Integrated Thinking: Connected Security for Smart Infrastructure

ASSA ABLOY

ABLOY®

The global leader in door opening solutions

The connected world is revolutionising the way critical assets are protected by national infrastructure organisations. But is true system integration really achievable?

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Introduction

Critical national infrastructure organisations are under more pressure than ever before.

In 2016, the population of the UK was 65.6 million, its largest ever . The UK population is projected to continue growing, reaching over 74 million by 2039, and the impact of this is being felt across the country by power generation, utilities, telecoms, healthcare, transportation and financial institutions.

This pressure is amplified by the requirement for a more sustainable infrastructure, with targets for increased efficiencies and reduced environmental impact rife amongst most, if not all, organisations.

Compliance is also a critical issue - stringent standards are set by regulators and audits must be completed successfully. Not to mention the requirement for smooth continuation of services, no matter what external impact to the organisation.

This study outlines the potential for system integration in the critical national infrastructure sphere and discusses the vast scope of benefits that could be achieved from a truly integrated way of operating.

65.6m
UK population in 2016

74m
UK population in 2039

The rise of IoT

Unless you are truly disconnected from the modern world, it's likely you'll be familiar with a few terms created in the last few years, such as BREXIT and GDPR.

Another that has been in circulation for a while is IoT, the Internet of Things. Interestingly for Abloy as a Finnish company the first references to the 'Internet of Things' appear to be coined in a Finnish article in 2002 .

IoT refers to a network of connected devices, at work, in the home, a network of physical devices with embedded connectivity allowing them to receive and transmit data.

The phenomenon is associated with the connected world and the rise of the smartphone - at the very least as a means of controlling these devices, and in certain cases as a data provider itself.

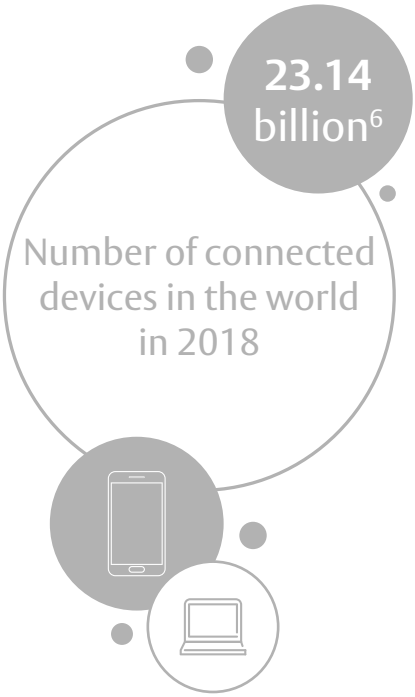
However, these devices often don't necessarily all talk to each other as you could be led to believe.

Disconnected World

Although we live in what we consider a 'connected' world where there are more smart devices than ever before, the reality is we are still disconnected. There are a number of reasons for this.

Firstly the number of connected devices in the world is said to be 23.14 billion in 2018, but what are these connected to? In terms of security, why isn't permit to work to inextricably linked to site access? Why can't we use telemetry data to define access or automate and adjust access requirements based on any number of secure inputs from around an organisation?

There are some devices that are ahead of the curve that will claim an element or all of this, but in this world of connected devices, why isn't it the norm?



Research shows the global electronic access control systems market is expanding rapidly, with a forecast growth of more than 6% between 2017-2022 . Two decades of growth in the electronic access control sector have led to a rise in system integrators, a provider in the market of 'integrated solutions'.

But in reality, the solutions often provided only 'integrate' on a basic level, and leave out many system inputs that could support greater efficiency and ultimately greater outputs.

True integration of systems is rare. So, this gave rise to the data company, the middleware provider, that sell only the means to make things talk rather than the 'things' themselves - complicated professional services, process and workflow design, APIs, SDKs and direct programming, design specifications that eat up resources before anyone even writes a line of code.

Therefore, we live in a connected but very disconnected world. The concept of 'integrated thinking' is a mind set to help us move forward with a philosophy that because it should it can, not because it can it should.

If a customer recognises a need for two separate systems to talk, then a manufacturers' responsibility is to ensure that they already had that in mind and that the path to get there is simple. Not a company line of 'we have an API/SDK, you can integrate' - a statement of 'we built the solution to integrate and we will make sure it does'.

Integrated thinking is a pledge to the 'API first' thought process, if we think about connecting the solution holistically throughout the design, engineering, sales and support process, and we adopt an integrated thinking relationship marketing strategy, then we will achieve true connected status and we will build SMART Infrastructure solutions alongside our clients.

30 billion[7]

Number of connected devices in the world in 2020

6%[9]

Global electronic access control systems market growth forecast between 2017-2022

75 billion[8]

Number of connected devices in the world in 2025

Our blue sky

One area that Abloy has investigated is how often a key is actually doing what it is supposed to be doing?

What percentage of a key's life is spent at risk, you could argue that anytime that a key is not in a lock it is not doing what it is designed to do and therefore represents a risk.

We would wager that the key is only doing what it is supposed to around 1% of the time - our blue sky is to make that key secure 100% of the time.

When is a key more than just a key?

Possibly one of the most common requests is for “keyless solutions”, in the belief that using a smartphone does away with worrying about lost keys or cards or nothing else is required to secure the access.

This is again convenient if you’re in a warm and comfortable environment, with all the usual expectation of having basic national infrastructure resources on tap such as electricity, Wi-Fi, or wired data communications.

In the majority of national infrastructure sites, however, assets tend to be very remote and disconnected. Battery technology is improving as we can see with electric or hybrid cars, but batteries tend not to like cold or wet environments - two elements reliably found across UK national infrastructure.

The fact is the traditional key is still a practical and very reliable device, especially in harsh environments. Provide it with power and data that you can carry around in your pocket, and the basic key becomes far more than just a key. It is now a connected device that provides all the solutions expected in a connected society.

Infrastructure is no different from any other commercial business, it needs to strive for greater efficiencies and better use of time. Not to just remain competitive in the market, but to allow the “routine operations to happen routinely”, integrated automation can fulfil the needs of infrastructure.

Regulators set standards and demand audits to verify compliance has been maintained as part of the essential service provided to society. CEO’s and Health and Safety Managers would want to guarantee only fully trained competent individuals operate dangerous equipment, and that all inductions have been fulfilled before work starts.

It should be routine but so often it turns into a paper chain with a few links missing.

Is the time right?

Taking a solution to a market that isn't ready for it can be just as dangerous as realising a gap in the market too late.

At a recent communications summit we heard about the roll out of 5G, distributed antennae services and the amount of data expected to travel through our communications infrastructure – one self-driving car may need up to four terabytes of data every day!

With the rapid changes in the communications sector to build our infrastructure to reach the ambitions of the 'connected world' we need to be ready to make the most of it.

Changing the way you think doesn't happen overnight - we started seven years ago and believe it is crucial that critical infrastructure organisations develop their integrated approach as a priority.

Keeping security in mind

When considering Economic Value to the Customer - the maximum amount that a customer will give up in exchange for something - you probably immediately think of a monetary value. Of course, this is important, but in reality are people willing to give up other things?

The electric car requires you to give something up in exchange for fuel efficiency, financial gain and sustainability – you have to give up your time. That's 30 minutes to fast charge your car versus 5 minutes to fill up with conventional fuels. Internet banking, an efficient, all day, anytime access to your finances – on your phone. But have you given up some security?

Access Control is a similar story, the efficiency gain of an access control door is immediately recognisable, a high traffic door in an office building where a card access system can record users in and out and can restrict the flow of people based on time of day rather than the key they hold is clearly a step forward.

But does a magnet that can be defeated with a can of hairspray or piece of chewing gum provide you the same security as the British Standard mechanical key and lock case that you replaced?

Certainly, there is a convenience and efficiency benefit of card/token operated access control systems, against a key operated lock, however security is in the majority of cases lost or at best reduced.

From a practical perspective, providing power and data cabling in warm clean office environment is relatively simple, but try doing this on national infrastructure when the critical asset is sited across acres of agricultural land only accessed once or twice a year traditional access control becomes impractical.

There is a responsibility belonging to manufacturers to recognise the needs of their customers, and security is a fundamental requirement if you are a security product manufacturer. Making sure the right solutions are installed in the right places is critical to brand reputation and future business.

At Abloy security is at the heart of what we do, our CLIQ® system enhances our mechanical heritage and security rather than replacing it. We have introduced the features and functions without the compromise, in fact we have had new security threats to consider, in cyber threats and data protection.

Abloy understands the challenges and needs of National infrastructure, the reluctance to spend on security to protect valuable national assets and resources either from terrorist attack or the opportunist disrupter. Security has been difficult to sustain especially in very large business, the very moment you hand a key to an employee, and control is lost.

Integrated technologies will provide sustainable security, not just as a means to control access but also as a means of saving time which delivers operational efficiencies and health and safety assurances.

Taking control

So, what is the solution to this issue of key control to protect critical assets and information? Electronic key solutions that feature web-based management can be integrated with existing telemetry systems to help control and manage operations.

This offers a high level of both physical and data protection – given they only use accredited software and infrastructure providers. For example, some systems boast an electronic key system where all the power is retained by the key or locks themselves. This means no wiring is required, whether the system uses door cylinders, cabinet locks or padlocks.

Users have secure access to an online management application from anywhere in the world and can change key access permissions, profiles, schedules and validity, even revoking their use virtually at the click of a button. Keys can be validated daily, weekly or monthly keeping them continuously secure, and users are required to change their password every three months.

This enables an organisation to comprehensively track and audit who has access to which locations, when they had access and how often. Access can be granted only at the exact moment it is required, mitigating the risk associated with lost or stolen keys.

What's more, certain advanced systems take advantage of the latest Bluetooth 4.0 technology, meaning keys can be activated through a smartphone and access rights can be granted to the user 'on-site'. This revolutionises remote access control by bringing it into the mobile era - offering flexibility, time-saving, ease of use and integration.

This offers a solution to the issue of key control and being able to effectively manage access rights in organisations where there is staff fluidity. If a key is lost, or if a contractor or temporary staff member needs access revoking, this can all be done centrally by an administrator, minimising risk of a physical security breach.

In addition, if access rights need to be altered, with a permanent employee being given permission to enter more areas, this can be done quickly and easily, even with the use of a smartphone.

Operational efficiency

In the case of critical national infrastructure operations, security is vital to the continuity of essential services. But as well as minimising the vulnerability of an organisation, there are many additional benefits to be gained when installing a solution such as this and integrating it with other 'smart' systems.

Financial savings, CO_2 emissions savings, and most importantly time savings can be made with smart infrastructure integration. For example, access control can be linked with Enterprise Resource Planning systems to identify key holders on shift. Or Permit to Work systems can be linked to ensure they are still compliant for the job at hand, and Telemetry and SCADA systems to see where they need to be.

The hybrid between mechanical and electronic technologies is the 'key' to success in this arena, maintaining the strict standards required for security whilst enhancing the operational efficiencies and the security for the future.

Many organisations in the power generation, water supply, telecoms, financial and healthcare sectors have seen improved operational control and efficiency when moving to an integrated web-based access control system. One institution even saw return on investment of 600 per cent in the first 12 months following installation.

But most importantly, when the data is secure and managed effectively, the service continuity and resilience is guaranteed.

The Abloy solution

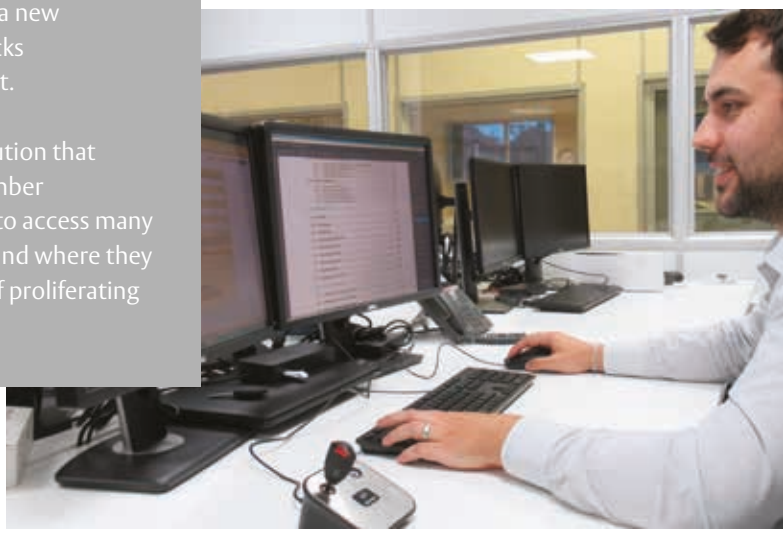
The ABLOY PROTEC2 CLIQ® solution provides users with an electronic key cut to the same code as their mechanical ones, but with the addition of time-based access rights and flexible opening permissions.

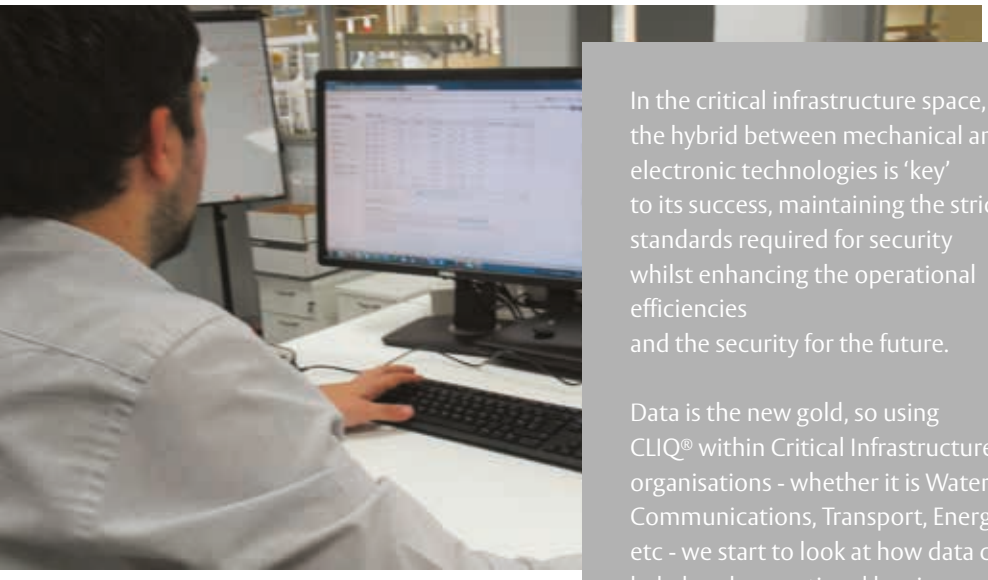
What's more, when used in conjunction with Abloy's CLIQ® Connect technology and Bluetooth Low Energy (BLE) Key, keys can be activated through a smartphone. This revolutionises remote access control by bringing it into the mobile era - offering flexibility, time-saving and ease of use.

The BLE online key takes advantage of the latest Bluetooth 4.0 technology, and connectivity provides a real-time audit trail on wire free products such as padlocks and cam locks, and access rights can be granted to the user 'on-site'.

This not only offers enhancement to security, but a significant efficiency measured in time. In the past, employees were bound by the shackles of risk, a mechanical key once lost is only truly eliminated by the introduction of a new mechanical suite of locks – at an unwelcome cost.

CLIQ® is a one-key-solution that enables each staff member to have their own key, to access many different assets when and where they need to without fear of proliferating risk assessments.





In the critical infrastructure space, the hybrid between mechanical and electronic technologies is 'key' to its success, maintaining the strict standards required for security whilst enhancing the operational efficiencies and the security for the future.

Data is the new gold, so using CLIQ® within Critical Infrastructure organisations - whether it is Water, Communications, Transport, Energy, etc - we start to look at how data can help break operational barriers, and a wealth of new opportunities become available.

Imagine the financial savings, CO_2 emissions savings, sustainability benefits and most importantly time savings that could be made by linking to Enterprise Resource Planning systems to identify key holders on shift. Or linking Permit to Work systems to ensure they are still compliant for the job at hand, and Telemetry and SCADA systems to see where they need to be.

With CLIQ®, employees are only activating their key for access when and where they need it – without human intervention, without the need to collect a key, provide key holding, or attended visits.

CLIQ® offers automation and integration in a key that only has access for the few seconds it needs it, wherever and whenever it needs it. While it is doing what it is supposed to, it gathers data and creates traceability and information that can further enhance the efficiency and security of your systems.

Case in point

North Lincolnshire and Goole NHS Trust

Security expert Abloy UK has supplied high security CLIQ® cylinders and keys to Northern Lincolnshire and Goole Hospitals NHS Foundation Trust to upgrade the security of the drug cabinets at Scunthorpe General Hospital, resulting in significant cost and time savings.

The CLIQ® technology provided the hospital with added benefits such as easily being able to amend or delete access rights and collecting audit trails from the ABLOY CLIQ® cylinders, coupled with the ability to easily delete lost or stolen keys from the system ensuring that security remained a priority.

Mike Urwin, Clinical Director of Pharmacy and Medicine Management at Scunthorpe Hospital, comments: "Throughout the trial of CLIQ® Remote we undertook research to discover how much time was actually spent on nurses looking for keys, the results were astonishing.

"Typically a nurse will spend an average of 40 minutes per shift looking for keys, this equates to 250 minutes lost on a ward every day. Over a year, if this equation was used across the whole of our 51 wards, the lost time would be the equivalent of having an extra 24 nurses on duty every day across the whole Trust!

40 minutes lost per nurse per shift looking for keys

250 minutes lost on a ward each day

equates to **24** nurses on duty across the trust

Case in point

Electricity North West Limited

Almost 15,000 Abloy CLIQ® locking cylinders and padlocks have been fitted at Electricity North West Limited multiple sites. The installed CLIQ® system offers high flexibility, as mechanical cylinders and padlocks were installed in conjunction with the electromechanical CLIQ® cylinders across all the sites.

Electricity North West Limited is also using almost 2,000 CLIQ® user keys and over 40 CLIQ® programming devices to update access rights of keys remotely. Electricity North West Limited's old brass padlocks had on occasion been targeted by thieves for their scrap value.

The new padlocks all meet required security standards, are tested to BS EN12320 and are certified to LPS 1654. The CLIQ® software supports the complex workflow of the utility company, by enabling audit trails to be generated for individual locks, keys or system users. If a key is not returned or lost, this no longer creates a major security risk because all keys can be activated, access changed or removed using the CLIQ® web manager software, making a truly dynamic secure system.

The battery-powered CLIQ® keys are programmable; for example, a temporary contractor can be issued with a key that permits entry to specific sites for a limited time period. After the authorisation period ends, the key is not able to open the lock. Abloy UK are proud to be helping Electricity North West Limited secure electricity supply to 5 million people, with the CLIQ® locking solution.

supplies electricity to

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LPS 1654

Case in point

Northumbrian Water

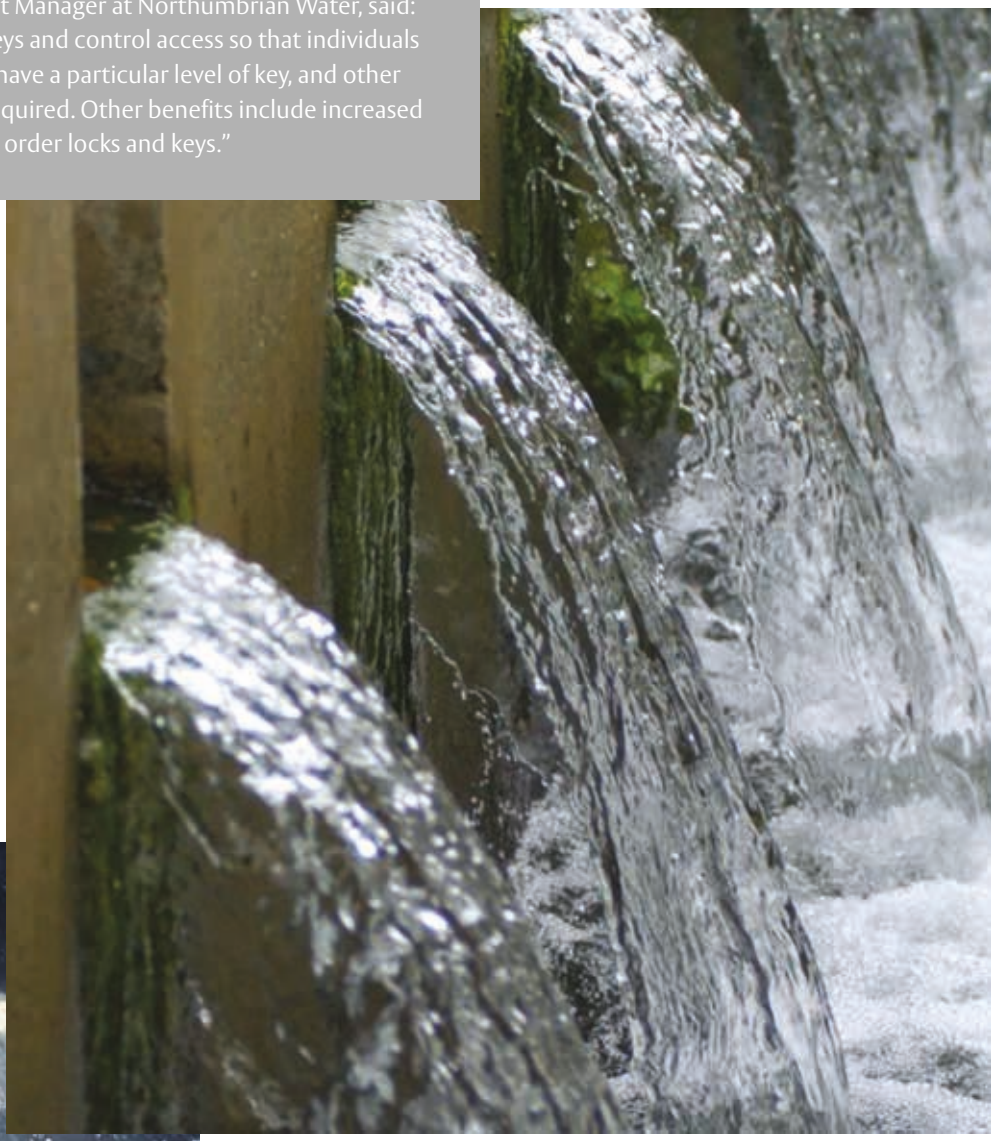
Security expert Abloy UK has supplied the Northumbrian Water Group in Durham with high security padlocks and cylinders for 3,000 clean and waste water sites, helping the company upgrade its security systems in line with stringent Government legislation.

The PROTEC2 CLIQ®cylinder system was specified as it is specially designed to provide the highest level of security for the most sensitive areas; it offers a patented disc controller structure that requires a moving element in the key.

Victoria Jobling, Investment Delivery Project Manager at Northumbrian Water, said: "The Abloy key system allows us to grade keys and control access so that individuals that only need to access certain assets can have a particular level of key, and other employees can have a higher level where required. Other benefits include increased general security, as we can control who can order locks and keys."

3000

clean and waste water sites



Appendix

[1] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/july2017

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Abloy understands the challenges and needs of National infrastructure

Security. Integration. Savings. Efficiency. Sustainability. Return on investment.

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