Access control

This month the cost research department at Davis Langdon Mott Green Wall reviews the increasing use of access control systems using internet protocol-based technology

Third generation access control systems are entering a new age, as part of the intelligent building revolution using technology based on internet protocol (IP), which offers the advantages of greater functionality, flexibility and cost-effectiveness.

The new-build property developments of the 21st century are increasingly demanding smarter security solutions that operate over information technology (IT) infrastructure using common protocols such as Ethernet IP communications. Advances in the design of such systems now mean that this technology can be more cost-effective than comparable conventional analogue systems.

Third generation IP access control technology can be best used in two main areas:

- Ethernet card-reading technology.
- Linking access control systems to the IT system and associated databases.

Ethernet card-reading technology

Manufacturers of access control systems are now introducing IP card-readers, which allow connection to a data network point at door locations using standard CAT5/CAT6 structured cabling. This is a significant development for access control technology and follows the trend of electronic devices such as telephones and other security and control systems such as CCTV and BMS, connecting to, and communicating over, the network.

IP card-readers can also be powered directly off the network using Power over Ethernet (PoE) technology, which also offers significant advantages over conventional systems. The card-reader can connect to a data network in the same way as a PC or an IP telephone does.

The benefits of IP card-readers can be summarised as follows:

- Ethernet connectivity using standard CAT5/CAT6 cabling as standard.
- CAT5/CAT6 cables are simpler to install and cost less than dedicated wiring.
- PoE connectivity eliminates the requirement for 230 V power supplies at each door. This offers the significant cost reduction of approximately £300 per point.
- A more flexible solution in terms of office churn, providing a significantly lower cost of ownership for the end-user.

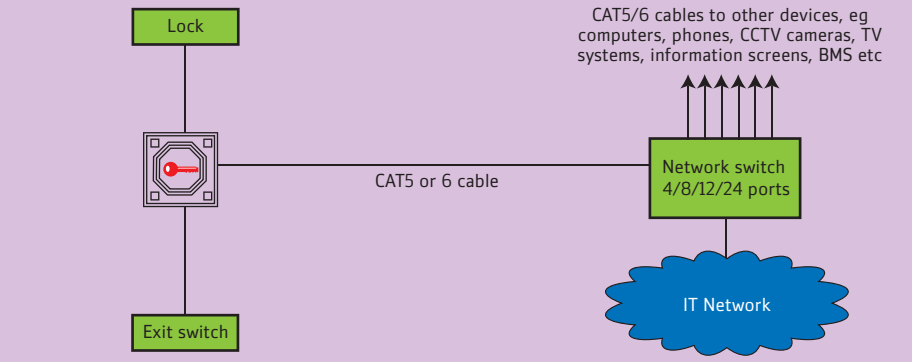
Access control can be used on systems comprising just one or two doors up to systems with thousands of doors, and can be deployed equally well on a single site or across several working sites.

In multi-tenanted buildings where different companies occupy different floors of the building, the control system and database can be configured to restrict the management and programming rights to relevant areas. This means that landlords can manage the access control to their own areas, with each individual tenant managing the access control for their particular area/floor of a building without interference.

At the opposite end of the scale, large organisations can control a complete network of systems centrally and regionally to allow cardholders to gain access wherever they go within their company across any site.

Smart cards are becoming increasingly used by building occupants, and these cards are usually the same shape and style as credit cards and carried around in similar ways. They are multipurpose devices that can both read and write information, and they provide a variety of uses such as vending, loyalty schemes and purchasing.

With developments in smart card chip technology, costs have been reduced to the point where it is becoming cost-effective to incorporate access control as one of the card's main functions.



Schematic showing a typical door control system

Access control systems

There are several areas where access control technology has made particular advances over the last few years to offer additional functionality and value. The key developments are summarised as:

- Linking access control databases to other systems to share cardholder information, which provides lower cost of ownership and more efficient working.
- IP-based access controlled systems where readers connect directly to the LAN.
- New card chip technology being imbedded in other devices such as mobile phones.
- Asset tracking and management of high-value items.
- Integration of access control with other electronic security systems such as CCTV, intruder alarm systems, BMS and car parking, leading to increased levels of security.
- Biometrics, such as eye-scanning machines and fingerprinting.

Cost comparison of analogue and internet protocol systems

Small system	Analogue (£)	IP (£)
CCTV 20 cameras	15,000	15,000
Access control 20 doors	18,000	16,000
Alarm management 20 zones	1,000	800
Integration	2,000	500
Total cost	36,000	32,300
Medium system		
CCTV 50 cameras	40,000	34,000
Access control 50 doors	44,000	36,000
Alarm management 50 zones	4,500	2,000
Integration	4,500	3,000
Total cost	93,000	75,000
Large system		
CCTV 100 cameras	70,000	62,000
Access control 100 doors	80,000	60,000
Alarm management 100 zones	8,000	6,500
Integration	6,000	4,500
Total cost	164,000	133,000

Exclusions: Site organisation and management costs other than specialist contractor allowances; contingencies; main contractor's overhead and profit or management fee; professional fees; VAT; inflation beyond first quarter 2007

The advantages of using IP-based access control systems and linking this to an IT system and associated databases are significant and can be summarised as follows:

- Main contractors can employ the structured cabling company to flood-wire the site using low-cost CAT5/CAT6 cabling for multiple system use.
- The end-user has a lower cost of ownership in terms of office churn as the common cabling infrastructure can easily be adapted by incumbent IT personnel.
- The amount of cabling is greatly reduced as several systems use the same cabling network. Also the IT backbone transmits all this over a common network.

IP-based access control technology is now being used in the majority of new commercial and retail buildings across the UK, as well as projects such as Heathrow Terminal 5.

Upgrading systems in line with the latest standards is straightforward and cost-effective, as has been demonstrated by the IP-based access control and CCTV systems at Luton Airport that were installed several years ago.

Cost analysis and comparison

Connecting several systems to a single common-cable infrastructure can lead to a material saving of between 25% and 30%, compared with a conventional system, due to a reduction in the use of proprietary cabling, where both power and controls wiring is normally provided with each device.

Labour costs are also greatly reduced, not only by having to run less cabling but also in the commissioning and setting to work of the systems, since each device used in the system can be pre-programmed and simply plugged into the network.

When IP access control technology first became available, the industry initially saw an increase in equipment costs of approximately 30% over comparable analogue systems. However, as the technology has become more widespread, this disparity has closed to the point where there is now little difference in the equipment costs between an analogue solution and an IP-based one.

The cost comparison table (left) compares typical analogue and IP-based costs for different sizes of security systems. As discussed above, the savings are in the reduction in cabling and reduced labour time. These costs do not take into account the savings due to easier upgrades and the lower costs of ownership and more efficient working. ■

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