time** - A standard video recorder stores approximately 50 individual frames (pictures) per second. When played back at normal speed, these appear to the eye as continuous movement.

**Cycles** - When more than one camera is in use in a system, the available frames per second being recorded are divided between them. The time taken for the system to record in turn two pictures from any one camera is known as the cycle time. With large systems this time interval can become long enough for vital information to be missed in a sequence of events. Recommendations are for a maximum cycle time of one second per camera; i.e., in real time recording the maximum recommended number of cameras to one recorder is 50. Cycle time is adversely affected by time-lapse recording.

**Time-lapse** - Time-lapse recording allows the normal recording time of a tape to be extended. This is achieved by slowing down the tape speed, with the result that fewer frames per second of tape are recorded. The reduction in the number of frames per second recorded is proportional to the extension of

recording time. For example, if a 3 hour tape is set to record in time-lapse for 24 hours, an increase of eight times, the number of fields per second is reduced by eight times from fifty to approximately six.

As longer recording periods are selected, the images on playback appear less like film and more like consecutive photographs. As a result key events may not be recorded. Time-lapse recording extends system cycle time significantly. For example, a 3-hour tape being recorded in 24-hour mode will be recording approximately 6 fields per second. In order not to exceed the recommended cycle time, the maximum number of cameras recommended for one recorder will be six. In 48-hour mode this will drop to only three. The use of special 'real time' time-lapse recorders, able to record more fields per second in time-lapse mode, can increase the number of cameras that can be used. Alternatively, split systems with multiple recorders should be considered.

**Event or Alarm Image Recording** - Should a CCTV system be automatically activated, relevant camera images of the activation event are captured and stored. Once the data transmission link to the monitoring centre has been connected, these pictures are passed to the monitoring centre operators for viewing.

**DVST/ADPRO** - Computer based control and transmission technology for remotely monitored CCTV systems. Signals are converted to digital form, and transmitted via fibre optic cable or ISDN lines.

**Compression** - To give acceptable data transmission times/refresh rates, the digital information within images needs to be reduced before transmission to a remote monitoring centre. Various software protocols exist to ensure that this is achieved without undue loss of picture quality. Common compression acronyms include JPEG, MotionJPEG and MPEG 1 and 2.

**Refresh Rate** - A measure of how often the pictures being transmitted to the remote monitoring centre are being updated.

**Frame Overlap** - A means of speeding up refresh rates, by only transmitting that portion of a camera picture that has changed since the last frame.

**Remote Monitoring Centre** - Manned premises equipped to receive pictures from CCTV systems at various other locations.

#### **Sources of Further Information**

Other Aviva Hardfacts Numbers:  
A-5598 - Closed Circuit Television (CCTV) Systems - An Introduction  
A-5599 - Closed Circuit Television (CCTV) Systems - Guidelines for Purchasers