



Surge protection for CCTV systems

CCTV systems are used in all sectors for access control and facility supervision. In the following, surge protection measures will be described which meet the high availability requirements of CCTV systems.

A CCTV system consists of at least one camera, one monitor and one suitable video transmission path. Remotely controlled camera stations are typically equipped with a pan/tilt head which allows the operator to individually adjust the position and the perspective of the station.

In the simplest case, the transmission line between the junction box and the monitor is a coaxial or a balanced two-wire

cable. Coaxial cables are used for unbalanced transmission, in other words the video signal is transmitted through the core of the coaxial cable (inner conductor). The shield (earth) is the reference point for signal transmission. Balanced transmission (baluns) where the coaxial signal is converted to a two-wire signal is used for two-wire cables.

The voltage supply cable is often routed separately. In case of IP cameras, however, a single cable is used for the transmission of the video signal and for voltage supply. An RS 485 bus controls the panning and tilting of the camera.

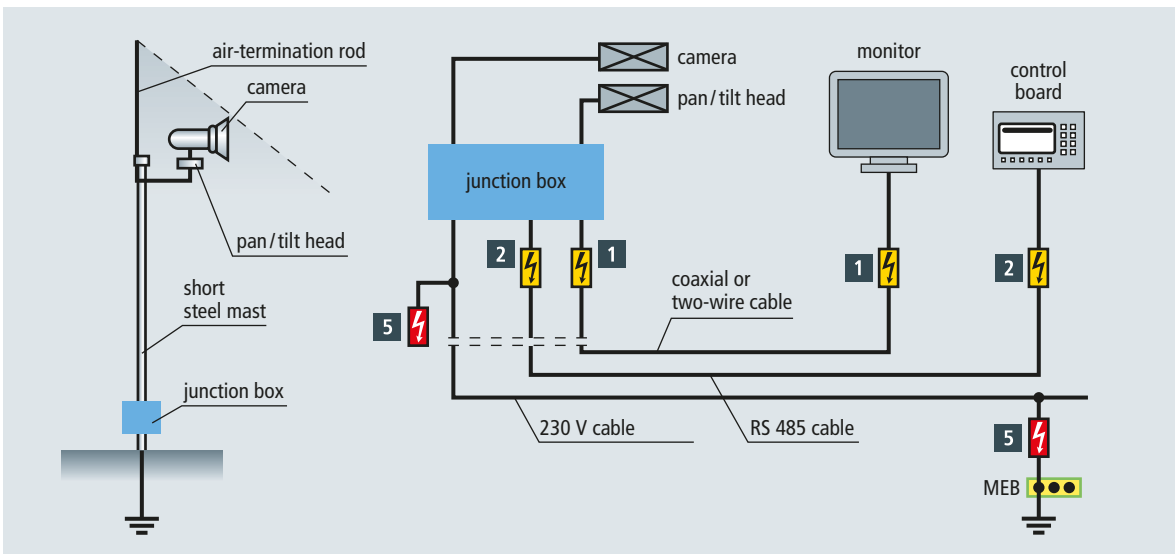


Figure 9.7.1 Camera connected to a building with external lightning protection system and lightning current carrying surge protective devices on both ends

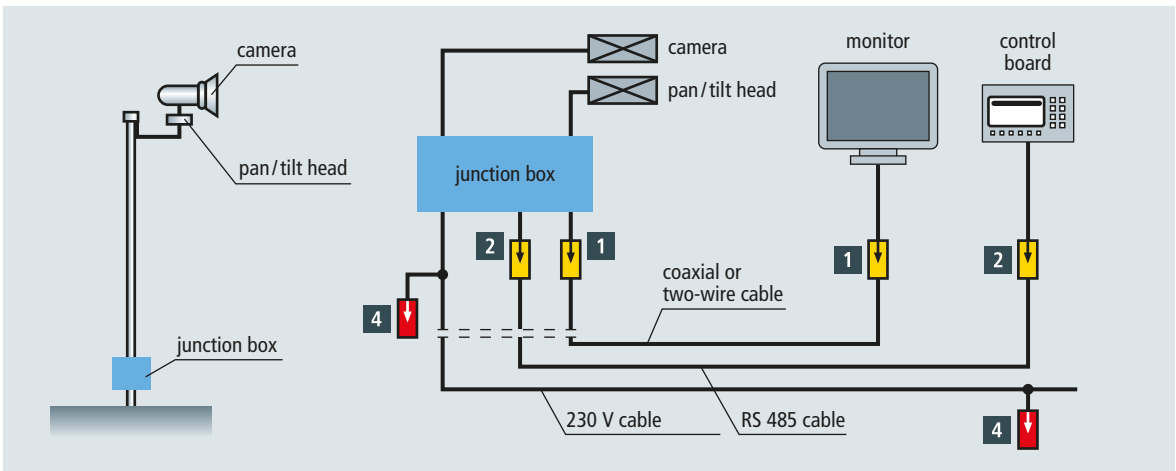


Figure 9.7.2 Camera connected to a building without external lightning protection system with surge protective devices on both ends

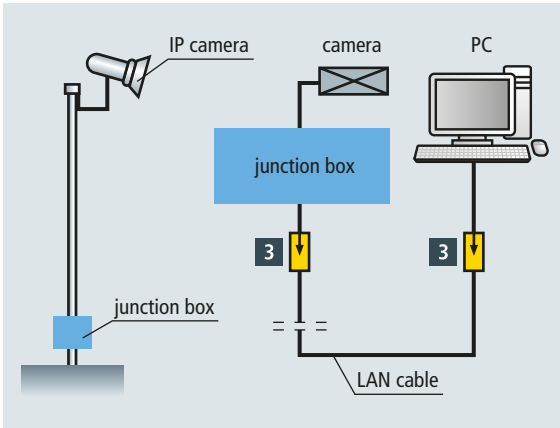


Figure 9.7.3 IP camera with surge protective devices on both ends

Building with external lightning protection system

Figure 9.7.1 shows a CCTV camera installed at a mast. A direct lightning strike to the camera can be prevented if an air-termination rod is installed at the mast. The connecting cable between the junction box and the camera is typically installed

in the metal mast. If this is not possible, the camera cable must be routed in a metal tube and conductively connected to the mast. In this case, surge protective devices do not have to be installed in the junction box if the cable length does not exceed some metres.

Lightning equipotential bonding must be established at the entrance point into the building for all cables mentioned above which are routed from the junction box at the mast to a building with external lightning protection system (**Table 9.7.1**). If cameras are mounted on the outer façade of a building, it should be ensured that the camera is located in the protected volume or is protected from direct lightning strikes by an air-termination system.

Building without external lightning protection system

If buildings are not equipped with an external lightning protection system, the risk resulting from a direct or nearby lightning strike to the building is assumed to be low and is thus acceptable. In this case, the installation of surge arresters provides sufficient protection (**Table 9.7.1**).

Figure 9.7.2 shows a multi-line CCTV system and **Figure 9.7.3** a digital IC camera system.

No.	Protection for...	Surge protective device	Part No.
Surge protective devices for information technology systems			
1	Two-wire cable (video transmission)	BLITZDUCTOR XT / BLITZDUCTOR SP + BXT BAS	920 271 / 926 271 920 300
	Coaxial cable (video transmission system)	UGKF BNC or DGA BNC VCID	929 010 909 711
2	RS 485 cable (camera controller)	BLITZDUCTOR XT / BLITZDUCTOR SP + BXT BAS	920 271 / 926 271 920 300
3	LAN cable (IP camera)	DPA M CLE RJ45B 48	929 121
		DPA M CAT6 RJ45H 48	929 110
Surge protective devices for power supply systems – Surge arresters			
4	a.c. TN system	DEHNguard DG M TN 275	952 200
	a.c. TT system	DEHNguard DG M TT 2P 275	952 110
Surge protective devices for power supply systems – Combined arresters			
5	a.c. TN system	DEHNshield DSH TN 255	941 200
	a.c. TT system	DEHNshield DSH TT 255	941 110

Table 9.7.1 Surge protective devices shown in Figures 9.7.1 to 9.7.3

