



**ekey net**

en **SPECIFICATIONS**

**ekey net 4.4**

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# 1 Information about these specifications

## 1.1 Note

Read these specifications carefully before use. These specifications form a component of the product. Ensure that they are stored in a safe place. These specifications contain important information on the product; in particular, its proper use, safety, installation, activation, usage, maintenance, and disposal.

Please contact your dealer for further information about the product.

A large-font version of these specifications is available at <http://www.ekey.net>.

These operating instructions are not subject to updating. We reserve the right to make technical modifications and change the product's appearance; any liability for errors and misprints is excluded.

## 1.2 Declaration of conformity

ekey biometric systems GmbH hereby declares that the product conforms to the relevant European Union regulations. The declarations of conformity for the individual products can be downloaded from <http://www.ekey.net>.

## 1.3 Warranty and manufacturer's guarantee

The version of our general terms and conditions in force on the date of purchase shall apply. See <http://www.ekey.net>.

## 1.4 Copyright

Copyright © 2016 ekey biometric systems GmbH.




All content, artwork, and any ideas contained in these specifications are subject to applicable copyright laws. Any transmission, relinquishment, or transfer of this content or parts thereof to any third party requires the prior written consent of ekey biometric systems GmbH. Translation of the original documentation.

## 1.5 Target group

These specifications are aimed at persons who activate and perform maintenance on the *ekey net* system, create users, and instruct users in how to operate the system.

## 1.6 Explanation of symbols, abbreviations, and terminology

### 1.6.1 Symbols

|   |  |
|---|--|
|  | References to sections of these specifications |
|  | References to the mounting instructions        |
|  | References to the wiring diagram               |
| □   | Listing without specified order, 1st level     |
| <i>ekey net FS OM</i>   | Product names                                  |

### 1.6.2 Abbreviations and terminology

|                   |  |
|-------------------|--|
| CP                | Control panel  |
| CV LAN            | LAN converter  |
| FS                | Finger scanner   |
| HTTP              | Hypertext transfer protocol  |
| IPC               | Interprocess Communication   |
| MSMQ              | Microsoft Message Queuing  |
| RU                | Registration unit  |
| UDP               | User Datagram Protocol   |
| VM                | Virtual machine  |
| Registration unit | Covers all <i>ekey net</i> finger scanners, the <i>ekey net station</i> , the <i>ekey net keypad</i> , and <i>ekey</i> RFID readers.   |
| RS-485 bus        | 2-core cable serial bus line for transmitting data between registration units, control panels and an <i>ekey net CV LAN</i> .  |
| Type 1 hypervisor | A native or bare metal type 1 hypervisor is built directly to the hardware and does not required any advance operating system installation. The type 1 hypervisor must support the host system's hardware with corresponding drivers.  |
| Type 2 hypervisor | A hosted type 2 hypervisor is built on a fully fledged operating system, the host system. It uses the device driver's operating system to access the host system's hardware. Type 2 hypervisors can therefore run on all host systems on which the host operating systems supported by hypervisor can be operated. |

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## 2 Safety information

### 2.1 Proper use and areas of application

This product is a network access control system with a biometric or mental identification feature (finger scan or pin code). The system is comprised of hardware and software components. It is available in various hardware models and component combinations.

The biometric version of the system detects the characteristics (minutiae) of the fingerprint contours, compares them to the biometric information saved from the reference fingerprint, and opens the door in the event of a match. One variant allows the user to be identified and the door opened by means of an RFID transponder.

The mental version of the system detects the pin codes which are entered, compares them to the stored reference pin codes, and opens the door in the event of a match.

The system is primarily designed for opening internal and external doors and garage doors on business premises.

To ensure proper use, the ekey system must be installed in accordance with the mounting instructions and the wiring diagram. The installation must be performed in full and by a professional. The electrical engineer who installs the equipment must approve the ekey system for use, as well as any accessories that are installed.

The ekey system is suitable for use as outlined in these specifications. Any other kind of use is deemed improper use.

### 2.2 Product liability and limitation of liability

Safe operation and function of the devices can be impaired in the following situations. Liability due to malfunctioning is transferred to the operator/user in such cases:

- The system devices are not installed, used, maintained, or cleaned in accordance with the specifications
- The system devices are not used within the scope of proper use
- Unauthorized modifications are carried out on the system devices by the operator.

These specifications are not subject to updating. We reserve the right to make technical modifications and change the product's appearance; any liability for errors and misprints is excluded.

### 2.3 Classification of notices



#### DANGER

**Safety notice:** Denotes imminent danger which could lead to death or serious injuries.

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#### ATTENTION

**Notice:** Denotes possible property damage which cannot result in injuries.

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#### NOTICE

**Notice:** Denotes additional information and useful tips.

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## 2.4 Notices



### DANGER

**Risk of electrocution:** All *ekey net* devices are to be operated with Safety Extra Low Voltage (SELV). Only use power supplies rated protection class 2 according to VDE 0140-1. Failure to do so will create a risk of fatal electrocution. Only certified electricians are authorized to carry out the electrical installation work!

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### ATTENTION

**Tamper-proofing:** Do not mount the control panel outdoors. If it is mounted outdoors, it could be tampered with. Mount the control panel in a secure internal area.

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## 3 System architecture

### 3.1 General

An *ekey net* system consists of an *ekey net master server* and at least one *ekey net terminal server*. A maximum of 10 *ekey net terminal servers* are permitted. An *ekey net terminal server* usually represents one location.

The *ekey net master server* manages a database. The *ekey net admin* application enables you to edit the database.

The *ekey net master server* must be able to access all computers involved in administration, and all *ekey net terminal servers* in the network. Routing must take place in both directions. The computer names must be mutually resolvable via DNS and NetBIOS.

Each *ekey net terminal server* can have up to a maximum of 20 *ekey net CV LANs* assigned to it. Each *ekey net terminal server* must be able to access its assigned *ekey net CV LANs* in the network. Routing must take place in both directions.

Each *ekey net CV LAN* can have a maximum of eight devices assigned to it on the RS-485 bus: a maximum of 4 registration units, each with a corresponding control panel. The entire *ekey net* system must contain no more than 80 registration units.

### HINWEIS

***ekey net keypad:*** Each *ekey net CV LAN* can have a maximum of one *ekey net keypad* assigned to it on the RS-485 bus. This limitation only applies to the number of code pads on the RS-485 bus; it is possible to have one code pad and three additional registration units with finger scanner matching assigned to a single *ekey net CV LAN*.

It is possible to assign one code pad and one registration unit with server matching to a single *ekey net CV LAN*.

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Each *ekey net CV LAN* can have a maximum of one *ekey net CV WIEG RS-485* assigned to it on the RS-485 bus.

## 3.2 Components

### 3.2.1 Server components

| Windows service                  | Description   |
|----------------------------------|---|
| <b>ekey communication server</b> | It controls communication in both directions between <i>ekey net CV LAN</i> and <i>ekey net terminal server</i> , <i>ConfigConverter</i> and <i>ModuleUpdate</i> . Communication with the <i>ekey net CV LAN</i> is performed via UDP and communication with the other components via MSMQ. |
| <b>ekey net master server</b>    | Central database server. It administers all <i>ekey net terminal servers</i> . It is administered with <i>ekey net admin</i> . There is only one <i>ekey net master server</i> per system.  |
| <b>ekey net terminal server</b>  | It administers the <i>ekey net CV LAN</i> buses.  |
| <b>ekey service guard</b>        | It monitors the services <i>ekey communication server</i> , <i>ekey net master server</i> , and <i>ekey net terminal server</i> .   |

### 3.2.2 Administration and utility components

| Component                               | Description  |
|---|--|
| <b>ConfigConverter.exe</b>              | Configuration and firmware update for <i>ekey net CV LAN</i>               |
| <b>EkeyInfo.exe</b>                     | Utility program for diagnostics and info                                   |
| <b>ekeynetadmin.exe</b>                 | Administration of <i>ekey net</i>  |
| <b>ekeynetcursorfill.exe</b>            | Utility program  |
| <b>ekeynetinstallterminalserver.exe</b> | Utility program for setting up the <i>ekey net terminal server</i> service |
| <b>ekeyNetRestore.exe</b>               | Utility program for restoring the <i>ekey net</i> database                 |
| <b>ModuleUpdate.exe</b>                 | Utility program for updating the firmware of the <i>ekey net</i> devices   |

### 3.2.3 Component communication

| Component                        | Communication partner  | Protocol |
|----------------------------------|--|----------|
| <b>ekey net master server</b>    | <i>ekey net terminal server</i>  | MSMQ     |
|                                  | <i>ekey net admin</i>  | MSMQ     |
|                                  | External app via <i>ekey net sdk</i>   | IPC      |
| <b>ekey net terminal server</b>  | <i>ekey net master server</i>  | MSMQ     |
|                                  | Browser  | http     |
|                                  | <i>ekey communication server</i>   | MSMQ     |
| <b>ekey communication server</b> | <i>ekey net terminal server</i>  | MSMQ     |
|                                  | ConfigConverter  | MSMQ     |
|                                  | ModuleUpdate   | MSMQ     |
|                                  | <i>ekey net CV LAN</i>   | UDP      |
| <b>ekey net CV LAN</b>           | Devices on the RS-485 bus (registration units, control panels, <i>ekey net CV WIEG</i> ) | RS-485   |
|                                  | <i>ekey communication server</i>   | UDP      |
| <b>ekey net admin</b>            | <i>ekey net master server</i>  | MSMQ     |
| <b>ConfigConverter</b>           | <i>ekey communication server</i>   | MSMQ     |
| <b>ModuleUpdate</b>              | <i>ekey communication server</i>   | MSMQ     |

### 3.3 License variants

*ekey net* is available in two different license variants, which define the scope of services offered by the *ekey net* system. The license variant selected applies to the entire *ekey net* system. You cannot, for example, add an *ekey net light* license key to an *ekey net business* system.

| License variant          | Description  |
|--------------------------|--|
| <b>ekey net light</b>    | For private users or small installations with a restricted functional scope. |
| <b>ekey net business</b> | Unrestricted full version.   |



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For details of the differences between the license variants, see “Functional limits”, page 11.

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#### NOTICE

**Licensing from *ekey net 4.0*:** Licensing was first introduced with *ekey net 4.0*. If an older version of *ekey net* or *ekey TOCAnet* is updated to *ekey net 4.x*, it is automatically run as *ekey net business*.

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#### NOTICE

**License upgrade:** A license can only be upgraded from *ekey net light* to *ekey net business*. A license cannot be upgraded from *ekey net business* to *ekey net light*.

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## 4 System requirements

### 4.1 General minimum requirements

| Requirement                       | Details  | Dependency                                      |
|-----------------------------------|--|---|
| <b>TCP/IP</b>                     | All computers involved in the <i>ekey net</i> system must be equipped with TCP/IP v4-capable network interface cards. TCP/IP v4 must be activated. <i>ekey net</i> does not support TCP/IP v6. | Network communication                           |
| <b>Name resolution (DNS)</b>      | It must be possible to mutually resolve the names (NetBIOS and DNS name) of all computers used in the <i>ekey net</i> system via DNS.  | MSMQ, DNS                                       |
| <b>Routing</b>                    | It must be possible to access all computers involved in the <i>ekey net</i> system in both directions via TCP and UDP.   | MSMQ, UDP, HTTP                                 |
| <b>Local time on the computer</b> | All computers involved in the <i>ekey net</i> system must run with the same system time. Deviations of greater than or equal to 3 s between the computers are not tolerated.                   | <i>ekey net</i> services, <i>ekey net admin</i> |

### 4.2 Minimum computer requirements

- x86 or x64 dual core processor with at least 1.5 GHz
- 2 GB RAM
- Hard disk or SSD with at least 10 GB memory space available
- Ethernet port with at least 100 Mbit/s

### 4.3 Supported operating systems

| Operating system                       | Minimum Service Pack Level |
|--|----------------------------|
| Windows 7 x86                          | SP1                        |
| Windows 7 x64                          | SP1                        |
| Windows 8.1 x64                        |                            |
| Windows 10 (Home, Pro, Enterprise) x64 | Version ≥ 1803             |

| Operating system       | Minimum Service Pack Level |
|------------------------|----------------------------|
| Windows Server 2008 R2 | SP1                        |
| Windows Server 2012    |                            |
| Windows Server 2012 R2 |                            |
| Windows Server 2016    |                            |
| Windows Server 2019    |                            |

## 4.4 Requirements for operation in virtual machines



### NOTICE

**Virtual machines:** Solutions for virtualization, such as VMware and Microsoft, are not checked by ekey. ekey does not offer any support if *ekey net* is operated in these environments.

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Please note the following:

- The system must meet the requirements for *ekey net*.
- For virtualization, ekey recommends products with a bare metal type 1 hypervisor, e.g., Microsoft Hyper-V, VMware ESX/ESXi or Xen. Products with a type 2 hypervisor should not be used. E.g.,: Oracle VM VirtualBox, Windows Virtual PC, VMware Workstation, or Parallels Desktop for Mac.
- The guest operating system must not be integrated via NAT network interface, NAT network, internal network, or host-only network.
- A dual core CPU with 2.0 GHz, 4 GB RAM, and 100 Mbit network is required as a minimum.
- Network communication between the computers (physical computer or VM) must run smoothly in both directions. The MSMQ service must be able to communicate across computers. The DNS and NetBIOS names must be able to be resolved.
- The VM should serve the *ekey net* service exclusively. ekey does not recommend running additional resource-intensive applications on the VM. Communication with the *ekey net converter LAN* may not be able to run smoothly if the VM has too few resources. The *ekey net* system would be unstable: Devices and servers would go offline/online on a regular basis.

## 4.5 Incompatible software

From version 4.4., the *ekey net* system uses a different access layer for the USB finger scanner. This new access layer is no longer compatible with the old one. The two products *ekey bit* and *ekey sensor drivers* are mutually exclusive. You cannot operate products that rely on *ekey bit* on a computer that is installed with *ekey net 4.4*.



### NOTICE

**Compatibility of *ekey net* from version 4.4:** From version 4.4, *ekey net* is no longer compatible with the following products:

- *ekey bit*
- *ekey logon*

These products must be uninstalled from the computer in order to operate *ekey net* from version 4.4.

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## 4.6 Supported devices on the RS-485 bus

A version-dependent list of supported devices can be found in the document "Version compatibility for ekey net devices" at <http://www.ekey.net>.

## 5 Functional limits

| Function   | <i>ekey net business</i> | <i>ekey net light</i> |
|--|--------------------------|-----------------------|
| Maximum number of time zones   | UNLIMITED                | 3                     |
| Maximum number of user groups  | UNLIMITED                | 1                     |
| Maximum number of terminal groups  | UNLIMITED                | 1                     |
| Maximum number of <i>ekey net CV LANs</i> connected to the <i>ekey net terminal server</i> via VPN | 10                       | 10                    |
| Maximum number of <i>ekey net terminal servers</i>   | 10                       | 10                    |
| Maximum number of <i>ekey net CV LANs</i> per <i>ekey net terminal server</i>                      | 20                       | 20                    |
| Mixed operation of Atmel finger scanner and Authentec finger scanner on an <i>ekey net CV LAN</i>  | Not permitted            | Not permitted         |
| Maximum number of devices per <i>ekey net CV LAN</i>   | 8                        | 8                     |
| Maximum number of control panels and registration units per <i>ekey net CV LAN</i>                 | 4 + 4                    | 4 + 4                 |
| Maximum number of finger scanners with finger scanner matching per <i>ekey net CV LAN</i>          | 4                        | 4                     |
| Maximum number of finger scanners with server matching per <i>ekey net CV LAN</i>                  | 1                        | 1                     |
| Maximum number of registration units in the system   | 80                       | 80                    |
| Maximum number of users in the system  | 4,000                    | 4,000                 |
| Access   | YES                      | YES                   |
| Maximum number of entries per time zone (this value may vary depending on the type of entries)     | 31                       | 31                    |
| Attendance list  | YES                      | NO                    |
| Calendar   | UNLIMITED                | 1                     |
| Easy Mode  | YES                      | YES                   |
| Concierge mode   | YES                      | NO                    |
| RFID   | YES                      | YES                   |
| RFID MIFARE DESfire EV1 (Only if exclusively RFID finger scanners are operated with EV1)           | YES                      | YES                   |
| WIEGAND  | YES                      | NO                    |
| Initial settings can be changed  | YES                      | NO (pre-defined)      |

| <b>Function</b>  | <b><i>ekey net business</i></b> | <b><i>ekey net light</i></b> |
|--|---------------------------------|------------------------------|
| <b>Customized device templates</b>                                   | YES                             | NO                           |
| <b>CSV logging</b>   | YES                             | Positive only                |
| <b>Reporting</b>   | YES                             | NO                           |
| <b>ODBC logging</b>  | YES                             | NO                           |
| <b>HTML logging</b>  | YES                             | NO                           |
| <b>UDP logging</b>   | YES                             | YES                          |
| <b>Time control</b>  | YES                             | NO                           |
| <b>Time-controlled anti-pass back</b>                                | YES                             | YES                          |
| <b>Maximum number of relays that can be switched with one finger</b> | 2                               | 2                            |
| <b>Opening via web interface with one-time PIN</b>                   | YES                             | YES                          |
| <b>Offline capability</b>  | Restricted                      | Restricted                   |
| <b>Day switching with or without first entry</b>                     | YES                             | YES                          |
| <b>Zone switching</b>  | YES                             | YES                          |

#### **Details on offline capability**

The *ekey net* system is not designed for permanent operation in offline mode. Offline mode is used solely to bridge failures in server components (*ekey net master server*, *ekey net terminal server*, and *ekey communication server*).

## 6 Hardware installation



### ATTENTION

**Property damage in the event of incorrect mounting and wiring:** The system devices are operated using electricity.

They could be destroyed if they are mounted and wired incorrectly.

Mount and wire the system devices correctly before connecting the power.



Mount the system in accordance with the supplied mounting instructions.



Wire the system in accordance with the supplied wiring diagram.

### 6.1 Wiring of the devices on the RS-485 bus

The RS-485 wiring must meet the following criteria:

- The devices must be connected in series
- The bus contains a maximum of 8 devices
- The total wire length is no longer than 500 m
- The spurs must not exceed 5 m
- Only the final device on the RS-485 bus must be terminated. No other device may be terminated. All registration units, control panels and the *ekey net CV WIEG* are classed as devices.

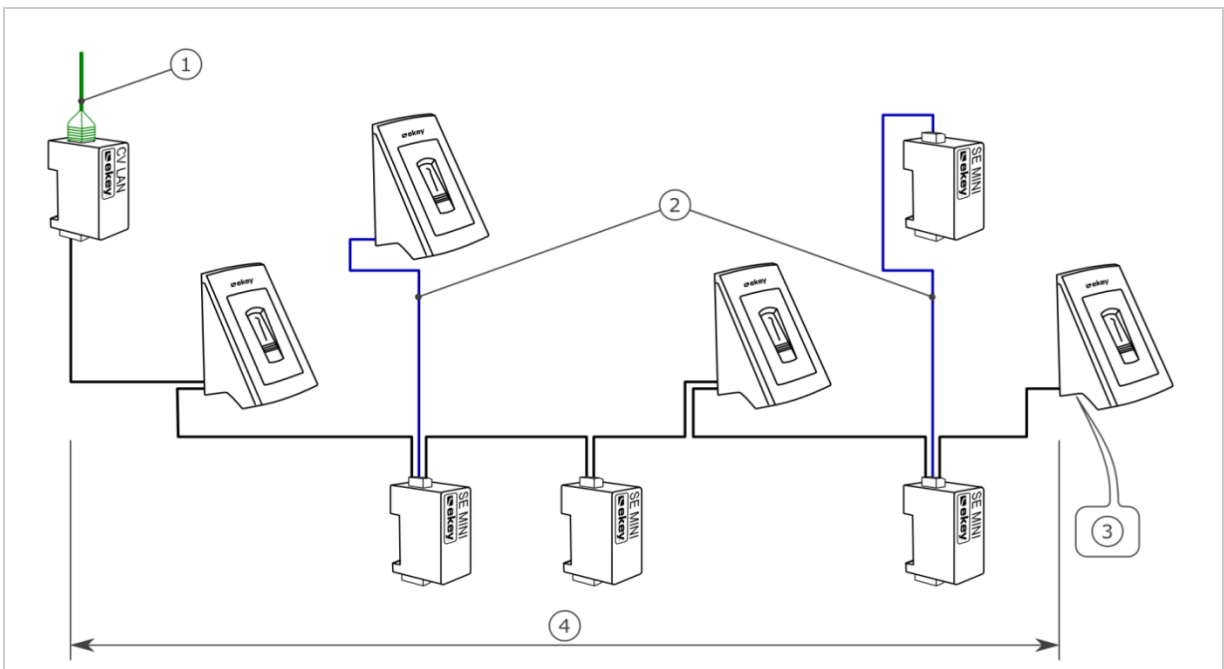


Fig. 1: Example of RS-485 wiring

1 RJ-45 network connection

2 Spurs (max. 5 m)

3 Active termination on the final device on the bus

4 Maximum cable length: 500 m



## ATTENTION

**Star-type wiring:** Star-type wiring prevents the devices from communicating reliably with one another.

The devices will not respond as expected.

Connect the devices in series with a maximum spur length of 5 m.

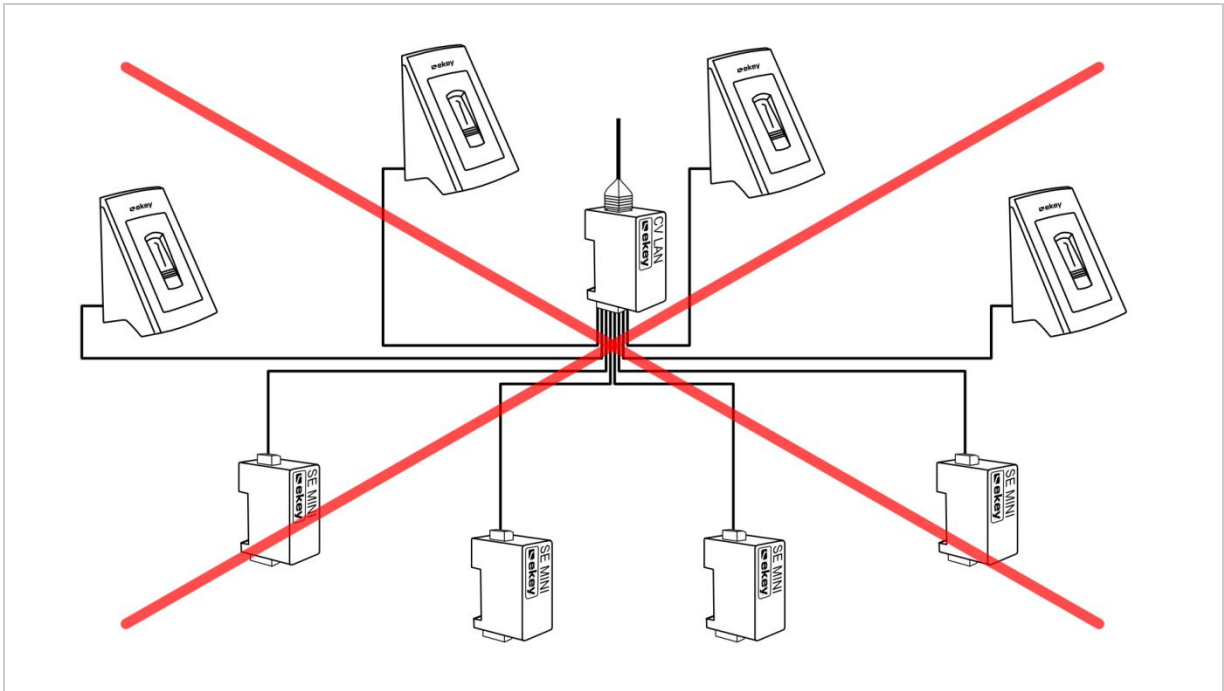


Fig. 2: Unauthorized star-type wiring for RS-485

## 7 Hardware maintenance

The system is largely maintenance-free.

The sensor surface of the finger scanner is essentially self-cleaning due to repeated use (swiping of fingers). However, if the finger scanner becomes soiled, clean it with a damp (not wet), non-abrasive cloth. Q-tips, microfiber cloths, and glasses-cleaning cloths are suitable for this purpose. Cotton-containing materials, paper towels, tissues, kitchen sponges, damp dish towels, and kitchen roll are not suitable. Use clean water without adding detergent.

For safety, clean fingerprints and dirt off the code pad from time to time using a damp (not wet), non-abrasive cloth. Use clean water without adding detergent.

## 8 Disposal



Pursuant to Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment, electrical and electronic equipment supplied after August 13, 2005 is to be recycled. It must not be disposed of with household waste. As disposal regulations within the EU can differ from country to country, please contact your dealer for further information as necessary.

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