BEYOND SECURITY KABA®

Kaba Remote Reader 91 25-AM (US/CAN)

Technical Manual

04045708 - 04/2016

EN

Kaba AG
Access & Workforce Management
Hofwisenstrasse 24
8153 Rümlang
Switzerland

Phone +41 44 818 93 11
www.kaba.com

Kaba AG
Access & Workforce Management
Mühlebühlstrasse 23
8620 Wetzikon
Switzerland

Phone +41 44 931 61 11
www.kaba.com

Kaba GmbH
Access & Workforce Management
Albertistraße 3
78056 Villingen-Schwenningen
Germany

Phone +49 7720 603 0
www.kaba.com

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1 About this Document

1.1 Validity

This document describes all device versions and optional equipment and functions. Options need to be paid for and are therefore only available if they have been purchased. Additional equipment and functions may not yet be available at the time of issuing the document and, possibly, can only be purchased at a later stage.

Product name:	Kaba remote reader 91 25 (US / CAN)
Article number:	04044475
Functional type:	AM (access manager)
Serial number:	
Date of manufacture:	
Firmware version	from BREB03.05.RD_ Display in Kaba exos: BREB03.05.RD

1.2 Target group

This document is exclusively intended for specialist personnel.

The descriptions require specialist personnel trained by the manufacturer. The descriptions do not replace product training.

For reasons of device safety, the installation and maintenance operations described in this document must be carried out only by service persons according to EN 60950-1 (Information technology equipment - Safety).

Service persons are persons having adequate technical training and sufficient experience to be aware of and to minimize the possible risks for themselves or other persons, which may occur when carrying out these operations. The service persons are responsible for adhering to the instructions given by the manufacturer and to the applicable standards and regulations during execution of their work.

This document is also used as information for persons with the following tasks:

- project planning and implementation
- Commissioning the product within the network
- Connecting the product to the user software by programming customer applications
- Customer-specific adjustment by setting the parameters of the product

1.3 Contents and purpose

The contents is limited to the assembly, installation, start-up, and basic operation of the hardware.

1.4 Supplementary Documents

Supplementary documentation is available on the Kaba website. The technical manuals are located in a secured area of the website.

- Access is only possible after logging in.
- An account will need to be created before logging in for the first time.

Access and login:

1. In the browser, access the Kaba page http://www.kaba.com.
2. Select the language in the top right.
3. Under "Products", select the "Access Management" or "Workforce Management" product division.
4. In the top right section of the screen, click on the following symbol: 👤.
5. Enter your e-mail address and password and login or create an account (see below).

⇨ The technical manuals can be found under "Downloads".

Create account:

1. Click "Create account".
2. Complete the data fields and confirm.
   ⇨ A confirmation link will be sent to your e-mail address.
3. To activate your account, click on the confirmation link in your e-mail.

1.5 Change Log

The most important changes to the last issue of this manual are listed below:

Version number	Edition	Brief description
TM_RemoteReader9125-AM-US-CAN_201603	03/2016	First edition (US / CAN)

1.6 Orientation in the Document

This document contains the following orientation aids to facilitate finding of specific topics:

- An index in the alphabetical order is given at the end of the manual.
- The table of contents at the beginning of the manual gives an overview of all topics.
- The header always contains the respective main chapter.
- This step-by-step guide goes through the installation and commissioning.
- Cross references always indicate the number of the chapter in which the supplementary information can be found. Example [▸ 5.7].

1.7 Abbreviations/Term Definitions

Abbreviations and terms used in this document:

Abbreviation/ term	Term definition from 07/01/14
Remote reader	Kaba remote reader 91 25
Device	Kaba remote reader 91 25
Door manager	Kaba remote reader 91 25
Registration unit	Kaba registration unit 90 01
	Kaba registration unit 90 02
	Kaba registration unit 90 00
Antenna	Registration unit
Extension module	Kaba extension module 90 31
	Kaba extension module 90 30
Host	Host system
KCP	Kaba Communication Protocol (RS-485)
BPA/9 subset	Protocol for subterminal communication via RS-485 BPA = Benzing Protocol Asynchronous
Control unit	• Access manager or • B-web terminal
KMM	Kaba Media Manager
Access Manager	Kaba access manager 92 00
Kaba exos AMC	Kaba exos AMCII
Programmer	Kaba Programmer 1460
Authorized access	Is active until the door is closed again or the alert duration has expired
Door opener key	Key which triggers single, authorized door opening
Door handle contact	Contact in the door handle with which authorized door opening is reported to the system
Frame contact	Contact in the door frame with which the door status open or closed is reported
Blocking contact	Contact with which the access point can be blocked. In this case, any identification on the registration unit is rejected as access not authorized and signaled accordingly.
Alarm buzzer/alarm relay	This signal is used to control the relay output if the door is forced open or in the event of 'Door open too long'
Hold-open mode	In the event of authorized access, the door remains activated (opened) until the user medium is within the range (field) of the antenna.

1.8 Warnings

Warnings containing information/instructions and prohibitions to prevent injury to persons and damage to property are specially labeled.

Please pay attention to warnings. They are intended to help prevent accidents and avoid damage.

1.8.1 Hazard Categories

Warnings are split into the following categories:

⚠

⚠ CAUTION

Slight Risk

Describes a potentially hazardous situation that could result in minor physical injuries.

❗

NOTICE

Information on how to handle the product correctly.

Failure to comply with these warnings may result in malfunctions. The product or something in its vicinity could be damaged.

1.8.2 Symbols

Depending on the source of the hazard, symbols are used for the warnings, and these have the following meanings:

⚠	General danger		Danger for electronic components from electrostatic discharge

1.9 Notes

Notes are labeled with an info symbol.

ℹ

Tips and useful information.
These help you to make best use of the product and its functions.

2 Grouped safety messages

This product has been built in accordance with state-of-the-art standards and the recognized safety rules. Nevertheless, its use may constitute a risk to persons and cause damage to material property.

ℹ Read and observe the following safety instructions before using the product.

2.1 Use as directed

The product is only intended for use as described in chapter “Product description”. Any use beyond that is considered contrary to its designated use. The manufacturer cannot be held liable for damage resulting from such use. Such use is at the sole risk of the user/operator.

2.2 Mounting and Installation

Mounting and installation may only be carried out by service persons (see chapter 1 “Target group”).

Installation may only be carried out in places that fulfill the climatic and technical conditions stated by the manufacturer.

The manufacturer is not liable for damages resulting from improper handling or incorrect installation.

2.3 Service and Maintenance

Maintenance work / troubleshooting

Only the service person (see chapter 1 “Target group”) is entitled to remove faults and carry out maintenance work.

Reconstruction and modification

Any alteration or modification to the device may only be performed by the service person (see chapter 1 “Target group”). Any alteration or modification performed by unauthorized persons shall render void any liability.

2.4 Accessories and spare parts

Accessories and spare parts must comply with the technical requirements specified by the manufacturer. This is guaranteed when using original accessories and spare parts from Kaba.

2.5 ESD (electrostatic discharge) protective measures

NOTICE

Danger for electronic components due to electrostatic discharge.

Improper handling of printed circuit boards or components can cause damages that lead to complete failures or sporadic errors.

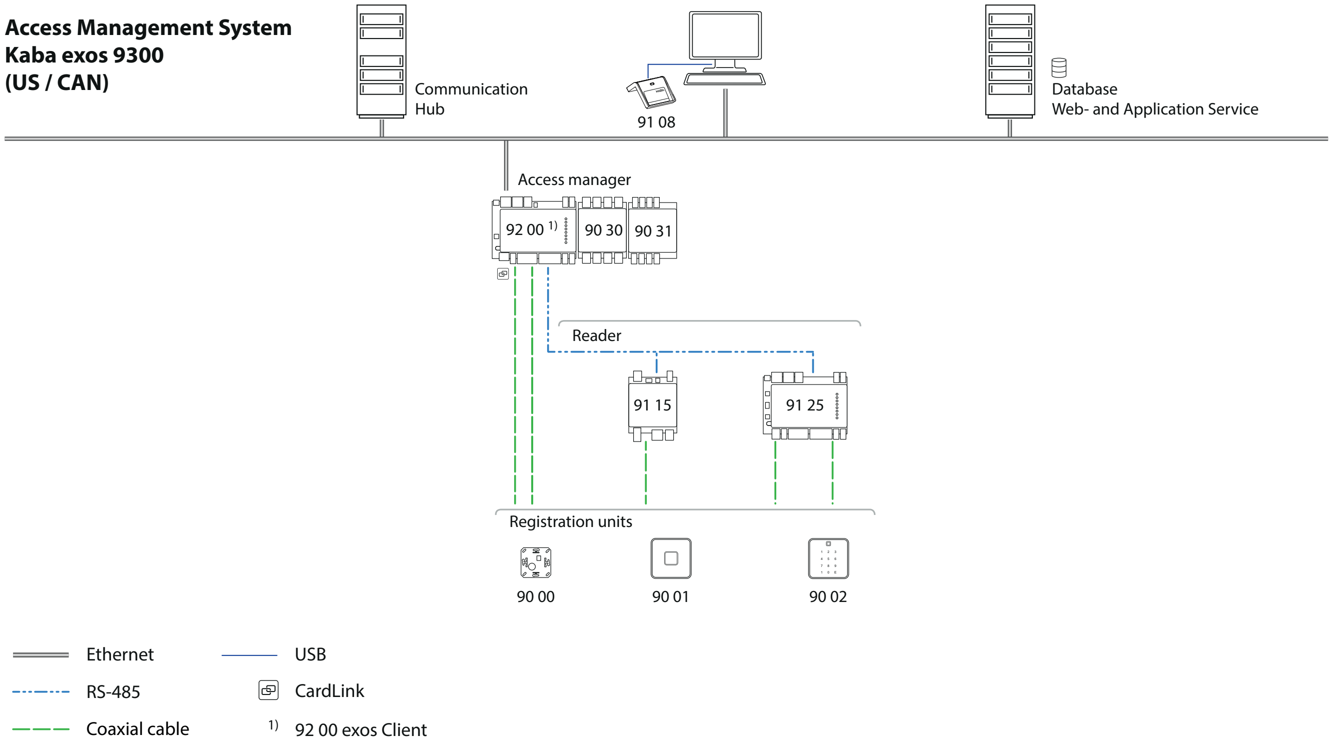
- During installation and repair of the product, the ESD protective measures must be considered.
- Wear an ESD wristband when handling electronic components. Connect the end of the wristband to a discharge socket or an unvarnished grounded metal component. This way, static charges are discharged from your body securely and effectively.
- Touch only the edges of circuit boards. Do not touch the circuit board nor the connector.
- Place all dismantled components on an antistatic surface or in an antistatic container.
- Avoid contact between circuit boards and clothing. The wristband only protects the printed circuit boards against electrostatic discharge from your body, but there is still a risk of damage through electrostatic discharge from your clothing.
- Transport and dispatch dismantled modules only in electrostatically shielded protective bags.

3 Product Description

3.1 Overview

The Kaba remote reader 91 25 with functional type AM can either control and monitor access control at access points or register coming/leaving bookings for time registration.

Two registration units can be connected to the Kaba remote reader 91 25. The remote reader has two RS-232 interfaces (e.g. for keypads, Hyper X or system-dependent functions) and can be integrated into the Kaba exos access control system. The remote reader is installed on a DIN rail. Thanks to the separation of the remote reader and registration units, the remote reader can be installed in a tamper-proof area and the registration units can be installed in an area that is not tamper-proof.
The door components (locking elements, monitoring contacts) are directly connected to the remote reader. This controls the electric strikes as well as the optical and acoustic signal transmitters of the registration units. As two registration units can be connected, one Kaba remote reader 91 25 is sufficient for implementing an on/off configuration (e.g. turnstile). The remote reader communicates with the host system via the RS-485 interface. The host system checks the company codes and the user medium numbers, and activates the access points.
If the communication between the remote reader and the host system is interrupted, then, with the relevant programming of its offline behavior, the remote reader automatically takes on the tasks of the host system; i.e. authorization checks and door functions are retained.



3.2 Registration Unit Compatibility

The following registration units are supported.

Registration unit	Control unit	
	Access Manager	Remote reader
		Functional type Access manager
Kaba registration unit 90 00	✓	✓
Kaba registration unit 90 01	✓	✓
Kaba registration unit 90 02	✓	✓

Registration unit	FCC	IC
Kaba registration unit 90 00	Tested Standard: FCC Code of Federal Regulations, CFR 47, Part 15, Sections 15.205, 15.207, 15.215 and 15.225	Tested Standard: Industry Canada Radio Standards Specifications RSS-GEN Issue 4, Sections 8.8, 8.9 and 8.10 and RSS-210 Issue 8, Section A2.6 (Category I Equipment)
Kone registration unit PCB		
Kaba registration unit 90 01		
Kone registration unit 90 01		
Kaba registration unit 90 02		
Kone registration unit 90 02		

3.3 Operating modes

The door configuration determines the operating mode of the Remote reader. A detailed description of the door configurations and their operating modes can be found in the chapter Operating Types and Modes.

3.4 Supported RFID Standards with Possible Media Definitions

The following table shows the RFID standards and media definitions supported by the device.

The Kaba remote reader 91 25 recognizes up to eight different media definitions at the same time.

Media definitions		**Supported RFID technologies**				
		MIFARE DESFire	**MIFARE Classic**	**LEGIC advant**		**LEGIC prime**
		ISO 14443A	**ISO 14443A**	**ISO 14443A**	**ISO 15693**	**LEGIC RF**
Unique number (UID) *1		✓	✓	✓	✓	-
Safe UID		-	-	-	-	✓
Card ID		✓	✓	✓	✓	-
Kaba group header		-	-	✓	✓	✓
Kaba advant ID		-	-	✓	✓	-
LEGIC access™ (advant)		-	-	✓	✓	-
LEGIC access™ pool (prime)		-	-	-	-	✓
CardLink 1.1	Data	✓	✓	✓	✓	-
	Actuator status	✓	✓	✓	✓	-
	Media traceback *2	✓	-	✓	-	-
CardLink 1.0	Data incl. actuator status	-	-	-	-	✓
Additional media numbers		✓	✓	✓	✓	✓
*1		The LEGIC chip set does not use the safe UID command set so that UID from other media, such as MIFARE, can also be read.				
*2		Media traceback information can only be read out directly on the access manager and no media traceback information is written.				

3.4.1 MIFARE

The system can evaluate everything that can be defined in Kaba media manager. MIFARE DESFire or MIFARE Classic media can be read and described on the same Kaba remote reader 91 25 MIFARE using various media applications.

3.4.2 LEGIC

LEGIC prime or LEGIC advant media can be read and described on the same Kaba remote reader 91 25 LEGIC using various media applications (LEGIC advant media can only be described using LEGIC advant components).

Dual chip card

A dual chip card with LEGIC advant (14443 A) and CardLink LEGIC prime (LEGIC RF) is supported.

3.5 Interface for Extension Modules

3.5.1 Number of Supported Extension Modules

The extension modules are connected to the system bus of the Kaba remote reader 91 25. There is a limit to the maximum number of supported extension modules.

The host system determines the maximum number of connectible extension modules.

Configuration of the Kaba remote reader 91 25	**Max. connectible extension modules 90 30**	**Max. connectible extension modules 91 31**	**Minimum supply voltage of the Kaba remote reader 91 25**
Only extension module 90 30	9	0	20 VDC*
Only extension modules 90 31	0	5	As specified in the technical data: 10 VDC
Mixed operation (extension modules 90 30 and extension modules 90 31)	2	2	As specified in the technical data: 10 VDC
*non-standard			

3.6 Technical Data

3.6.1 Overview of Technical Data

Mechanics	
Mounting	• Indoors • On DIN rail in accordance with EN 50022
Housing	• ABS black, with imprinted connection diagram
Combustion category	• HB (UL94)
Dimensions	• 125 x 102 x 45 mm (L x W x H) or seven space units 17.5 mm width measurement includes screw/plug terminals
Connections	• All connections are screw/plug terminals • Max. terminal load: 5 A

Power supply	
Input voltage, without external wiring	• 10–34 VDC (50/60 Hz), current consumption max. 330 mA, max. 4.5 W • Power consumption/heat capacity: – at 12 VDC typically 2 W – at 24 VDC typically 2.7 W
The Remote reader supplies connected devices with power via the RS-232 connection.	• 5 VDC • max.* 1 A (at 25°C) * Total of all connected devices
Notice: The device may only be supplied with SELV (Safety Extra Low Voltage) and LPS (Limited Power Source), according to IEC/UL/CSA 60950-1.	

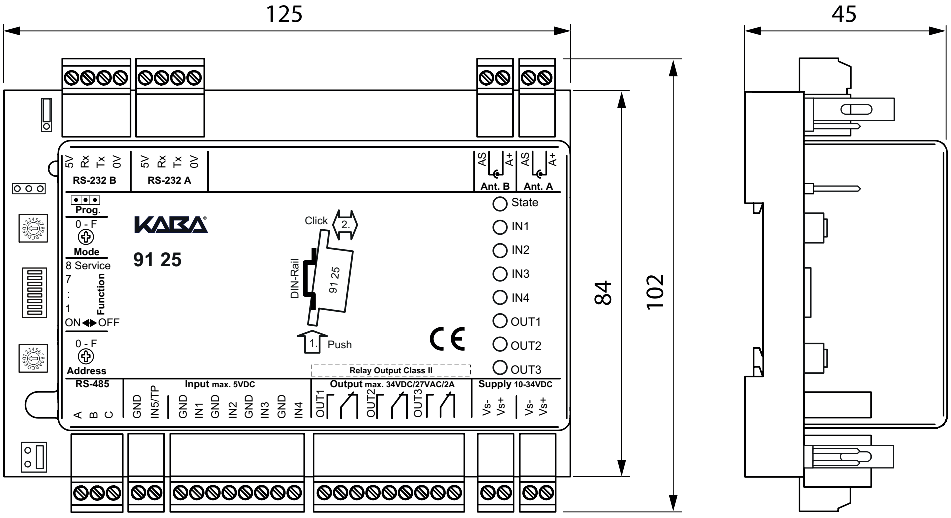
Interfaces	
HF RFID	• Two registration units with or without keypads (ant. A/B) • Coaxial cable, impedance 50 Ohm • Encrypted data transfer
Two RS-232 (A/B) Basic setting (can be parameterized)	Connection with following (default) properties: • Connection for registration units (keypads, wide area access solution, as well as system-dependent functions) • Baud rate max. 115 200 baud (Kaba exos AM: 9600 baud) • 8 data bits, no (None) parity, 1 stop bit • Output voltage 5 VDC, max. 500 mA each • Via Kaba exos AM can be parameterized up to 9600 baud

Interfaces	
RS-485	• For the connection to access hub • KCP protocol; galvanically separated, 2-wire • Baud rate 19200 baud (fixed) • 8 data bits, even (Even) parity, 1 stop bit • Termination resistance for bus or star wiring • Addressing 1–8
Programmer interface	• For firmware update or programmer connection
Extension modules	• Maximum number of supported extension modules, see chapter 3.5

Inputs and outputs	
5 binary inputs one of which can be used as a tamper switch (usually IN5).	• With internal power supply and common ground, for connection of insulated switches • Maximum 5 V DC • Line monitoring (can be disabled) • LED status indicator
2 internal inputs	• In operating mode Kaba exos lock for the door handle contact • Status indicator (LED OUT1 and OUT2)
3 relay outputs	• Switchover contact, max. voltage 34 VDC max. current 2 A at 30 VAC/DC • Switching cycles at 30 VDC/1A typical 500,000 (VdS 2358 requirement is 200,000) • Switching cycles at 30 V DC/2A typical 100,000 • Status indicator

Ambient conditions	
Ambient conditions	• Operating temperature: 0 °C to +50 °C • Storage temperature: -20 °C to +65 °C • Relative humidity: 0% to 95%, non-condensing • Protection type: IP20

3.6.2 Dimensions



3.7 Conformity

This product conforms to the following standards:

EN 60950-1 : 2014-08
EN 60950-1:2006/A2:2013
UL 60950-1:2007/R:2014-10
CAN/CSA-C22.2 No. 60950-1:2007/A2:2014-10

EN 301 489-1 V1.9.2 : 2011-09
EN 301 489-3 V1.6.1 : 2013-08
EN 300 330-1 V1.8.1 : 2014-12
EN 300 330-2 V1.6.1 : 2014-12

in accordance with the provisions of the EC directives

2014/53/EC: R&TTE Directive

RoHS This device complies with the regulations of the Directive **2011/65/EU** of the European Parliament and of the Council of June 8, 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

The original Declaration of Conformity can be downloaded from **www.kaba.com/conformity** in PDF format.

Tested Standard:

FCC Code of Federal Regulations, CFR 47, Part 15, Sections 15.205, 15.207, 15.215 and 15.225

FCC ID NVI-KRR9125-K5

FCC § 15.19

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC § 15.21 (Warning Statement)

[Any] changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

FCC § 15.105

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Tested Standard:

Industry Canada Radio Standards Specifications RSS-GEN Issue 4, Sections 8.8, 8.9 and 8.10 and RSS-210 Issue 8, Section A2.6 (Category I Equipment)

IC:11038A-KRR9125-K5

ICES-003

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Canada RSS-GEN 8.4

This device complies with Industry Canada’s licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : 1) l’appareil ne doit pas produire de brouillage; 2) l’utilisateur de l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

3.8 Labeling

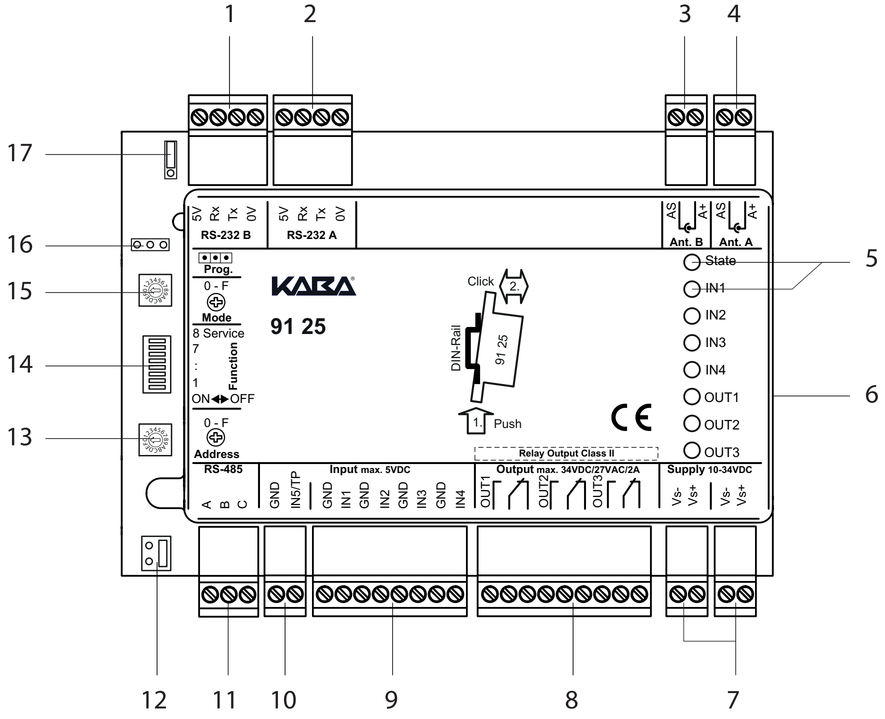
The identification plate is located on the side of the device.

The following information can be found on the identification plate:

- Device designation
- Article number
- Serial number
- Function type
- Connection data (power supply)
- CE mark
- WEEE mark as per DIN EN 50419

4 Design and function

4.1 Device structure



Item	Connection/switch	Remark
1	RS-232 interface B	Connection of peripherals
2	RS-232 interface A	
3	Antenna B	Registration unit B (antenna B)
4	Antenna A	Registration unit A (antenna A)
5	LED Displays	
6	Interface for Extension Modules	e.g. 90 30/90 31
7	Power supply 10–34 VDC	
8	Relay outputs OUT1–OUT3	
9	Inputs IN1–IN4	
10	Tamper switch	
11	RS-485 interfaces A, B and C	Connection to the host system
12	Bus termination RS-485	Jumper for adjustment of the termination resistance
13	Addressing RS-485, 1–8	Rotary switch for selecting the address
14	Function	DIP switch for selecting the function
15	Operating modes	'Mode' rotary switch for selecting the operating mode
16	Interface for Kaba programmer PD 1460	
17	Not used	

The functions and connections of the interfaces, inputs, relay outputs, rotary and DIP switches are described in the chapter Design and function [▸ 4].

4.2 Firmware

The hardware of this product is used in various Kaba system solutions. The functions and possible uses of the product are determined by the firmware used.

This manual solely describes the Kaba remote reader 91 25 functional type access manager (AM).

Firmware designation

Reader type	**M**	MIFARE
	A	LEGIC
	B	LEGIC or MIFARE (determined during commissioning) MRD (multi RFID device)
Device type	**RC**	Compact reader
	RR	Remote reader 91 15
	RE	Remote reader 91 25
Functional type	**A**	E300 V4 or N300/T300/U300 V3
	B	Access Manager
	C	Subterminal
	E	AMC/II (cDML)
Version number	**xx.xx**	Version
Addition 1	**R**	Final, approved version
Addition 2	**A**	Subversion
Addition 3	_	Reserve

Example

Designation of firmware for Kaba remote reader 91 25 with functional type access manager:

- BREB03.xxRxx (MRD)

Firmware mark on the product

Devices with firmware with the functional type access manager bear a mark reading "Type: Access manager" on the identification plate.

4.3 System Requirements

- Kaba exos 9300 release 4.0.1 and higher
- Kaba access manager 92 00 AM firmware version 3.00 and higher

Further details can be found in the Release Overviews and Release Notes.

4.4 Behavior with two Registration Units

The Remote reader 91 25 communicates alternately via the connections 'Ant. A' and 'Ant. B' (toggling) with the connected registration units. This means that the Remote reader 91 25 cannot communicate with both registration units at the same time. This results in the following behavior:

- During a longer reading process, the other registration unit is blocked.
- The fields of the two connected registration units do not influence each other. This means that the two registration units can be installed close together.
- In the case of registration units installed close together, it may be the case that the medium is read by the two registration units one after the other.

4.5 Behavior with Several Media in the Field (Anti-Collision)

The Remote reader 91 25 can recognize several LEGIC advant user media (ISO 14443 A) in the field simultaneously. The Remote reader 91 25 only considers the first user medium, which corresponds to the search criteria defined in the system. The remaining user media are ignored.

4.6 Functions

All data for access decisions are saved in the host control device. The authorization check of a badge and access control are undertaken by the control device.

Functions available before the remote reader is connected to the host system

Standalone access control (without host system); see chapter "Standalone Access Control without Host System" Commissioning [▸ 6.2]

Access control functions

- Authorization check using badges and temporal authorization incl. verification
- Connection of two separate registration units
- Control of optical and acoustic signal transmitters of the registration units
- Control of electric strikes (doors with electrical blocking elements)
- Support for door opener keys or door handle contacts
- Monitoring of the door status with frame contact, bolt monitoring and door handle contact
- CardLink support: Validation and UID additional recording (only LEGIC)
- Inspection of the functionality even without host system

- Two RS-232 serial interfaces, e.g., for keypads, Hyper X or system-dependent functions, such as input or issue (only online) of user media numbers
- Hold-open mode, so that, when access is authorized, the door remains open for as long as the badge remains within range of the antenna (field)
- Monitoring of a tamper switch by integrating the Remote reader into housing
- Signal for authorized access, e.g., for alarm bypass

Restrictions with interrupted connection (offline)

MIFARE

Reduced authorization check using site keys.
Door function is retained depending on the offline parameter setting.

- Authorization check using site keys. A maximum of eight site keys can be saved.
- Not taken into consideration: Time zones and PIN code
- Logbook for 2000 events
- No room monitoring/balancing and no CardLink functionality
- No change in fabrication key

LEGIC

Reduced authorization check using segment search keys. Door function is retained depending on the offline parameter setting.

- Authorization check using segment search keys. A maximum of eight segment search keys can be saved.

- Not taken into consideration: Time zones and PIN code
- Logbook for 2000 events
- No room monitoring/balancing and no CardLink functionality

Restored connection

Automatic forwarding of saved bookings as well as status and alarm messages when connection is restored.

4.7 LED Display

The LED display shows operating statuses and errors. Troubleshooting tips are listed in Chapter [▸ 8].

LED Designation	**LED Behavior**	**Meaning**
State	green permanent	Device in operation (offline)
	flashes green	RS-485 interface in the receive or send mode (online)
	orange permanent	Service mode
	red permanent or off	Device defective
	flashes green and orange	After an interruption in communication, until the device is queried for the first time by the host system
IN1–IN4	green permanent	LED lights once the corresponding input is enabled
	orange flashing	Service mode
	orange permanent or off	Update via programmer 1460
IN1–IN4 Monitoring enabled	orange permanent	Short circuit
	red permanent	interruption
OUT1–OUT3	green permanent	the relevant output is active
	flashes green	Undervoltage (Vs) or relay defective
	red permanent	Write/read authorization (launch data) is deleted
OUT1	red permanent	Input 5 (only in Kaba exos lock operating mode) As soon as the door handle contact is active

4.8 Operating Types

4.8.1 Overview of Operating Types

An operating type of the Remote reader is always made up of the operating mode (door configuration) with the associated extended functions and of the communication with the host system (access hub). The Remote reader supports the online and offline operating types.

Online operation: The Remote reader communicates with the system.

Offline operation: If a Remote reader connected with the system is disconnected from the system, then the Remote reader switches to the offline mode.

For the online and offline operation of the device, a minimum of the following hardware settings must be carried out before putting into operation:

System used	Minimum hardware settings
Kaba exos 9300	**Online operation:** • Address **Offline operation:** • DIP and rotary switch

4.8.2 Online operation

In online operation, the Remote reader communicates with the host system. The system makes the access decision on the basis of badges, time-dependent authorization and verification. The system controls the access points. If communication between Remote reader and system is interrupted, then the Remote reader independently switches into offline operation. If the Remote reader is queried by the system again, then the Remote reader switches back into online operation.

4.8.3 Offline Operation

Even in offline operation, i.e. without communication with the host system, an access point is monitored and controlled by the Remote reader. For access decisions,
site keys are used under **MIFARE** and
segment search keys are used under **LEGIC**.
The Remote reader controls access points in accordance with the operating mode, door configuration and the corresponding 'extended functions' (offline configuration).
In order to ensure fault-free offline operation, the Remote reader should be operated with a secure power supply (e.g. UPS).

Offline operation can be turned off in the system and/or using the 'Mode' rotary switch (F = off). This means that the offline behavior defined in the hardware settings is deactivated and the access point remains blocked if there is an interruption in communication.

Behavior in the event of an interruption to communication

- The access point goes to the basic status (possibly alarm if the access point is not closed)
- Relays which are not involved in a door process (according to DIP switch) deactivate; the same is true for the connected Kaba extension module 90 30.

4.8.3.1 Offline Access Decision

The customer determines the nature of the offline access decision which is parameterized in the system. We differentiate the following offline access decisions:

Parameter settings in the system: no offline access decision

The Remote reader rejects all bookings in offline operation.

Parameter settings in the system:
Checking site key (MIFARE)/segment search key (LEGIC)

In the online mode, the site key (MIFARE)/segment search key (LEGIC) is sent to the Remote reader by the system and saved in the Remote reader. During the offline mode, the Remote reader only checks the site key (MIFARE)/segment search key (LEGIC). The time zone is not considered for this kind of access decision.

Logbook

The logbook records and saves a maximum of 2000 events during the offline operation. Once the Remote reader is online again, the saved data is sent to the host system and deleted from the memory of the Remote reader.

The following events are logged:

- Authorized accesses (incl. type of authorization)
- Tampering, door forced open, door opener key

If there are more than 2000 entries, the oldest will be overwritten (ring memory).

Service mode

See chapter Service mode [▸ 7.3]

Also see about this

- 🗎 7.3 Service mode [▸ 87]

4.9 Operating modes

The operating mode of the Remote reader must be selected on the basis of the door configuration.

The operating mode is set using the rotary switch, see Chapter Set Operating Mode. The extended functions of a selected operating mode are set using the DIP switch Extended functions of the operating modes [▸ 5.7.6.1].

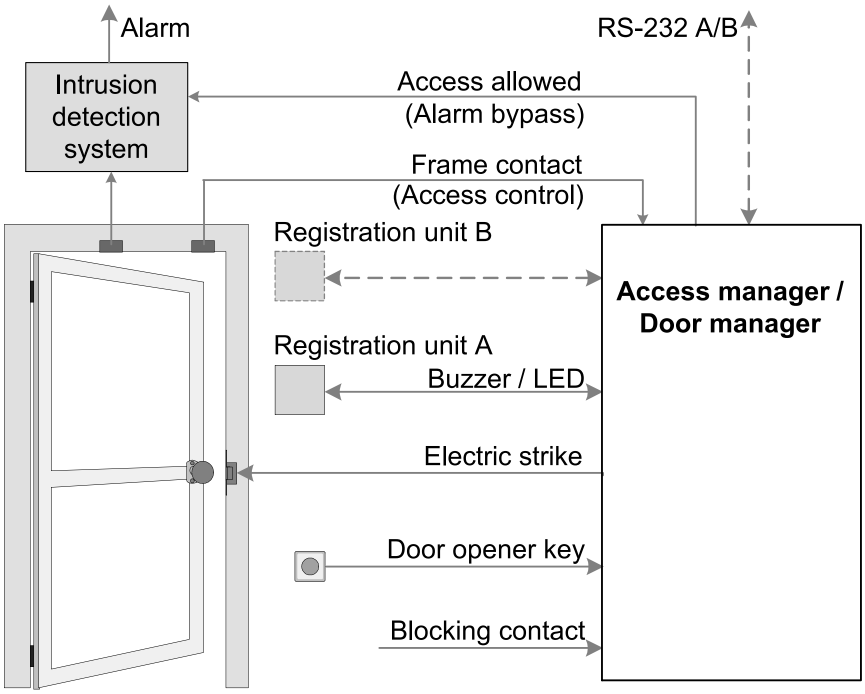
Possible operating modes:

- Electric strike; for doors with electrical blocking elements
- Motor bolt; for doors with electrical blocking elements
- Automatic doors; for doors with their own electronic control system (control with enable pulse; e.g. sliding door)
- Turnstile; for turnstiles/tripod turnstiles with their own electronic control system (control with direction-dependent enable pulses)
- Night lock; for doors with the two elements electronic strike and motor bolt
- Kaba exos lock; for doors with self-locking Kaba panic locks;
- Cylinder interface LI-EL; for doors with mechatronic Kaba elolegic cylinders
- Motor bolt with panic function; for doors with electrical blocking elements and additional mechanical panic opening
- Motor bolt type II with panic function (two outputs); for doors with electrical blocking elements and additional mechanical panic opening. 1 output each for the pulses 'unlock' and 'lock'.
- Motor bolt type III with panic function (1 output); for doors with electrical blocking elements and additional mechanical panic opening. 1 output for the pulses 'unlock' and 'lock'.
- Electric lock with panic function; for doors with electrical blocking elements and additional mechanical panic opening
- Automatic door with night lock for doors with their own electronic control system and additional night lock

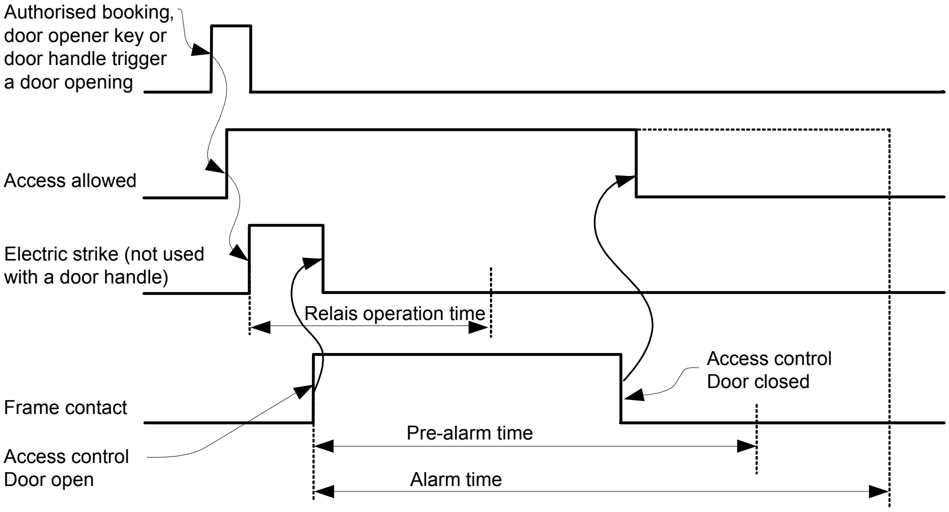
Also see about this

🗎 4.9.1 'Electric strike' operating mode [▸ 35]

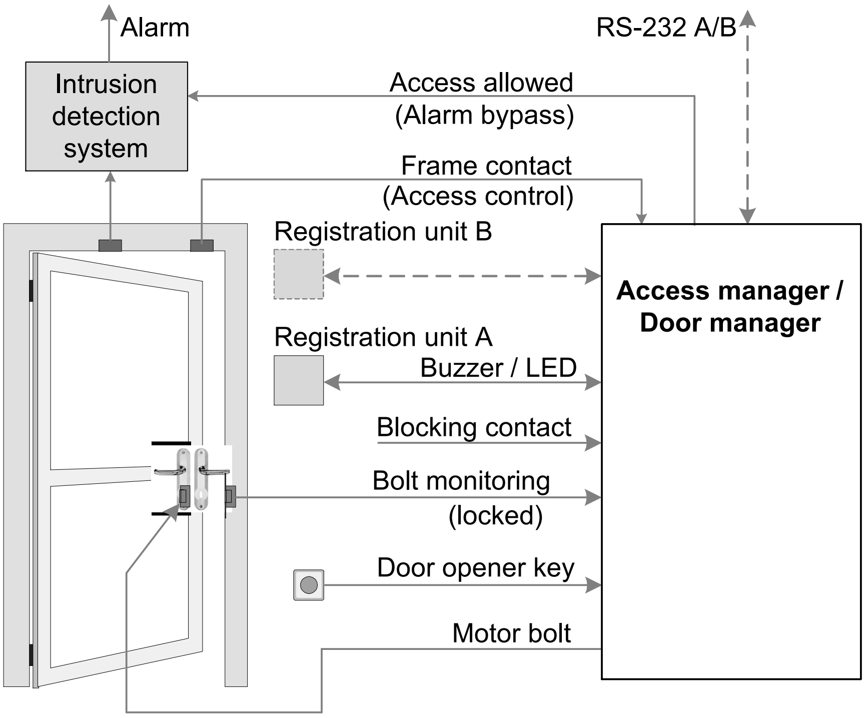
4.9.1 'Electric strike' operating mode


Alarm
RS-232 A/B
Intrusion detection system
Access allowed (Alarm bypass)
Frame contact (Access control)
Registration unit B
Access manager / Door manager
Registration unit A
Buzzer / LED
Electric strike
Door opener key
Blocking contact

The 'Electric strike' operating mode is mainly used to operate doors with electric locking elements (strike, magnet).
The access authorised signal is triggered by authorised booking, the door opener key or the door handle. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.
Then the electric strike is triggered. The door is now released for opening and the set relay operating time starts to run. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').


Authorised booking, door opener key or door handle trigger a door opening
Access allowed
Electric strike (not used with a door handle)
Relais operation time
Access control Door closed
Frame contact
Access control Door open
Pre-alarm time
Alarm time

4.9.2 'Motor Bolt' Operating Mode

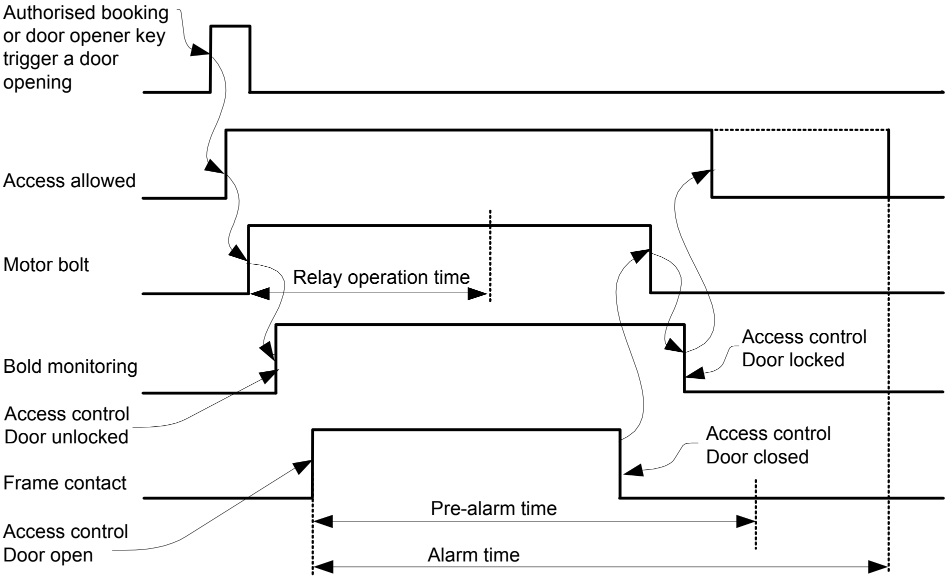


The 'motor bolt' operating mode mainly operates doors with electrical locking elements.

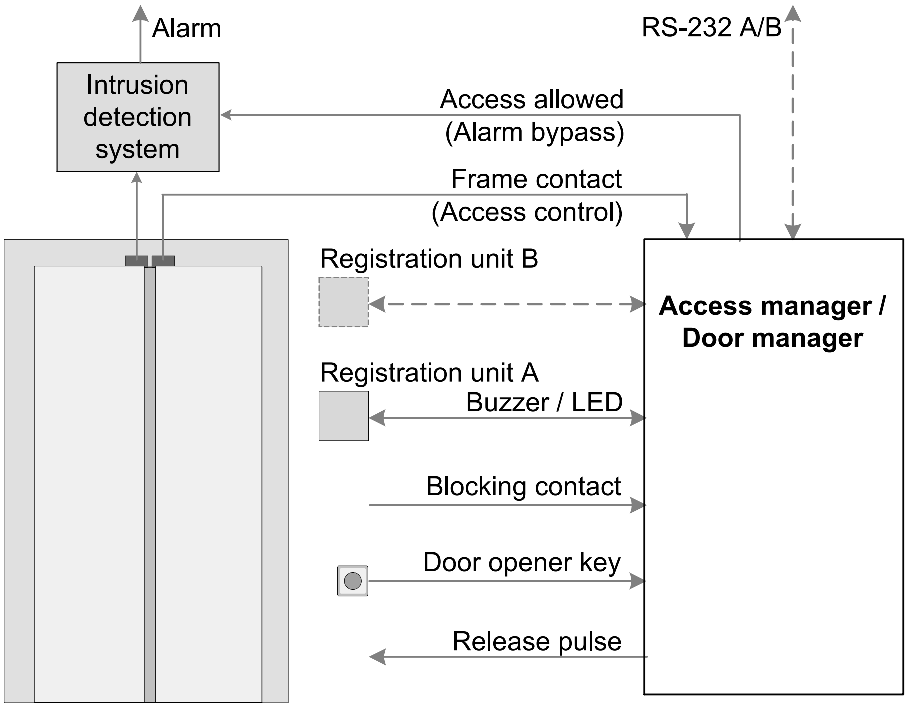
The 'authorized access' signal is generated through being triggered by an authorized booking or the door opener key. So that subsequent door opening does not generate an alarm, the 'authorized access' signal activates the alarm bypass.

Then the motor bolt is activated. The door is now released for opening and the set relay operation time starts to run. When opening the door, the pre-alarm and alarm time start to run ('Door open too long').

The motor bolt is activated until the frame contact signals that the door is closed again. Only then will the lock of the motor bolt be extended again. If the motor bolt is not extended (e.g. in the event of a defect or tampering), then an alarm ('Bolt position incorrect') is triggered.


Authorised booking or door opener key trigger a door opening
Access allowed
Motor bolt
Relay operation time
Bold monitoring
Access control Door locked
Access control Door unlocked
Access control Door closed
Frame contact
Pre-alarm time
Access control Door open
Alarm time

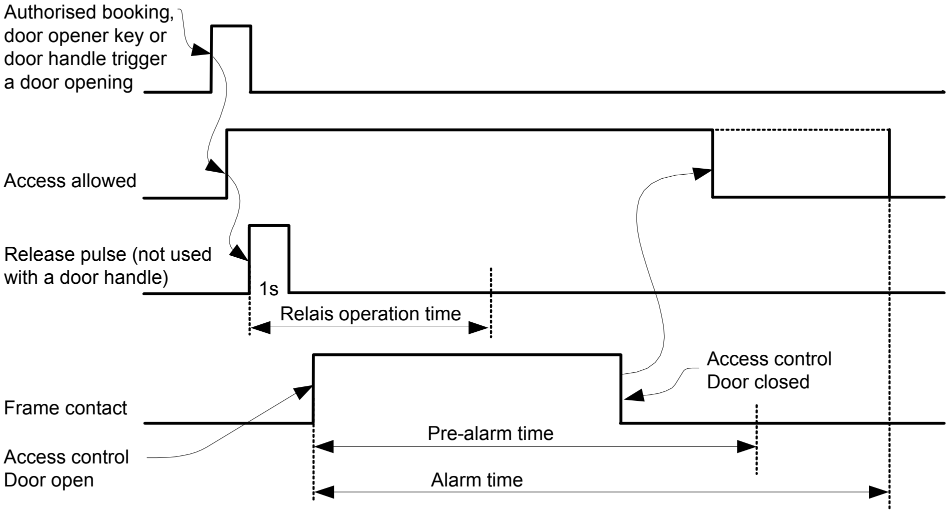
4.9.3 'Automatic door' operating mode



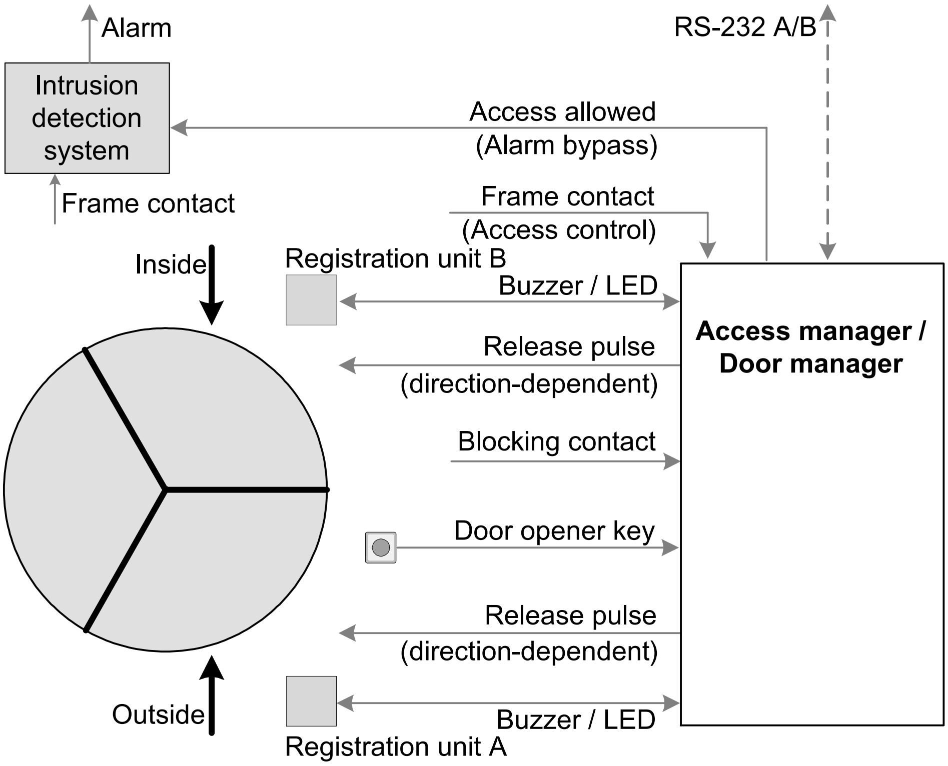
The 'Automatic doors' operating mode is mainly used to operate doors with their own control electronics (e.g. sliding doors). The control is carried out using a release pulse.
The 'Access authorised' signal is generated triggered by an authorised booking or the door opener key. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

The release pulse (approx. 1 s) is then sent to the control electronics. The set relay operation time starts to run. If the door is opened within the relay operation time, then the pre-alarm and alarm time start to run ('Door open too long').

If the door is opened outside of the relay operation time, then unauthorised door opening is present.


Authorised booking, door opener key or door handle trigger a door opening
Access allowed
Release pulse (not used with a door handle)
1s
Relais operation time
Access control Door closed
Frame contact
Pre-alarm time
Access control Door open
Alarm time

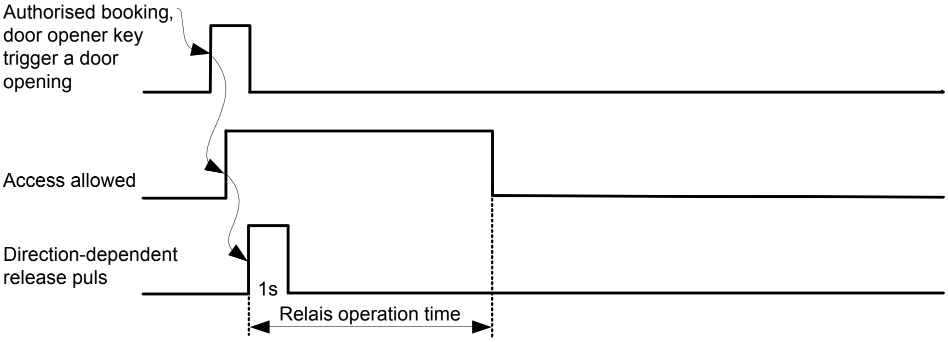
4.9.4 'Turnstile' operating mode


Alarm
Intrusion detection system
Frame contact
RS-232 A/B
Access allowed (Alarm bypass)
Frame contact (Access control)
Inside
Registration unit B
Buzzer / LED
Access manager / Door manager
Release pulse (direction-dependent)
Blocking contact
Door opener key
Release pulse (direction-dependent)
Outside
Buzzer / LED
Registration unit A

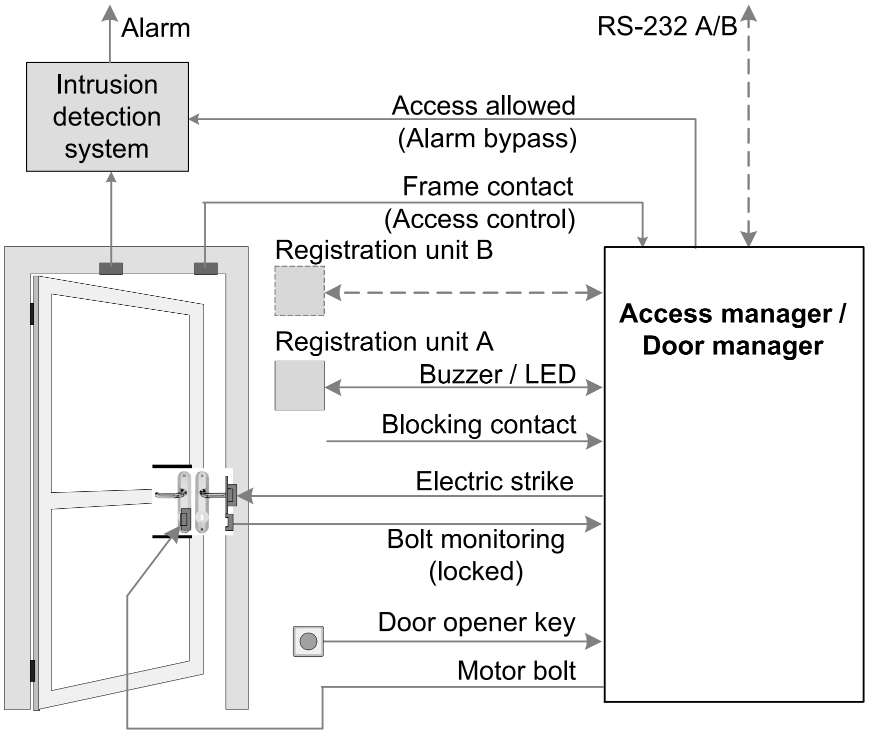
The 'Turnstile' operating mode is mainly used to operate turnstiles/tripod barriers with their own control electronics (triggered with direction-dependent release pulses). The turnstile is an access point in which the access point sides (outside/inside) are released in a direction-dependent manner. Therefore two opposite directions of rotation are possible.

The 'access authorised' signal is triggered by authorised booking or the door opener key. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

Then the direction-dependent release pulse (approx. 1 s) is sent to the control electronics and the set relay operation time starts to run. If the door is opened outside of the relay operation time, then unauthorised door opening is present.



4.9.5 'Night lock' operating mode

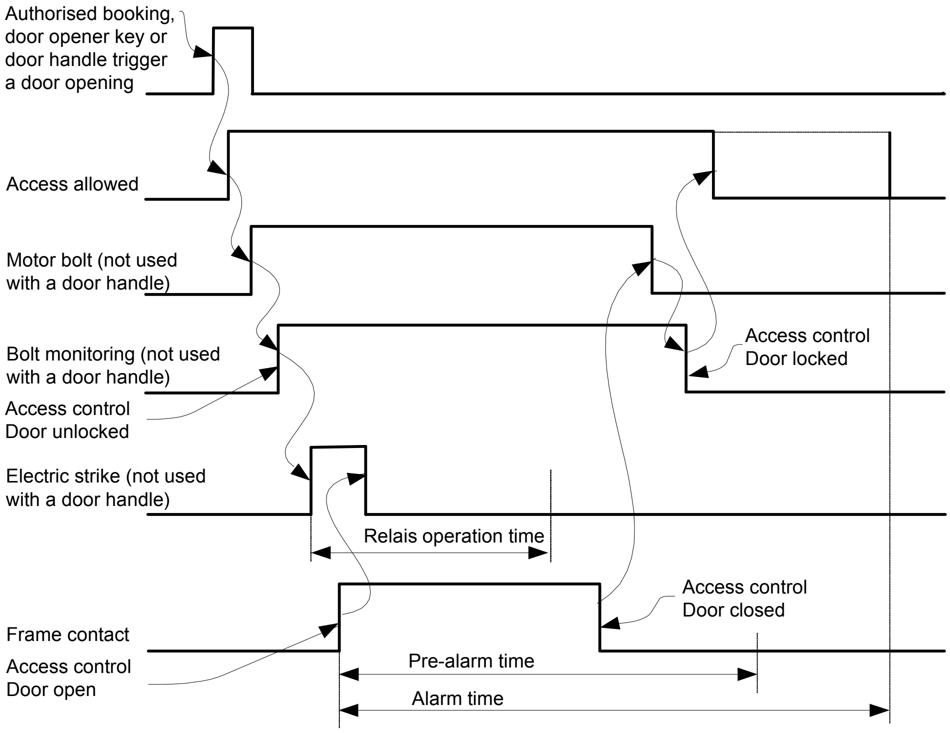


The 'Night lock' operating mode is mainly used to operate doors with the two elements electric strike and motor bolt. Therefore during the day only the door opener relay needs to be enabled, and the door can be additionally locked at night (e.g. X-Lock motor lock with control unit; but without bolt monitoring).

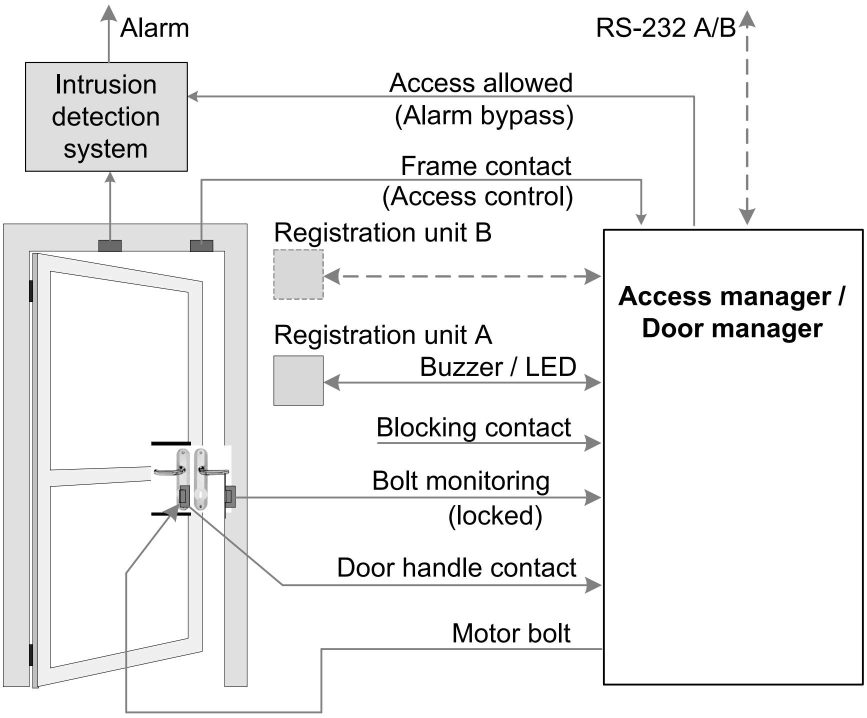
The 'access authorised' signal is triggered by authorised booking or the door opener key. So that subsequent door opening does not trigger an alarm, the Access authorised signal activates the alarm bypass.

Then the motor bolt is triggered. As soon as the motor bolt is retracted (motor bolt monitoring), the electric strike is triggered and the door is released for opening. The set relay operation time starts to run. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').

- The time profile saved for the night lock only works in online mode.
- Offline mode always corresponds to the night setting. Motor bolt and door opener relay are controlled.


Authorised booking,
door opener key or
door handle trigger
a door opening
Access allowed
Motor bolt (not used
with a door handle)
Bolt monitoring (not used
with a door handle)
Access control
Door unlocked
Electric strike (not used
with a door handle)
Relais operation time
Frame contact
Access control
Door open
Pre-alarm time
Alarm time
Access control
Door closed
Access control
Door locked

4.9.6 'Motor bolt with panic function' operating mode

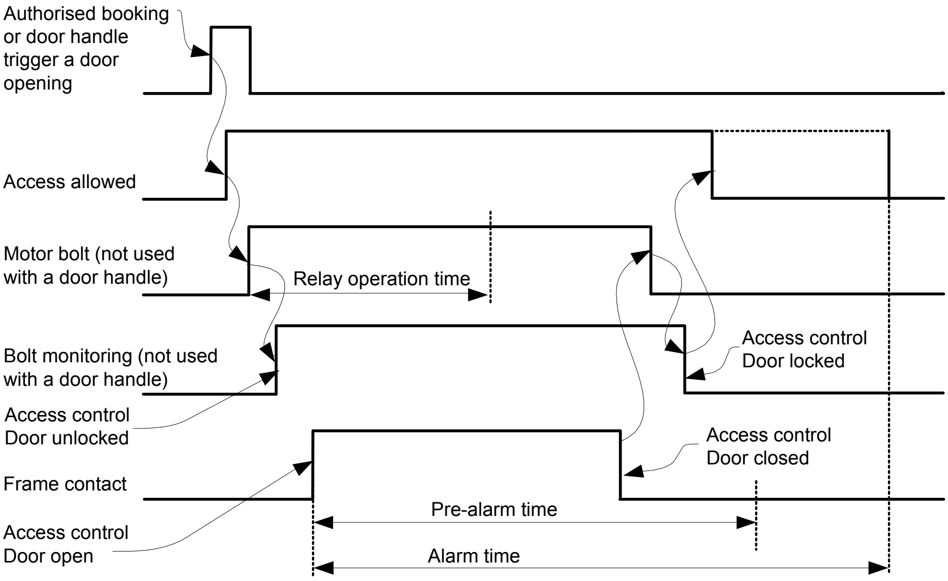


The 'Motor bolt with panic function' operating mode is implemented in the same way as the 'Motor bolt' operating mode. Instead of the door opener key, the door handle contact is assessed for mechanical panic opening.

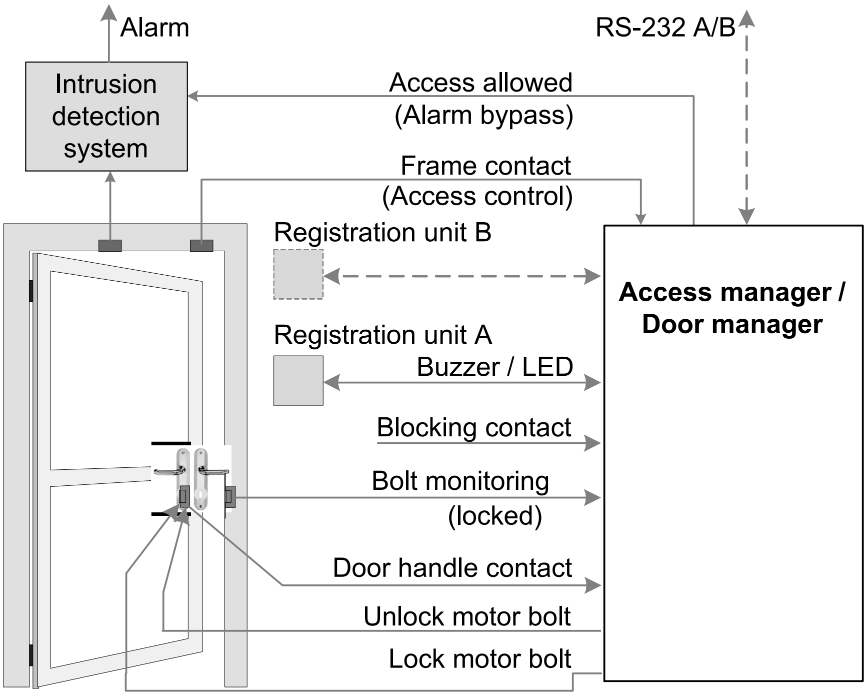
The 'access authorised' signal is triggered by an authorised booking or the door handle. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

The door is now released for opening and the set relay operating time starts to run. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').

The motor bolt is controlled until the frame contact signals that the door is closed again. Only then will the bolt of the motor lock be extended again. If the motor bolt is not extended (e.g. in the event of a defect or tampering), then an alarm ('Bolt position incorrect') is triggered.


Authorised booking or door handle trigger a door opening
Access allowed
Motor bolt (not used with a door handle)
Relay operation time
Bolt monitoring (not used with a door handle)
Access control Door locked
Access control Door unlocked
Access control Door closed
Frame contact
Pre-alarm time
Access control Door open
Alarm time

4.9.7 'Motor bolt type II with panic function' operating mode (2 outputs)

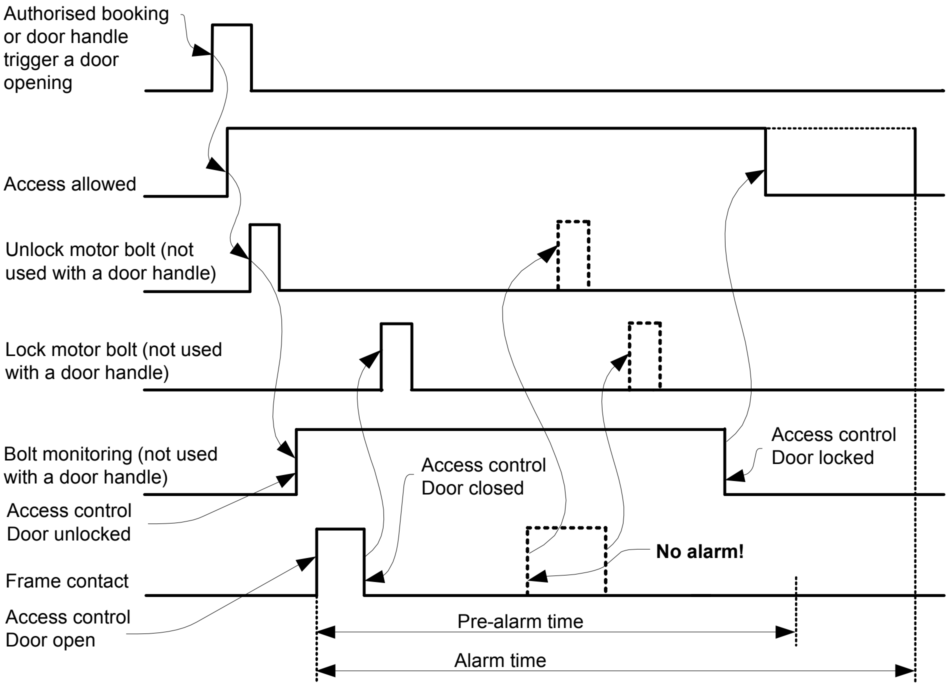


The 'Motor bolt type II' operating mode is implemented in the same way as the 'Motor bolt with panic function' operating mode. In place of the static 'Motor bolt' signal, there is one line each for 'Motor bolt unlocking' and 'Motor bolt locking' connected to the lock (e.g. MIWA AL-02/AL-3M).

The 'access authorised' signal is triggered by an authorised booking or the door handle. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

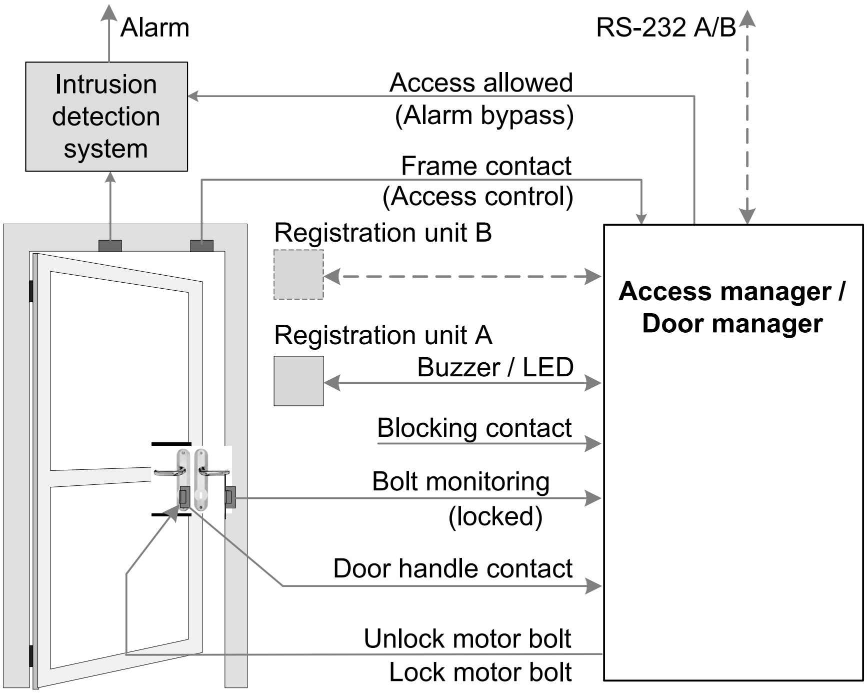
Then the motor bolt is retracted with the 'unlock' pulse. The door is now released for opening. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').

If the frame contact signals that the door is closed again, then the bolt of the motor lock is extended again via the 'lock' pulse. If the motor bolt is not extended (e.g. in the event of a defect or tampering), then an alarm ('Bolt position incorrect') is triggered. If the unlocked door (bolt monitoring) is opened again, no alarm will be generated.


Authorised booking or door handle trigger a door opening
Access allowed
Unlock motor bolt (not used with a door handle)
Lock motor bolt (not used with a door handle)
Bolt monitoring (not used with a door handle)
Access control Door unlocked
Frame contact
Access control Door open
Access control Door closed
No alarm!
Access control Door locked
Pre-alarm time
Alarm time

Depending on the door used, it may be the case that a door opener key is parameterised as the door component in Kaba exos instead of a door handle.

4.9.8 'Motor bolt type III with panic function' operating mode (1 output)

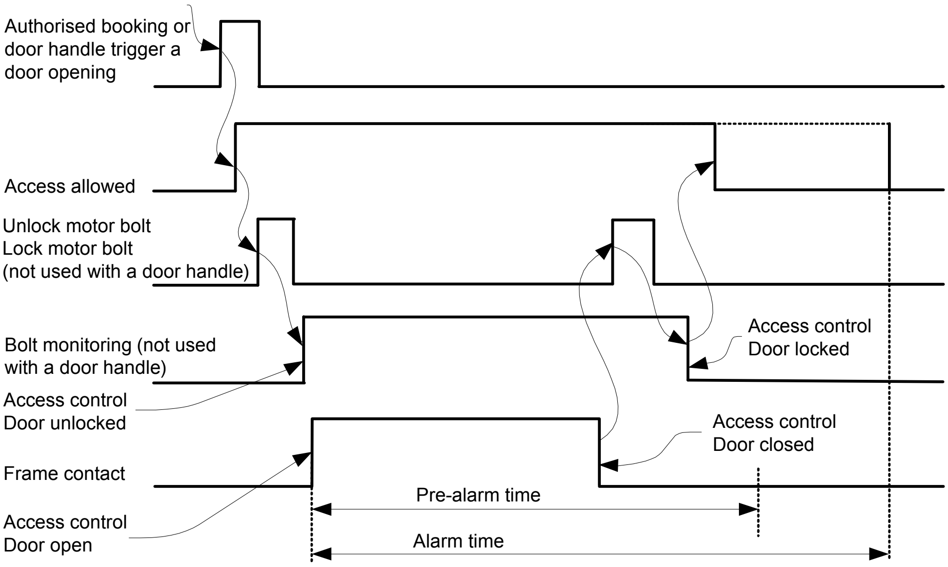


The 'Motor bolt type III' operating mode is implemented in the same way as the 'Motor bolt with panic function' operating mode. Instead of the static 'Motor bolt' signals, the 'Motor bolt unlocking' pulse is generated on one output and the 'Motor bolt locking' pulse is generated on the other output.

The 'access authorised' signal is triggered by an authorised booking or the door handle. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

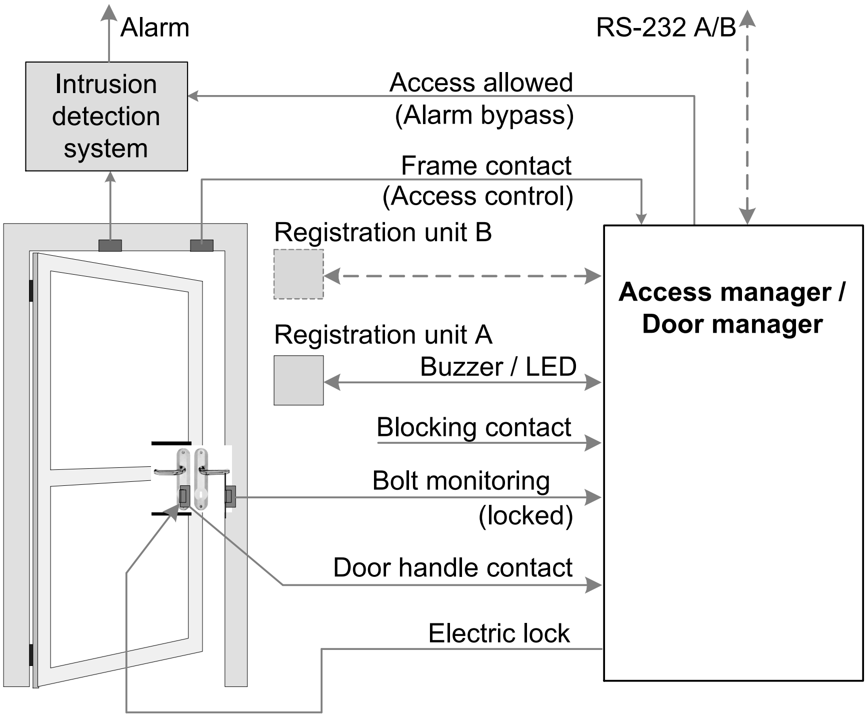
Then the motor bolt is retracted with the 'unlock' pulse. Now the door is released for opening. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').

If the frame contact signals that the door is closed again, then the bolt of the motor lock is extended again via the 'lock' pulse. If the motor bolt is not extended (e.g. in the event of a defect or tampering), then an alarm ('Bolt position incorrect') is triggered.


Authorised booking or door handle trigger a door opening
Access allowed
Unlock motor bolt
Lock motor bolt
(not used with a door handle)
Bolt monitoring (not used with a door handle)
Access control Door unlocked
Access control Door locked
Access control Door closed
Frame contact
Access control Door open
Pre-alarm time
Alarm time

Depending on the door used, it may be the case that a door opener key is parameterised as the door component in Kaba exos instead of a door handle.

4.9.9 'Electric lock with panic function' operating mode



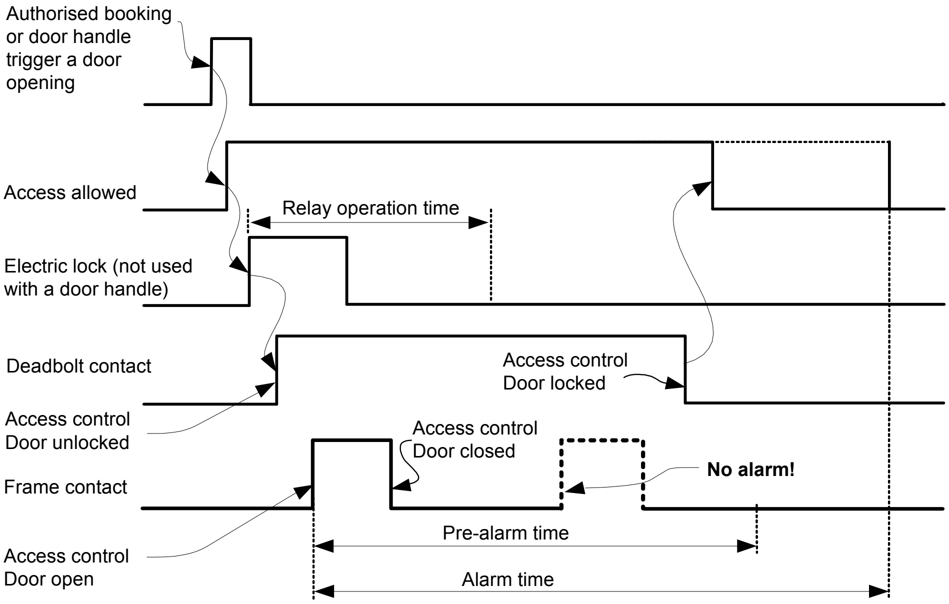
The 'Electric lock with panic function' operating mode is implemented in the same way as the 'Motor bolt with panic function' operating mode. An electric lock (e.g. X-Lock electric lock, MIWA AUTA/ALTA) is controlled instead of the motor bolt.

The 'access authorised' signal is triggered by an authorised booking or the door handle. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

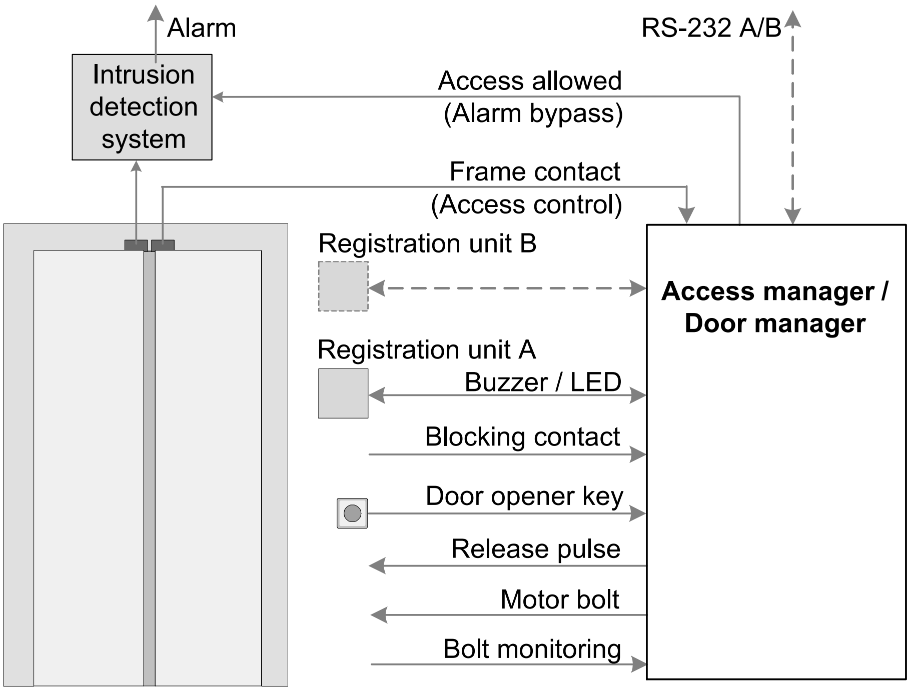
Then the electric lock is triggered. The door is now released for opening and the set relay operating time starts to run. When the door is opened the pre-alarm and alarm time start to run ('Door open too long').

The 'Access authorised' signal is enabled during the alarm time until the door is locked.

If the door is opened again during this alarm time, then no alarm is generated.


Authorised booking or door handle trigger a door opening
Access allowed
Relay operation time
Electric lock (not used with a door handle)
Deadbolt contact
Access control Door locked
Access control Door unlocked
Access control Door closed
No alarm!
Frame contact
Pre-alarm time
Access control Door open
Alarm time

4.9.10 'Automatic door with night lock' operating mode



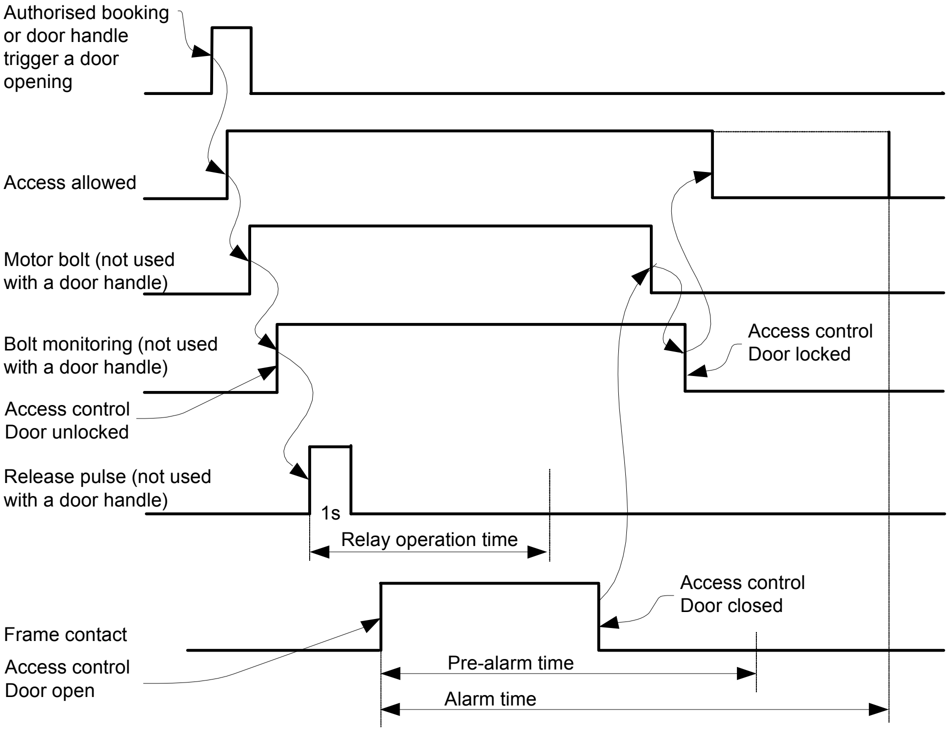
The 'Automatic door with night lock' mode is used to operate automatic doors with the two elements release pulse and motor bolt. This means that during the day only the release pulse is active and at night the door is additionally locked.

The 'access authorised' signal is triggered by authorised booking or the door opener key. So that subsequent door opening does not trigger an alarm, the 'Access authorised' signal activates the alarm bypass.

Then the motor bolt is triggered. As soon as the bolt is retracted (bolt monitoring), the release pulse (approx. 1 s) is sent to the control electronics. The set relay operation time starts to run. If the door is opened within the relay operation time, then the pre-alarm and alarm time start to run ('Door open too long').

If the door is opened outside of the relay operation time, then unauthorised door opening is present.

- The time profile saved for the night lock only works in online mode.
- Offline mode always corresponds to the night setting. Motor bolt and door opener relay are controlled.


Authorised booking or door handle trigger a door opening
Access allowed
Motor bolt (not used with a door handle)
Bolt monitoring (not used with a door handle)
Access control Door unlocked
Release pulse (not used with a door handle)
1s
Relay operation time
Access control Door locked
Access control Door closed
Frame contact
Access control Door open
Pre-alarm time
Alarm time

4.9.11 'Online Operation' Operating Mode

The 'Online operation' operating mode is used for purely online operation. If communication to the host system is interrupted, then no locking elements will be activated. All connected outputs and relays drop off.

5 Installation

This chapter describes the installation of the device.

5.1 Installation process

Procedure

1. Determine the installation site.
   Installation site [▸ 5.2.2]
2. Lay the installation cables.
   Installation lines [▸ 5.4]
3. Secure the device.
4. Connect registration units.
   'Ant. A' and 'Ant. B' Connections [▸ 5.6.4],
   Coaxial Cable to the Registration Units [▸ 5.4.4],
   Coaxial Cable Terminal [▸ 5.4.6.4]
5. Check read behavior without system configuration:
   Book with an ISO 14443 A medium or Legic Prime medium.

   ⇨ If the medium can be read, the registration unit signals this as unauthorized access.
6. Connect keypads or system-dependent functions.
   RS-232 A and RS-232 B Interfaces
7. Connect the inputs.
   Inputs IN1 – IN4, tamper and input 5 [▸ 5.6.8]
8. Connect the relay outputs.
   Output OUT1 – OUT3 [▸ 5.6.9]
9. Plug in/connect extension modules where required.
10. Connect Kaba remote reader 91 25 and host device to the RS-485 bus cable.
    RS-485 interface [▸ 5.6.3]

Configure the device after installation.
Configuring [▸ 5.7]

Also see about this

- 5.5 Mounting the device and extension modules [▸ 60]
- 5.4 Installation lines [▸ 53]
- 5.7 Configuring [▸ 68]

5.2 Installation conditions

5.2.1 General

An accurate installation of all components is a basic requirement for a properly functioning device. The following installation instructions must be adhered to.

5.2.2 Installation site

The device is assembled on a DIN rail in a housing or IT cabinet.

The device should be installed in a tamper-proof location within the area to be secured.

Electromagnetic fields

The device must not be installed in the area of strong electromagnetic fields caused by switching power supply, power lines, phase controllers, etc.!

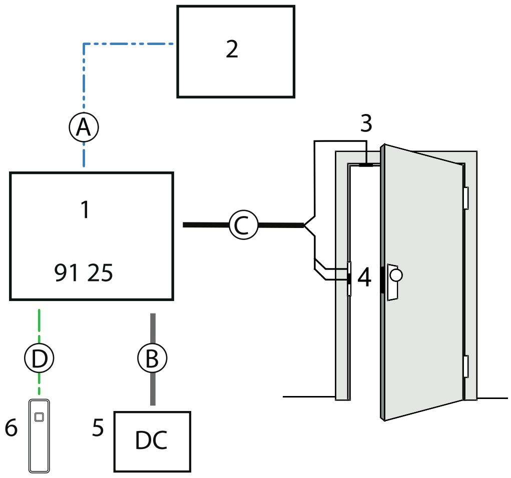
5.2.3 Connections

The following connections must be available at the location where the access manager is to be installed:

- Power supply for the device
- RS-485 cable to the host device
- Cables to door openers and switches
- Coaxial cable to registration units

ℹ The installation lines have to be flush with the surface or be laid in the vandal-proof area.

5.3 Installation layout (example)



1 Kaba remote reader 91 25

2 Kaba access manager 92 00

3 Door frame contact

4 Door contact, door opener

5 Power supply

6 Kaba registration unit

Installation cables

A Data line

B Power supply line

C Line to the door opener and door contacts (if required)

D Coaxial cable

5.4 Installation lines

This chapter describes:

- Line requirements
- Maximum permitted line length
- Grounding concept

The chapter Connections describes the assignment of connections and switch settings.

Only connect the terminals when the power is switched off.

5.4.1 Power supply line

The device can be supplied with power in the following ways:

- From the host control device (power supply and data line in one cable)
- From a separate power supply

NOTICE

Voltage drops, caused by line resistance, must be taken into consideration for long lines.
The given cable types and diameters are examples and serve as recommendations. The technical specifications of the cable manufacturer are authoritative for the precise determination of the cable diameter/cross section and the resulting maximum cable lengths. The voltage drop across the cable length is decisive in this case. As such, the voltage that is available at the end of the cable may, under no circumstances, be less than the minimum permitted supply voltage of the connected components. This always applies in consideration of the maximum power consumption of the connected components.

Only connect the terminals when the power is switched off.

The device may only be supplied with SELV (Safety Extra Low Voltage) and LPS (Limited Power Source), according to IEC/UL/CSA 60950-1.

5.4.1.1 Power supply from the host control device

(Central power supply)

Power is supplied from the host control device.

In the case of bus wiring, the power supply and data line can be carried in one cable (maximum total length of 350 m).

In the case of star wiring, the power supply and data line can be carried in one cable (maximum length per stub of 20 m).

A separate power supply must be used for greater distances.

Permissible Cable Lengths and Cable Types				
Type of wiring:	**Star**	**Bus**		
Max. cable length:	**< 20 m** (per stub)	**< 50 m** (total)	**< 100 m** (total)	**< 350 m** (total)
Cable type CAT.5 S-UTP *	4 x 2 x AWG 24		4 x 2 x AWG 22	4 x 2 x AWG 20
Cable type J-Y (ST)	4 x 2 x ø 0.6 mm		4 x 2 x ø 0.8 mm	4 x 2 x ø 1.0 mm

*S-UTP (screened unshielded twisted pair)

Do not ground the device.

5.4.1.2 Power supply and data transfer in separate cables

(Local power supply)

Data lines and power supply lines are carried with one of each in a cable.

Power is supplied locally, e.g. from a power supply unit.

A local power supply can be used in the following cases:

- in long data lines
- if there are increased requirements regarding the operational safety of the device (offline capability).

Permissible Cable Lengths and Cable Types				
	Data line RS-485			**Power supply**
Type of wiring:	**Star**	**Bus**		
Max. cable length:	**< 100 m** (per stub)	**< 1200 m** (total)		**< 10 m**
Cable type CAT.5 S-UTP *	2 x 2 x AWG 24			1 x 2 x AWG 24
Cable type J-Y (ST)	2 x 2 x ø 0.6 mm			1 x 2 x ø 0.6 mm

*S-UTP (screened unshielded twisted pair)

The device may only be supplied with SELV (Safety Extra Low Voltage) and LPS (Limited Power Source), according to IEC/UL/CSA 60950-1.

5.4.2 Data line RS-485

Only connect the terminals when the power is switched off.

The device is connected to the host control device via a two-wire party line connection (RS-485).

For information on permissible cable lengths and cable types, please see:

-
-

5.4.2.1 Cable

NOTICE

Local legal provisions (e.g., VDE) must be observed during installation of components.
For notes on structured cabling, see the standard EN 50173.

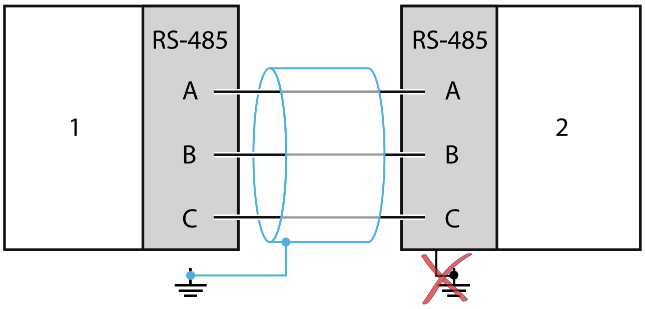
The cables recommended in the chapter have a foil screen and are designed based on S-UTP (screened unshielded twisted pair). The wire pairs are not individually shielded against each other (unshielded). Each pair comprises two color-coded wires that are twisted together (twisted pair).

NOTICE

It must be ensured that the screen is applied with the aid of the drain wire. The drain wire must be insulated to avoid short circuits on the circuit boards of the connected devices using a shrink-on tube or similar.

5.4.2.2 Connection RS-485

Lines A and B are arranged as a twisted wire pair.
Lines A and B must not be crossed.



1 Host control device 2 Kaba remote reader 91 25

Connecting shielding

1. On the host device connect the shielding of the RS-485 cable (blue) to the ground.
   Do not ground the Kaba remote reader 91 25.
2. Connect all shieldings pertaining to the RS-485 cables used (blue) to each other.

5.4.2.3 Using several remote readers

If several Kaba remote reader 91 25 are to be connected to a host control device, either **bus wiring** or **star wiring** can be used.

See:

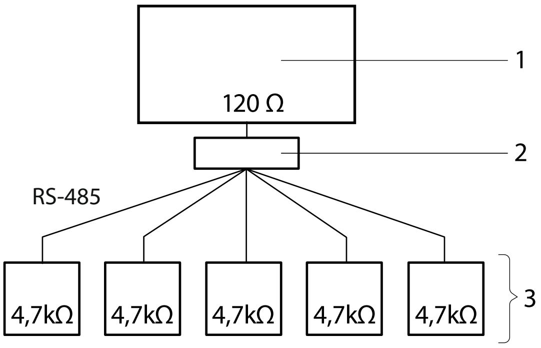
- Star wiring
- Bus wiring

5.4.2.4 Star wiring

Max. eight devices can be operated on a party line.

Power supply and data line in one cable: Maximum cable length per remote reader or stub: 20 m

Power supply and data line in separate cables: Maximum data line length per remote reader or stub: 100 m



1 Host control device (Kaba access manager)
2 Distributor (e.g. screw terminal)
3 Kaba remote reader 91 25

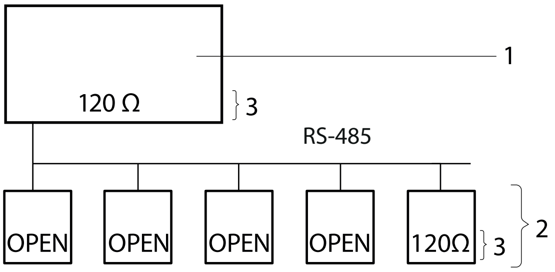
See also

Connection RS-485 [▸ 5.4.2.2]
Set RS-485 termination resistances
Set peripheral addresses [▸ 5.7.4]

5.4.2.5 Bus wiring

A maximum of eight devices can be operated on a party line.
Maximum total length of data lines (incl. stubs): 1200 m
A stub itself may be a maximum of 100 m in length.
The length of the party line can be increased using a repeater.

5.4.2.5.1 Bus wiring with 1 bus

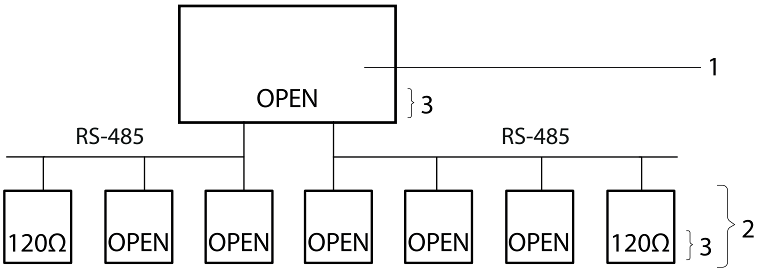


1 Host control device (Kaba access manager)
2 Kaba remote reader 91 25
3 Terminating resistors

See also

Connection RS-485 [▸ 5.4.2.2]
Set RS-485 termination resistances
Set peripheral addresses [▸ 5.7.4]

5.4.2.5.2 Bus wiring with two buses



1 Host control device (Kaba access manager)
2 Kaba remote reader 91 25
3 Terminating resistors

See also

Connection RS-485 [▸ 5.4.2.2]
Set RS-485 termination resistances
Set peripheral addresses [▸ 5.7.4]

5.4.3 Line to the door opener and door contacts

Line requirements: Cable diameters from 0.5 mm to 0.8 mm.

Recommended cable: CAT.5 S-UTP 4 x 2 AWG 24 or AWG 22 (according to EIA/TIA568) or higher.

5.4.4 Coaxial Cable to the Registration Units

Cable Type RG174/U	Coaxial cable 50 Ohm, item No. 161.250 Maximum cable lengths: Cable type RG174: up to 30 m Cable type RG178/U: up to 30 m (RU 90 02: up to 10 m)
Recommended cable length	< 10 m
Max. cable length	30 m

5.4.5 RS-232 Connection

Cable type CAT.5 S-UTP	2 x 2 x AWG 24
Cable type J-Y (ST)	2 x 2 x 0.6 mm
Max. cable length	15 m

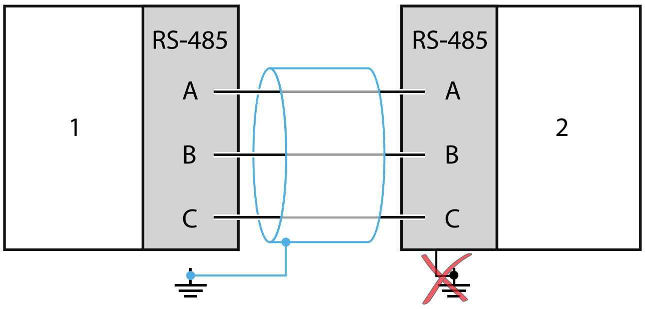
5.4.6 Grounding Concept

5.4.6.1 Power supply

The divice is in a plastic housing and is not grounded.
The power supply can be operated floating or grounded.

5.4.6.2 Communication lines

1. On the host control device connect the shielding of the RS-485 cable (blue) to the ground.
   Do not ground the Kaba remote reader 91 25.



1	Host control device	2	Kaba remote reader 91 25

1. Connect all shieldings pertaining to the RS-485 cables used (blue) to each other.

5.4.6.3 RS-232 Connection

The RS-232 connection lines are not electrically isolated.

Measures to reduce faults:

- Use shielded cables.
- Connect the shield to the 0 V line (ground) of the RS-232 connection.

5.4.6.4 Coaxial Cable Terminal

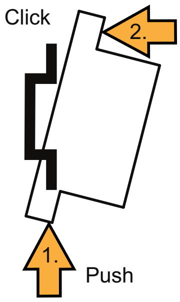
NOTICE

Inner conductor A+ and shield AS of the coaxial cable may be connected to the ground.

5.5 Mounting the device and extension modules

Mount the device on a 35 mm DIN rail (EN 50022).

1. Install the rail.
2. Screw grounding terminal to the rail.



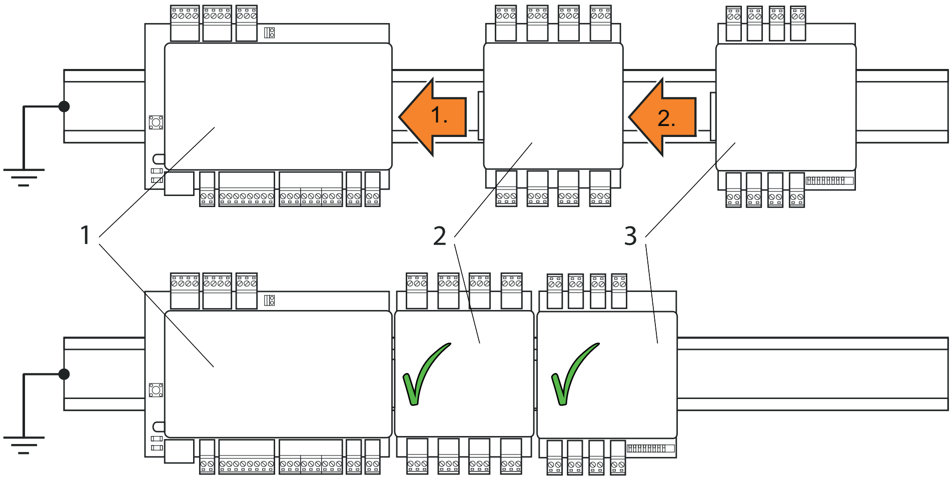
3. Hang the device on the bottom of the DIN rail – without tilting – and press it upwards and keep it pressed.
4. Press the device upwards against the rail at the same time until it can be hung on the rail.

Connecting extension modules

NOTICE

Attaching live extension modules may cause damage to the devices.

Always switch off the power supply before attaching the extension modules.



1 Kaba remote reader 91 25

2 Extension module 90 30

3 Extension module 90 31

1. Firstly, carefully insert all extension modules 90 30 into the device (1) or an extension module 90 30 (push the devices together on the rail).

   ⇨ All extension modules 90 30 are inserted.

2. Then insert extension modules 90 31.

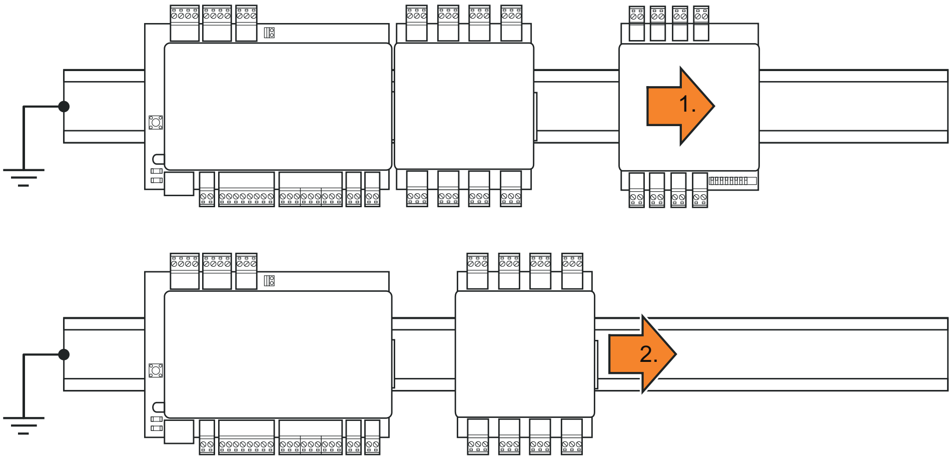
   ⇨ The extension module 90 31 which is closer to the device (1) is designated as **module 1**. The next module is designated as **module 2**.

Removing extension modules

NOTICE

Removing live extension modules may cause damage to the devices.

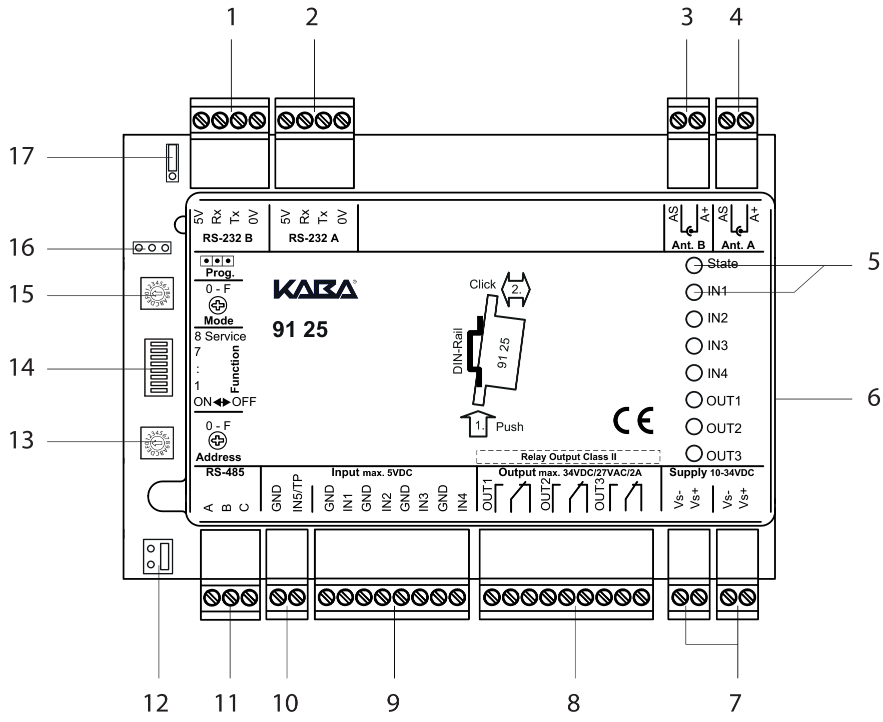
Always switch off the power supply before removing the extension modules.



1. Push the extension module away from the adjacent module until the contact is fully disconnected.
2. Remove the disconnected extension module from the rail.

5.6 Connections

Only connect the terminals when the power is switched off.



Item	Connection/switch	Remark
1	RS-232 interface B	Connection of peripherals
2	RS-232 interface A	
3	Antenna B	Registration unit B (antenna B)
4	Antenna A	Registration unit A (antenna A)
5	LED Displays	
6	Interface for Extension Modules	e.g. 90 30/90 31
7	Power supply 10–34 VDC	
8	Relay outputs OUT1–OUT3	
9	Inputs IN1–IN4	
10	Tamper switch	
11	RS-485 interfaces A, B and C	Connection to the host system
12	Bus termination RS-485	Jumper for adjustment of the termination resistance
13	Addressing RS-485, 1–8	Rotary switch for selecting the address
14	Function	DIP switch for selecting the function
15	Operating modes	'Mode' rotary switch for selecting the operating mode
16	Interface for Kaba programmer PD 1460	
17	Not used	

The functions and connections of the interfaces, inputs, relay outputs, rotary and DIP switches are described in the chapter Connecting.

5.6.1 Connections, General

Only connect the terminals when the power is switched off.

Connection Type	Connection Occupancy
Pluggable screw terminals	The occupancy of the connection terminals can be taken from the following tables

5.6.2 Power Supply

2 x 2 clamps are available for the power supply. These are connected in parallel.

Terminal	Meaning
Supply Vs+	10–34 VDC Current consumption max. 330 mA, without external wiring
Supply Vs-	0 VDC
Supply voltage for RS-232 and extension modules at 25°C	5 VDC, max. 1 A

The device may only be supplied with SELV (Safety Extra Low Voltage) and LPS (Limited Power Source), according to IEC/UL/CSA 60950-1.

5.6.3 RS-485 interface

The device communicates with the host system (access hub) via the RS-485 interface.

Terminal	Meaning
A	RS-485 wire A
B	RS-485 wire B
C	RS-485 wire C (Common)

Set RS-485 termination resistances
Set peripheral addresses [▸ 5.7.4]

5.6.4 'Ant. A' and 'Ant. B' Connections

The connections 'Ant. A' and 'Ant. B' are for the connection of the registration units to the device. Coaxial cables are used for the connection. LED and acoustic signal transmitter of the registration unit are controlled via the coaxial cable.

Terminal	Meaning
A+	Antenna cable inner conductor
AS	Antenna cable shield wire

5.6.5 RS-232 A and RS-232 B Interfaces

The required power supply is provided via the Kaba remote reader 91 25.

Terminal	Meaning
5 V	5 VDC
Rx	RXD (Receive/in)
Tx	TXD (Transmit/out)
0 V	0 V

Further information about the system-dependent functions:

- System documentation

5.6.6 Programming Interface

For connecting the Kaba programmer.

Usage:

- Firmware update, see Chapter Firmware Update/LEGIC OS Update

5.6.7 Interface for Extension Modules

For the connection of:

- Kaba extension module 90 30
- Kaba extension module 90 31

Number of Supported Extension Modules [▸ 3.5.1]

Also see about this

🗎 3.5.1 Number of Supported Extension Modules [▸ 18]

5.6.8 Inputs IN1 – IN4, tamper and input 5

NOTICE

Connecting Isolated Inputs.

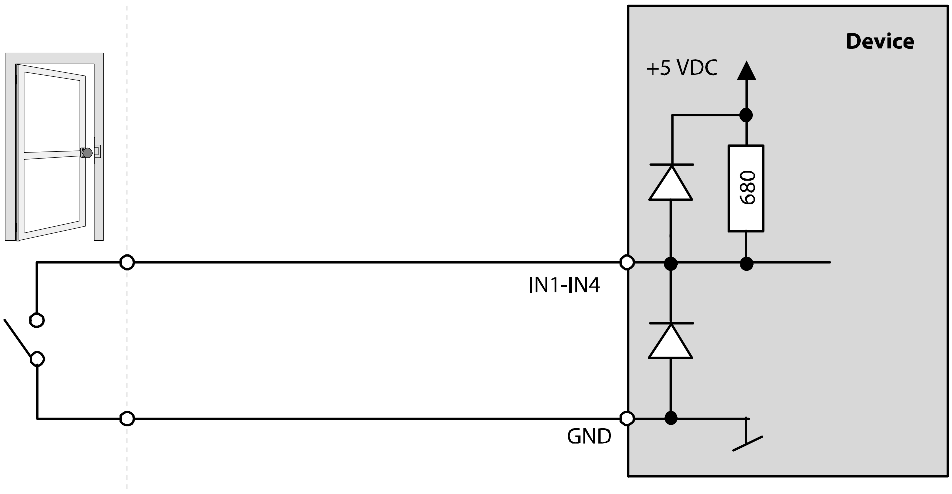
The logic (normally open/normally closed) of the inputs can be changed by the host system.

If the Kaba remote reader 91 25 needs to behave in the same way in both online and offline operation, the inputs and relay outputs must be connected according to the operating mode and configured with the DIP switches.

IN1 and IN4 can, when necessary, be used as line-monitored inputs.

5.6.8.1 Inputs IN1 – IN4 (Without Line Monitoring)

If no inputs with line monitoring are used, no additional resistors need to be connected.



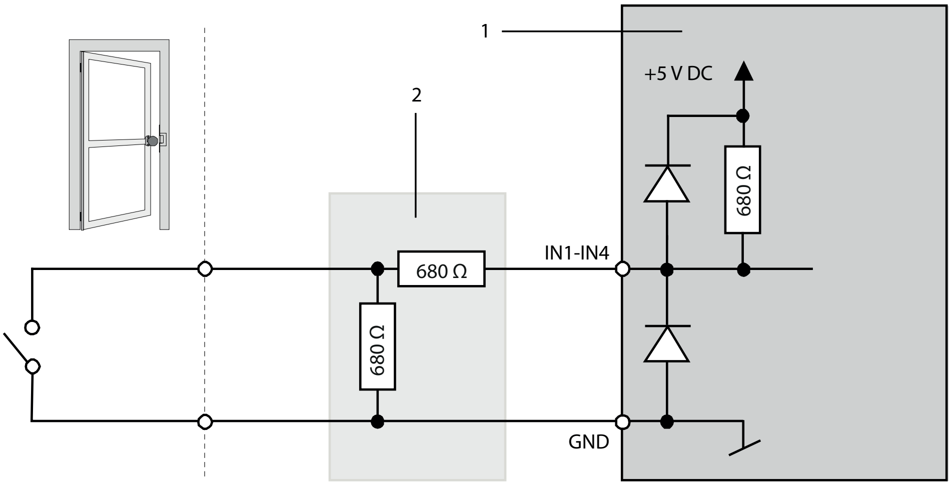
Internal wiring without line monitoring

5.6.8.2 Inputs IN1 – IN4 With Line Monitoring

Any tampering with the lines between the Kaba remote reader 91 25 and, for example, the door frame contact is detected.

1. **Activate/deactivate line monitoring:**
   Activate or deactivate line monitoring for each input on the host system.

2. **Inputs with line monitoring:**
   Attach resistors (R=680 Ω, ¼ W 2%), ensuring they are tamper-proof.



1 Kaba remote reader 91 25

2 Tamper-proof area

3. **Using inputs with and without line monitoring at the same time:**
   No resistors need to be connected to lines without line monitoring.

5.6.8.3 Input Tamper

The input tamper is connected as a line-monitored input. Its logical status is enabled open. If the Kaba remote reader 91 25 is offline and the tamper enabled, this event is entered in the logbook of the Kaba remote reader 91 25.

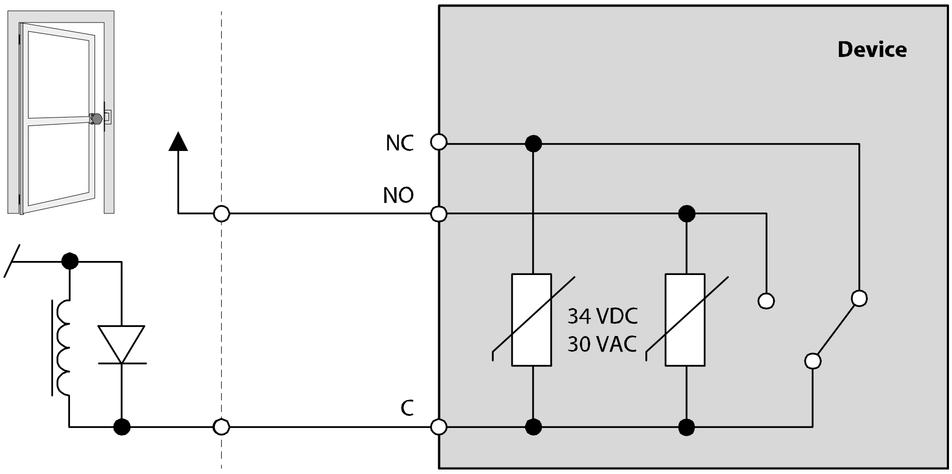
5.6.8.4 Input IN5 (only in the Kaba exos lock operating mode)

Input 5 is an internal input for the door handle contact of the Kaba exos lock. The signal is transferred via the coaxial cable and evaluated in the Kaba remote reader 91 25 as input 5.

5.6.9 Output OUT1 – OUT3

Usage e.g.:

- electric strike



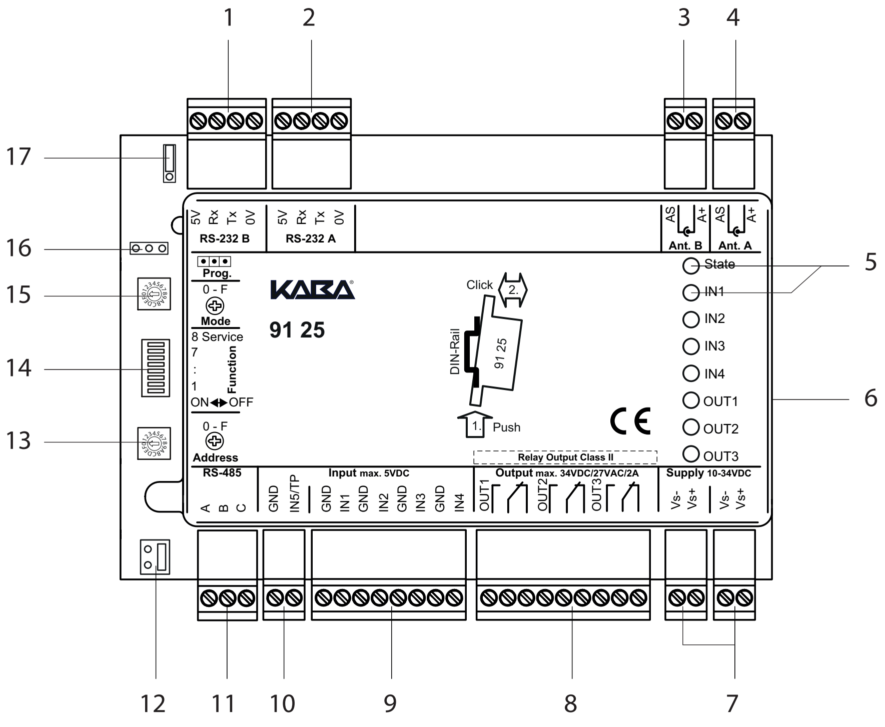
5.7 Configuring

5.7.1 Configuration process

1. Set address of the Kaba remote reader 91 25, see chapter
   Addressing.
   Note down the address. It is required for the configuration in the host system.
2. Set termination resistance on the RS-485 bus as per the bus topology, see chapter
   Bus termination RS-485
3. Set operating mode according to the door configuration, see chapter
   Set Operating Mode
4. Set extended functions for the selected operating mode, see chapter
   Extended functions of the operating modes [▸ 5.7.6.1]
5. Activate or deactivate monitoring of all inputs, see chapter
   Activate monitoring of all inputs (DIP switch 7)

5.7.2 Change Settings

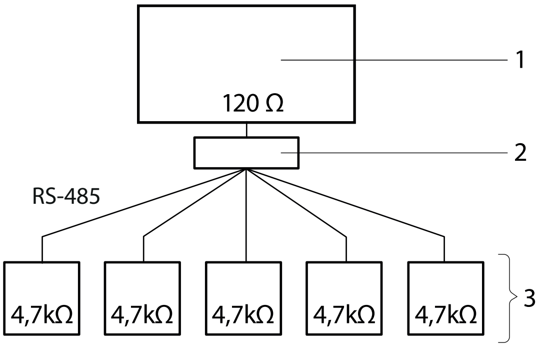
Jumper, DIP switch and rotary switch settings must only be made when the power is switched off.
Changes of jumper-, DIP switch- and rotary switch settings are only activated after turning on the power supply (cold start).



5.7.3 Set RS-485 termination resistances

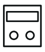
The connection architecture determines the terminating resistors.

Star wiring



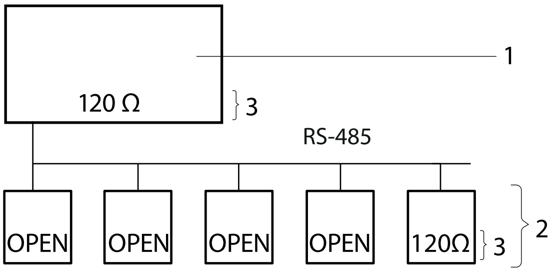
1	Host control device (Kaba access manager AM)
2	Distributor (e.g. screw terminal)
3	Terminating resistors Kaba remote reader 91 25

1. Set the terminating resistor to 4.7 kΩ on the Kaba remote reader 91 25 using the jumper (12).



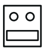
2. Set the terminating resistor to 120 Ω on the host control system (1).

Bus wiring with 1 bus

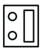


1	Host control device (Kaba access manager AM)
2	Kaba remote reader 91 25
3	Terminating resistors

1. Set the terminating resistor to 120 Ω on the last Kaba remote reader 91 25 of the bus wiring.

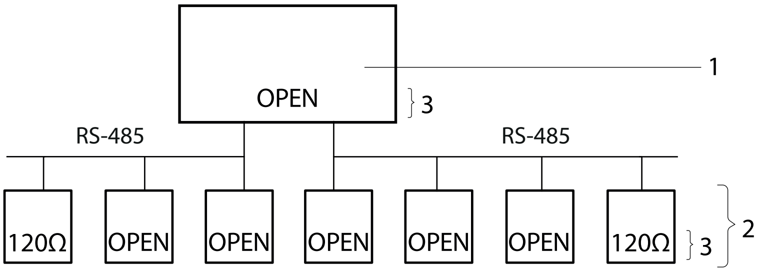


2. Set the terminating resistor to **open** on all other Kaba remote reader 91 25 of the bus wiring.



3. Set the terminating resistor to 120 Ω on the host control system.

Bus wiring with two buses



1	Host control device (Kaba access manager AM)
2	Kaba remote reader 91 25
3	Terminating resistors

1. Set the terminating resistor to 120 Ω on both terminal devices of the bus wiring.
2. Set the terminating resistor to **open** on all other Kaba remote reader 91 25 of the bus wiring.
3. Set the terminating resistor to **open** on the host control system.

5.7.4 Set peripheral addresses

Each device connected to an RS-485 bus must have a unique address.

1. Assign the Kaba remote reader 91 25 with rotary switch (13) a unique peripheral address.

Position	Peripheral address		Position	Peripheral address
0	Default, not used		5	5
1	1		6	6
2	2		7	7
3	3		8	8
4	4		9–F	Not used

5.7.5 Set Operating Mode

The door configuration determines the operating mode of the Kaba remote reader 91 25.
The operating mode is set with the rotary switch (15).

In order to define the offline behavior of the device, the "extended functions" must be set in addition to the operating mode. The Chapter [▸ 5.7.6.1] explains the extended functions.

Kaba remote reader 91 25	
Position **Rotary switch**	**Operating mode**
0	Electric strike
1	Motor bolt
2	Automatic door
3	Turnstile
4	Night lock
5	Kaba exos lock
6	Cylinder interface LI-EL
7	Motor bolt with panic function
8	Motor bolt type II with panic function (2 outputs)
9	Motor bolt type III with panic function (1 output)
A	Electric lock with panic function
B	Automatic door with night lock
C–E	Not used
F	Online operation

The chapter Operating modes [▸ 4.9] describes the operating modes.

5.7.6 Set functions

The following functions can be set with the DIP switches (14):

DIP switch Number		Function
1–6		Extended functions (according to operating modes)
7		Not used
8	ON	Service mode

5.7.6.1 Extended functions of the operating modes

The DIP switches 1–6 (14) are used to set the extended functions of the operating modes.

The chapter Operating modes describes the operating modes.

If the Kaba remote reader 91 25 needs to behave in the same way in both online and offline operation, the inputs and relay outputs must be connected according to the operating mode and configured with the DIP switches.

The parameterization of the access point must match the selected configuration in the host system. See also chapter Operating Types [▸ 4.8]

NOTICE

The DIP switches should only be put to ON if the relevant component is also connected to the device.

The following chapters describe the individual operating modes with their connections and configurations.

5.7.6.1.1 Operating Mode 0; Electric Strike

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Electric strike	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door opener key	DIP 3
-	IN4	Freely available (only on-line)	-

5.7.6.1.2 Operating Mode 1; Motor Bolt

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Motor bolt	-
	IN4	Deadbolt contact (locked)	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door opener key	DIP 3

5.7.6.1.3 Operating Mode 2; Automatic Doors

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
Door	OUT1	Enable pulse for automatic door	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6

Access point	Designation	Connection/function	DIP switch ON
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door opener key	DIP 3
-	IN4	Freely available	-

5.7.6.1.4 Operating Mode 3; Turnstile

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	OUT1	Direction-dependent enable pulse	-
Door	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	OUT3	Direction-dependent enable pulse	-
	IN1	Door opener key	DIP 3
-	IN4	Freely available	-

5.7.6.1.5 Operating Mode 4; Night Lock

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Electric strike	-
	OUT3	Motor bolt	-
	IN4	Deadbolt contact	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door opener key	DIP 3

5.7.6.1.6 Operating Mode 7; Motor Bolt with Panic Function

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Motor bolt	-
	IN4	Deadbolt contact (locked)	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door handle contact	DIP 3

5.7.6.1.7 Operating Mode 8; Motor bolt type II with panic function (2 outputs)

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Lock motor bolt	-
	OUT3	Unlock motor bolt	-
	IN4	Deadbolt contact (locked)	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door handle contact	DIP 3

5.7.6.1.8 Operating Mode 9; Motor bolt type III with panic function (1 output)

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Motor bolt	-
	IN4	Deadbolt contact (locked)	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door handle contact	DIP 3

5.7.6.1.9 Operating Mode A; Electric Lock with Panic Function

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Electric lock	-
	IN4	Deadbolt contact (locked)	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
	OUT3	Alarm buzzer	DIP 6
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door handle contact	DIP 3 off
	IN1	Door opener key	DIP 3 on

5.7.6.1.1 0 Operating Mode B; Automatic Door with Night Lock

Access point	Designation	Connection/function	DIP switch ON
Outside	Ant. A	Registration unit A	-
	RS-232 A	Optional	-
	Ant. A	Hold-open mode	DIP 2
Door	OUT1	Enable pulse for automatic door	-
	OUT3	Motor bolt	-
	IN4	Deadbolt contact	-
	OUT2	Authorized access	DIP 1
	IN2	Frame contact	DIP 4
	IN3	Blocking contact	DIP 5
Inside	Ant. B	Registration unit B	-
	RS-232 B	Optional	-
	IN1	Door opener key	DIP 3

5.7.6.2 Hold-open mode (DIP switch 2)

In hold-open mode, the door remains open upon an authorized access (identification) for as long as the badge remains within range of the antenna (field). The hold-open mode only works without PIN entry. Kaba exos lock and cylinder interface LI-EL are not supported.

- Hold-open mode applies for antenna A and antenna B

5.7.6.3 Activate the monitoring of inputs

Line monitoring can only be activated and deactivated by the host system.
The position of DIP switch 7 does not affect line monitoring.

5.7.6.4 Service mode (DIP switch 8)

Service mode is only used for service, e.g. for

- commissioning Hyper X
- Reset Kaba remote reader 91 25 to the basic status, see Chapter

DIP switch 8 activates service mode.

DIP switch position	**Meaning**
ON	Service mode activated
OFF	Service mode deactivated

If the device is in service mode, then the access point is blocked and no configuration data will be accepted.

6 Start-up

6.1 Putting into operation process

✓ The device is installed.
Installation process [▸ 5.1]

✓ The device is configured.
Configuring

1. Reset device to its basic state.
Factory Reset/Reset Device to the Basic Status
2. Connect the power supply to the Kaba remote reader 91 25, see chapter Power Supply [▸ 5.6.2]

   ⇨ LED **state** illuminates green – LED **state** flashes green as soon as the RS-485 interface is in the receive or send mode (online).
3. Put the device into operation in accordance with the following chapter.

6.2 "Standalone Access Control without Host System" Commissioning

(Construction site mode)

The Remote reader can already be used on a host system even before connection. This allows for the use of the remote reader, e.g., during the construction phase.

ℹ By connecting the remote reader to a host control device (host system), the functions of the remote reader described in this chapter are replaced by parameterization of the system.

Also see about this

🗎 1.4 Supplementary Documents [▸ 8]

6.2.1 Using LEGIC

If using "Standalone access control (without host system)", only the LEGIC stamp (segment search key) is checked. To authorize access, the user medium's stamp must match the stamp of the remote reader.

- If using "Standalone access control (without host system)" the remote reader can only be used with one stamp (segment search key).

Preparation

1. Use security card C1 (IAM) to define the stamp of master A (only LEGIC ISO 14443A) (see RM_LEGIC_advant_Media_Definition).

Putting into operation

1. Carry out factory reset on the remote reader, see Chapter
2. Present Master A (only LEGIC ISO 14443A) to the connected registration unit.

   ⇨ In the event of successful transfer of the stamp: 3x short beep

   ⇨ The stamp (segment search key) was transferred onto the remote reader.

   ⇨ The remote reader is now ready for bookings.

Functions

- Book
- Save the following events (max. 2000):
  - Door forced open

  - Doors opened using the button/door handle
  - Door open too long
- Not saved:
  - Access events
  - The time and date stamps are incorrect/invalid because the clock on the remote reader has not been set yet.

Book

1. Present a LEGIC user medium (LEGIC prime, ISO 14443A or ISO 15693) to the connected registration unit.

   ⇨ If the stamp (segment search key) of the remote reader matches a stamp of the user medium: Access authorized

Connection to the host control device (host system)

After connecting the remote reader to the host control device (host system), the saved events are sent to the control device. The time and date stamps are not correct/invalid because the clock of the remote reader had not yet been set (at the time the events were saved).

6.2.2 Using MIFARE

If using "Standalone access control (without host system)", only the site key/fabrication key is checked. During the check, the medium's fabrication key is not replaced. To authorize access, the user medium's site key must match one of the remote reader's site keys.

- A security card C, a master A, or a master B medium can contain up to eight site keys.
- On the medium, the site key's identification file must match the "default ARIOS configuration"; the application ID, file ID, and coding of the identification number must match. Media with changed application IDs or non-standard identification number coding will not be recognized.

Putting into operation

1. Carry out factory reset on the remote reader, see Chapter
2. Hold security card C, a master A or a master B medium in front of the connected registration unit.

   ⇨ In the event of successful transfer of the stamp: 3x short beep

   ⇨ A maximum of eight site keys are transferred onto the remote reader.

   ⇨ The remote reader is now ready for bookings.

Functions

- Book
- Save the following events (max. 2000):
  - Door forced open
  - Doors opened using the button/door handle
  - Door open too long
- Not saved:
  - Access events
  - The time and date stamps are incorrect/invalid because the clock on the remote reader has not been set yet.

Book

1. Present a MIFARE user medium (MIFARE DESFire or MIFARE Classic) to the connected registration unit.

   ⇨ If the user medium's site key matches one of the remote reader's site keys: Access authorized

Connection to the host control device (host system)

After connecting the remote reader to the host control device (host system), the saved events are sent to the control device. The time and date stamps are not correct/invalid because the clock of the remote reader had not yet been set (at the time the events were saved).

6.3 Functional Test (RS-232 A/B)

Requirements

- Remote reader is installed and connected, see Chapter Installing and Connecting
- Remote reader is configured, see Chapter Configuring
- Remote reader is parameterized, see Chapter Parameterizing
- Remote reader is connected to the power supply, see Chapter Connect Power Supply

Functions

If the requirements listed above are met, then the parent control unit informs the remote reader which units are connected to the RS-232 interface. The remote reader communicates with the connected units according to the settings. The remote reader stores the settings of the connected units. The Chapter Factory Reset/Reset Device to the Basic Status describes the deletion of this stored settings.

Commissioning Hyper X

- For the commissioning of a Hyper X, the distributor code must be scanned with a booking in service mode.

6.4 Issue Write/Read Authorization (Launch)

A write/read authorization is required in the following cases:

- If the Remote reader needs to write on a write-protected segment of a medium, e.g. in the case of CardLink applications, validate write-protected CardLink segments
- If the Remote reader needs to read a read-protected segment of a medium

In this chapter, the term "Write authorization" will be used for the terms "Write authorization" and "Read authorization".

Write authorization with a LEGIC prime SAM 63 card is only valid for LEGIC prime.

Write authorization with a LEGIC advant SAM 63 card is only valid for LEGIC prime and LEGIC advant 15693 and 14443A.

In this chapter, the designation "Security card C2" will be used for the card designations "SAM 63" and "Security card C2 (SC-C2)".

The signaling is carried via the registration unit on which the card is presented.

Requirement

- For the write authorization, a security card C2 with corresponding segment area is required.
- ISO standard 14443A must have been activated using security card C2.
- The ISO standard of the SAM 63 card must match the parameterized ISO standard.
- The device should be in regular operation and waiting for an RFID entry.

Procedure

1. Present the security card C2 to the connected registration unit without interruption (approx. 15 s).

   ⇨ The Registration unit illuminates green during the process.

   ⇨ Signaling after successful write authorization: 3x beeps
   If the Remote reader has previously been granted write authorization using the same security card C2, this will be signaled immediately by 3x beeps
   No indications are made on the exos lock or cylinder interface LI-EL following successful write authorization.

   ⇨ No signaling: Write authorization has **not** been granted.
   Possible reasons
   - The security card C2 was removed from the RFID field too early
   - ISO 14443A is not activated in the system
   - If SAM+ media are being used: No credit is available

2. Remove the security card C2 from the field.

6.5 Cancel Write/Read Authorization

The write/read authorization needs to be canceled in the following cases:

- If the Remote reader no longer needs to write on write-protected segments of a medium
- If the Remote reader no longer needs to read read-protected segments of a medium

In this chapter, the term "Write authorization" will be used for the terms "Write authorization" and "Read authorization".

In this chapter, the term "Writing right" will be used for the terms "Writing right" and "Reading right".

6.5.1 Cancel all writing rights granted by a write authorization

1. Reset remote reader to the basic status, see Chapter

6.5.2 Cancel a particular writing right granted by a write authorization:

Use the SAM 64 card to delete the relevant stamp.

The signaling is carried via the registration unit on which the card is presented.

Requirement

- In order to cancel the write authorization, a SAM 64 card with the relevant segment range is required.
- The device is in normal operation and waits for an RFID entry.

Procedure

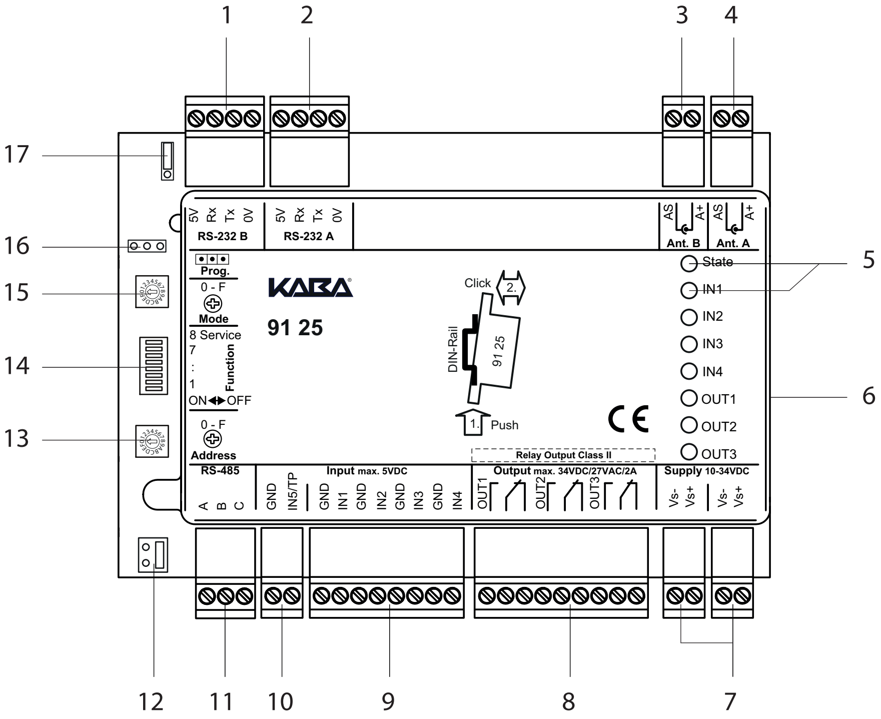
1. Present the SAM 64 card to the connected registration unit without interruption (approx. 15 s).
   - ⇨ The Registration unit illuminates green during the process.
   - ⇨ Signaling after successful cancellation of the write authorization:
     3x Beep

     If the write authorization has already previously been canceled with the same SAM 64 card, this will be signaled immediately with 3x beeps.
   - ⇨ No signaling: **un**successful cancellation of write authorization
     Possible reasons
     - The SAM 64 card was removed from the RFID field too early (no signaling)
     - ISO 14443A is not enabled in the system
     - If SAM+ media are used: there are no credits available
2. Remove the SAM 64 card from the field.

7 Servicing

7.1 Programming interface

A 3-pin connection (16) to connect to the Kaba programmer 1460 is located on the front of the Kaba remote reader 91 25. The connection (16) is used to update the firmware.



7.2 Restart

Consequences of the restart

- Duration approx. 3 seconds
- The access point is blocked during the restart.
- The saved parameter settings and data remain in place.
- The device is restarted.

1. Switch the power supply off and on again.

   ⇨ The LED **state** goes out.

   ⇨ The access point is blocked.

2. After the restart, the LED **state** changes back to green.

   ⇨ **Offline mode:** If the device is parameterized for offline mode, the access point is now ready for bookings.

   ⇨ **Online mode:** After the connection has been set up with the host control device, the remote reader is ready for operation in online mode.

Restarting resets the internal clock. After restarting, the clock will read 01/01/2010 00:00. Logbook entries will be saved with an incorrect date stamp as a result until the next online operation.

7.3 Service mode

Service mode is part ...

- of the factory reset
- of the firmware update

7.3.1 Enable service mode

Procedure

1. Disconnect device from the power supply

   ⇨ The access point is blocked while in service mode

2. If the write authorization has to be canceled: set 'Mode' rotary switch to 'F'
3. Set DIP switch 8 to 'ON' (in the event of uninterrupted power supply, a change in the status of the DIP switch has no effect)

   ⇨ Service mode is activated

7.3.2 Disable service mode

Procedure

1. Disconnect device from the power supply
2. Set DIP switch 8 to 'OFF'.

   ⇨ Service mode is deactivated

7.4 Factory Reset/Reset Device to the Basic Status

Consequences of the factory reset

- The device is returned to its basic state (factory settings).
- The parameter settings are deleted.
- If the Mode rotary switch is set to **F**, the write authorization (launch data) will be deleted.
- The stamps are deleted.
- The factory reset lasts approximately 3 seconds.
- The access point is blocked during the factory reset.

The factory reset is controlled by the following switches:

- DIP switch for selecting the function, see chapterDevice structure
- 'Mode' rotary switch for selecting the operating mode, see chapter Device structure

Procedure	**Signaling** **Remote reader**	**Signaling** **Registration unit**
1. Disconnect the device from the power supply.		
• The access point is blocked during the factory reset.		
2. If the write authorization is to be deleted (launch data): Set 'Mode' rotary switch to **F**		
3. Set DIP switch 8 to **ON**. (Switching the DIP switch when the power supply is connected has no effect).		
• Service mode is activated.		
4. Connect the device to the power supply.		
• Device is reset to the factory settings (for further effects, see above, consequences of the factory reset).	State: permanent orange IN1–IN4: permanent orange If 'Mode' rotary switch is set to 'F'*: OUT1–3: permanent red	2 x short beep, then red/green flashing
5. Wait until the IN LEDs flash orange.		
6. Disconnect the device from the power supply.		
7. Set DIP switch 8 to **OFF**.		
• Service mode is deactivated.		
8. Set the desired operating mode on the 'Mode' rotary switch.		
9. Connect device to the power supply.		

• The device is in operation again. • In the event of online connection: The host control device loads the current parameters on the remote reader. • The access point is ready for bookings.	State: permanent green or flashing green	permanent green

* The write authorization (launch data) is deleted.

7.5 Firmware Update/LEGIC OS Update

An update can be performed in the following ways:

- Using the access manager service tool via access manager (via Ethernet and the RS-485 interface)
- Using the Kaba EAC service tool and programmer 1460

NOTICE

Consequences of the firmware update:

- Device is reset to the factory settings(basic status)
- The parameterization is deleted
- The data is deleted
- The stamps are deleted

7.5.1 Firmware update/LEGIC OS update via access manager

The firmware/LEGIC OS is updated using the **access manager service tool** via access manager (via Ethernet and the RS-485 interface). The access manager reference manual describes the process.

7.5.2 Firmware Update / LEGIC OS Update with programmer 1460

The firmware update/LEGIC OS update lasts around 120 seconds.

Requirements

- The firmware has been transferred from the Kaba EAC service tool to the programmer 1460 (the LEGIC OS is integrated into the firmware).
- The user is familiar with the handling of the programmer and the Kaba EAC service tool.
- Kaba EAC service tool ≥ V 2.6.1 is installed.
- FTDI driver (using the operating system) for Kaba programmer 1460 is installed (FTDI CDM supports D2XX and VCP functionality) http://www.ftdichip.com/FTDrivers.htm
- Microsoft .Net Framework 4 Client Profile is installed http://www.microsoft.com/net/

Procedure	**Signaling** **Remote reader**	**Signaling** **Registration unit**
1. Disconnect the device from the power supply. (Switching DIP switch 8 when the power supply is connected has no effect.) • The access point is blocked during the firmware update.		
2. Turn DIP switch 8 to **ON**. • Service mode is activated.		
3. Connect the device to the power supply.		

	IN1–4 flash orange	2 x short beep, then alternate red/green flashing
	If the programmer is connected before switching on the power supply, then there is no flashing.	If the programmer is connected before switching on the power supply, then there is no flashing.
4. Connect the programmer to the device using the programming cable.		
	LED off or permanent orange	LED off

NOTICE

During the firmware update, the power supply and the connection to the programmer must not be interrupted.

5. On the programmer, select the firmware to be transferred and then **download**.		
After successful download:		
6. Disconnect the device from the power supply.	If the programmer is removed before the power supply is interrupted, then the LEDs flash according to the update mode.	If the programmer is removed before the power supply is interrupted, then the LEDs flash according to the update mode.
7. Set DIP switch 8 to **OFF**.		
• Service mode is deactivated.		
8. Disconnect the programmer from the device.		
9. Connect the device to the power supply.		
• The device is in operation again. • In the event of online connection: The host control device loads the current parameters on the remote reader. • The access point is ready for bookings.	State: permanent green or flashing green	permanent green

The settings of the rotary switch (operating modes, addressing) have no influence on the service mode.

7.6 Crossgrade

A crossgrade can be used to amend the functional type of a device. For example, a device with the functional type access manager (AM) can be turned into a device with the functional type AMC.

The process for changing the functional type is described in the user manual for Kaba programmer 1460, document no k1evo809.

7.6.1 Device with Bxxx firmware (MRD)

Remote reader type before crossgrade			**Remote reader type after crossgrade**	
	Functional type			**Functional type**
MRD (multi RFID device)	• AM • AMC	Crossgrade ⇨	MRD (multi RFID device)	• AMC • AM

Illustrative example

Only **B**xxx firmware (MRD) can be transferred to a device with **B**xxx firmware (MRD).
It is possible to change functional type.
It is possible to change between LEGIC and MIFARE.

8 Troubleshooting

8.1 LED Displays on the Remote Reader

LED designation	LED signaling	Meaning	Measures
State	red permanent	• Incorrect firmware • Remote reader defective	• Carry out firmware update • Replace remote reader
	flashes green and orange	After an interruption in communication, until the Kaba remote reader 91 25 is queried for the first time by the host system	
	orange permanent	Service mode	
IN1–IN4 (Assignments: IN5 to IN1 IN6 to IN2)	orange permanent	Short circuit	Check DIP switch 7 or lines/ resistances, see chapter 5.7.6.2
	red permanent	interruption	
OUT1–OUT3	flashes green	• Undervoltage (Vs) or • relay defective	• Check voltage (Vs) • Replace remote reader

8.2 During Installation

Error	Possible cause	Measures
Host system does not recognize the remote reader	Communication between remote reader and host system defective	Check communication using the LED state and adjust
	The address set on the remote reader does not match the address set in the system	Check address settings on the remote reader and in the host system
	Incorrect termination resistances	Adjust RS-485 termination resistances
	Interruption	Check/repair cable and connections

Error	Possible cause	Measures
Remote reader does not read correctly	Interruption	Check/repair connection of registration units
	Incorrect customer medium used	Check whether the correct customer medium was used when putting it into operation
	Medium does not match the definition in the system	Check whether the medium found and its definitions are parameterized correctly in the system
	Several devices which are connected to the RS485 bus have the same address	Give a unique address to each divice which is connected to the RS485 bus
	RF standard not parameterized in the host system	Adjust the configuration in the host system

8.3 During operation

Error	Possible cause	Measures
Host system does not recognize or only temporarily recognizes the remote reader	Facility changed by user	Adjust facility
	New sources of interference (e.g. new or replaced hubs, cash dispensers or other security systems)	Reduce influence of the sources of interference (enlarge distance, shielding)
	Cabling changed	Adjust cabling
	Configuration of the access point in the host system changed	Adjust configuration of the access point in the host system
	Several devices connected to the RS-485 bus have the same address	Assign a unique address to each device connected to the RS-485 bus
Remote reader does not read correctly	Facility changed by user	Adjust facility
	New sources of interference (e.g. new or replaced hubs, cash dispensers or other security systems)	Reduce influence of the sources of interference (enlarge distance, shielding)
	Cabling changed	Adjust cabling
	Incorrect handling of the medium	Inform user of correct use of the medium and the registration unit
		RF standard not set correctly
	Structure of the medium or its structure in the system not correct	Adjust structure of the medium or its structure in the system

Error	Possible cause	Measures
Time-related sequence of the access point control is incorrect	Configuration of the access point in the host system changed	Adjust DIP switch settings
	Memory of the remote reader deleted via factory reset and the data of the host system has not yet been written to the remote reader	Adjust times in the host system and transfer to the remote reader
		Check whether the data has been loaded from the control device onto the remote reader after a factory reset
		Check whether the desired times have been defined in the host system
	Cabling changed	Adjust cabling
Remote reader does not write on the media	Remote reader has no write authorization	Issue write authorization, see chapter 6.4
	CardLink settings in the host control device are incorrect	Adjust the configuration of the host control device

9 Packaging/Return

Incorrectly packaged assemblies and devices may cause expenses due to damage during transport.

Please observe the following information when sending Kaba products.

Kaba shall not be liable for damage to products which can be attributed to insufficient packaging.

9.1 Complete Devices

The original packaging is specially adapted for the device. It offers the greatest possible protection against transport damage.

Always use the original packaging for returns.

If this is not possible, then ensure the packaging prevents damage to the device.

- Use a stable, thick-walled transport crate or a box. The transport crate should be large enough that there is 8–10 cm space between the device and the container wall.
- Wrap the device in suitable film or put in a bag.
- Pad generously around the device e.g. using foam padding or bubble wrap. It must be ensured that the device does not move within the packaging.
- Only use dust-free environmentally-friendly filling material.

9.2 Electronic Assemblies

Electronic assemblies sensitive to ESD, such as circuit boards, readers, etc., must be stored, transported and sent in suitable ESD protective packaging. The packaging of electronic assemblies may only be carried out in ESD-protected workplaces by persons who are familiar with and follow the general ESD protective regulations.

The return of electronic assemblies in packaging with sufficient ESD protection is a condition for

- making guarantee claims in the event of malfunctions of any kind.
- replacement delivery of electronic circuit boards and components when an exchange is provided.

In order to guarantee a high quality standard, electronic components supplied in packaging without sufficient ESD protection will be neither analyzed nor repaired, but instead disposed of directly.

9.3 Marking

Complete return papers and correct labeling allow us to process matters quickly. Please ensure that a delivery note is included with the package. The delivery note should include the following information:

- Number of devices or components per package.
- Item numbers, serial numbers, designations.
- Address of your company/contact.
- Reason for the return, e.g. repair exchange.
- Informative description of the fault.

In the event of returns from outside of the EU, a customs invoice with the real customs value will also be required. In some countries (e.g. Switzerland) a preference will be required.

10 Disposal

This chapter provides important information on disposal.

10.1 Decommissioning

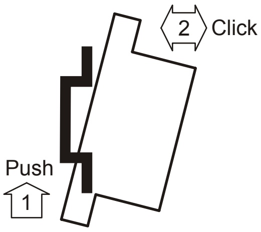
The following steps should be executed for the decommissioning of the device in an access control system:

1. For online operation: Check configuration of the host system
2. Disconnect the device from the power supply
3. Disconnect RS-485 connection from the host system

10.2 Dismantling

✓ The device has been decommissioned.

1. If available, unplug extension modules
2. Disconnect relay outputs from the device
3. Disconnect inputs from the device
4. Disconnect RS-232 interface and/or keypads, biometrics or system-dependent functions from the device
5. Disconnect registration units from the device
6. Remove device from the rail



10.3 Disposal

This product meets the requirements of the WEEE Directive and, in accordance with DIN standard EN 50419, is labeled with the WEEE crossed-out garbage can symbol.

The symbol indicates the separate disposal of electric and electronic equipment in EU countries.

Do not dispose of the device with household waste under any circumstances.

Used devices contain valuable recyclable materials that should be recycled. Used devices should therefore be disposed of via the collection system used in your country.

Disposal in Germany:
After use, Kaba GmbH undertakes to carry out the proper disposal of the supplied goods in line with legal requirements (such as the ElektroG law in Germany). All costs incurred for the transport of goods to the manufacturer's plant will be borne by the owner of the used electronic equipment.

Disposal in Switzerland:
Send the device to an electronic equipment collection facility as per the VREG regulation.

In the EU, electrical devices should be disposed of in accordance with national waste disposal and environmental directives.

The erasure of personal data before disposal must be carried out self-dependent.

♻ **Dispose of packaging in an environmentally-friendly manner.**

The packaging materials are recyclable. Please do not put the packaging in with household waste, instead dispose of with waste for recycling.

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