

## Get the picture on smart cabling

Cat 5 cabling for closed-circuit television makes good sense and should be considered as the preferred method for CCTV installations.

Conventional installations for connecting a network of closed-circuit television cameras (CCTV) to a digital video recorder involve a combination of coaxial cable and figure-eight cable, or a composite cable for video and power.

This has been long-accepted practice in the CCTV industry. However, there is now a much better and smarter cabling method in Cat 5e cable, which is becoming the industry standard – and for good reasons.

The change is so easy that every installer can start using Cat 5 cabling with little training. The main difference as shown in figure 1 is to use a video balun at each end and Cat 5 cable to connect the baluns.

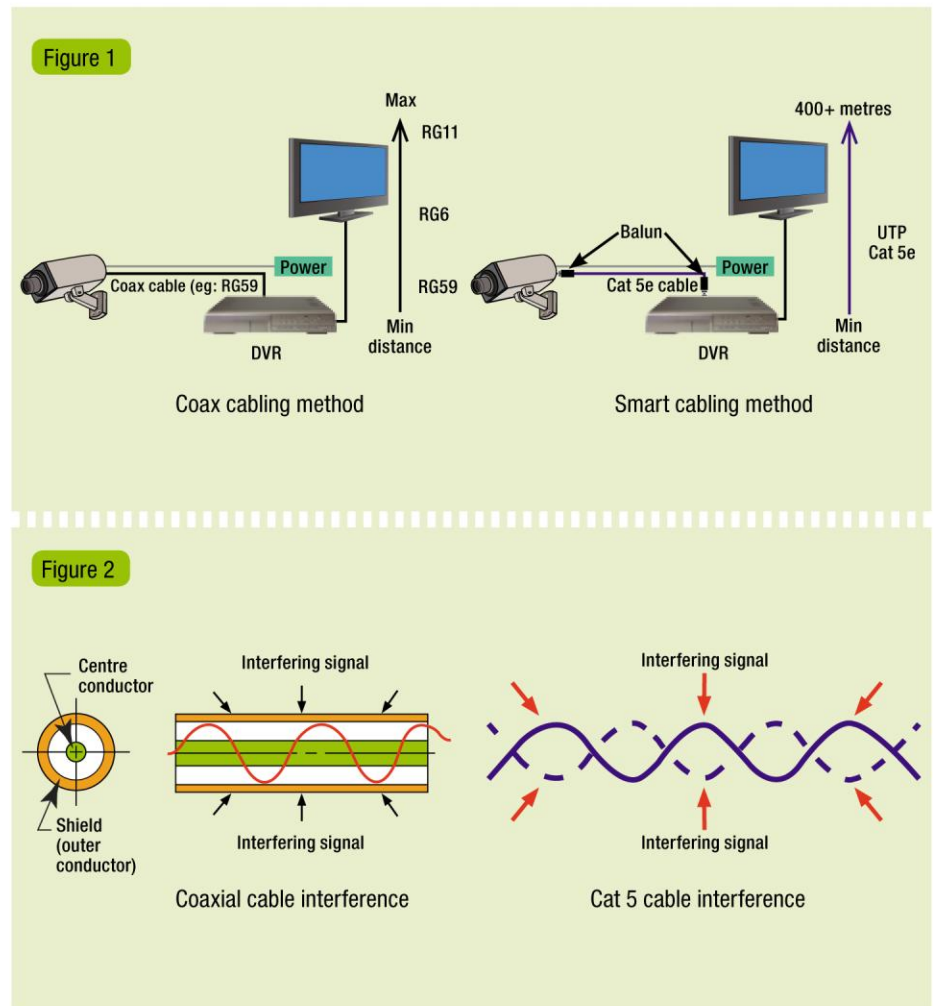
Besides cost savings and other benefits, which will be discussed later, what you get by using Cat 5 cabling is less interference, ease of installation and longer range – to 400m.

For any CCTV installation, the main hallmarks of a good installation should include a quality interference-free picture, reliability (minimum downtime), ease of installation, cost effectiveness, reduced installation risks and future proofing.

Yet not all of these are always taken into consideration during the planning or costing phase of a job.

One of the main attributes of Cat 5e is the cable itself, comprising four pairs of twisted cable. This allows the simultaneous carriage of four video signals over one cable pair.

And, by the very nature of the pairs being twisted and identical (unlike coaxial cable), any interference signals induced will be very similar in strength. On arrival at the end of the cable where the balun has been installed,



the interference signals will oppose each other, leaving less harmful interference and consequently a clearer picture.

This immunity, in conjunction with a balun having a high common mode rejection ratio (interference rejection), is the main reason that Cat 5 cable can cover distances to 400m and more – distances

not possible with unamplified coaxial cable installations.

For best results it is imperative to use good-quality Cat 5 cable with known crosstalk characteristics and baluns with good return loss (>15dB), low insertion loss (<1.5dB) and high common mode rejection ratio (40–50dB) over the video bandwidth of 8MHz.

Only one pair is used for video, leaving three pairs that can be used for feeding DC or AC power to the camera from the control centre. This is a simple process by using a 'power through balun' instead of a single balun (see figure 3).

The main difference is that this type of balun has a BNC video and separately a figure-eight cable for injecting power to the balun at one end and applying power to the camera at the other.

Under this arrangement it is possible to have a range of more than 300m, and cost savings over composite cable of 26-51% for distances of 100-300m.

Compared with coaxial, especially over a distance, Cat 5 is much easier to install, so there will be additional savings in labour. The ease of installation comes with the smaller size and weight of the cable, support for four video channels (or video plus power) and a smaller bending radius enabling the cable to go round tighter corners.

The physical size means much reduced duct and cable riser space (see figure 4).

A typical four-camera application using a single Cat 5 backbone and quad baluns with a range of 400m is shown in figure 5.

Material cost savings of 35-70% can be achieved for distances of 100-350m, with more savings when labour is taken into account.

Where an 'all Cat 5' solution is required, the quad balun at the camera end can be replaced with a quad splitter for the Cat 5 backbone and connected to the camera using single baluns.

Baluns and Cat 5 for CCTV installations also represent a lower risk, as the greater interference immunity of the cable means less likelihood of picture degradation during the warranty period.

It offers substantial benefits over coaxial, including:

- Greater interference immunity;
- Easier installation;
- Longer range;
- Video and camera power on one Cat 5 cable;
- Four cameras using one Cat 5 cable;
- Installation cost savings up to 70% compared with coaxial;
- Reduced installation risks;

- Future-proof cabling for Internet protocol applications. ■

Net Security Wholesalers now stock Violet Cat5e, which is recognized for use in CCTV installations and allows for easy identification of CCTV circuits.

Figure 3



Power through balun

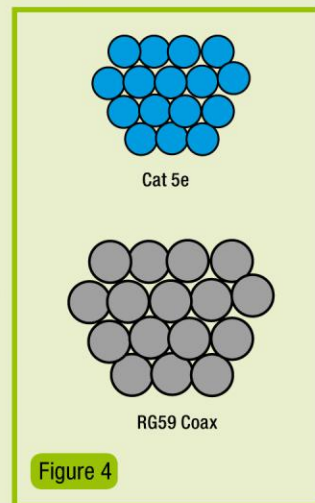


Figure 4

Figure 5

