Access Control 101.

ICT's ultimate beginner's guide to physical security.

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Introduction.

Access Control. What does that even mean?! Why do I need to know about terms such as intrusion, or integrated security? Now you've downloaded this guide, you'll learn the answers to all of this, and more.

Whether you're a business owner, a property manager, an IT professional, most people only tend to think of security once they have an issue. And that's OK, because why should you worry about it all the time?

With a modern access control system, you'll get peace of mind, knowing that your staff or customers can stay safe – a key priority of any business owner or manager. You can also rest easy at night as you're less likely to get those annoying late-night phone calls because someone has forgotten to lock the door. And forget those costly call-out fees to change the locks every time someone loses a key.

Once you have a functioning security system, you won't even notice it. It just works.

But where to start? It can seem rather daunting – lots of acronyms, abbreviations, and technical terms that you've never heard before. We get it, we had to learn it all too. That's why we created this guide. Think of it as a fast track to security success. It's dotted with tips and tricks from our staff and customers to ensure you can make an informed decision. We've even included a handy guide to the common acronyms and terms you're likely to encounter.

So read on, learn, and emerge empowered to start your own access control journey, armed with all the knowledge you need to secure your premises.

What is access control?

The aim of access control is to manage entry so only authorized people can enter a building or premises, or specific areas within a building. Access control systems help a business to minimize risk and create a safe environment. They restrict unauthorized users while providing an unobtrusive experience for approved people. Access control systems also provide a layer of audit and reporting, should you need to track movements of people or goods around a site.

Why access control?

Your site may have areas where you need to restrict and monitor who can enter. You might also have health and safety requirements that mean you need to know where your team is at any given time. You could run a 24/7 facility that needs to save power during downtime while still offering user access. Or it could be that you have a gate that needs to open for the right people at the right time. You can meet all these needs, and much more, using access control.

When done well, access control systems should enable effortless movement and enhance the overall efficiencies of day-to-day business.

Evolution of access control.

Many businesses still use traditional locks and keys. Surprisingly, this technology has not progressed much since the 1860s when Linus Yale, Jr., patented his cylinder pin-tumbler lock. And yes, it's the same Yale you still see on some padlocks today!

However safe traditional locks were, businesses spent a lot of time and money calling out locksmiths to rekey all the locks just because someone lost a key, and then reissuing keys to everyone. Technology has led to major changes in access control. Advancements in the 70s and 80s led to RFID card technology.

The widespread adoption of the 125kHz proximity (or prox) card took security into the modern age, and for a time, provided convenient and robust electronic access control.

As flaws in 125kHz became apparent, other technologies were developed - from PINs and biometrics, through to 13.56MHz proximity smart cards and mobile credentials - but until recently, none have looked to overtake the ubiquity of the humble 125kHz prox card.

However, the increasing adoption of smartphones and the Internet of Things (IoT) mean the next generation of security is being driven by increasing connectivity and ease of use.

The modern system.

Modern access control systems give you the flexibility to make even small changes when you need them. If a card is lost, simply deactivate it and issue another without affecting anyone else's access. Easily change schedules to ensure security is not compromised on a public holiday or enable after-hours access for cleaners. You can even allow or disable access to certain areas on a temporary or permanent basis. Ease of use is a crucial factor and removes a pain point for staff. Say goodbye to that clunky bunch of keys, and replace them with a single card, fob, or your mobile phone - which allows access to all authorized doors.

A modern system comes into its own when access is included as a part of an ecosystem that manages a site. When you combine access control with building automation and intrusion detection (such as alarms or video surveillance), multiple security products make your property even safer by working together. And a unified system means you can control all of these from one simple interface.

Access control.
Restrict entry, keeping unwanted people out while allowing authorized people to enter.
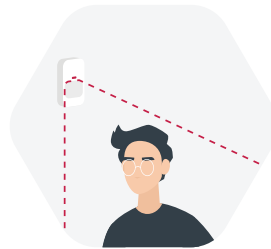
Intrusion detection.
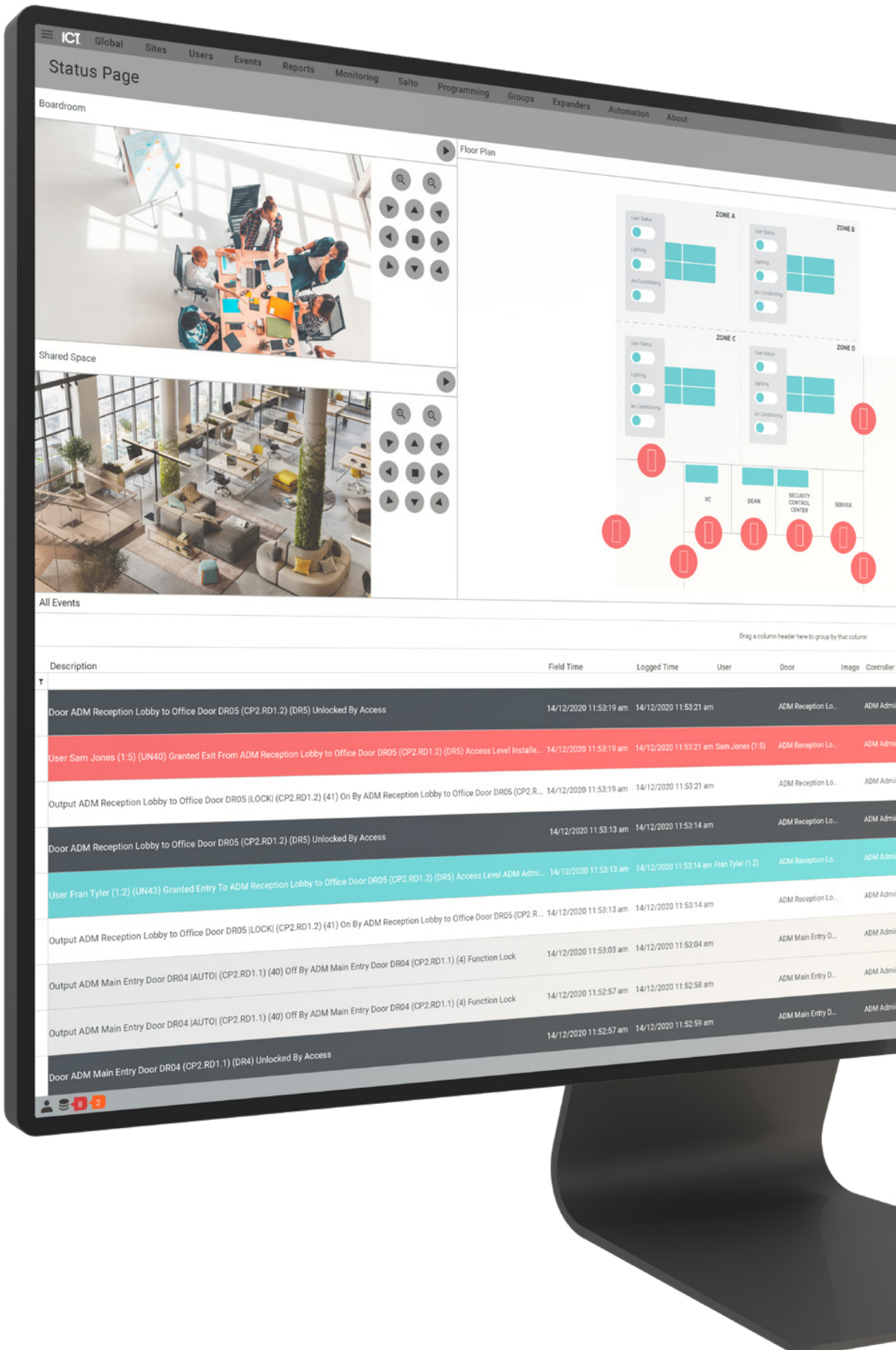Alarms, motion detectors, and video surveillance ensures that unauthorized access doesn't occur.

Building automation.
Reduce energy consumption by automating manual tasks such as turning lights or heating on and off.

Benefits.

> Increased safety and security.

> Peace of mind from the visibility the solution offers.

> Enhanced employee satisfaction due to ease of use.

> Potential upfront capital savings as your new access control system may work with some of your current security infrastructure like motion sensors or existing cabling, saving replacement costs.

> Reduce false alarms with reliable reporting and alarm and fire monitoring services.

> Incorporating added functionality by using third-party integrations such as wireless locking, elevator controls, or video surveillance, while still maintaining a single system for access and security.

> Extra cost savings and efficiencies by integrating with a Building Management System to reduce energy consumption by controlling HVAC (heating, ventilation, and air conditioning), lighting, and more.

> The ability to sync data with external sources like HR systems or student management software so there's a single source of truth.

> No more ongoing costs to rekey doors each time someone loses a key. Simply deactivate their card and issue a new one.

> No after-hours trips when someone has left their key at home. Grant access or change settings remotely.

> Increased business efficiencies by using monitoring and reporting functions to make evidence-based decisions such as checking meeting room usage, then re-deploying it if it's underutilized.

> Respond quicker to problems by setting up instant notifications to your mobile or monitoring service when an unusual event like a broken window or door being forced open is reported.

> Allowing implementation of health-safe practices such as touch-free access, contactless delivery services, or limiting capacity to certain areas for social distancing.

> Future proof your business by choosing a modular system like ICT's that uses secure encryption protocols and can scale with your business growth.

> The ability to track access to items such as tools, hardware, or medicine that are stored in a locked area.
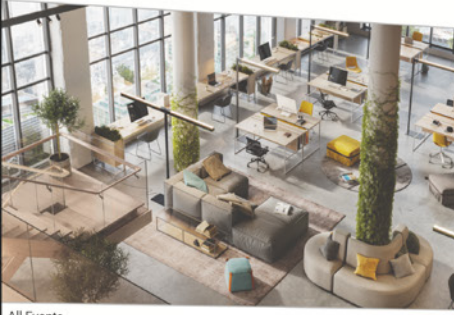
ICT   Global   Sites   Users   Events   Reports   Monitoring   Salto   Programming   Groups   Expanders   Automation   About

Status Page

Boardroom

Floor Plan

ZONE A   ZONE B
User Status   User Status
Lighting   Lighting
Air Conditioning   Air Conditioning

ZONE C   ZONE D
User Status   User Status
Lighting   Lighting
Air Conditioning   Air Conditioning

VC   DEAN   SECURITY CONTROL CENTER   SERVER

Shared Space

All Events

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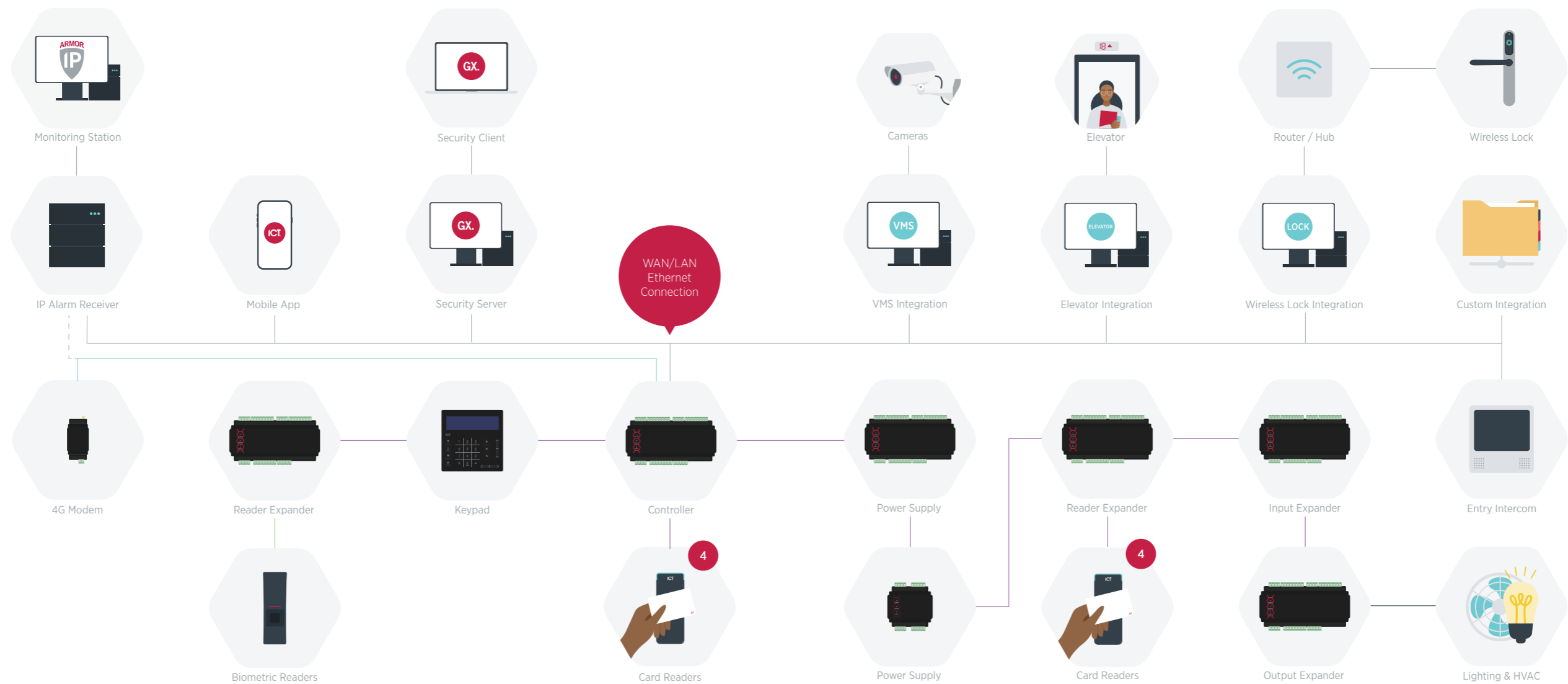| Description	Field Time	Logged Time	User	Door	Image	Controller
Door ADM Reception Lobby to Office Door DR05 (CP2.RD1.2) (DR5) Unlocked By Access	14/12/2020 11:53:19 am	14/12/2020 11:53:21 am		ADM Reception Lo...		ADM Admi
User Sam Jones (1:5) (UN40) Granted Exit From ADM Reception Lobby to Office Door DR05 (CP2.RD1.2) (DR5) Access Level Installe...	14/12/2020 11:53:19 am	14/12/2020 11:53:21 am	Sam Jones (1:5)	ADM Reception Lo...		ADM Admi
Output ADM Reception Lobby to Office Door DR05 |LOCK| (CP2.RD1.2) (41) On By ADM Reception Lobby to Office Door DR05 (CP2.R...	14/12/2020 11:53:19 am	14/12/2020 11:53:21 am		ADM Reception Lo...		ADM Admi
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User Fran Tyler (1:2) (UN43) Granted Entry To ADM Reception Lobby to Office Door DR05 (CP2.RD1.2) (DR5) Access Level ADM Admi...	14/12/2020 11:53:13 am	14/12/2020 11:53:14 am	Fran Tyler (1:2)	ADM Reception Lo...		ADM Admi
Output ADM Reception Lobby to Office Door DR05 |LOCK| (CP2.RD1.2) (41) On By ADM Reception Lobby to Office Door DR05 (CP2.R...	14/12/2020 11:53:13 am	14/12/2020 11:53:14 am		ADM Reception Lo...		ADM Admi
Output ADM Main Entry Door DR04 |AUTO| (CP2.RD1.1) (40) Off By ADM Main Entry Door DR04 (CP2.RD1.1) (4) Function Lock	14/12/2020 11:53:03 am	14/12/2020 11:53:04 am		ADM Main Entry D...		ADM Admi
Output ADM Main Entry Door DR04 |AUTO| (CP2.RD1.1) (40) Off By ADM Main Entry Door DR04 (CP2.RD1.1) (4) Function Lock	14/12/2020 11:52:57 am	14/12/2020 11:52:58 am		ADM Main Entry D...		ADM Admi
Door ADM Main Entry Door DR04 (CP2.RD1.1) (DR4) Unlocked By Access	14/12/2020 11:52:57 am	14/12/2020 11:52:59 am		ADM Main Entry D...		ADM Admi

8   2

The basics.

Parts of an access control system.

To most people, the only visible parts of a commercial access control system are the keycard that you swipe at the card reader to get in, or perhaps the keypad where you set the alarm. But there is a lot more that goes on behind the scenes to make a complete security system.

It all starts with a controller – the heart of your system. From here you can add different products depending on your business needs. A small business may just need one or two doors secured with a card reader for access and a keypad for an alarm. While a large organization may require many more features such as wireless locks, video surveillance and elevator control.

Monitoring Station	Security Client	Cameras	Elevator	Router / Hub	Wireless Lock

IP Alarm Receiver · Mobile App · Security Server · WAN/LAN Ethernet Connection · VMS Integration · Elevator Integration · Wireless Lock Integration · Custom Integration

4G Modem · Reader Expander · Keypad · Controller · Power Supply · Reader Expander · Input Expander · Entry Intercom

Biometric Readers · Card Readers · Power Supply · Card Readers · Output Expander · Lighting & HVAC

Behind the enclosure.

Overview and control of the system comes from your interface – which can be web-based, a mobile app, or standalone security client. Your access control software will have a status page (like a dashboard) which shows events generated by the system, and allows you to manage any security issues in real-time.

Security systems allow integrations with third-party products for added functionality, and secure transfer of data from external databases to automate tasks. This could be onboarding new employees from a staff management system, or a visitor and contractor management solution.

Other security infrastructure you will see in access control systems are battery backups, wiring, electronic locks, and additions such as security cameras or passive infrared (PIR) motion detectors.

Put all these parts together and you can start to see how flexible (and potentially complex!) a modern access control system can be.

System requirements.

Access control systems are useful and effective whatever market your business is based in. As the diagram below illustrates, the security required can range from light to very high depending on the industry. While you'll find a lot of similarities in security solutions, some verticals may require specific features.

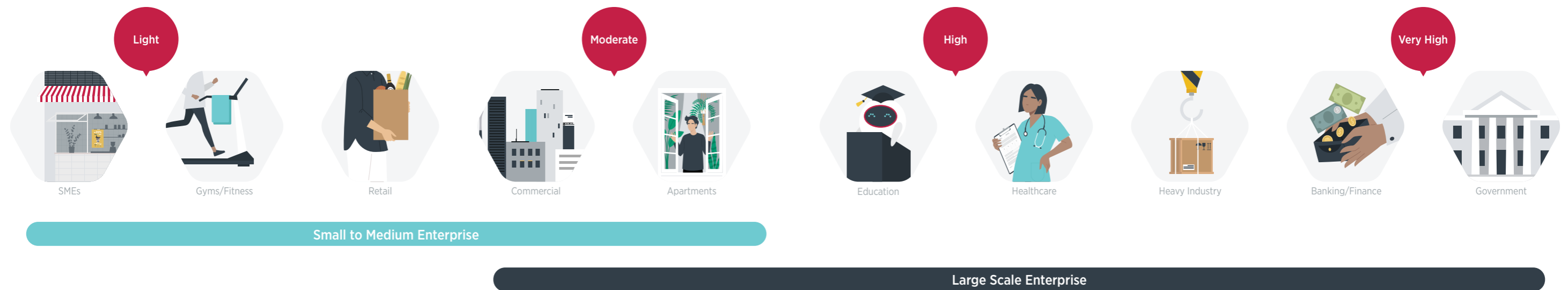## Basic features:

> Access control

> Alarms (intrusion detection)

Advanced features:

> Mobile solutions (access from your smartphone)

> Two-factor authentication (access card plus PIN)

> Third party integrations

> External database sync with API

Integrations.

Increase the functionality of your solution by integrating with third-party products. You'll add value to any existing technology and infrastructure investments, and truly unlock the full power of your system. Integrations can include:

> Video Management Systems (VMS)

> Wireless Locking

> Wireless Sensors & Detectors

> Elevator Systems

> Intercom Systems

> Biometric Systems

> Building Management Systems

> Custom Integration Tools

Light

Moderate

High

Very High

SMEs

Gyms/Fitness

Retail

Commercial

Apartments

Education

Healthcare

Heavy Industry

Banking/Finance

Government

Small to Medium Enterprise

Large Scale Enterprise

Beyond the basics.

We have tried to keep it as simple as possible in this guide, but there are a few more concepts you should familiarize yourself with before you choose your system.

# Understanding credentials.

Credentials.

A credential is what you present to the reader for validation. It could be a keycard, fob key, PIN code, mobile phone, or even your finger or face. The card reader checks your credential and validates it with the system before granting or denying access.

What you have.
An access card or fob.

What you know.
This could be a PIN or password.
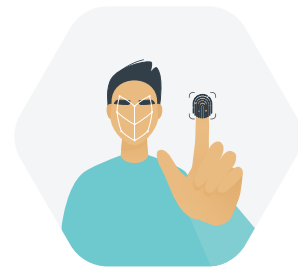
Who you are.
A biometric credential like a fingerprint or facial scan.

What You Have makes up most credentials present in the marketplace today. This includes keycards, mag stripe cards, wristbands, key fobs, mobile credentials, and license plate recognition.

Credential technology.

As we mentioned earlier, not all credentials are created equal. Here's a quick rundown on the two most common card technologies.

125kHz proximity.

125khz proximity (or prox) cards are low frequency, and offer one-way data transfer that's unencrypted. They're fast and convenient, but **highly vulnerable.**

13.56MHz smart technology.

Smart cards are high frequency and allow two-way communication between the credential and the reader. They are encrypted and data can be stored on-board. Some formats even offer multi-sector functionality, so you can use the same card on a reader and wireless locks (or even to pay for public transport!).

For an industry-leading level of security, we recommend MIFARE DESFire for all sites. DESFire has the highest level of card security currently available so users can feel assured that their credentials are protected by best practices.

Use a mobile app with a mobile credential for convenient, card-free access to unlock your door from your smartphone or mobile device. No more issues with lost or forgotten cards and fobs – simply present your mobile device within range of the reader to gain entry.

Mobile apps also let you monitor and control your business on the go. It's like having an access control, intrusion detection and building automation system in your pocket. Check the status of a site, arm or disarm alarms, control lights, locks, signage, heating – even cameras – from anywhere, at any time.

Access control models.

Most businesses currently use a form of the Role-Based Access Control (RBAC) model. This allocates permissions according to roles, which are then assigned to individual users. For example, you could give all members of the Finance team the same access rather than adding permissions individually.

The 5-step method.

The purpose of access control is to secure your premises so that unauthorized people cannot walk in off the street. There is a five-step method that acts as a pathway to ensure the correct process is being followed. By following this path, you can be sure that you'll have a robust system in place to protect your business.
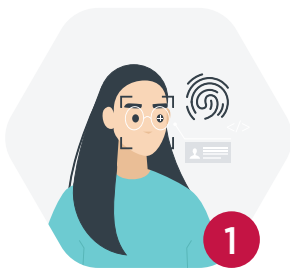
Authorize
The process of changing a stranger to someone known to your organization. Once authorized, you will likely use RBAC to assign their privileges.
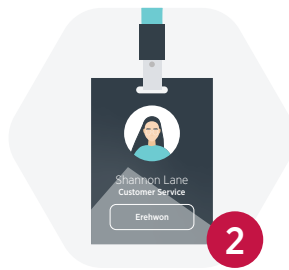
Authenticate
The user presents their credential to the reader for authentication. The system decides whether to grant access.

Access
If authenticated, access is granted, and your infrastructure unlocks the door so they can enter.

Manage
Administrators can remotely track activity, change area permissions, and manage changes including adding new staff.

Audit
Certain organizations have specific legal compliance requirements that auditing can meet. It is also good practice to ensure that your system is working and create a baseline to help track suspicious activity.

Choosing your system.

As you can see, there are many things to consider when thinking about an access control system.

> The fundamental thing to think about is what is the purpose of the security system? Ask yourself what security perception are you trying to portray? A highly secure premises with multiple security layers like gates, access doors and turnstiles, or an open and welcoming space with restricted areas such as a retail store? Then identify your risks – for example, staff and/or customer safety, burglary, robbery, espionage – and decide which of those risks you need to mitigate and to what level. Don't forget to also consider if you have any specific insurance requirements.

- Chris Newton – Head of Project Design at Focus Digital Security Systems.
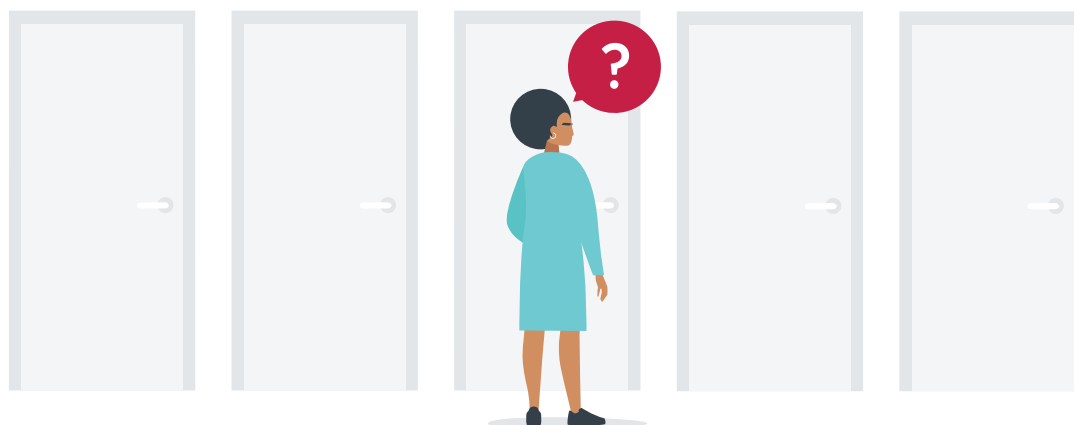
Our experts can guide you through this process, but there are some questions to ask yourself before you begin:

> How many doors and areas are you looking at securing, and how secure do these areas need to be? Will people need a card to get out as well as in, or just push a button to exit? And will any doors require both a card and PIN? This will determine the number and type of card readers you'll need.

> Is this a new build or retrofit? What existing hardware (for example, motion sensors or card readers) do you have already? There may be opportunities to integrate these with your new system and save capital costs.

> Do you want to use proximity card technology for readers and credentials, or would you prefer mobile phones with Bluetooth, or even biometrics (fingerprint or face scanning)?

> Does the system need to integrate with a new or existing CCTV surveillance system?

> Is there potential to integrate with a Building Management System (BMS) to control elements such as lighting and HVAC and reduce energy consumption and operating costs?

> Does your business have any specific requirements that might be out of the ordinary? What do you do differently that we should know about? What best describes your business (eg: what vertical market)? This will help a security expert to tailor the system to your unique needs.

It's important to understand that not all access control systems will give you the flexibility to do this. An ICT Protege system brings together all elements of access control, intruder detection, and building automation into a single unified solution. Our open technology can integrate with, or takeover, some existing systems to add value to the infrastructure your business already has.

ICT system options.

Small to medium businesses.

Choose something that is simple to deploy with no software to install. A platform such as **Protege WX** means you can use the web-based interface to configure, control, and monitor your system from anywhere.

Large enterprise organizations.

Get a feature set that's easy to operate, simple to integrate, and effortless to extend. A comprehensive solution like **Protege GX** future-proofs your security and provides true benefits to any organization.

Next steps.

Now you have read Access Control 101 – ICT's Ultimate Beginner's Guide to Physical Security you should understand the basics involved in securing a location using a modern access control system.

With an understanding of the benefits provided by an integrated security platform like ICT's Protege WX or Protege GX, and knowing the terms that you might hear and questions you're likely to be asked, you can now move forward with confidence.

Talk to one of our experts today. They can put you in touch with one of our Qualified Installation Partners in your location, so you can take the next step in your security journey and provide peace of mind that your most valuable assets – **your people and your property** – are secure.

With our guide, you now have what you need to get started!

Glossary.

Here are some common terms you may come across while you're scoping an access control system.

Acronyms:

> ACU - Access Control Unit

> ALPR - Automatic License Plate Recognition

> API - Application Programming Interface

> BLE - Bluetooth Low Energy

> BMS - Building Management System

> CCTV - Closed Circuit Television

> DESFire - DES - Data Encryption Standard

> DIN - Deutsche Institut für Normung (Eng trans: German Institute of Standards)

> EAC - Electronic Access Control

> HVAC/R - Heating, Ventilation, Air-Conditioning & Refrigeration

> ICT - Integrated Control Technology

> NFC - Near Field Communication

> OSDP - Open Supervised Device Protocol

> PCB - Printed Circuit Board

> PIR - Passive Infrared (motion detectors)

> PTZ - Pan, Tilt, Zoom (for video cameras)

> REX - Request to Exit

> RFID - Radio-Frequency IDentification

> SaaS - Security as a Service (or SECaaS)

> VMS - Video Management System

> VSaaS - Video Surveillance as a Service

About ICT.

Founded in 2003 by Hayden and Rachael Burr, ICT began with a focused vision to provide innovative and easy-to-use electronic access control and security solutions. Almost 20 years later, tens of thousands of companies worldwide use ICT products and systems every day, and our vision remains steadfast and engrained in all we do.

With headquarters in Auckland, New Zealand, we have a global presence and an international reach. Offices in Denver (USA), Toronto (Canada), Melbourne (Australia), Copenhagen (Denmark) and Hong Kong, provide full local sales, support and service to our clients and partners around the world.

> Our security solutions are reliable and easy to use. Certified and manufactured to the highest standards, they are installed in thousands of sites worldwide and backed by a global network of installation and support services."

- Richard Hawker – Global Director of Sales at ICT

Innovation is in our DNA.

With more than 40% of our staff dedicated to research and development, innovation is a core part of the ICT DNA. When you invest in an ICT solution, you can rest assured that your investment is protected by the best in the industry.

One solution, maximum value.

Our use of open technology allows our products to integrate seamlessly with your existing systems, providing a comprehensive solution that adds value to the infrastructure investments you already have on site.

From design to dispatch.

Every ICT product is designed and manufactured in New Zealand from our state-of-the-art purpose-built premises, with 100% of products going through rigorous testing standards to ensure superior quality.

This is all backed up by local sales, support, and training. In addition, we offer a 5-year warranty for our ICT Dealer Network members, providing the perfect solution for your next project, regardless of scope.

www.ict.co