KONE

THE SCALABLE AND FLEXIBLE ACCESS CONTROL SOLUTION

Planning guide for KONE Access™

TABLE OF CONTENTS

GENERAL

This planning guide provides general specification and installation information about KONE Access™. For specific details relating to individual building layouts, contact your KONE Sales Professional.

This guide is intended to be a reference book for KONE customers to refer to when needed. The sections and subsections will help the reader locate specific information quickly and efficiently.

The initial chapters introduce KONE Access and how access control helps optimize people flow in buildings. The guide then describes how to configure individual solutions and addresses key construction considerations.

Appendix A contains information about various scenarios of integration between KONE Access and third party access control systems.

This guide is primarily intended for architects, builders, site managers, consultants, investors, subcontractors and project managers, as well as those involved in related areas such as electrical installation and building security access.
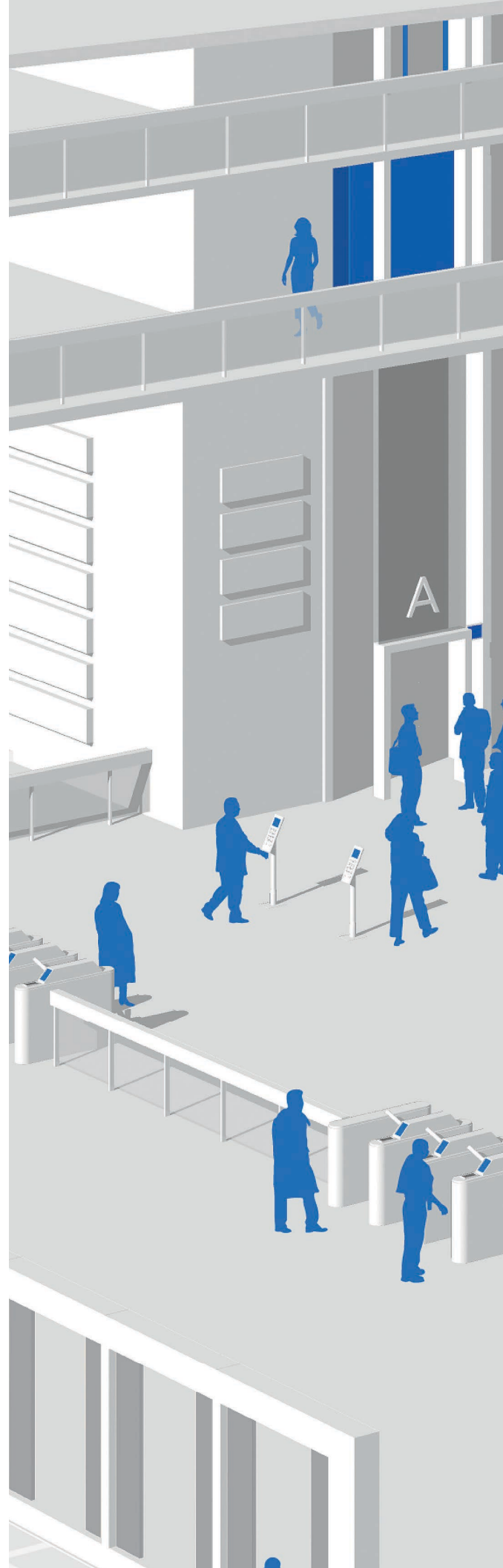
INTRODUCTION TO KONE ACCESS™

KONE Access is a comprehensive access control solution designed to enhance people flow and optimize elevator operation.

KONE Access provides locking functionality for elevators, landing call devices, destination operating panels and turnstiles (which can be integrated with a destination control system if required).

Key customer benefits

KONE Access features a fully scalable access control system that is seamlessly integrated with elevator systems and turnstiles.

It helps enhance building security, ensures smoother, smarter people flow and can help add real value to a property. Customizable and flexible, KONE solutions can be easily adapted to meet changing needs and requirements.

Key benefits include:

- improved people flow with an integrated elevator and access control system
- the possibility to adapt or scale the system if needs change, with a straightforward user interface for easy integration of new tenants or expansion to new building areas
- an easy and straightforward installation process
- a single point of contact for planning, installation and maintenance of KONE elevators and KONE turnstiles, which means less coordination and faster implementation
- early planning and coordination that helps reduce the risk of costly and complex construction modifications in later stages
- personalized elevator features and a clean, modern appearance

User benefits

Facility managers and building personnel can easily:

- create and manage access profiles according to area, time, date or person
- give turnstile and elevator access according to individual access rights
- specify personalized elevator calls for user groups or individuals, including allowed floors, home floor, accessibility features and priority calls
- manage visitor access for improved convenience and building security

Tenants of office and high-end residential buildings can benefit from:

- convenient direct elevator calls from turnstiles to the home floor
- ease of use
    - access control integrated into elevator-call devices and building doors
    - fast system response after access card is displayed
    - personalized elevator features

Long-term benefits

KONE Access™ provides convenience, improved accessibility and easy access control. These can contribute to both increased tenant satisfaction and building value.

KONE Access is ideally suited for office and high-end residential buildings, where access control, accessibility and user convenience are especially important. It can help enhance the value and desirability of the building, providing high-end features for a marginal cost increase of the total elevator project.

Potential long-term benefits of KONE Access are:

- increased building value
- improved building security
- increased tenant satisfaction
- reduced tenant turnover and faster renting of vacant floor space
- planning, installation and maintenance of KONE elevators and turnstiles with KONE Access all handled by a single provider

Table 1: Customer benefits

Design		Realization		Operation	
Architectural design	The visual appearance of integrated KONE Access system is highly valued, especially for its simplicity	Physical construction	Integration of KONE Access and elevator systems is built in, and performance is verified through extensive system testing	Maintenance and repair	Single maintenance partner for KONE elevators and turnstiles with KONE Access means less coordination
People flow design	Early planning of integrated KONE Access enables efficient people flow	Installation	Single provider for KONE elevators and turnstiles with KONE Access means less coordination, fewer meetings, and reduced installation time	Access rights configuration	Only one registration of access rights needed; flexible integration of new tenants
Engineering	Provide savings in working time due to less coordination of providers	Access control system implementation	Single provider for KONE elevators and turnstiles with KONE Access enables quicker implementation and faster commissioning	People flow management	Well-designed, integrated KONE Access for KONE elevators and turnstiles helps enhance security in the building
Tendering of different work	With all elements available from one provider, all components for KONE elevators and turnstiles with KONE Access can be specified in a single tender	Training of operators and users	Reliable system means less down time, which means happier tenants and less time spent by facility manager for coordinating troubleshooting	Upgrades and installation of new features	KONE Access software platform enables flexible upgrades and easy system expansion
Access control system design	KONE Access system both solves the challenges and meets the strict requirements of the elevator environment	Provider management	Fewer contractors means less working time and reduced costs	Fault handling	Faster troubleshooting and fewer faults; when faults do occur, there is a single point of contact for KONE elevators and turnstiles with KONE Access

GENERAL INFORMATION ABOUT ACCESS CONTROL SYSTEMS

Although the primary reason for installing an access control system is to improve security, these systems can also improve people flow and enable a more personalized experience for users. The easiest way to see this is in elevators with integrated access control and turnstiles.

Though KONE does not provide full building access control systems, we've included general background information here that is important to understand when planning access control in a building. The important questions that should be considered before installing an access control system are: who is it for, when is it needed and where is it needed?

The who and when concern users, to whom access rights are granted and managed according to specific timeframes. User groups can include:

- employees, whose access permission can range from medium- and long-term to permanent, depending on the organizational structure
- contractors, who normally have short- to medium-term access permission, normally limited to their assigned working areas
- visitors, who have short-term access permission, typically one day, and who are escorted by a host

The where deals with the areas that require access control. Access control devices can be installed in a semi-public area, such as next to the main door of an office building and inside the elevators, or in a secure area such as the staff entrance and office door. Access to public areas is usually unrestricted.

The concept of access control security is based on access areas and access points.

Access areas

An access area is an area with common access rights, for example the office space of a tenant company. Access areas for contractors or the public can also be defined if needed.

The example below shows a building floor divided into four access areas. The lobby and reception area does not require any access rights, thus it forms access area 1. The area after the turnstiles is access area 2. Access areas 3 and 4 require additional access rights. Personal access rights can be granted to one, several or all of the access areas.

Access area 1
Access area 2
Access area 3
Access area 4

Interior door with one-way access control
Turnstile with one-way access control
Entrance door with one-way access control, only mechanical opening from other side
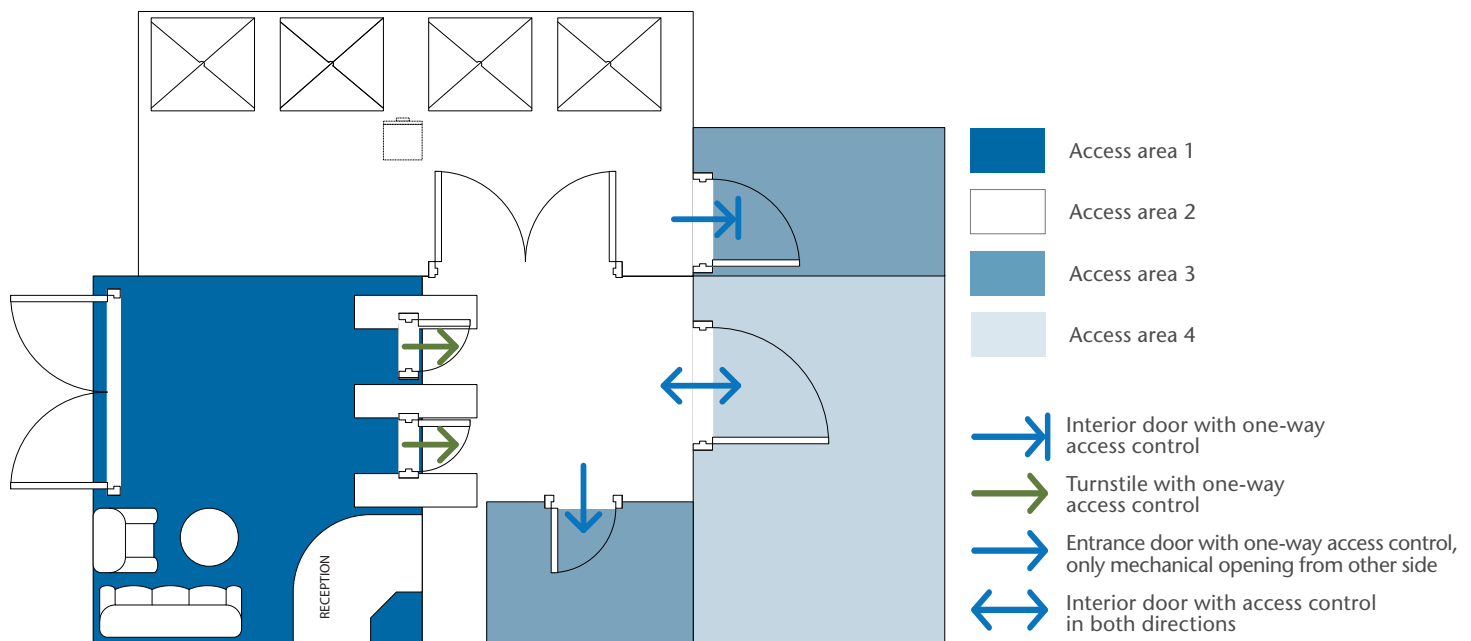Interior door with access control in both directions

Figure 1: Example of access areas

Access points

An access point is a controlled passage between access areas. In Figure 1, there are two types of access points: one-way passages and two-way passages. In the one-way passage the card reader is either installed next to the door or integrated into the elevator signalization. In the case of the door, the traffic coming in the opposite direction is handled with a push button that opens the door lock or with a standard mechanical lever.

In the two-way passage there are two card readers, one on each side of the controlled passage. In this kind of arrangement users are required to show their access card in both directions, meaning access is tightly controlled.

Any component that monitors and controls access in a single unit is considered an access point. For example, an elevator can be considered as an access point.

Example of normal access rights by group

Employee
- medium-term, long-term, or permanent access, normally unlimited
- access rights set according to organizational structure – by department or cost center, for example
- time-based access rights: 5 days (Mon-Fri) x 15 hrs (5 am - 8 pm), 5 days x 24 hrs, 7 days x 15 hrs

Contractor
- short- or medium-term access permission, normally limited
- access rights set according to contract and working area (cleaners, consultants, security, staff, etc.)
- time-based access rights: 5 days (Mon-Fri) x 15 hrs (5 am - 8 pm)

Visitor
- short-term access permission, normally 1 day
- access rights set according to host status, usually escorted around the building
- time-based access rights: 5 days (Mon-Fri) x 10 hrs (8 am - 6 pm)

Elevator as an access point

The elevator can be an access point between access areas provided that the access control is controlled in an elevator. As illustrated in Figure 2, this can serve as an access point between the lobby (as access area 1) without restrictions and the office area (as access area 2) on each floor with restricted access rights. For each floor it is possible to assign different access rights, which will be especially useful in multi-tenant office building. The elevator can also serve as an access point within the same floor. For instance, when elevator lobby is one access area and office is different access area (see Figure 2).
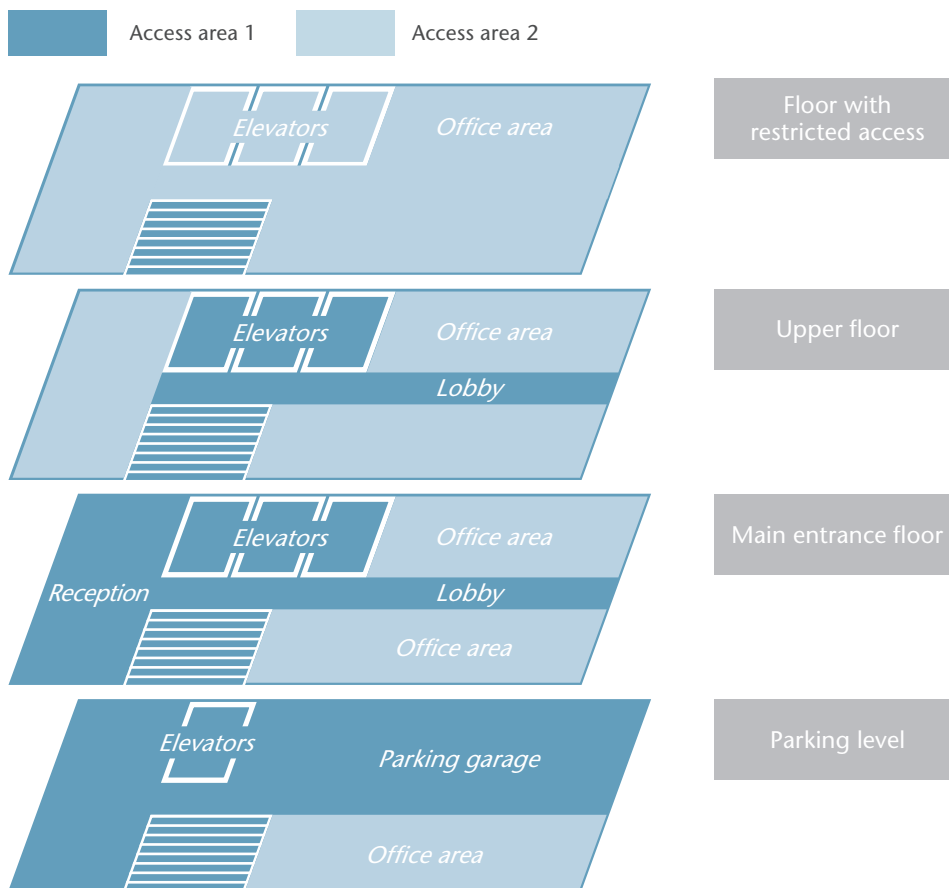

Figure 2: Access area of the elevator

KONE ACCESS™ SPECIFICATIONS

Architecture

This section introduces the KONE Access system architecture, major components and functionalities. Since this guide is not intended to be a detailed design blueprint, the level of technical detail in this section is kept at a general level. However, it does contain all the information required by architects, builders, site managers, consultants, investors, subcontractors and project managers when specifying and ordering KONE Access.

With KONE Access, customers can plan a comprehensive, state-of-the-art access control solution that covers all key access-related points in the building, beginning with elevators and turnstiles.

Although the access card readers and devices for building doors are to be provided by the building owner, KONE Access is flexible and can utilize the same access card type. This helps maintain one centralized access card throughout the building. In addition, an optional feature for KONE Access is the ability to integrate databases through the KONE Access Connectivity Suite™.

Everything is controlled via management software (provided by KONE) and a server (provided by either KONE or the customer). Elevator access control features are delivered by KONE; customers are responsible for organizing the installation of the required local area network with the building's electrical contractor. The KONE representative can also help with any issues regarding electrical cabling.

KONE Access can be installed in a wide range of KONE elevator call devices, such as COPs (car operating panels), DOPs (destination operating panels) and landing call stations (LCSs). Integration is possible both with conventional elevators and those that use a destination control system (DCS).
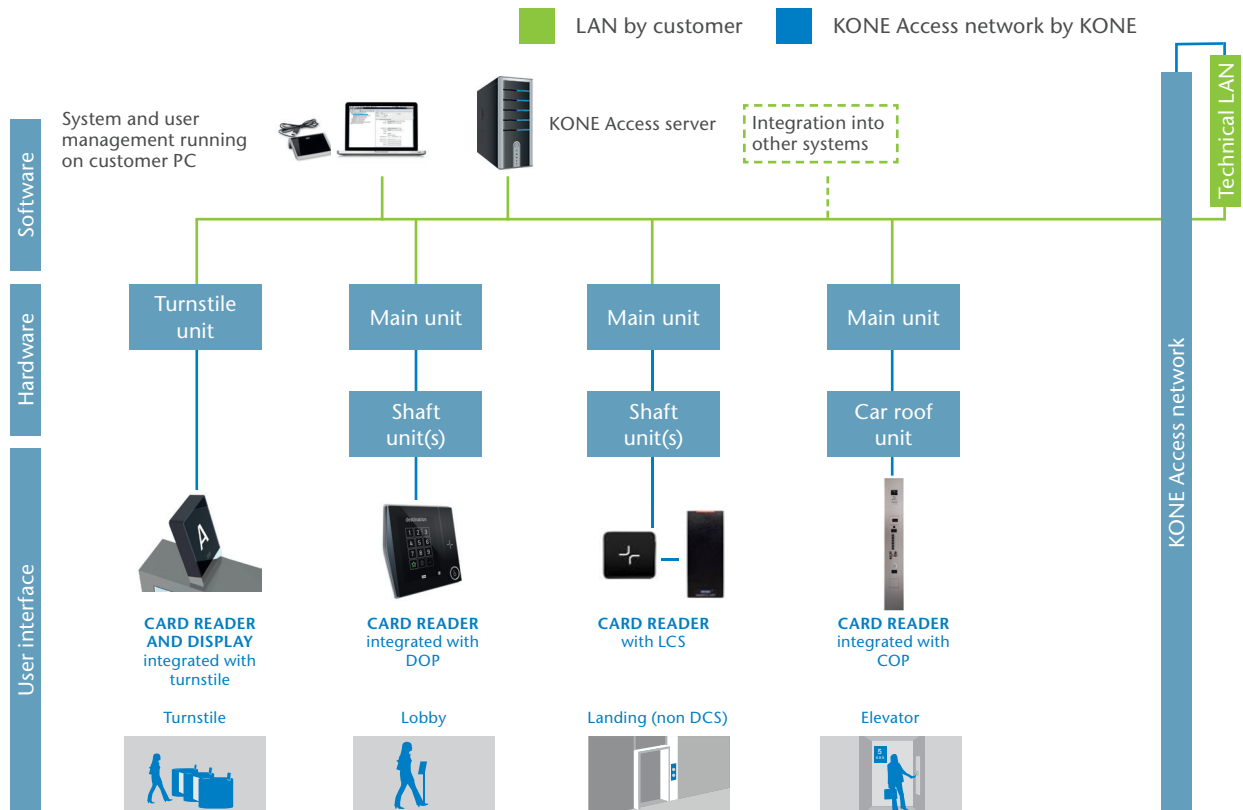
Figure 3: KONE Access system architecture
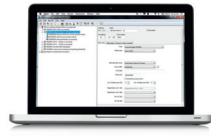
14

Components and software

Software
- Access control features
- Elevator-related features
- Management tools

KONE Access server — Desktop reader — System and user management running on customer PC

Hardware
- Card readers (visible elements)
- Systems hardware units (access manager and remote reader)
- Access cards

Card readers (MIFARE® or HID™) — Access cards (MIFARE only) — Access manager — Remote reader

Figure 4: KONE Access components

Card readers integrated with:
- Destination operating panels
- Car operating panels

KONE Polaris™ touchscreen destination operating panel

KSS 570 car operating panel

KONE Polaris keypad destination operating panel

Main unit

The main unit comprises the main controlling units of the elevator-related access control system components installed in elevator machine rooms or shafts. Access managers, which control the remote readers, are the primary components of the main unit.

Shaft unit

Shaft units, installed in elevator shafts, control the card readers and transfer messages forward to the main units. Remote readers are the primary components of shaft units.

Car roof unit

Car roof units control the card readers integrated into the COPs and transfer messages to the main unit. Remote readers are the primary components of car roof units.

Card reader

Card readers can be integrated into elevator COPs, turnstiles, and, where a DCS is in use, into DOPs as well. In supported models the card unit is fully integrated into the DOP or COP, while in unsupported models and LCSs, surface-mounted card readers are used. Card readers are controlled by remote readers and access managers.

Turnstile unit

If turnstile integration is required, the hardware provided by KONE includes a turnstile unit. KONE also installs the turnstile displays and surface-mounted card readers.

NOTE: Destination Guidance Display is available, enabling direct home floor call feature.
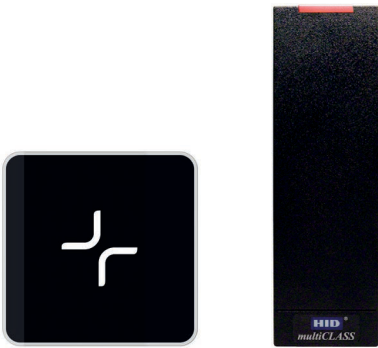
Figure 5: Two types of surface mounted card readers (MIFARE® or HID™ proximity/iCLASS multi-reader)

Desktop reader

The desktop reader is used for programing access cards. Receptionists, for example, can use it to program visitor badges in the lobby.

Figure 6: Desktop reader (MIFARE type shown)

Access cards (badges for MIFARE type only)

KONE offers three different kinds of access cards if
MIFARE readers are selected:

- **Classic** – the standard employee badge is completely white
  to allow for customized printing. This badge normally
  has no access time limit – it is valid as long as the holder
  is registered with the access control system or until the
  badge is blocked by the administrator. The Classic badge
  is usually used as the default badge, and is sufficient for
  most standard access control applications.
- **Desfire** – an advanced employee badge with more
  memory and a higher security level, the Desfire can be
  used for a variety of different applications (for example, as
  a payment method on public transport and as an access
  card for multiple facilities).

- **Visitor Classic** – visitor badges can be assigned by a
  receptionist using the visitor management software's
  graphical user interface, which makes checking visitors in
  and out quick and easy. Time limits can be set individually
  for each visitor badge: after the validity period expires,
  the badge is automatically blocked by the system. The
  building's security plan dictates visitor badge time limits,
  distribution policy and other parameters.

Please note: KONE only offers access cards if the MIFARE
readers are selected. If the HID readers are selected,
customer shall purchase the HID proximity or iCLASS access
cards from a third-party vendor.

Staff card	
Front	**Back**
85 / 54	85 / 54

Visitor card	
Front	**Back**
85 / 54	22 / 22 / 85 / 54
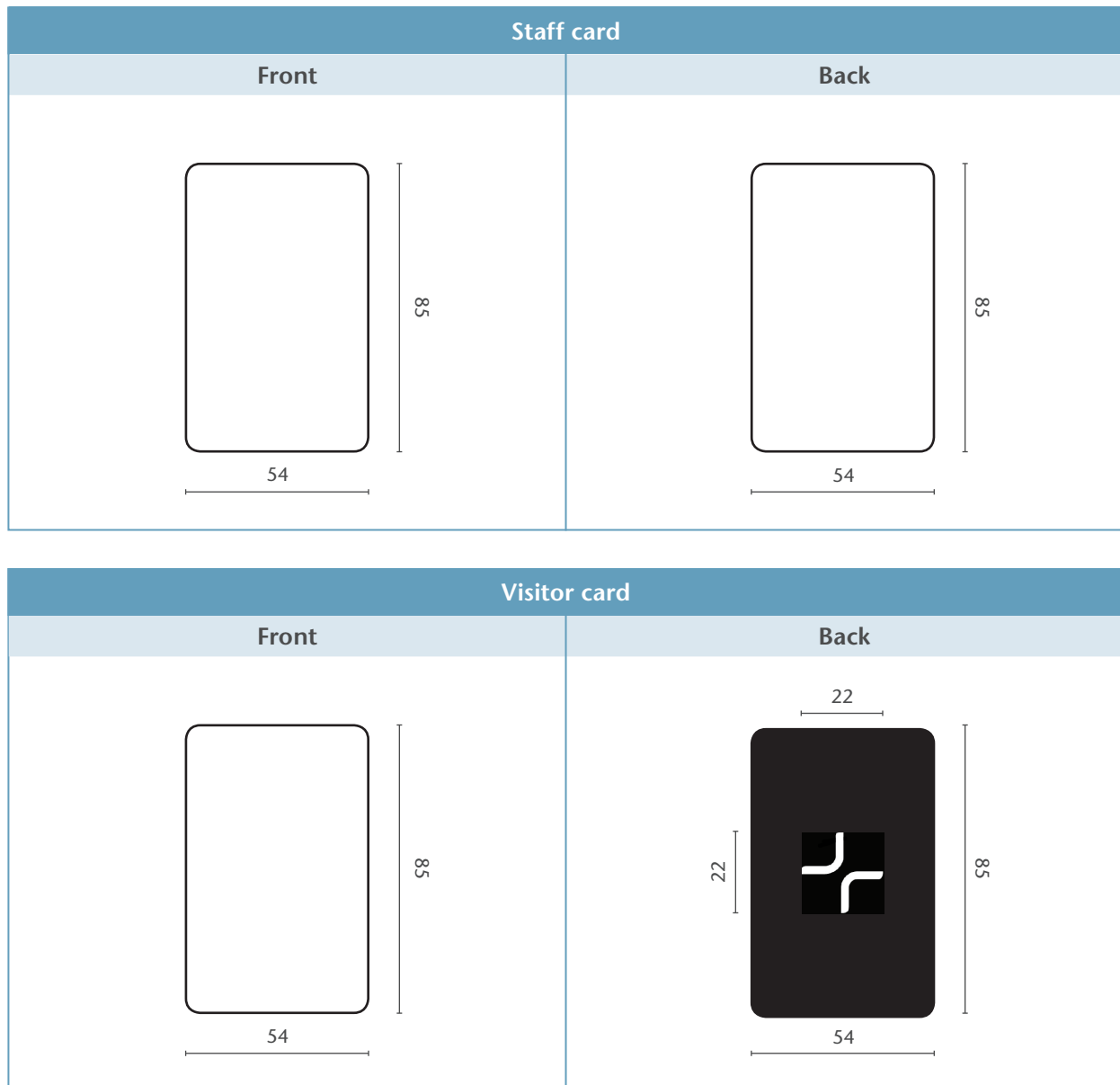
Figure 7: Access cards (badges)

Server and workstation computers

KONE Access™ requires a server, software and a software license. A workstation is needed for each administrator in the lobby. Server hardware can either be provided by KONE or the customer. The server is connected to the elevator system via a low-latency LAN.

KONE Access software and license

The software and license are preinstalled on the server provided by KONE. Other required software is installed as part of the system commissioning process. There are two license options: standard and extended. See Features, page 19.

Table 2: KONE Access hardware requirements

Workstation requirements	
CPU	Intel Pentium 4 processor or higher
Memory	1 GB main memory (RAM)
Hard disk	Hard disk with at least 200 MB free memory
Others	Network adapter, DVD drive
Server requirements	
CPU	Intel i7 processor Quad Core
Memory	Min. 4GB main memory (RAM
Hard disk	2 hard disks, RAID1, 250 GB
Others	Network adapter, DVD drive optional

Features

KONE Access is supplied with either a standard or extended license. The basic features of the standard license are sufficient for basic access management, whereas the extended license enables more versatile monitoring and control.

Table 3 details the features of the standard and extended licenses. For elevator-related access control, KONE Access enables DOP and COP locking and unlocking according to personal access rights, as well as personalized elevator calls for user groups and individuals (see the first section of Table 3 for details). The access control features of the KONE Access software enable creation and management of access rights for tenants and visitors. In addition, turnstiles can be seamlessly integrated with a destination control system, meaning that a single badge swipe both opens the access gate and initiates a personalized elevator call to the user's home floor. The optional access control features provide more advanced functionalities.

Table 3: KONE Access features

Elevator-related access control features (standard license)
DOP and COP unlocking according to personal access rights
Personalized elevator calls for user groups (only with destination control system) • Accessibility call – activates accessibility features: extra door time for entry, extra walking time, annunciator (ACU), preselected car, extra door time on exit • Empty car call – assigns user to empty car, non-stop travel to destination floor • Priority to destination – enables fastest possible travel time by not accepting other calls • Space reservation – reserves extra space inside the car
Personalized elevator calls for individuals • Allowed floors, access based on time profile • Home floor (direct call from turnstile to user's predefined home floor)
LCS locking and unlocking and priority landing calls (not DCS)
Access control features (standard license)
Access areas – create and manage access areas inside the building
Time profiles – create and manage access profiles based on time or date
Personal access rights – create and manage personal access rights based on access areas and time profiles
Visitor management – issue temporary visitor badges
System administration – option to add multiple administrators
RFID badge creation – receptionist can prepare and allocate badge for user. Also possible to allocate temporary transitional badge with limited validity.
Data log reports – data on device status and usage is available from the system database
Building interface (standard license)
Locking and unlocking of turnstiles
Grant access according to personal access rights
Optional access control features
Tenant management (extended license) – independent management of access rights by tenant; for organizations with autonomous divisions that share common servers and network infrastructure
Access-point and devices-status monitoring (extended license) – statuses are shown in the management UI as an interactive graphic
KONE Access Connectivity Suite (separate license) – KONE Access software license that provides database linking/integration

KONE ACCESS™ FOR YOUR BUILDING

Defining a KONE Access solution

Below are the basic steps to designing an access control solution.

A. Define access control needs
- Building layout and access grids
- Security needs and tenant analysis
- Typical configurations for building type

B. Define the optimal solution
- Characteristics of access control solution
- Product recommendations
- Product-specific modules, including specifications, options and dimensions

C. Define details
- Installation requirements
- Construction considerations in relation to safety

Site survey

The site survey is an essential part of any access control project and is a collaborative process involving the customer and the KONE representative. This ensures efficient planning and high quality right from the start. During the site survey, the building is investigated from the point of view of its access control and security needs, and the scale of the installation.

Information gathered during the site survey and the planning stage:
- Building specifications
  - Layout of elevators, DOPs and turnstiles
  - Number and height of floors
  - Access grid and access point layout
  - Population and estimated visitor numbers
- Access control and security needs
  - Card format type (MIFARE® or HID™)
  - Estimated number of access points (number of turnstiles and elevators)
  - Estimated number of users
- Elevator platforms
- Elevator types and control methods (full DCS, hybrid or conventional)
- Required software features (see page 19, Features)

KONE Access is highly scalable. In order to ensure smooth and reliable operation, it is important to estimate the expected system usage. Single-server solutions can handle up to 150,000 events per day, which is typically up to 100 access points and 1,000–3,000 users. Multiple servers are needed for larger installations. Please contact your KONE Sales Professional for further details.

Responsibilities

KONE supplies and installs all the hardware components and software needed for KONE Access™. Responsibilities for the building cabling and electrification are detailed in Table 4 below.

Table 4: Installation responsibilities

	Delivered by	
	KONE	Customer
LAN connection from additional access control system main units to server*		x
LAN connection from access control system turnstile units to server*		x
110V power supply for access control system turnstile units		x
Power and network cabling inside elevator shaft	x	
Network cabling inside machine room	x	
Power cabling inside machine room or control room (including disconnect)		x

*Cabling acceptance test reports are required

Project sequence

| Customer	KONE
1. Initial sales enquiry →	
	← 2. KONE site survey
3. Tender request form →	
TENDER	← 4. KONE tender
ORDER	
	← 5. Solution description
7. Approval →	← 6. KONE API implementation prerequisite work with third-party ACS (if KONE Access Connectivity suite is selected for database integration)
MANUFACTURING	
8. Building cabling, turnstiles, IT hardware →	**INSTALLATION** ← 9. Installation of KONE Access components and elevator cabling; requirements and recommendations for building cabling
HANDOVER	
USE/OPERATION	← 10. Maintenance and support

APPENDIX A

Integration with third-party access control systems

For additional flexibility, most third-party access control systems can be integrated with the KONE Access system. Access control to elevators will be covered by KONE Access™, ensuring availability of personalized elevator features, and interface to third-party access control system(s) for the rest of the building done using one of the scenarios below.

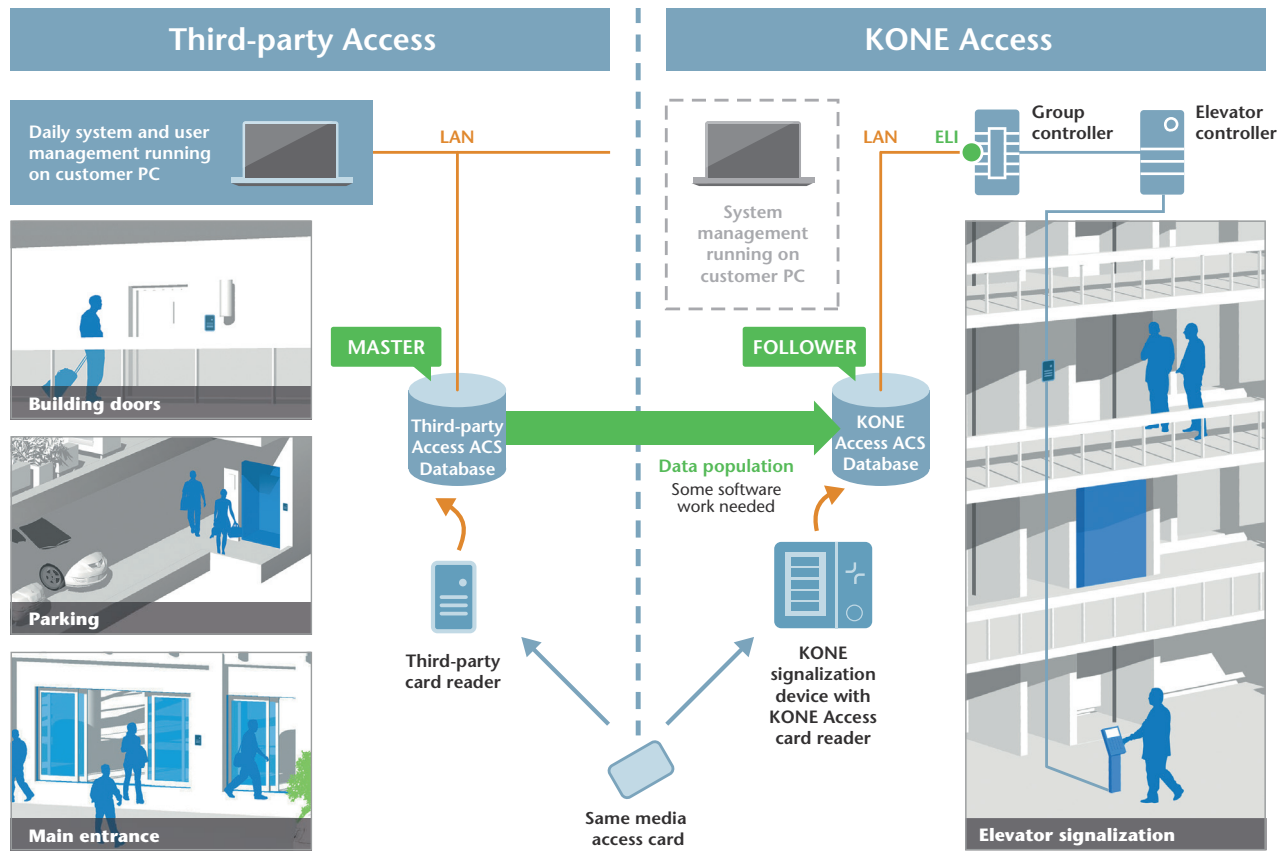### Scenario 1. KONE Access and third-party access control systems without database integration
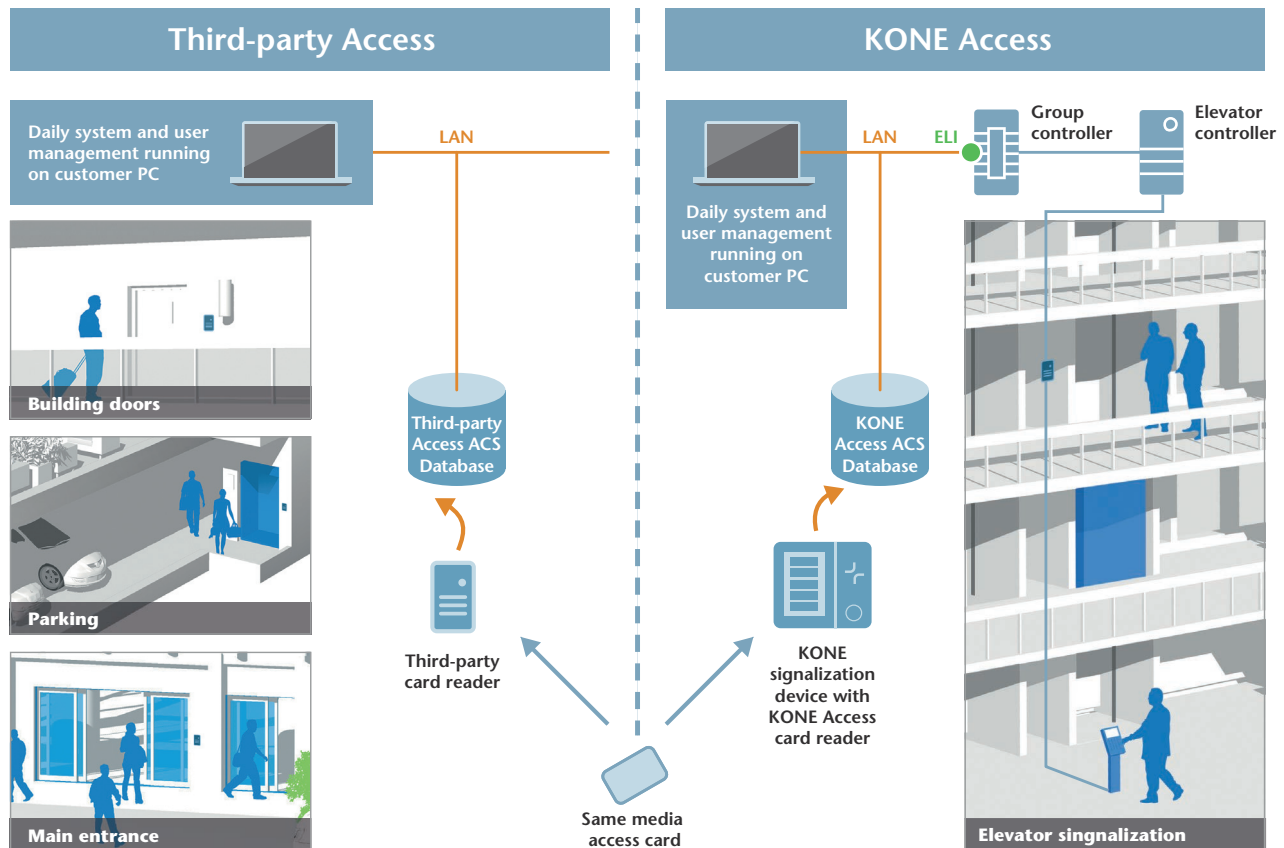
KONE Access can coexist with most other third-party access control systems. In practice this means two access control systems. All KONE signalization devices will be equipped with KONE Access card readers and background systems. This will ensure that all elevator features provided by KONE Access will be available, e.g., priority calls, disability features, special profiles. In addition to that, preferred by tenants or owners third-party access control for building doors will be used. End users will have only one access card and will see it as a single system, but the facility manager has to manage two databases. In this scenario if KONE and the third-party system both use MIFARE® or HID™ proximity/iCLASS protocol protocol for access cards as the access card media, the coexistence of two systems is quite straightforward.

However, if there are different card media used that either protocol type are supporting, there are following options available:

- having two access cards, which isn't very convenient
- using a sticker on cards instead, as a means of combining access cards, but this must be tested to make sure there is no interruption between systems
- using combo-cards as a means of combining access cards, but this must be tested to make sure there is no interruption between systems

This scenario might be quite cost-effective compared to integrating KONE elevators with third-party access control system from scratch, as no integration costs are present. However, costs of maintaining and managing two databases shall be kept in mind.

Scenario 2. KONE Access and third-party access control systems with optional database integration (KONE Access Connectivity Suite™)

Third-party Access

Daily system and user management running on customer PC

LAN

Building doors

Parking

Main entrance

MASTER

Third-party Access ACS Database

Third-party card reader

KONE Access

System management running on customer PC

LAN ELI

Group controller

Elevator controller

FOLLOWER

KONE Access ACS Database

Data population
Some software work needed

KONE signalization device with KONE Access card reader

Same media access card

Elevator signalization

KONE Access can be integrated with a third-party access control system via KONE Access Control Connectivity Suite. And though some cooperation with the third-party access control provider is needed, significantly less integration work needs to be done than with building integration from scratch.

End users will have only one access card and will experience it as one system. The third-party access control system's database will populate the KONE Access database with correct information.

Having only one database makes things easier for system users and maintainers. The facility manager also has to update and manage only one database.

The only condition for this scenario to work perfectly is that if KONE and the third-party system both use MIFARE® protocol or HID™ proximity/iCLASS protocol for access cards as the access card media. In this case, the user experience is the smoothest.

Elevator integration with most third-party access control system(s)

Your preferred access control system can be integrated with the KONE elevator system. The card readers can be installed in KONE elevator calling devices such as the COP or DOP.
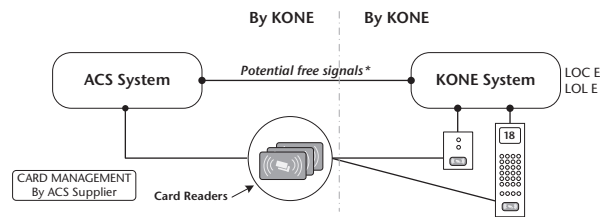
Conventional elevators

Key switch
A key switch can be used to lock one or several floors. A potential free contact of the key switch is connected to elevator system.

By KONE   By KONE

Potential free signals*   KONE System   LOC E
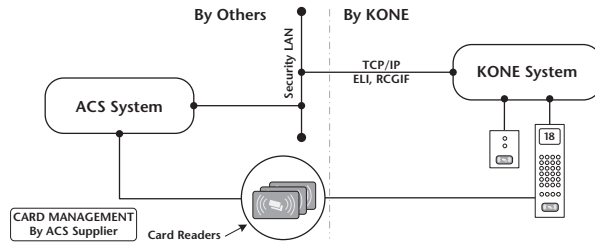LOL E

Interface with Potential free contacts
The access control system can be integrated using a potential free signal interface. In this case potential free signals from the access control system are connected to the elevator control system.

By KONE   By KONE

ACS System   *Potential free signals**   KONE System   LOC E
LOL E

CARD MANAGEMENT By ACS Supplier   Card Readers
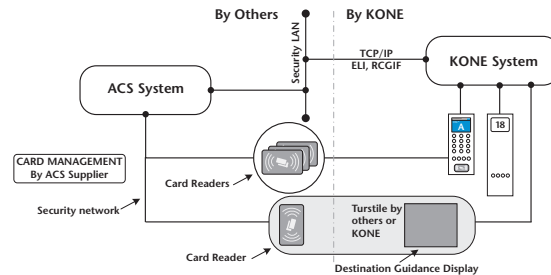
18

TCP/IP interface
Conventional elevators can be integrated using a TCP/IP interface to the access control system. This interface supports card readers in the Car Operator Panel (COP) only.

By Others   By KONE

Security LAN

ACS System   TCP/IP ELI, RCGIF   KONE System

CARD MANAGEMENT By ACS Supplier   Card Readers

18

Traditional Destination Control System (DCS)
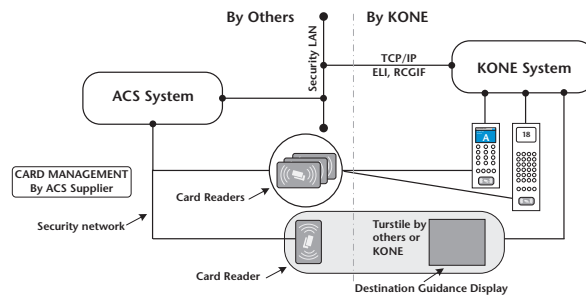
TCP/IP interface
When a traditional DCS is used, the calls are given only from the Destination Operating Panel (DOP). For this reason, the card reader is integrated only with the DOP. Turnstile integration can be done to activate direct home floor call feature when a person passes through it.

By Others   By KONE

Security LAN

ACS System   TCP/IP ELI, RCGIF   KONE System

CARD MANAGEMENT By ACS Supplier   Card Readers

18

Security network   Turstile by others or KONE

Card Reader   Destination Guidance Display

Hybrid Destination Control System (DCS)

TCP/IP interface
When a hybrid DCS is used, the calls are given from the Destination Operating Panel (DOP) and Car Operating Panel (COP). For this reason, the card reader is integrated with the DOP and COP. Turnstile integration can be done to activate direct home floor call feature when a person passes through it.

By Others   By KONE

Security LAN

ACS System   TCP/IP ELI, RCGIF   KONE System

CARD MANAGEMENT By ACS Supplier   Card Readers

18

Security network   Turstile by others or KONE

Card Reader   Destination Guidance Display

NOTE:
- The internet protocol TCP/IP interface makes installation easy because both systems are connected to same LAN. All KONE elevator systems can be connected to the building's access control system.
- The TCP/IP interface requires some software development on the Access Control System (ACS) vendor side.

GLOSSARY

DCS: Destination Control System

DOP: Destination Operating Panel

LCS: Landing Call Station

COP: Car Operating Panel

ACU: Annunciator

RFID: Radio Frequency Identification

LOL: Locking of landing calls

LOC: Locking of car calls

LAN: Local Area Network

Riser: a series of hall stations for an elevator or group of elevators

Access manager: a controller that autonomously controls and monitors access points

Remote reader: a reader unit for one card reader; it is always connected to an access manager via an RS-485 interface

Turnstile: a gate that allows one person to pass through at a time

Card reader: an RFID antenna device used together with control devices in an access control system (also known as a registration unit)

KONE provides innovative and eco-efficient solutions for elevators, escalators and the systems that integrate them with today's intelligent buildings.

We support our customers every step of the way; from design, manufacturing and installation to maintenance and modernization. KONE is a global leader in helping our customers manage the smooth flow of people and goods throughout their buildings.

Our commitment to customers is present in all KONE solutions. This makes us a reliable partner throughout the life cycle of the building. We challenge the conventional wisdom of the industry. We are fast, flexible, and we have a well-deserved reputation as a technology leader, with such innovations as KONE MonoSpace®, KONE EcoMod™ and KONE UltraRope®.

KONE employs nearly 50,000 dedicated professionals to serve you globally and locally.

KONE

kone.us