

A guide to Access Control and Sustainability



What is access control?

Access control provides the ability to control, monitor and restrict the movement of people, assets or vehicles, in, out and round a building or site.

The system is essential for all businesses to protect people and assets and has the added benefit of being expanded from controlling, for example, a single entrance door, to a large integrated security network. There are also huge potentials in terms of integrating this technology to other systems, such as Time and Attendance, Visitor Management, ANPR, Fire, Intruder and CCTV, which can cut costs and streamline administration costs.

The scope of the technology is certainly impressive, and with sustainability and financial concerns high on the agenda of many businesses, it is important to understand the many ways in which an effective access control system can also help cut energy bills by both reducing energy wastage and improving an organisation's environmental footprint.

What are the components of access control systems?

Access control systems are all designed to allow access only to people with the necessary authority to ensure that goods and staff are protected, whilst helping manage known or anticipated threats.

In general, access control systems form part of a comprehensive and integrated security strategy. For more information on what other measures businesses could integrate with their access control systems, visit the BSIA's website www.bsia.co.uk

Generally, systems comprise three component parts:

1. **The physical barrier** - to physically restrict access to a building or location via such methods as:
 - Doors; secured by either a magnetic or strike lock or can be revolving or sliding.
 - Turnstiles and speedgates; designed to limit access to one person for one card presented.

2. **The identification device** – There are a number of different technologies used to identify users of an access control system, such as:
 - A proximity card and reader using RFID – cards can be programmed to work at a short read range or a long read range.
 - A smart card and reader.
 - A swipe card and reader.
 - PIN pads.
 - Biometric (e.g. fingerprint, facial, iris scanning).

3. **The door controller and software** – The door controller and software are at the heart of the system and are used to decide who can gain access through which access point at what time of the day. These can vary dependent on the size of the system and how many readers or sites you are trying to control from one point. Some of the options include:
 - A stand-alone door controller linked to a single door with no software.
 - A number of door controllers all linked together to a single PC to control one site.
 - A number of sites all interlinked together over a wide network area.

How can access control help reduce a company's environmental footprint?

Despite the widespread financial cutbacks, corporate social responsibility and being able to demonstrate environmental credentials remains a priority for many businesses. What many often fail to realise, however, is the crucial role that their security provider can play in helping to combine cost savings and environmental commitments, whilst reducing the risk of theft and vandalism.

Access control has long held a valued place within organisations of all types, helping to monitor the flow of authorised personnel around the premises while playing a vital role in health and safety and visitor registration.

Recent developments in technology within the security industry means that access control measures can now also play a favoured role in reducing your premises' environmental footprint.

Perhaps the primary and most common way to achieve this is by carefully looking at the wealth of information that access control technology can provide.

The building or area occupancy data provided by the system can highlight which areas of a building are occupied and when, and which are not being utilised to their full potential. Identifying this can lead to a number of important decisions which will go a long way towards reducing your environmental footprint and producing substantial cost savings.

Examples include the decision to adjust lighting and HVAC (heating, ventilation and air conditioning) requirements depending on whether or not the area will be used at a certain time of the day, as well as to reallocate any unused space, either internally or by renting it out.

Other ways in which access control can help reduce the environmental footprint of a company is by integrating it with Building Energy Management Systems (BEMS), or avoiding heat wastage by isolating indoor spaces with the use of security revolving doors. The access control system itself can be energy efficient, for example using low voltage turnstiles.

Access control and sustainability in practice – case studies

The figures behind Building Energy Management Systems

While traditionally Building Energy Management Systems (BEMS) were focussed on controlling the building's internal environment, it is now commonplace for it to be integrated with the fire and security systems in place, including CCTV and access control.

BSIA member ADT provided BT's site in Castle Wharf, Nottingham, with a BEMS system which slashed electricity bill of the site by 77%, by implementing a better control system.

BT's Energy Manager for the Castle Wharf site, said about how this worked in practice: "We needed to refurbish the HVAC system and wanted to install variable speed drives because we knew there was a potential for energy saving. Out of hours, there are only a few occupants. As the fans were not speed controlled, this led to a large waste of energy. Also, the car park ventilation was not needed at night and needed to be controlled as well.

"Additionally, our Building Management System was not set up the way we wanted and so we decided to use a BACnet® based system. This would allow us to zone the building and introduce time controls to take account of occupancy patterns."

A BEMS can typically control up to 80% of a building's energy usage, so it's clear to see how using access control to optimise the system to suit the variable usage and occupation of a building can streamline energy usage.

In such systems, data gathered by access control and visitor monitoring systems is used to inform the BEMS of the nature and function of the people occupying a heating zone. Knowing what roles are being fulfilled by individuals operating within a heating zone also allows the BEMS to make adjustments and lower the amount of fuel consumed. This information is applied by the BEMS to heat-loss algorithms to determine the minimum amount of heat to be applied to a particular area, reducing the amount of energy consumed and avoiding unnecessary wastage. For example, a small group of students performing largely sedentary activities will require more heating than a large group of manual workers conducting more physical activity in a relatively small area.

Identifying patterns in visitor behaviour can stop the unnecessary heating of unoccupied heating zones, saving fuel and reducing CO2 emissions. This works intelligently, using past data to assess when a certain area of the building is likely to be occupied, activating heating in time for visitors' arrival and reducing temperature or turning off the heating entirely during periods of inactivity. This can be particularly useful for university buildings, where operations and activities adhere to a regular schedule which is easily 'learned' by the BEMS to assess the timing and level of heating required to adjust the systems accordingly.



Insulating access points at Redbridge College

One of the greatest challenges for any education establishment is balancing the need to create an open, stimulating and comfortable environment, while ensuring that people and equipment are protected from the threat of theft, vandalism and physical attack.

BSIA members, Kaba Ltd, were approached by Redbridge College to tackle the issue around the automatic sliding doors currently in place at the college.

It was explained to the BSIA member that the doors were allowing a cold ingress into the reception area and throughout the building each time the doors opened. With the frequent comings and goings of all site personnel and in light of today's continually rising utility rates, this was proving to be both impractical and costly.

After listening to the client's requirements, Kaba Ltd proposed and subsequently installed a fully automatic revolving door with bilateral automatic pass doors. The automatic pass doors were installed either side to provide seamless access for people with reduced mobility and for the transportation of goods via the reception area.



The product provides an energy efficient solution for entrance areas thanks to the thermal separation design incorporated into the facade of a building.

This allowed the college to achieve excellent thermal insulation, whilst having a customised design fitted and being provided with a solution for emergency escape routes.

Increasing the efficiency of Access Control itself

As well as integrating with systems such as BEMS to reduce energy wastages, recent developments in technology mean the access control systems themselves are now proving to be increasingly sustainable.

Access control systems can in fact offer energy savings whilst maintaining reliability and performance by utilising low energy light sources in office environments, resulting in an immediate cut down on energy use. As opposed to utilising a more traditional linear power supply, switched-mode power supplies are therefore gaining in popularity in the access control market. Such supplies can in fact offer sizable savings in energy consumption by incorporating a switching regulator in order to be highly efficient in the conversion of electrical power.

To prove the benefits associated with adopting the switch-mode power supply as opposed to linear systems, BSIA member TDSi tested both approaches. They calculated that using the switch mode power supplies in place of linear systems with transformers would save users, on average, an impressive £50 per controller per year in energy costs. Saving energy on each appliance therefore provides a solid foundation on which to cut operational costs.

However, to build on this requires the integration of all the different system components so as to offer a more efficient solution.



Thames Valley introduces integrated access control system

BSIA member Integrated Design Ltd completed an installation of Fastlane speedgates (pedestrian turnstiles with tailgate detection) for Thames Water, having been proposed by a UK based national systems integrator providing high-end systems.

The installation integrated retracting glass barrier gates and contactless smart-card readers, along with cashless payment canteen systems to create a seamless and sustainable experience for staff and visitors. The installation is designed to reinforce the use of staff access control cards without restricting access to authorised users.

The system's cards allow access to the building via the turnstiles and to zones relevant to the card holder, as well as carrying funds for purchasing food and beverages in the restaurant and vending facilities along with a 'follow me' printing solution.

The aesthetics and effectiveness of the secure solution were praised by the client, as was its extra low power consumption. The BSIA member in fact produced and installed its turnstiles with extra low power consumption of less than 50 Watts per pedestal. A fitting choice considering the theme of the business park is based around its green credentials.

What other benefits can access control systems bring?

In addition to ensuring the security of premises and being able to positively impact on an organisation's environmental footprint, there are many more functions that access control systems can cover to help with business operations.

Time and attendance

With both staff and visitors entering and leaving the premises, badge/token technology can be used to record employee hours and monitor visitor movement within a specific site. If appropriate, these can be processed against working hours, applicable for both temporary and permanent staff, which can work in real time to feed transactions through to the company's payroll. Time and attendance systems also accurately help keep employers on the right side of the European Working Time regulations and manage holidays and absences effectively. Fast, accurate and easy-to-use, these systems are suitable for businesses employing just a few people, right up to large multinational companies.

Visitor monitoring

In contexts where visitors can easily blend in with the high volume of staff present, the use of PC and computer networks should be considered. These systems can print photographic ID and allow access to be restricted to certain areas within the site. Moving to a software solution for visitor management is an easy and inexpensive solution and can provide a number of added benefits.

Automatic Number Plate Recognition

To monitor the movement of vehicles on site, CCTV-style cameras and computer software can be used to identify number plates of vehicles. Some systems can also store photographs of the driver and vehicle for subsequent analysis. This sophisticated software allows critical information to be passed to the police to assist in the pursuit, identification and capture of offenders should an incident occur. Visual proof of parking offences with the corresponding time and date information is provided as evidence and to avoid disputes. Using a Driver and Vehicle Licensing Agency (DVLA) link, monitors are then able to identify the owner of a vehicle and process the offence automatically.

Fire roll call

Fire roll call software will automatically generate a report in the event of a fire or other emergency containing crucial information in relation to who is within the building and their movements around the site. This software operates via the access control smart card or fob that an employee uses to gain access/exit to a building. In the event of an emergency, the fire roll call software alerts occupants to the emergency whilst simultaneously activating the report at a safe pre-determined remote point.

Please note that in order for the fire roll call software to effectively carry out its function, employees and visitors must always present their card or badge. The use of smart card or RFID controlled turnstiles can help in this situation.

Integrated security systems

Sites can benefit from a fully integrated access control system with CCTV, intruder alarm, turnstiles, fire detection and building management systems. One way to attain this is by adopting the use of Internet Protocol (IP) technology, which allows these systems to 'talk' to each other to maximise their effectiveness.

Separate access control and intruder alarm systems, for example, could allow an employee to access an area, through an external door, that is set with an alarm. However, unless the employee has the authority to unset the system, the access would result in a false alarm being activated. An effectively integrated system would recognise that the user does not have the authority to unset the system, so would not allow them in the area to begin with, until someone authorised grants them access by unsetting the alarm.

How do I identify the security solution needed for my organisation?

The outcome of an initial risk assessment for each site will determine the level of security you require and in turn influence your choice of access control system to be used. British Security Industry Association (BSIA) access control members can assist with this.

BSIA Access Control members have a wealth of experience providing tailored solutions that can address security concerns whilst also meet the sustainability demands of your organisation.

Moreover, Association members are subject to rigorous checks before they are admitted into membership, meaning you are selecting quality companies to achieve peace of mind. Below are just some of the reasons why you could benefit from using the services of a BSIA member:

- Independently inspected to the quality standard ISO 9001 with a UKAS accredited inspectorate
- Compliant with relevant British and European Standards and codes of practice
- Financially sound
- Professional
- Staff vetting conducted (where appropriate)
- Technically proficient
- Committed to quality training and development
- Up-to-date with the latest developments in British and European policy and legislation.

Is there any legislation I should be aware of?

Design of the access control system should take account of the Equality Act 2010 and Disability Discrimination Act so that physical aspects permit goods and services to be accessible to disabled people.

The Disability Discrimination Act was amended in 2005 and has significant impact not only in terms of the design of new systems, but also means that many systems may need to be upgraded to ensure compliance.

The BSIA has created a guide to help design access control systems following the introduction of the revisions which can be downloaded from www.bsia.co.uk/publications searching for form 173.

Other legislation to be considered in relation to the utilities sector is:

- National minimum care standards
- Health and Safety at Work Act
- Occupiers Liability Act
- Management of Health and Safety at Work Regulations

Where can I go for further information?

For more information on the work of the BSIA Access Control Section, visit www.bsia.co.uk/access-control

To find an access control provider in your area, visit www.bsia.co.uk/companyfinder

About the BSIA

The BSIA is the trade association for the professional security industry in the UK. Its members provide over 70% of UK security products and services and adhere to strict quality standards.

BSIA members are at the cutting edge of standards development in the UK and Europe. Each year the BSIA develops a number of its own codes of practice, which often go forward to be developed into British Standards. Customers can be confident that the products and services of BSIA members reflect the latest industry standards.

The BSIA would like to thank its members, and in particular ADT, Integrated Design Ltd, Kaba Ltd, TDSi and Tensor, for their contribution to the content of this guide.