Honeywell

Installation Instructions

ACS-8
Item no. 026575, 026580, 026585

	P32501-02-0G0-16 2017-07-20	VdS Z 105009	**Software-Version** **ZACS8.00.0V0.11.xx**	Subject to change without notice

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VdS Approval

VdS Z 105009, class C

Contents

Appendix

1. Safety instructions

Danger for device or user if ignoring the following safety instructions!

* Please read this manual carefully and completely before working with the ACS-8.

* Only use the ACS-8
  - for the purpose it is designed for
  - when there is no obvious damage to the unit
  - when it is installed as per the manufacturers recommendations
  - referring to the technical data supplied

* The manufacturer cannot be held liable for damage resulting from use contrary to the designated purpose.
* Store the documents accompanying the product and product-specific notes in a safe place.

* Mounting, programming, maintenance and repair work must be carried out only by authorized and trained personnel.

* Soldering and connecting work on any part of the system may only be carried out when the system is isolated from the power supply.

* Soldering work must only be performed with a temperature regulated soldering iron galvanically separated from the power supply.

* The VDE safety regulations and the prescriptions of the local electricity supplier must be observed.

* **Danger:** The ACS-8 must not be used in any environment where there is a risk of explosion or in areas with caustic or solvent atmospheres

1.1 Installation and expansion

Warning: Switch off the supply voltage before opening the device.

The VDE regulations and those of the electricity supplier must be observed during installation. Ensure that connections between the control unit and the external devices are in accordance with the connection diagrams.

An isolating circuit breaker must be integral to the supply of the building.

Use only shielded cables (see chapter 5 (Important installation instructions) and chapter 6 (ACS-8/cables)).

When using a DC door strike, ensure correct polarity at all times. Only use DC door strikes equipped with a protective diode.

1.2 Symbols

The following symbols are used in this manual:

Warning!
Instructions or information with vital importance for the safety of personnel or equipment.

Information relative or peripheral to the current topic.
Information on the current topic with important or far-reaching consequences.

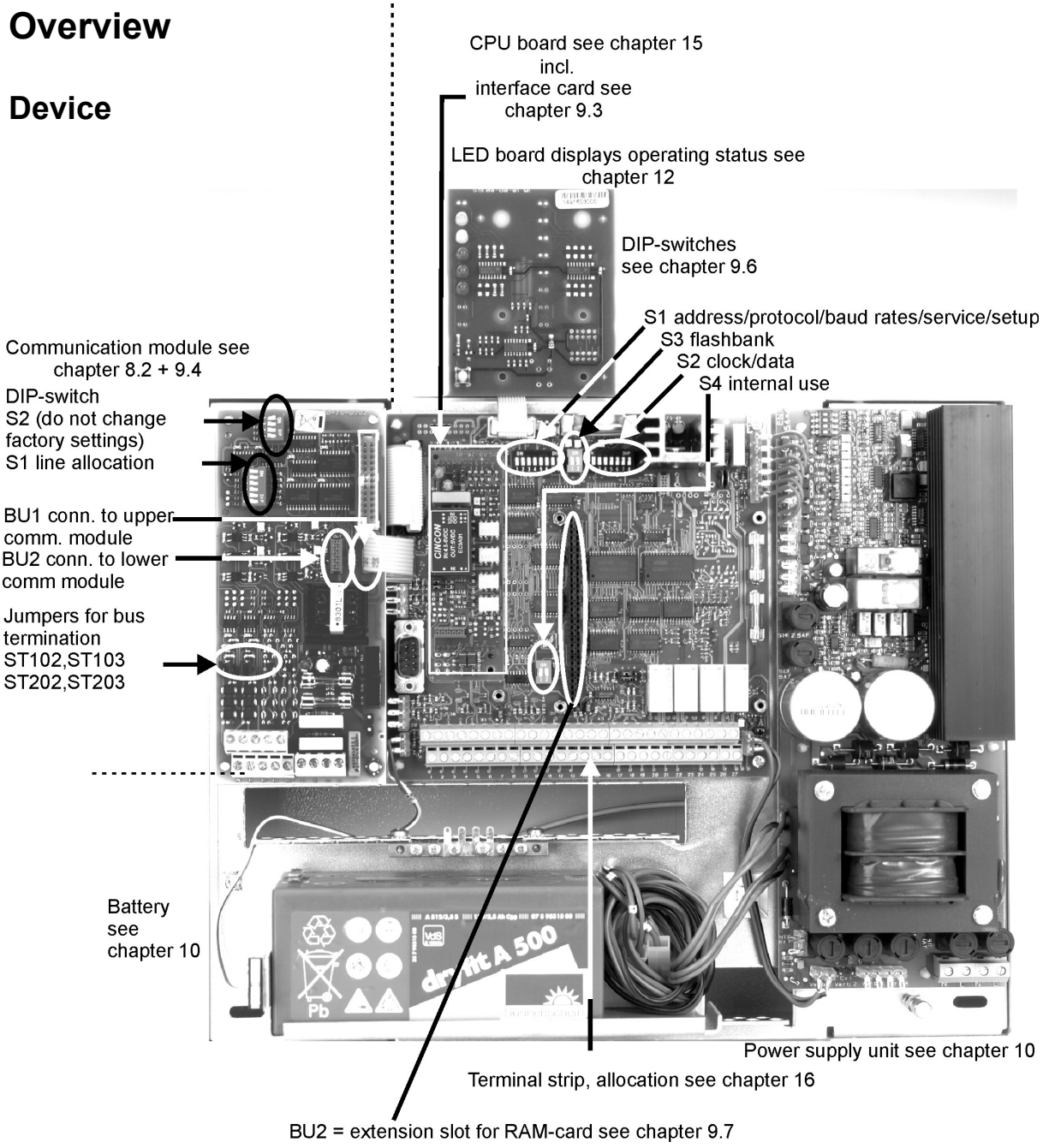
Information on mounting and installing.

1.3 Firmware update

The firmware update can be done by a flash update via the superior software (e. g. IQ MultiAccess). The procedure is described in the corresonding software manual. In general we recommend to update always to the latest available version in order to use all features - including new options. The current firmware can be found on the installation CD of IQ MultiAccess, it will be automatically copied into the firmware download directory of the IQ MultiAccess computer (server) during the installation routine or can be downloaded for free from our homepage.

2. Overview

2.1 Device



Functon (in alphabetical order)	to set up via	page
Address	S1 or ➜ Setup	61
Battery		71
Baud rate	S1 or ➜ Setup	62
Clock/Data	S2	63
Communication module	S1 of communication module	54-57
Flashbank	S3	63
Interface card	BU 4 / BU 5	53
Memory expansion	BU 2	65
Power supply unit		71
Protocol	S1 or ➜ Setup	62ff
RS 485	➜ Communication module / Terminating resistors	
Service	S1	62
Setup	S1	62f
Terminating resistors	ST 102/103, ST 202/203	54

2.2 Bus

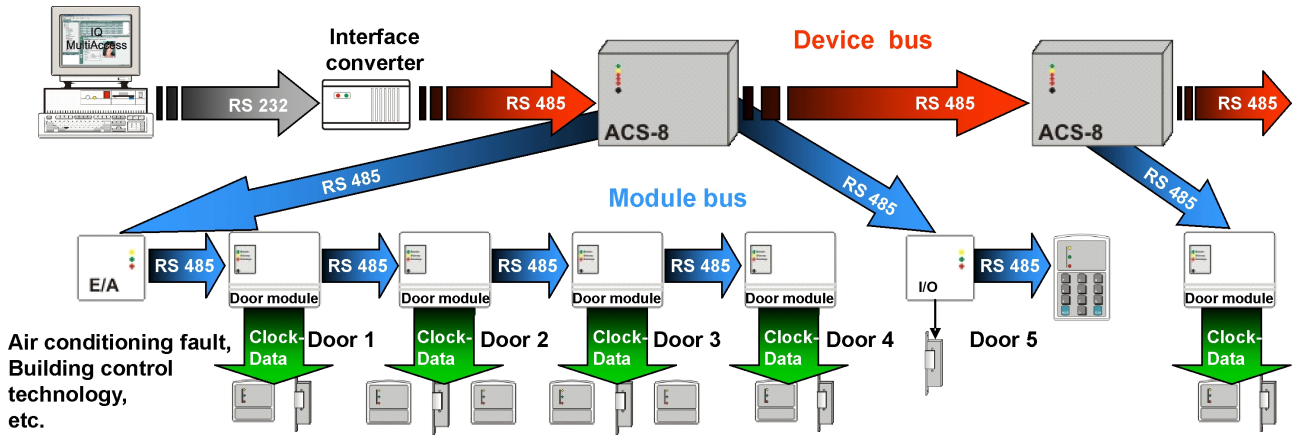
Furtheron the following terminology is used:

Device bus: RS 485 connection of the access control central units (e. g. ACS-8) to host.

Module bus: RS 485 connection of ACS-8 (via communication module, see chapter 8.2 and 9.4) to the bus modules controlled by the ACS-8.

Modules possible:
- Input module
- Output module
- Input- / output module
- Potential separator module
- Door module
- Bus reader (reader in RS 485 mode)
- Trafficpoint RS-485 for DLC and DLF

Clock/Data: Readers/keypads in clock/data mode connected directly onboard to the ACS-8. Connection diagrams see chapter 17.



3. General information

Access control systems are used where access to restricted areas is limited to authorised personnel.

Software
On the systems described here, *MultiAccess for Windows or IQ MultiAccess* is the governing software for all access control devices. Access rights for personnel, actions, time orders and the transmission of the data to the hardware can all be set up using this software.

Hardware
The ACS-Compact, ACS-1, ACS-2 and ACS-8 are the controllers that control access and together are responsible for the overall operational functionality. After receiving their data from *MultiAccess for Windows or IQ MultiAccess*, the controllers can operate in stand-alone mode. This means that the control of access remains active without impairment even if *MultiAccess for Windows or IQ MultiAccess* is not running.
When starting *MultiAccess for Windows or IQ Multi Access*, the events that have occurred while the PC was offline are automatically entered into the event log file.

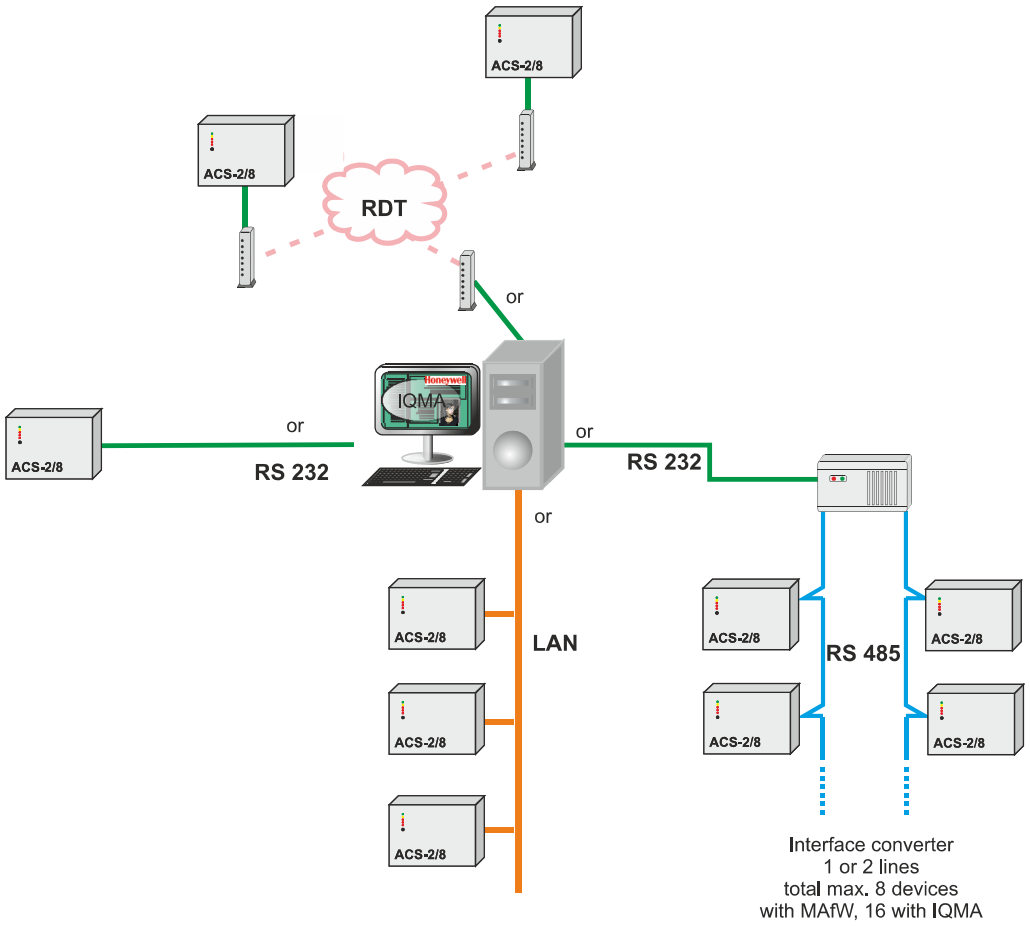
The display panel is a device used for the indication of door states, actions and the whereabouts of personnel.

The ethernet interface (LAN) links between the PC and the controllers and is also responsible for antipassback control. The PC configured with IQ MultiAccess must be in operation.

When ACS-8 systems are used in simplified mode the interface converter 026817.03 can be used.

If only <u>one</u> ACS-8 is connected it can be directly connected using the RS 232 serial interface.

These connections can be made in various permutations.



4. Protective measures

Defence against electrostatic discharge
Modern semiconductor devices are susceptible to electrostatic charges. The higher the integration density, the finer the structures on the chip and the greater the danger of electrostatic damage.

With some semiconductor devices, damage may be caused by less than 20V. This is a very low value when values of greater than 1000v can be generated by walking across a carpet.

Damage caused by electrostatic discharge rarely leads to instant failure. More commonly, semiconductor structures receiving damage from electrostatic discharges have a residual burning trace which initiates a chemical process on the chip, causing it to degrade over a period of days, weeks, months or even years. Partial operation can be difficult to detect until eventual failure occurs.

Protection against electrostatic charge
As electrostatic charges cannot be avoided, the electronics must be protected from dangerous voltage levels.

- Wear an ESD wriststrap connected to the earth connection of the controller.

- Use only soldering irons that are galvanically separated from the power supply and equipped with an electronic temperature control.

Protective measures against over-voltage transients
Protective shielding and grounding must be provided to avoid malfunctions and damage to system components due to over-voltage. This may occur due to switching of supplies or heavy machinery on the supply line or from direct or indirect effects of thunderstorms. (See DIN VDE 0845 part 1, Protection of telecommunication systems against lightning strokes, static charges and over-voltages caused by power installations – measures against over-voltages.)

Protection according to the VdS requirements is built into the products.

Protection against damage caused by lighting strokes and over-voltages can be assured by implementing appropriate measures for internal and external lightning (medium and coarse) protection. Additional requirements will depend on the installation location and the nature of other equipment connected to the system.

Over-voltage caused by switching actions causes a very steep rate of change of voltage. This means that the voltage can reach values of several kV within a few microseconds. Such voltage pulses (transients) cause the destruction of electronic components.

Adequate over-voltage protection, will absorb these transients.

Causes of transient interference voltages
Transient voltages are often caused by atmospheric discharge, i.e. lightning stroke. A lightning discharge may release currents reaching values over100kA with very short rise times. This current causes a high voltage drop in the earth resistance of a building and the high rate of change of current induces high voltages in conductive loops. The energy resulting causes the damage to unprotected devices.

Switching actions in electrical systems also cause over-voltage transients.

High-voltage power supply networks are fitted with high-frequency compensation systems and are coupled to low-voltage parts of the network. Over-voltages and high-frequency power transients in low-voltage installations can also be caused by sharp drops in voltage, phase control, etc. In these instances, the rate of change of current can reach higher values than a lightning stroke.

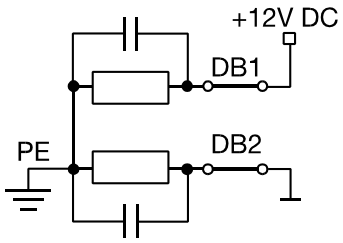
5. Important installation instructions

(See also chapter = Safety instructions)

5.1 Grounding and shielding

Use shielded cables and a suitable shielding connection for protection against electromagnetic interference. Make sure that the line shields in the distribution boxes are connected so that there are no links to other potentials. In the ACS-8, all shields should be connected to one point using the shortest possible route. The shield soldering bar serves as a common point for connection of the ground conductors and line shields (see below).

Circuit diagram DB1 and DB2 grounding bridges:



The grounding bridges are located on the CPU board near the power supply unit connector (see chapter 15.1).

The following shielding connections can be made:

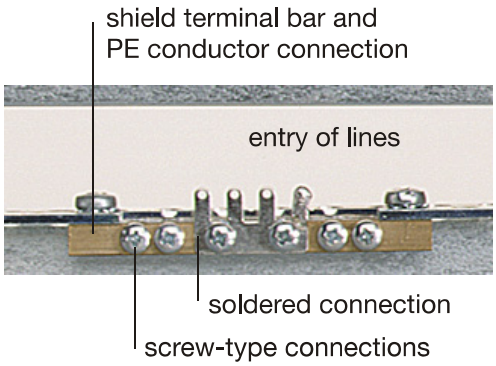
Connect the shield soldering bar to the ground conductor and keep the grounding bridges closed
With this method, the DB1 and DB2 grounding bridges provide a capacitive coupling between the ground conductor and the system operating voltage.
This connection offers excellent protection against conducted interference and cable shield discharges. However, this connection must only be used if PE and N are connected separately (modern grounding) and if it is guaranteed that the ground conductor does not carry any high or low frequency signals.

Connect the shield soldering bar to the ground conductor and open the grounding bridges
In this configuration, the capacitive coupling to the system operating voltage is interrupted by the removing the grounding bridges. This connection should be used if the ground is susceptible to interference, where the capacitive coupling would transfer it to the ACS-8.

Connect the shield soldering bar to the incoming mains terminal

With this configuration, the shield soldering bar ust be connected directly to the incoming mains terminal. This method is used where the ground conductor is heavily loaded and is the only way to overcome interference, if there is a problem with the previous methods described.

See: ➜ VDE 0800 part 2 edition July 1980
➜ VDE 0800 part 2 AI draft November 1982



5.2 Shielded lines

The ACS-8 devices are daisy-chained together using shielded cables.

Use Cat 5 cables or higher.

The shielding of the incoming line connects to the shield terminal bar of the ACS-8. The shielding of the outgoing line must not be connected.

The shield terminal bar in each ACS-8 must be connected to a separate PE.
(min. cable cross-section 1,5mm²)

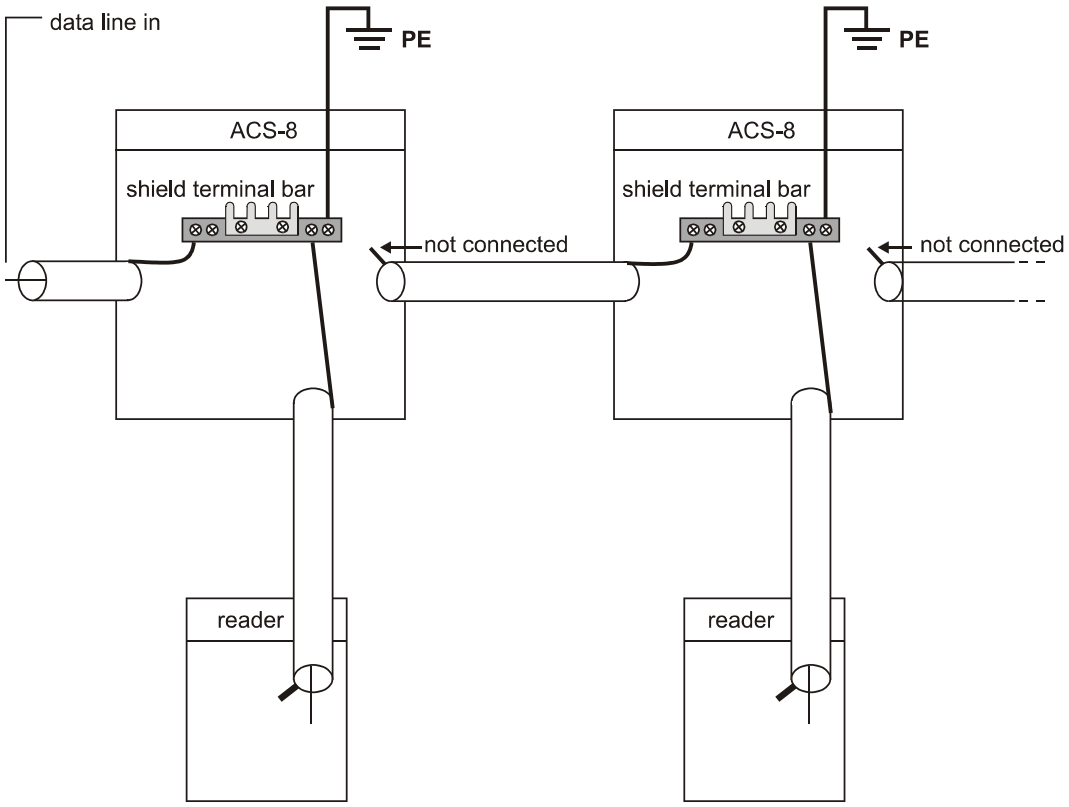
When it is not possible to provide a mains earth connection at each device on a 12V system, then a three core cable should be used to provide the 12V DC power and an earth continuity conductor.

The shielding of the reader line is connected on one side to the shield terminal bar in the ACS-8.

The above points also apply to the ACS-8 module bus.

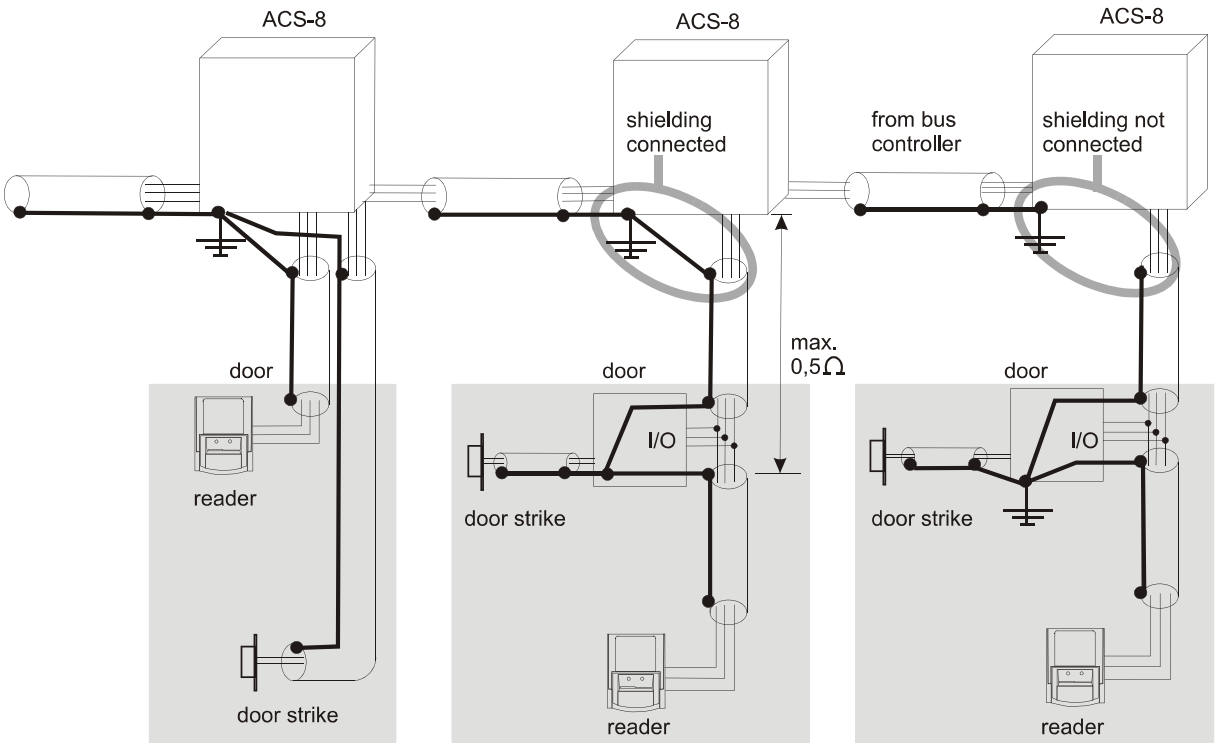
5.2.1 Illustration of the shielding

5.2.1.1 General shielding principle:



5.2.1.2 Shielding of the ACS-8 systems

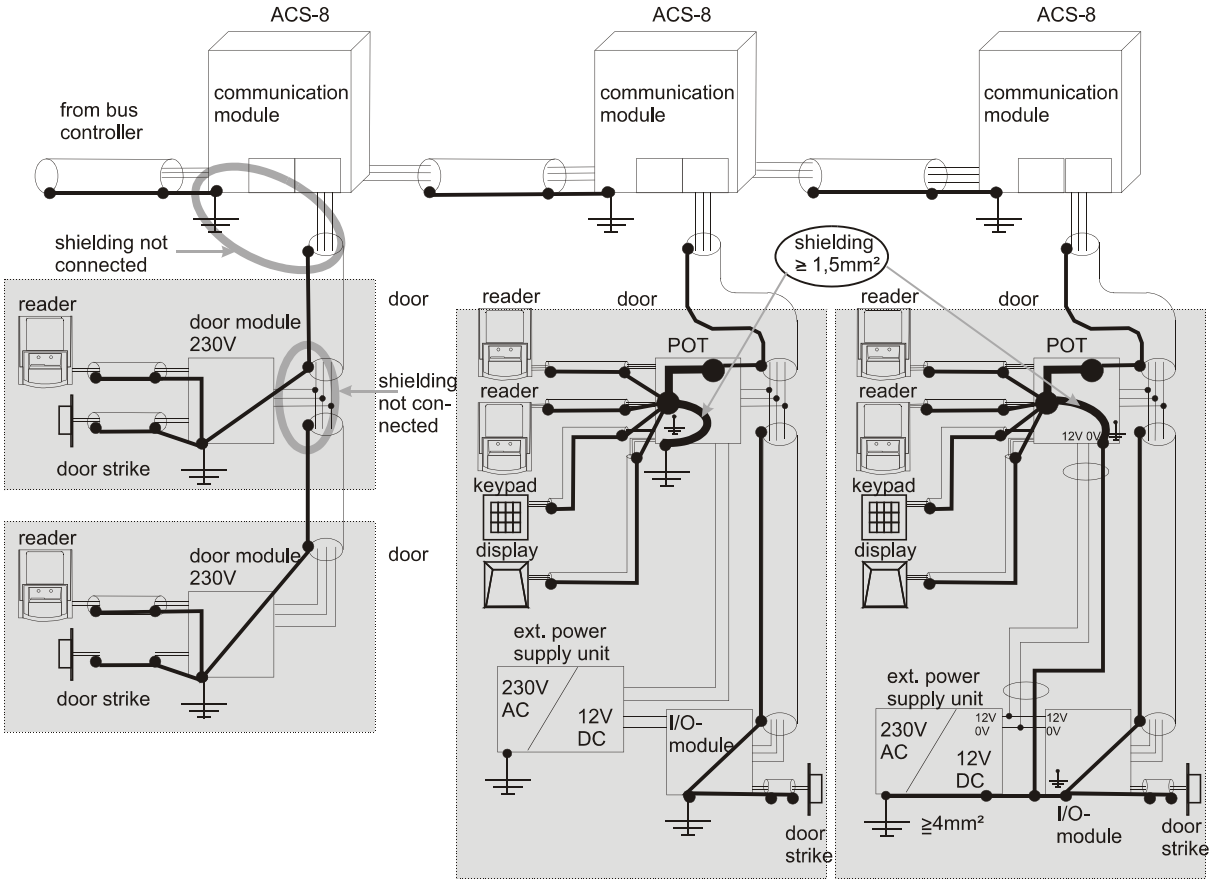
The following illustrations show the wiring (grounding) of an ACS-8 system in schematic form:



Example 1:
Conventional connection of readers and door strikes to ACS-8 (not via module bus).

Example 2:
Power supply via bus line.
I/O-module not grounded.
Grounding made via ACS-8.

Example 3:
Power supply via bus line.
I/O-module grounded, e.g. with a metallic door frame.



Example 4:
Each door module is individually grounded. Always the incoming line has to be connected with the shield terminal bar.

Example 5:
Each module is individually grounded, e.g. with a metallic door frame (which is to be grounded locally).

Example 6:
In this example a 3 core cable should be used for the 12V power supply to provide an earth continuity conductor for each device.

Example 5 is preferred to example 6!

6. ACS-8/cables

6.1 ACS-8 supply voltage

Please observe the informations about grounding and shielding in chapter 5.

6.1.1 ACS-8 230 V version

Parameter	***Value***
operating voltage range	230 V AC –15% +10%
mains frequency	40 – 60 Hz
power supply cable type	NYM 3 x 1,5 mm²

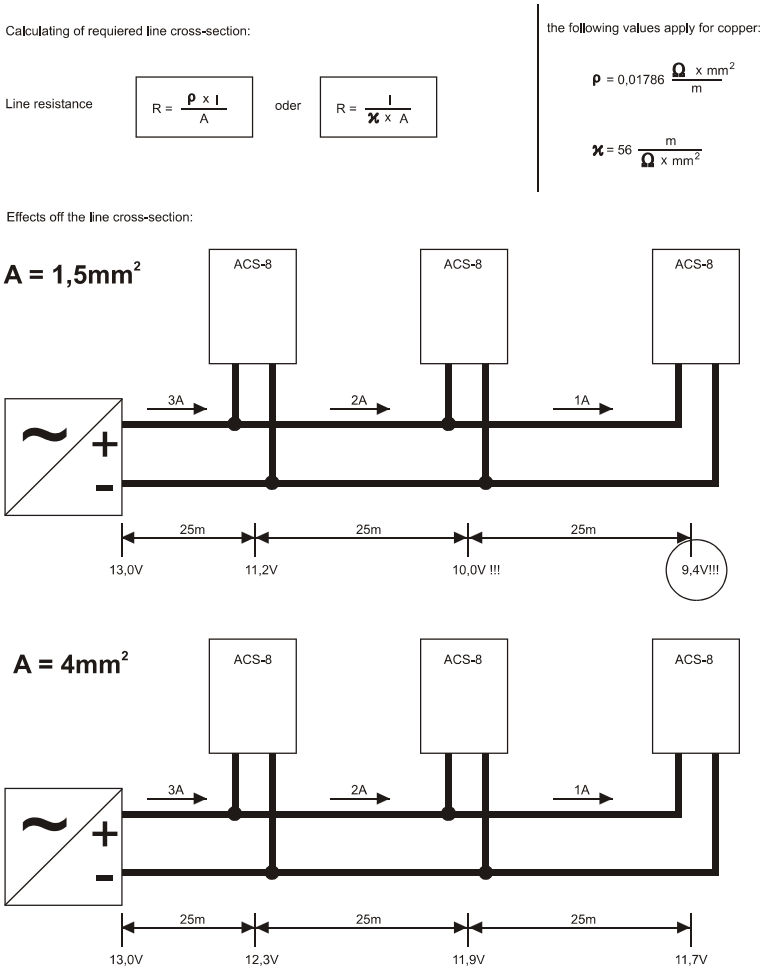
6.1.2 ACS-8 12V version

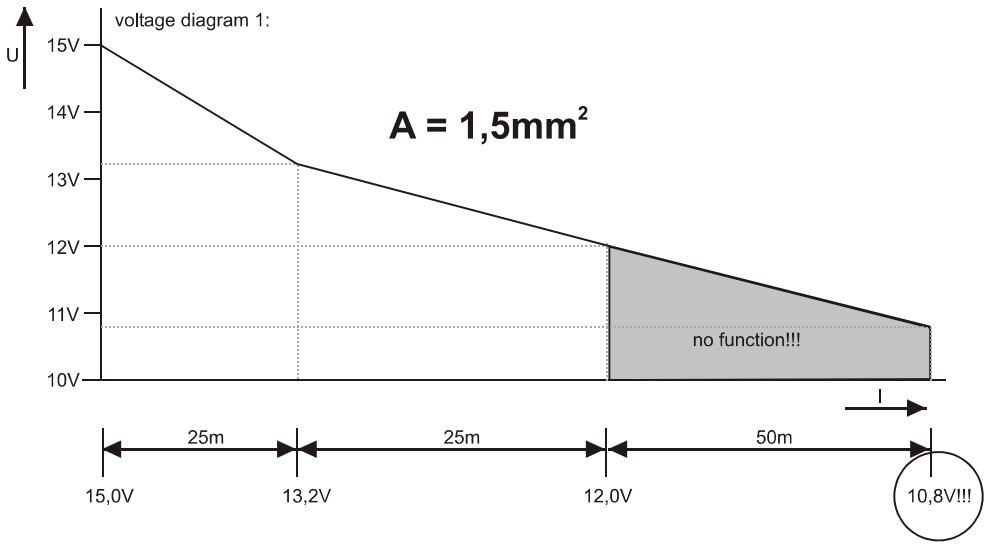
Parameter	***Value***
operating voltage range	10.0V to 15.0V DC
current consumption	depends on the reader type, the number of readers and the interface type

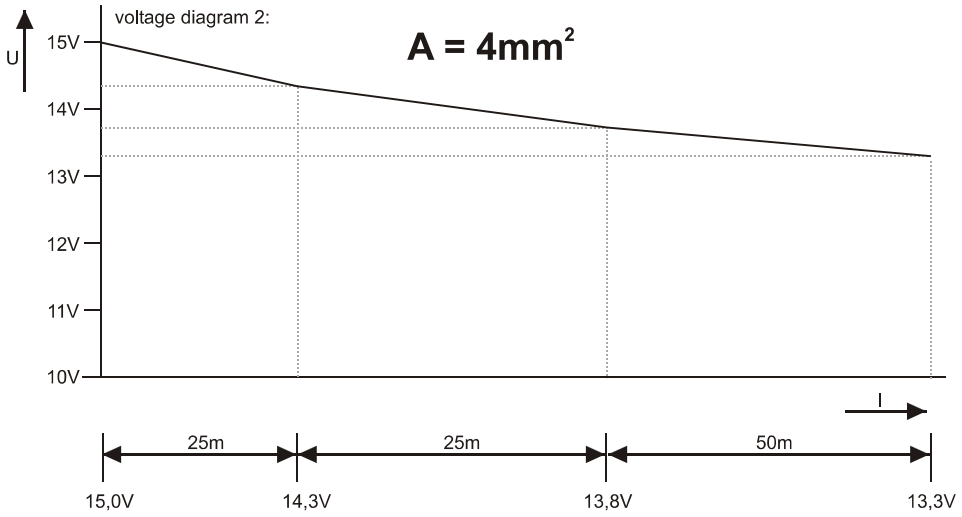
The door strike must be taken into consideration if its supply comes from the ACS-8. The current consumption of a door strike depends on the type, but lies somewhere between 200mA and 500mA.

The current consumption of an energized door strike must be known for each ACS-8 when designing a 12 V system.

The following drawing (powered on) shows the voltage drop of a 1.5mm² cable compared to a 4mm² cable.
A power consumption of 1A is calculated for each ACS-8.
Observe the outgoing and return line.







The voltage diagrams 1 and 2 compare the effects of two cable cross-sections.
The required line cross-section must be calculated using the graphs shown above .

Note! Pay attention to legal rulings!

The local requirements must be observed for the line cross-section. VDE 0100 applies to Germany. The output fuse of the power supply unit must have the appropriate current rating. The highest current rating is determined by the smallest line cross-section of the supply cable.

6.2 ACS-8 module bus/cables

6.2.1 Cable types for data lines

Type	*Length*	*Comments*
J-Y(St)Y	up to 40m	This cable is available with diameters of 0.6mm and 0.8mm and various numbers of cores.
Cat-5e (or better)	Up to 1200m	

6.2.2 Cable types for the power supply of bus modules

- **J-Y(St)Y** ⌀ 0.6mm, ⌀ 0.8mm, depending on the calculation (see appendix/Planning examples)
  Note: The required number of wires must not be greater than the terminal diameter.

When using a single J-Y(St)Y cable to carry both the power supply of the bus modules and the data signals, the cable length is limited to 40m since this is the data line limit (see 6.2.1 J-Y(St)Y as data line). This must be the case even if a longer distance was calculated for the power supply.

- **NYM 5 x 1.5mm²** (See appendix/Planning examples)

6.2.3 ACS-8 module bus

6.2.3.1 Power supply

There are two possible connection versions:

1. Central power supply of the ACS-8 (in the bus line or a separate line).
   - All modules have their voltage supplied by the ACS-8.
   - No potential separation is required.
   - The maximum distance depends on the voltage drop in the cable.

2. Decentralized power supply by one or more external power supply units distributed throughout the system.
   - All modules connected to an RS 485 module bus must have potential isolators fitted.

6.2.3.2 Power supply of the modules via the bus line

The calculations of the line cross-sections for +12V DC and 0V must take the current requirements of the connected modules into consideration. In addition, any occasional "switching current" (e.g. relay) must also be considered.
Even in case of emergency power operation, the operating voltage must not fall below 10V DC. This means that where the battery voltage is 10.5V DC, only a 0.5V voltage drop can be permitted.
For devices with a power supply of 12V, (without emergency power supply) a voltage drop of 2V can be permitted.

6.2.3.3 Power supply of the modules via a separate power supply unit

Since the power supply through a bus is very limited, a separate power supply unit located near the modules (door) must be used where larger distances or increased current consumption is required.

Each communication module has two RS 485 drivers with a separate supply.
An internal or external power supply can be used for each RS 485 driver. The supplies of the two drivers must not be inter-connected.

External power supply units supply the potential separation module (POT) with 12V DC. Details of these can be found in the product list.

6.2.3.4 Cable lengths and line cross-section

A maximum length of 1200m is possible for the RS 485 bus (without power supply).
Whether the +12V/0V lines are included in the bus or on a separate cable, the required cable cross-section must be calculated.
Modules with higher current demands, require a separate line or a cable with a larger cross-section.

6.3 Line stubs (Blind spurs)

Stubs are not appropriate for use with buses and lead to data reflections (the signals bounce back) from high impedance blind end terminations and should be avoided during installation.

If stubs cannot be avoided, they must not be greater than 3m in length and the terminating resistor should not be connected.

6.4 Potential Isolation

The communication module has two floating RS 485 interfaces.
The 4I, 4O, 4I/2O modules are each fitted with a floating RS 485 interface.
The reader, keypad and door modules are not floating.

If potential isolation is required, up to 4 of these modules can be connected to the RS 485 bus with the potential isolator. Each of the 4 modules can be located up to 10m from the potential isolator (POT).

6.4.1 Central power supply from the ACS-8

No potential isolation is required.

6.4.2 Decentralized power supply using several external power supply units distributed in the system

If problems should appear with the data transmission to the ACS-8, a potential isolator (POT) should be used.

6.5 Shielding or grounding of the module bus

(See also chapters 4 and 5)

Ground loops
Ground loops occur when the ground connection connects to one or more devices and then back to the ground point again.
This would be the case if in chapter 5 **example 3**[1] the shielding is connected at each end of the cable.
Such loops must be avoided as they can generate very high circulating currents by way of the shorted secondary transformer effect. Previously documented interference problems tend to be exacerbated in these circumstances leading to damage to the circuitry and components.

Chapter 5 **examples 1 to 6**[2] show the correct connections.
If the shielding and grounding are connected in this way, loop currents are not induced since there is no closed loop.

If the star principle of...

cabling all ground and shielding cables to a central ground point

...is observed, no ground loops are caused.

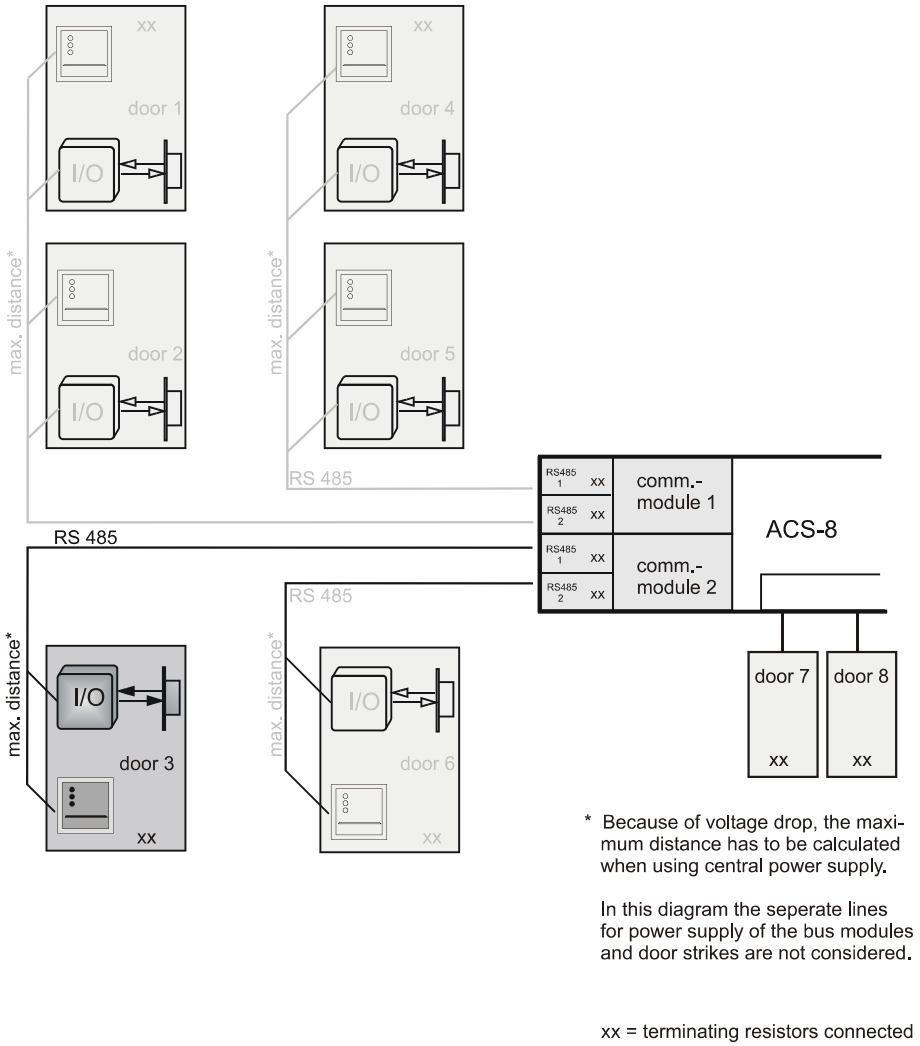
[1] The examples refer to the diagrams of chapter 5 “Important installation information”.

[2] The examples refer to the diagrams of chapter 5 “Important installation information”.

6.6 Calculation examples

6.6.1 Example 1:

Calculation of the line cross-section for door 3 with given cable length.



- ❍ The ACS-8 is equipped with two communication modules.
- ❍ ACS-8 with battery.
- ❍ A terminating resistor must be connected at the I/O-modules at the end of the bus (marked with XX in the drawing).
- ❍ The power supply for the module electronics is in the same multi-core cable as the bus.
- ❍ A separate line must be used for the power supply of the door strike.
- ❍ The door 3 to be calculated is connected to the communication module with a single cable.

❍ Current consumption of the devices in the example:

contactless / proximity reader (026390.10)	70mA
4I/2O-module (026592)	230mA
door strike	230mA

Calculation of the line cross-section with 40m cable length:

The required line cross-section can be determined from diagram 1 or 2 (page 30/31).
The maximum voltage drop of the line is 0.5V. If the ACS-8 is not equipped with a battery, a voltage drop of 2V-3V is possible. This means that smaller cross-sections can be used if the length is kept constant or longer lengths can be used if the cross-section is kept constant.

Module supply:

Total current consumption of the modules:

contactless / proximity reader (026390.10)	70mA
4I/2O-module (026592)	230mA
total:	300mA

❍ Calculation of the maximum line resistance:

$$R_L = \frac{Uv}{I} = \frac{500mV}{300mA} = 1.67\Omega$$

❍ Calculation of the required cross-section:

$\varkappa$ = electrical conductivity = $\frac{56m}{\Omega mm^2}$ of copper

$$A = \frac{2 \times L}{R_L \times \varkappa} = \frac{2 \times 40m}{\frac{1.67\Omega * 56m}{\Omega mm^2}} = 0.855mm^2$$

❍ Calculation of the number of wires with a wire cross-section of 0.28mm² (Ø 0.6mm):

$$\text{no. of wires} = \frac{0.855mm^2}{0.28mm^2} = 3.05 \text{ wires} \rightarrow 3 \text{ wires}$$

❍ Calculation of the number of wires with a wire cross-section of 0.5mm² (diameter 0.8mm):

$$\text{no of wires} = \frac{0.855mm^2}{0.5mm^2} = 1.71 \text{ wires} \rightarrow 2 \text{ wires}$$

Power supply door strike:

Current consumption: 230mA

❍ Calculation of the maximum line resistance:

$$R_L = \frac{Uv}{I} = \frac{500mV}{230mA} = 2.17\Omega$$

❍ Calculation of the required cross-section:

$$\varkappa = \text{electrical conductivity} = \frac{56m}{\Omega mm^2} \text{ of copper}$$

$$A = \frac{2 \times L}{R_L \times \varkappa} = \frac{2 \times 40m}{\frac{2.17\Omega * 56m}{\Omega mm^2}} = 0.66mm^2$$

❍ Calculation of the number of wires with a wire cross-section of 0.28mm² (diameter 0.6mm):

$$\text{no. of wires} = \frac{0.66mm^2}{0.28mm^2} = 2.25 \text{ wires} \rightarrow 3 \text{ wires}$$

❍ Calculation of the number of wires with a wire cross-section of 0.5mm² (diameter 0.8mm):

$$\text{no. of wires} = \frac{0.66mm^2}{0.5mm^2} = 1.32 \text{ wires} \rightarrow 2 \text{ wires}$$

Result:

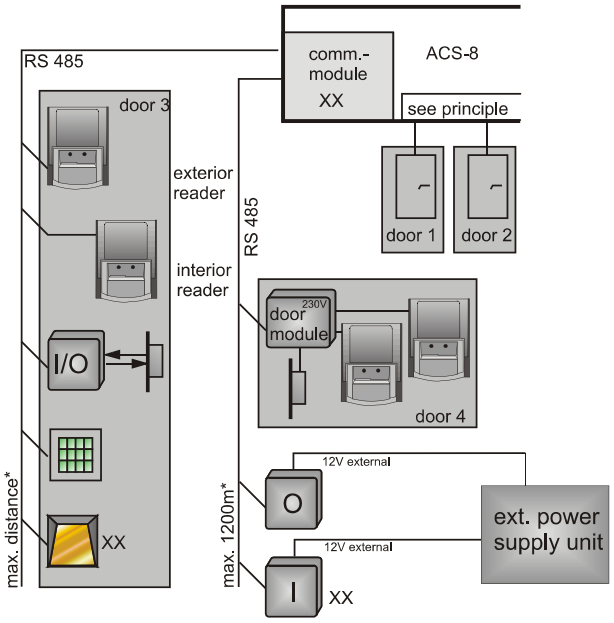
Line cross-section for module supply: 0.855mm²
Line cross-section for the supply of the door strike: 0.66mm²

J-Y(St)Y 5x2x0.6Ø or **4x2x0.8Ø** can be used as the power supply for the module electronics and the bus line, providing the the cable length does not exceed 40m.

A **separate line** with a minimum line cross-section of 0.66mm² must be used to power the door strike.

6.6.2 Example 2:

Calculation of the maximum cable length with given line cross-section.



* Because of voltage drop, the maximum distance has to be calculated when using central power supply.

In this diagram the seperate lines for power supply of the bus modules and door strikes are not considered.

xx = terminating resistors connected

- ❍ A terminating resistor must be located on the devices indicated to terminate the bus (marked with XX in the drawing).
- ❍ The power supply for the module electronics is carried on one wire of the bus. The users connected to the other wire have their own power supply or their own external power supply.
- ❍ A separate line must be used to power the door strike.
- ❍ Current consumption of the devices in this example:

contactless / proximity reader (026390.10)	2 x 70mA	140mA
4I/2O-module (026592)		230mA
door strike		230mA
display module (027555)		150mA
keypad module (027570)		50mA

Calculation of the cable length for door 3:

For handling reasons, the max. line cross-section of 0.84mm² corresponding to three wires when using J-Y(St)Y Ø0.6mm must not be exceeded.

The maximum cable length can be calculated or easily determined by means of diagram 1 or 2 (page 30/31). The maximum voltage drop of the line is 0.5V. If the ACS-8 is not equipped with a battery, a voltage drop of 2V-3V is permissible. This results in smaller cross-sections if the same length is used or in longer lengths if the same cross-section is used.

Module supply:

Total current consumption of the modules:

contactless / proximity reader (026390.10)	140mA
4I/2O-module (026592)	230mA
display module (027555)	150mA
keypad module (027570)	50mA
total:	570mA

❍ Calculation of the maximum line resistance:

$$R_L = \frac{Uv}{I} = \frac{500mV}{570mA} = 0.877\Omega$$

❍ Calculation of the maximum possible line length:

$\varkappa$ = electrical conductivity = $\frac{56m}{\Omega mm^2}$ of copper

$$L = \frac{A \times R_L \times \varkappa}{2} = \frac{0.877 \times 56m}{\frac{\Omega mm^2}{2}} = 24.556m$$

Power supply door strike:

Current consumption: 230mA

❍ Calculation of the maximum line resistance:

$$R_L = \frac{Uv}{I} = \frac{500mV}{230mA} = 2.17\Omega$$

❍ Calculation of the required cross-section:

$\varkappa$ = electrical conductivity = $\frac{56m}{\Omega mm^2}$ of copper

$$A = \frac{2 \times L}{R_L \times \varkappa} = \frac{2 \times 24.556m}{\frac{2.17\Omega * 56m}{\Omega mm^2}} = 0.40mm^2$$

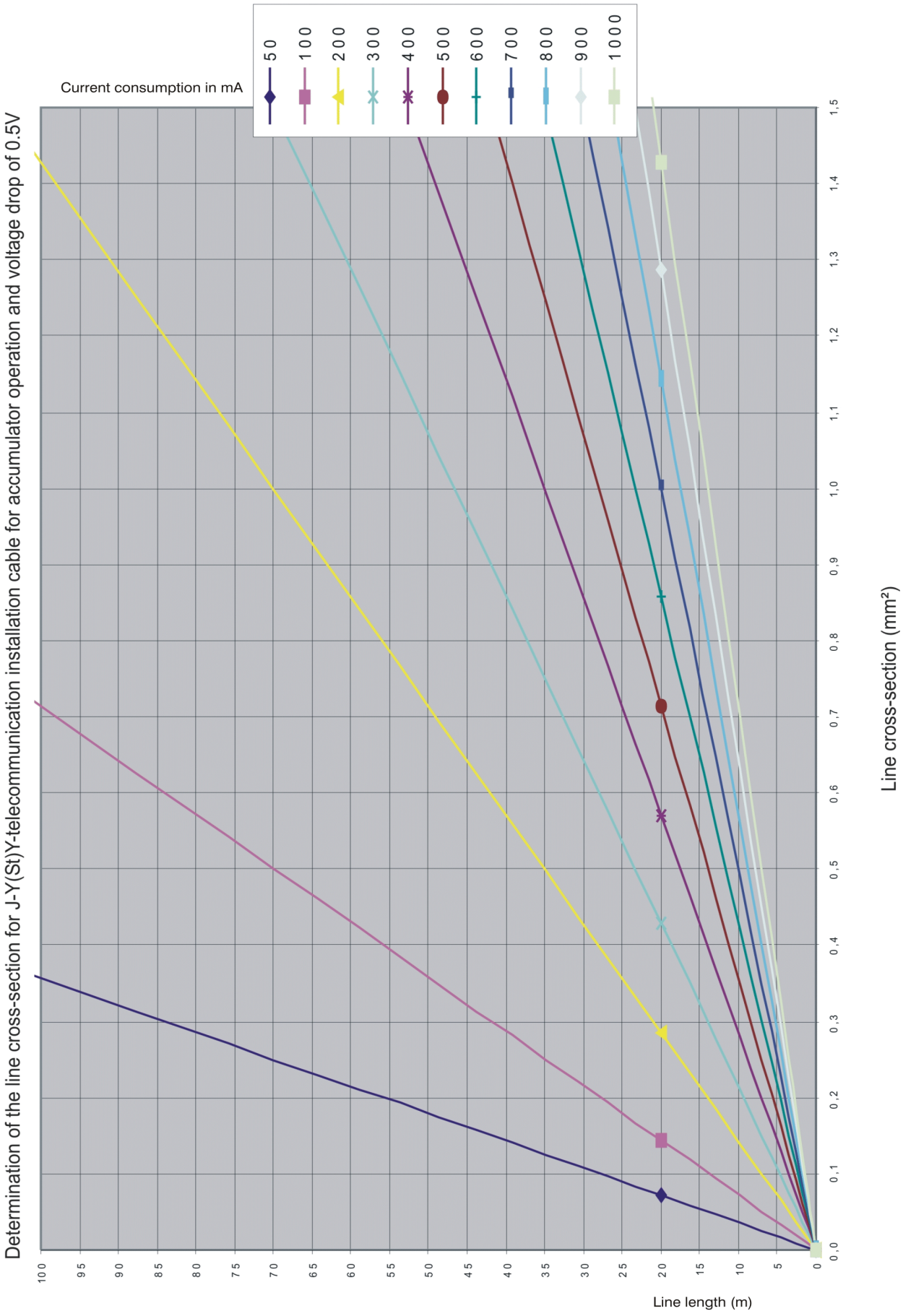
❍ Calculation of the number of wires with a wire cross-section of 0.6mm (Ø 0.28mm²):

$$\text{no. of wires} = \frac{0.40mm^2}{0.28mm^2} = 1.42 \text{ wires} \rightarrow 2 \text{ wires}$$

Result:

The current consumption above allows a maximum cable length of **24.6m** for the power supply of the module electronics. The number of wires for the door strike must be determined. A **J-Y(St)Y 8x2x0.6mm** cable must be used if the power for the door strike is carried in the same cable as the power supply for the bus modules.

For the data bus, a separate J-Y(St)Y or Cat 5 cable is required, because there are no spare conductors available In the power cable.


Determination of the line cross-section for J-Y(St)Y-telecommunication installation cable for accumulator operation and voltage drop of 0.5V
Current consumption in mA
50
100
200
300
400
500
600
700
800
900
1000
Line length (m)
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
Line cross-section (mm²)
0,0 0,1 0,2 0,3 0,4 0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5

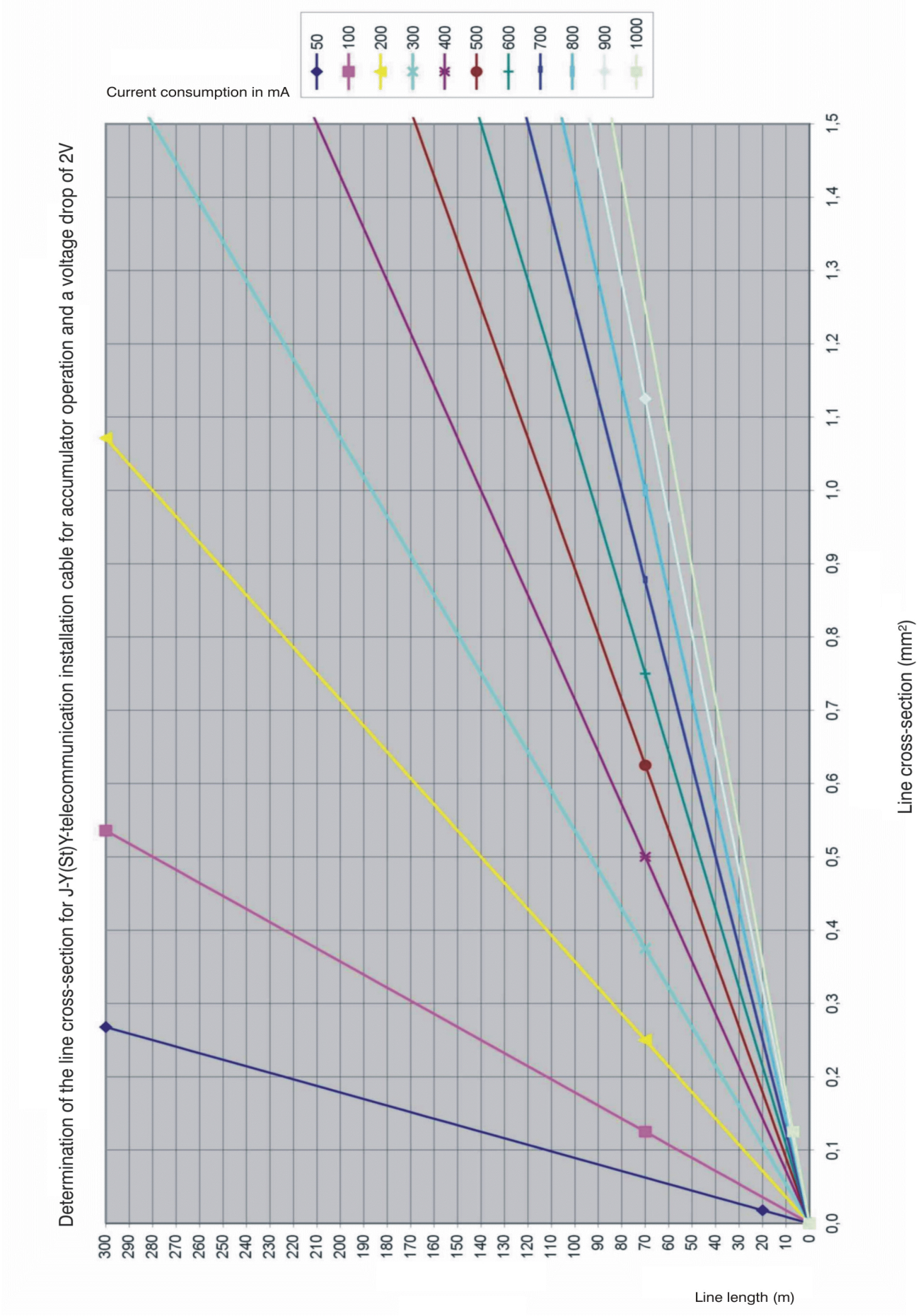

Determination of the line cross-section for J-Y(St)Y-telecommunication installation cable for accumulator operation and a voltage drop of 2V
Current consumption in mA
50
100
200
300
400
500
600
700
800
900
1000
Line length (m)
300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
Line cross-section (mm²)
0,0 0,1 0,2 0,3 0,4 0,5 0,6 0,7 0,8 0,9 1,0 1,1 1,2 1,3 1,4 1,5

Table 1: Current consumption of the individual module bus components

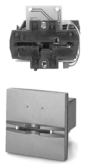
Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	ACS-8 without interface card and without peripheral devices	026580	10	400
	Communication module	026587	will be supplied internally	150
	Input module 4I	026590	9	140
	Output module 4O	026591	9,5	250
	Input / output module 4I/2O	026592	10	230
	Potential sparation module	026595.10	10	120
	Door module 12V incl. interface without peripheral devices	026593.10	10	250
Fail secure door strike (device with load current function) depending on type				120 - 230
Readers				
	proX			
	Contactless reader, extended range	026366.00 026366.10	11	400 + 12/LED
	Contactless reader, s.m. with keypad	026383.00	10	50 + 12/LED
	Contactless reader, f.m.	026387.00	10	50 + 30/LED
	Contactless reader, s.m.	026390.00 026390.10	10	50 + 12/LED

Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	Accentic reader without keypad	026420	9	60
	Accentic reader with keypad	026421	9	60
	luminAXS without keypad	027922 027910 (RS-485)	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)
	luminAXS with 2 keys	027924 027912 (RS-485)	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)
	luminAXS with 16 keys	027923 027911 (RS-485)	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)
	Proximity, proX	026480 026480.10	10	50 + 12/LED
	Contactless reader, s.m., with keypad	026481	10	50 + 12/LED
	Contactless reader, s.m. “Plug in”	027575 027575.20	10	50 + 12/LED
	Insertic 50 Leser, proX1/2	027660	8	210
	Insertic reader, proX1/2 without keypad	027666	8	210

Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	Insertic reader, proX1/2 with keypad	027667	8	210
	Contactless reader, Siedle	027540 - 027543	10	50 + 12/LED
	Contactless reader, Siedle	023330 - 023343	8	50
	Legic			
	Accentic reader without keypad	026424	11	50 + 10/LED
	Accentic reader with keypad	026425	11	50 + 10/LED
	LEGIC Leser Insertic Touch ohne Tastatur	027918 (C/D) 027916 (RS-485)	8	3,5 W
	LEGIC Leser Insertic Touch mit 12 Tasten	027919 (C/D) 027917 (RS-485)	8	3,5 W
	LEGIC advant Leser Feller ohne Tastatur	027665.10.FE	8	3,5 W
	LEGIC advant Leser Feller 12 Tasten	027665.20.FE	8	3,5 W
	Legic reader Oris	026485	10,5	500
	Contactless reader, s.m. with keypad	026491	10	150 + 10/LED

Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	Legic reader without keypad, s.m.	026492	10	150 + 10/LED
	Legic reader “Plug in”	027579	10	150 + 10/LED
	Insertic 50 reader, Legic	027664	8	210
	Insertic reader, Legic without keypad	027676 027676.10	8	210
	Insertic reader, Legic with keypad	027677 027677.10	8	210
	Accentic Fingerkey IK3	029340	8	160
	mifare			
	Accentic reader without keypad Accentic reader mifare DESFire (EV1)	026422 026435	11	50 + 10/LED
	Accentic reader with keypad Accentic reader mifare DESFire (EV1)	026423 026436	11	50 + 10/LED
	luminAXS without keypad	027913	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)

Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	luminAXS with 2 keys	027915	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)
	luminAXS with 16 keys	027914	9	40 mA + 4 mA/LED + 0,5 to 110 mA for lighting ring (depending on colour and brightness)
	mifare reader Oris	026484	10,5	luminAXS with 2 keys
	Contactless reader, s.m. with keypad	026493	10	luminAXS with 16 keys
	mifare reader without keypad, s.m.	026494	10	200 + 10/LED
	Insertic 50 reader, mifare	027662	8	210
	Insertic reader, mifare without keypad	027670	8	210
	Insertic reader, mifare with keypad	027671	8	210
	Mifare reader “Plug in”	027577	10	200 + 10/LED
	Accentic Fingerkey mifare	029341	9	160
	Magnetic cards			

Device		Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	Magnetic card morise reader, s.m.	026010.00	10	60
	Magnetic card morise reader, f.m.	026011.00	10	80
	Magnetic card motor reader, s.m.	026016.00	10	500
	Magnetic card motor reader, f.m.	026017.00	10	80
	Magnetic card morise reader, s.m. with keypad	026046.00	10	60
	Magnetic card motor reader, s.m.	026047.00	10	500
	Magnetic card swipe reader, s.m.	026053.00	10	60
	Magnetic card swipe reader, s.m. with keypad	026054.00	10	60
	Magnetic card mortise reader module, e. g. with Siedle front panel system “Vario” (item no. 027545-027548)	026345.00	10	80
	Magnetic card reader “Plug in”	027580	9	80
	Magnetic card reader, s.m.	027710	9	80
	Magnetic card mortise reader, s.m. with keypad	027711	9	80
	Magnetic card motor reader, s.m.	027712	10	500
	Magnetic card mortise reader module, e. g. with Siedle front panel system “Vario” (item no. 027545-027548)	027470.10	10	80

	Device	Item no.	Minimum power supply in Volt	max. current consumption without peripheral devices (mA)
	Chip cards			
	Chip card reader, f.m.	026340.00		
	Chip card reader, s.m.	026342.00	9	90 + Chipkarte 50
	Chip card reader, s.m. with keypad	026343.00		
	Chip card reader, s.m. without keypad	027740		
	Chip card reader, s.m. with keypad	027741		
Keypads				
	Keypad s.m., plastic housing	026064	10	20 + 12/LED
	Keypad s.m. housing	026070.02 026072.02	-	-
	Keypad s.m housing, waterprotected	026071.02 026073.02	-	-
	Keypad with analogue interface “Plug in”	027570 027570.20	9	50
	Scramble keypad with proX1 reader	026445 026445.10	10	600
	Traffic Piont / RF Module RS-485	022963	9	40 mA with 12 V DC 20 mA with 24 V DC

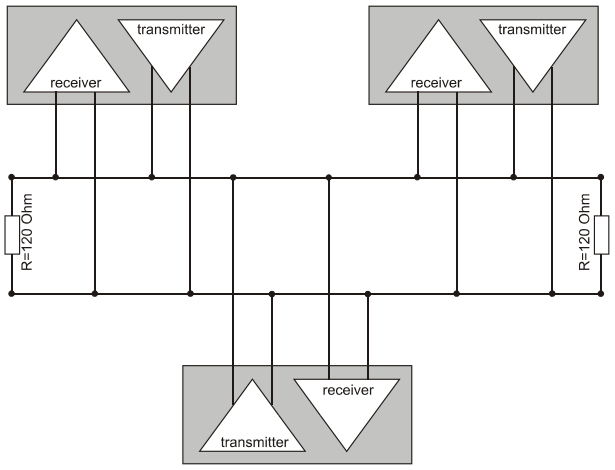
7. Interface and bus topology

7.1 Interface technology, RS 485 bus systems

There are two types of data transmission. These are known as point-to-point and multipoint.
In a point-to-point connection two controllers are communicating with each other directly. A point-to-point connection might use an RS 232 or a current loop interface.
In a multipoint connection, several controllers communicate with one another. The RS 485 interface would be used for a multipoint connection.

A bus topology is used for the RS 485 interface.

7.1.1 Principle:



7.1.2 General information

The RS 485 interface is a bidirectional interface with bus capability. Up to 32 users can be connected, each of which can transmit as well as receive. The line ends must have terminating resistors (fitted as standard) that can be configured on the interface by means of jumpers.

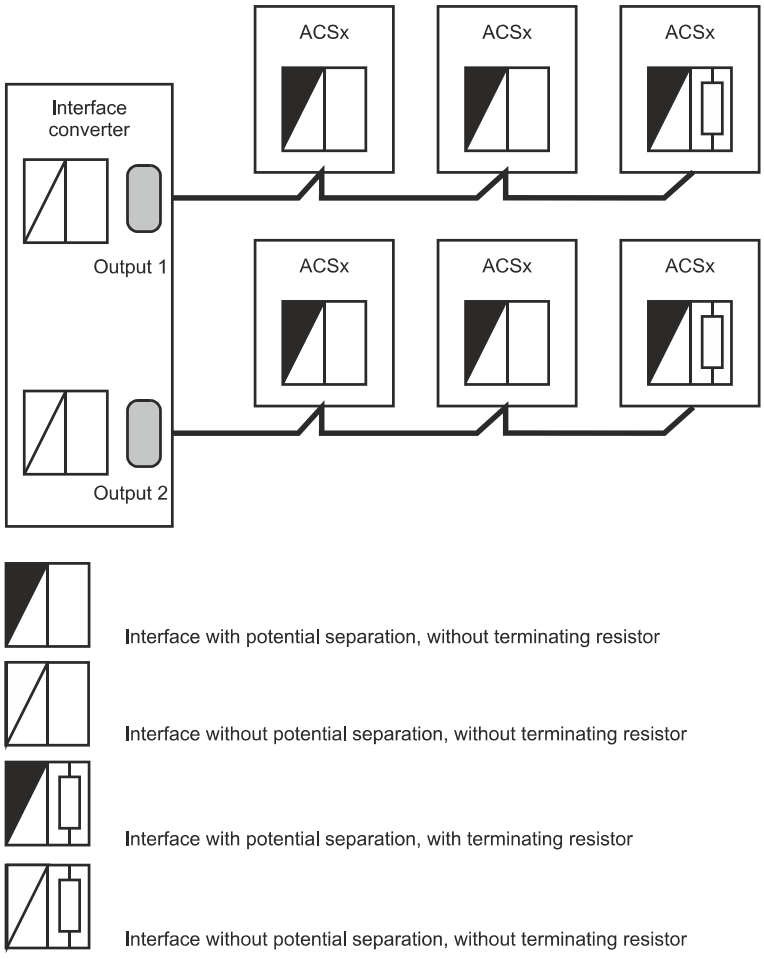
7.1.3 Potential separation and terminating resistance

Potential separation

One non-floating interface must be used for each RS 485 cable. The other interfaces must be floating. The best position for the non-floating interface, is in the middle of the RS 485 cable. The ACS-8 fitted with the non-floating interface must have a good ground connection. If this is not the case, another ACS-8 should be selected instead. A good ground is more important than the central location on the RS 485 cable.

Terminating resistors

The terminating resistors must be placed at the **first** and the **last** device of a line. Which device is the first or last device or any device within the line depends on the type of wiring.



Caution! Malfunction possible!

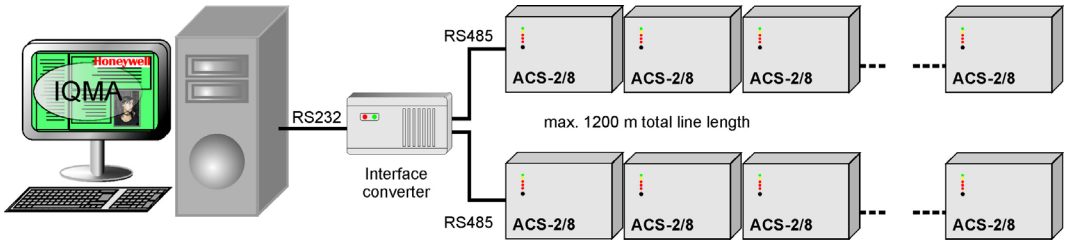
Star-shaped cabling of the devices is not allowed.

7.1.5 Ethernet connection (RJ45)

When installing an Ethernet interface card (Item no. 026840.29) or Ethernet interface card, encrypted (Item no. 026840.30) instead of an RS 485 interface card, the ACS-8 can be linked to an existing network via Ethernet.
For more information about the interface installation, please refer to the mounting and installation instructions for the interface.

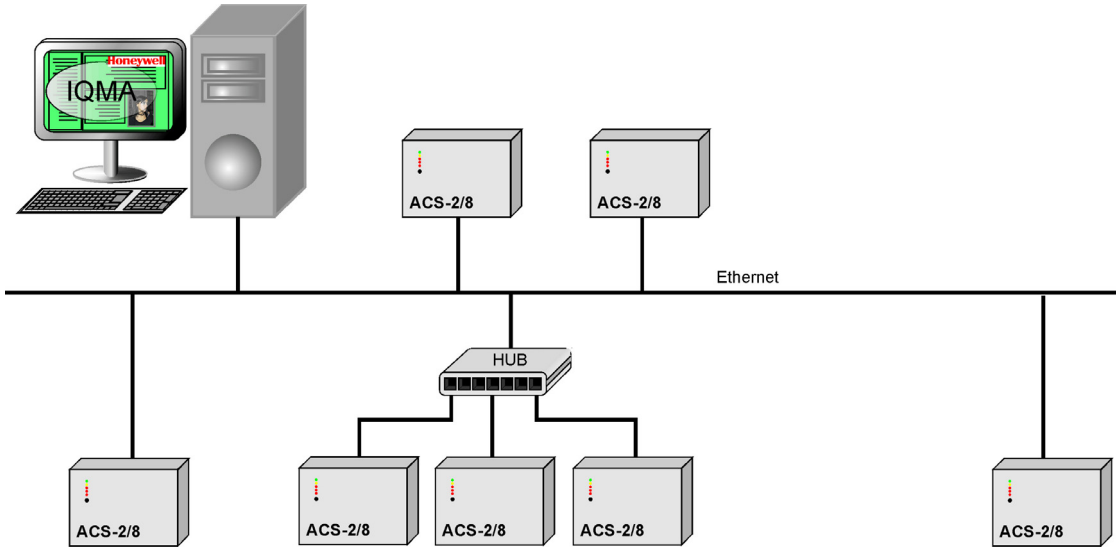
7.2 Connection examples and networks

Example 1: Connection via interface converter. One or two RS 485 cables, 5-wire line, ACS-8 only application for up to 8 controllers with MultiAccess for Windows, 16 with IQ MultiAccess.



Example 2: Ethernet connection

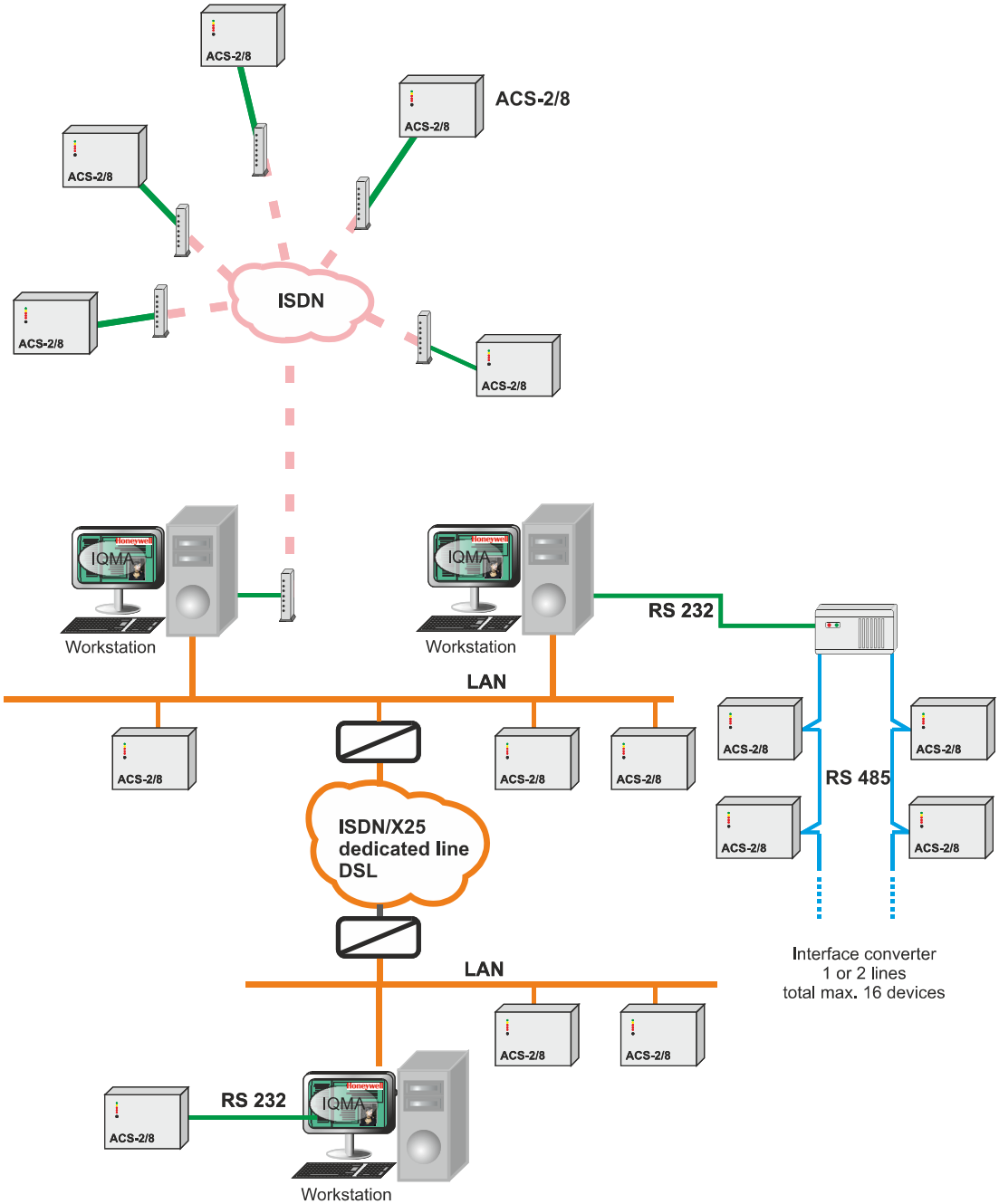
Connection to the network via standard Ethernet cable (Cat 5 or higher) connected to the HUB, router or switch via network terminal jack (RS45).



Example 3: Remote data transmission (RDT) and network

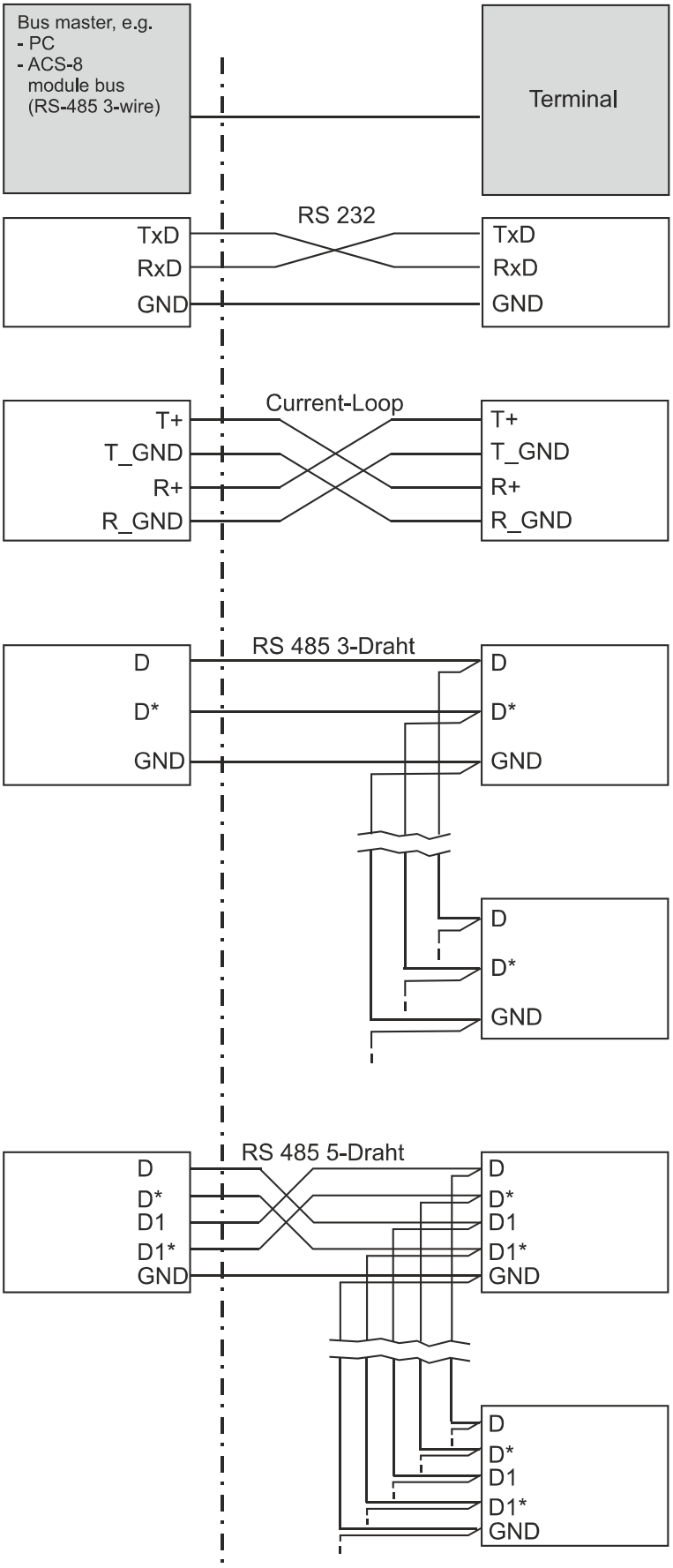
Remote data transmission (RDT):
Remote stations can be managed via Remote data transmission. It is possible to link one ACS-8 controller to one modem.

Network:
MultiAccess for Windows or IQ MultiAccess makes it possible to use existing networks. *MultiAccess for Windows* can be accessed from up to 64 workstations. With *IQ MultiAccess* there are no limitations. Any combination with other controllers is possible.



7.3 Interface connections

The pin assignments are described on the interface connections shown here and in the following two tables.



The data lines must be switched between the interface converter and the first RS 485 device. All following devices are to be connected 1 : 1.

7.4 Pin assignment tables

Table 1: Pin assignment of the interface multiplier/converter and PC.

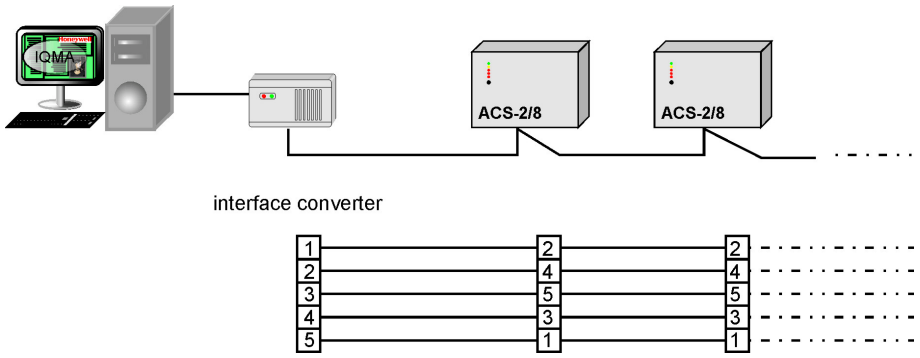
Device	Pin	RS 232	RS 485 (3-wire)	RS 485 (5-wire)	Current-Loop
COM1/COM2 9 poles	123 456 789	DCD RxD TxD DTR GND DSR RTS CTS RI			
COM1/COM2 25 poles	234 567 820 22	TxD RxD RTS CTS DSR GND DCD DTR RI			
Interface converter	123 45			D1 D D* D1* GND	

Table 2: Pin allocation of the controllers

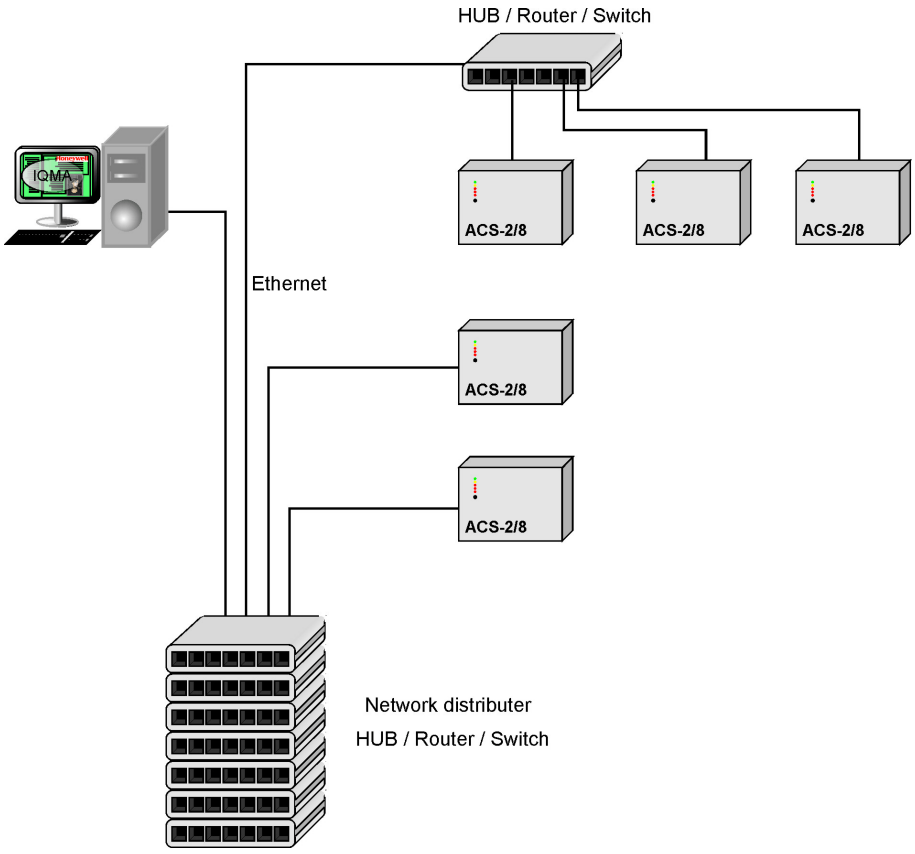
Device	Pin	RS 232	RS 485 (3-wire)	RS 485 (5-wire)	Current-Loop
ACS-1, ACS-Compact, ACS-2, ACS-8, TRS 6, TRS 8, TRS 10, TRS 15	123 45	GND TxD RxD	GND D D*	GND D D* D1 D1*	T GND T+ R+ R GND
Display panel, TRS 20, TRS 30	123 456 7	 TxD RxD GND	 D D* GND	 D D* GND D1 D1*	R GND T+ R+ T GND

7.5 Connection examples including terminal designations

Example 1: Connection via interface converter RS 485 5-wire technique.



Example 2: Connection via Ethernet.



8. Configuration

8.1 Conventional connections

The ACS-8 controls the access to a room and the use of an additional interior reader extends the use to control the exit from a room. The readers used must both use the same reading principle (magnetic card reader, contactless / proximity reader or chip card readers).
Using the door monitoring contact, the ACS-8 recognizes whether the door was opened, was open too long or was opened by force.

Configuration example 1: 2 entrance doors

A reader controls only access to a room. The room can be exited without identification. The door lock can be released manually by a push-button in the secured zone.

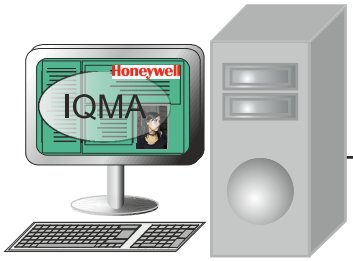
Configuration example 2: 1 entrance door with interior and exterior reader

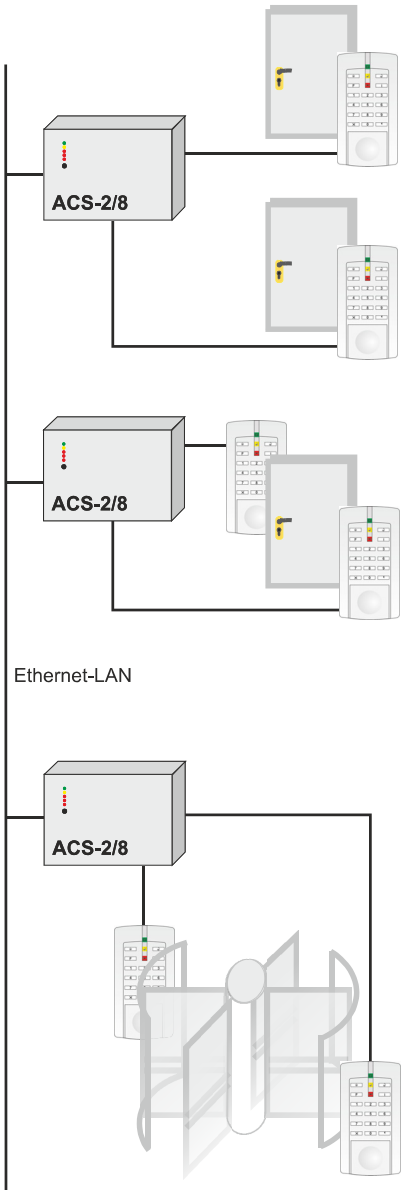
Both the access to and exit from a room, are controlled by separate readers.
The “antipassback” option can be activated and consequently, the current location of personnel can be found.

Configuration example 3: Turnstile for entrance and exit

The ACS-8 can also be operated in the “turnstile” mode.
In this case, a turnstile is controlled instead of the door strike. The door strike relay 1 is used for the first direction of rotation and the door strike relay 2 is used for the second direction of rotation.

In combination with IQ MultiAccess an ACS-8 can control a maximum of 4 doors. This means that all onboard relays are used as door strike relays. Two readers can be connected onboard via clock/data, the remaining readers must be used in RS 485 mode and are to be connected via the module bus (communication module required).





8.2 Connection via the optional communication module (026587)

The number of doors controlled can be increased to eight by using the optional communication module 026587 and the RS 485 bus technology

The following modules are available:

Device	Item no.
4I/2O-module (4 inputs, 2 outputs, for door control)	26592
Door module (for the control of one door, connection of 2 clock/data readers and 2 2-wire keypads)	265931002659410
4-I-module (4 inputs, for building management system)	26590
4-O-module (4 outputs, for building management system)	26591
Potential separation module	2659510
Readers / keypads see latest product catalogue	

8.2.1 Overview

The communication module has two floating RS 485 interfaces.

The 4I, 4O, 4I/2O modules each have floating RS 485 interfaces.

The reader, keypad and the door modules are not floating. If potential separation is required, up to 4 of these modules can be connected to the RS 485 bus using the potential separation module

There are two possible connection arrangements:

1. Using power supplied from the ACS-8
   - All modules are supplied with power from the ACS-8.
   - No potential separation is required.
   - The distance limitations for RS 485 are dependent on the voltage drop on the 12V supply lines. (All 12V modules have an operating voltage range of 10-15V DC).

2. Decentralized power supply from more than one external power supply units distributed throughout the system.
   - If problems should appear with the data transmission to the ACS-8, a potential isolator (POT) should be used.

8.3 Configuration examples peripheral devices

Legend for the overview on the following pages:

Reader (general)

ACS-8 input module (Art. No. 026590)

ACS-8 output module (Art. No. 026591)

ACS-8 input/output module (Art. No. 026592)

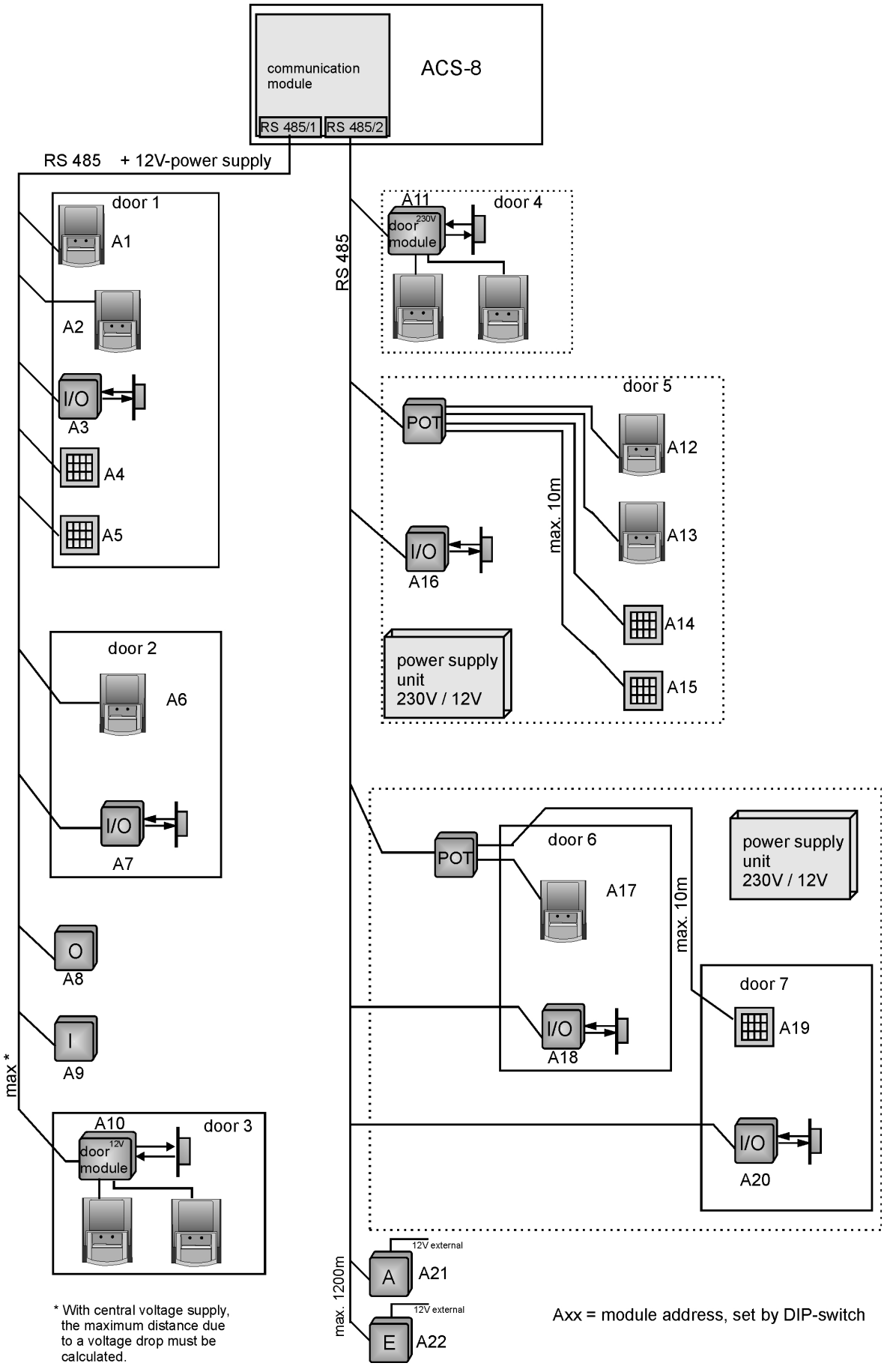
Potential separation module (Art. No. 026595)

ACS-8 door module (Art. No. 026593 / 026594)

Keypad (Art. No. 027570)

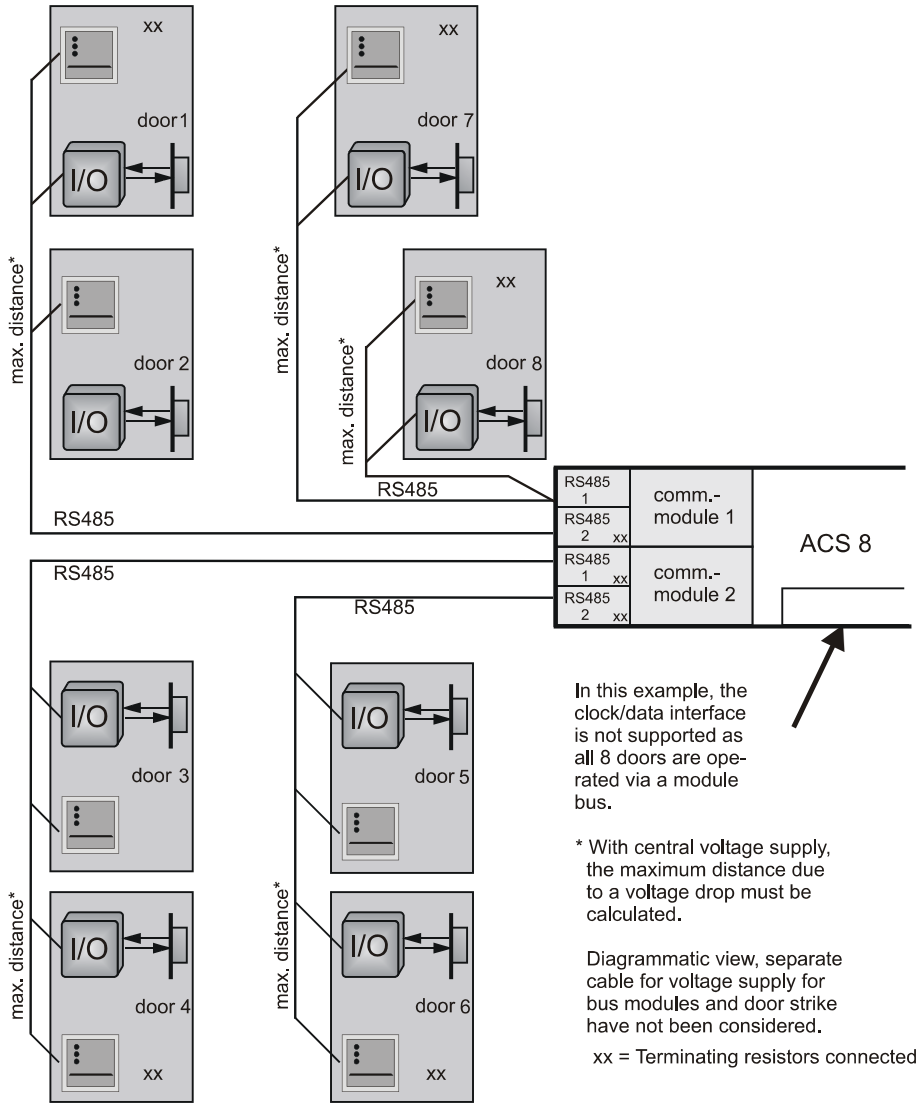
Door strike with monitoring contact

8.3.1 Configuration overview with address assignment example



8.3.2 Configuration example 1:

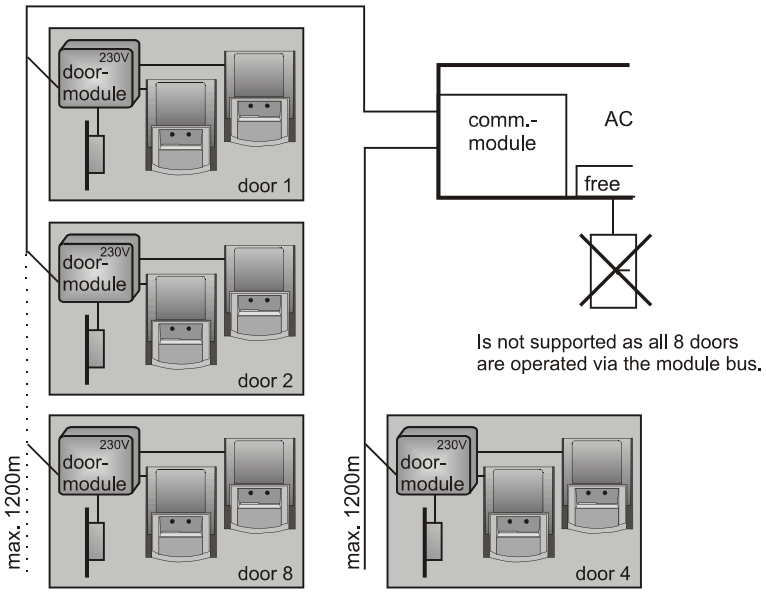
8 door configuration using RS-485 modules



- ❍ There are two communication modules cascadable.
- ❍ Each two doors have their own RS-485 output.
- ❍ The terminating resistors are placed in each last participant (marked by xx)
- ❍ The conventional connection is not used in this example, as all 8 doors are supported by the module bus.

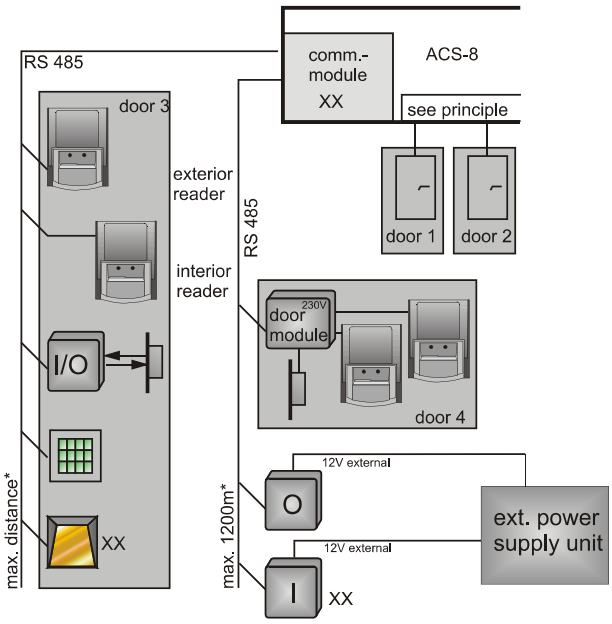
8.3.3 Configuration example 2:

Up to eight doors controlled by door modules, all doors have both interior and exterior readers.



8.3.4 Configuration example 3:

All RS 485 modules are connected to the ACS-8
Two doors connect directly to the ACS-8
One door connects via the RS 485 module
One door connects via a door module
Additional building management function are supported using the I/O modules



* Because of voltage drop, the maximum distance has to be calculated when using central power supply.

In this diagram the seperate lines for power supply of the bus modules and door strikes are not considered.

xx = terminating resistors connected

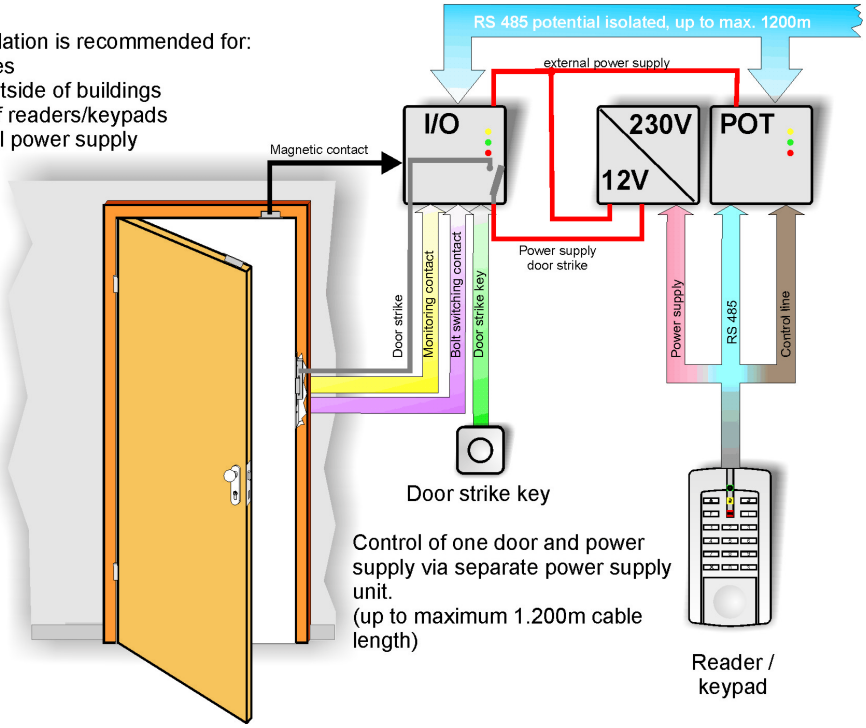
(See also chapter 6.6.2 for explanations of configuration example 3).

8.3.5 Configuration example 4:

Connection to I/O module with external power supply and potential isolation module

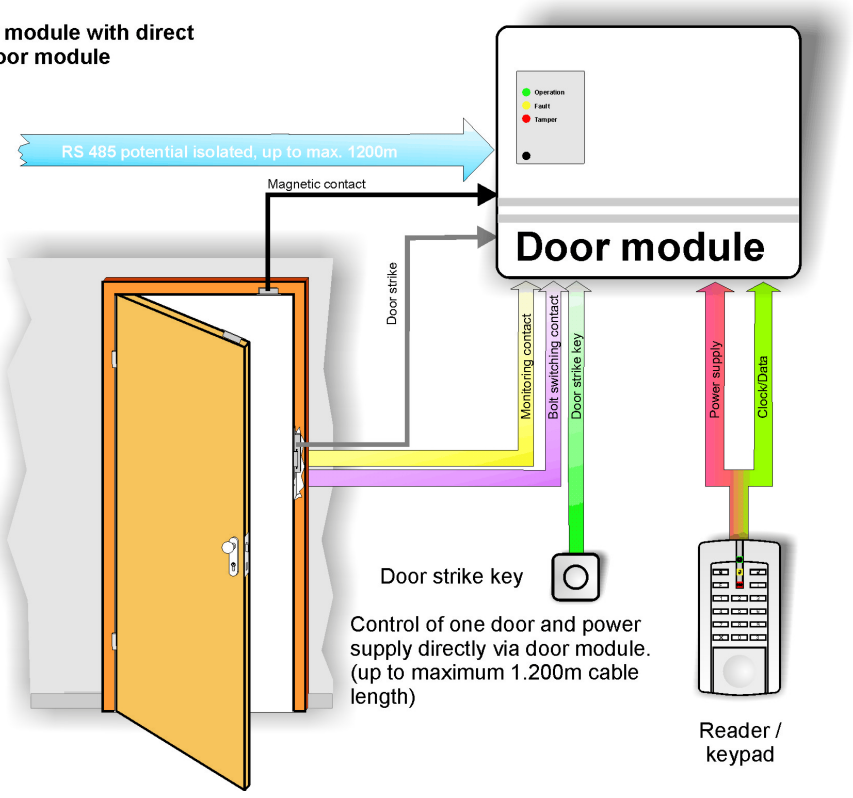
Module potential isolation is recommended for:

- long bus lines
- Bus lines outside of buildings
- Operation of readers/keypads with external power supply



8.3.6 Configuration example 5:

Connection to door module with direct power supply via door module



9. Mounting

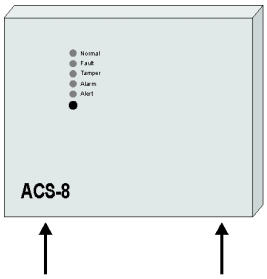
9.1 Installation location

It is recommended that the following criteria are considered when choosing the location for the control unit:

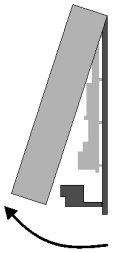
- within a building
- easily accessible
- within a secure zone
- protected from extraordinary environmental conditions, e.g. aggressive vapors, higher air humidity, etc.
- mounted at eye level
- not visible from the outside
- securely mounted sufficient to resist being pulled off
- adequate spacing between adjacent devices
- inner wall mounting in the secure zone – if the device can only be mounted on the outer wall, break-through monitoring might be required.

9.2 Mounting the ACS-8

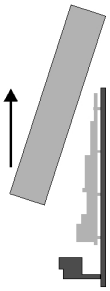
1. Remove the housing screws



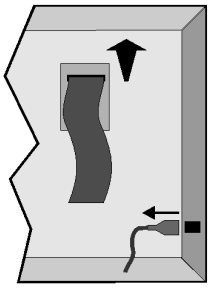
2. Tilt the housing cover to the front as shown in the illustration.



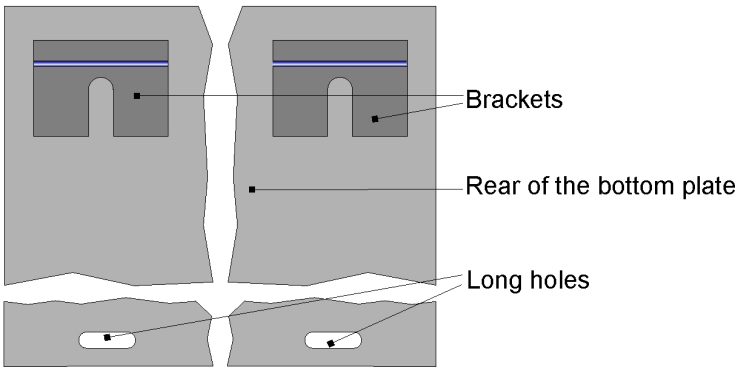
3. Remove the housing cover carefully.



4. Disconnect the LED board connecting cable and the ground conductor.



5. Locate the screws by observing the distance of the brackets and attach the bottom plate. Secure the bottom plate by means of two additional screws and the long holes.



6. The commissioning of the device is described in chapter 11. The individual steps to be carried out while the cover housing is open must be followed. Then replace the housing cover and secure it with the housing screws.

It is recommended that any batteries are only fitted when commissioning the system.

9.3 Installing the interface

Read all documentation accompanying the interface.

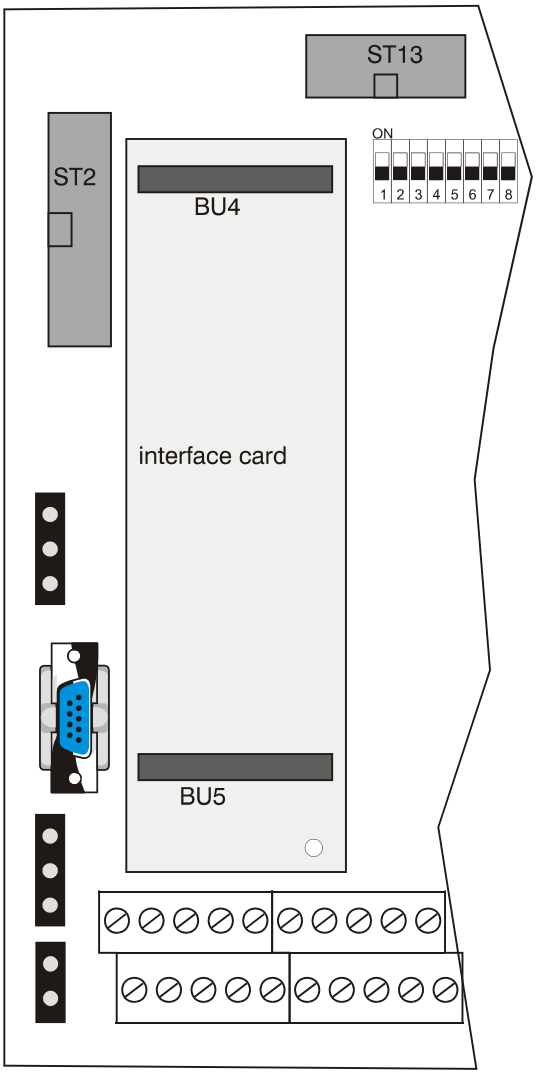
Switch the power supply off.

Antistatic handling precautions should be used when fitting the interface PCB.

Hold the interface by gripping only the sides and avoid touching the connectors.

Insert the interface. See illustration.

Secure the interface with the screw provided.



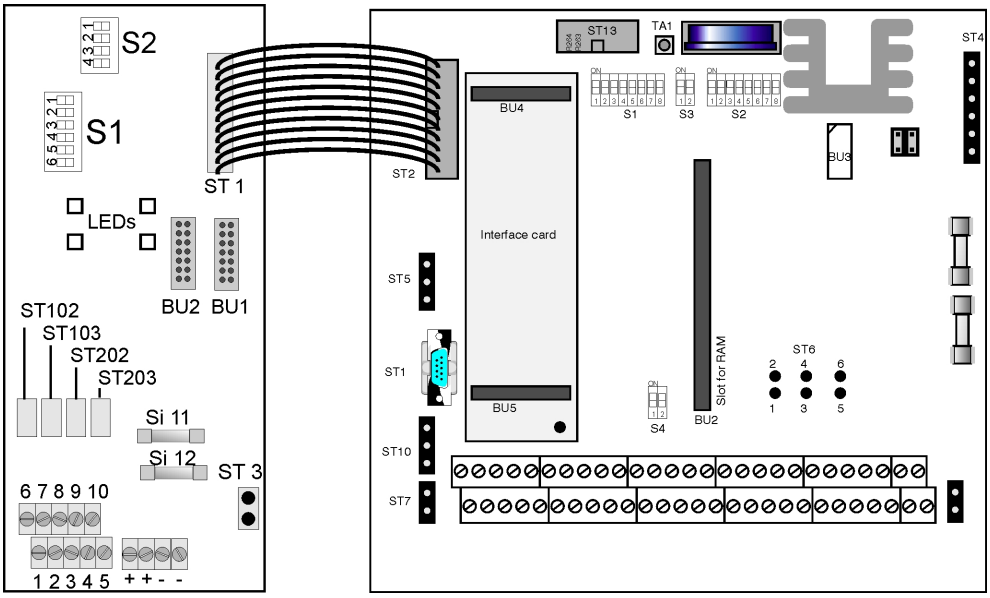
9.4 Installing the communication module

Warning! Destruction of the PCB possible!
Never remove the cable from ST1 of the communication module or from ST2 of the ACS-8 while the device is in operation!

Switch the ACS-8 off. Use antistatic handling precautions before taking the communication module out of the antistatic bag. Hold the communication module by gripping only the sides and avoid touching the connectors.

Fit the communication module to the mounting pillars and screw it in place. Connect it to the CPU board of the ACS-8 with the attached cable.

ST1 on the communication module links to ST2 on the CPU board



Pin assignments (also see chapter 8.4):

ST1: - Connection of a single communication module to the ACS-8.
- Connection of the first (lower) communication module to the ACS-8 (when using 2 communication modules).

ST3: 12V DC and 0V supplied from the power supply unit. WARNING! Ensure that the polarity is correct!

BU1 and BU 2 are used only if two communication modules are installed.

BU1: Not used for the first (lower) communication module.
By the second (upper) communication module for connection to the first (lower) one.

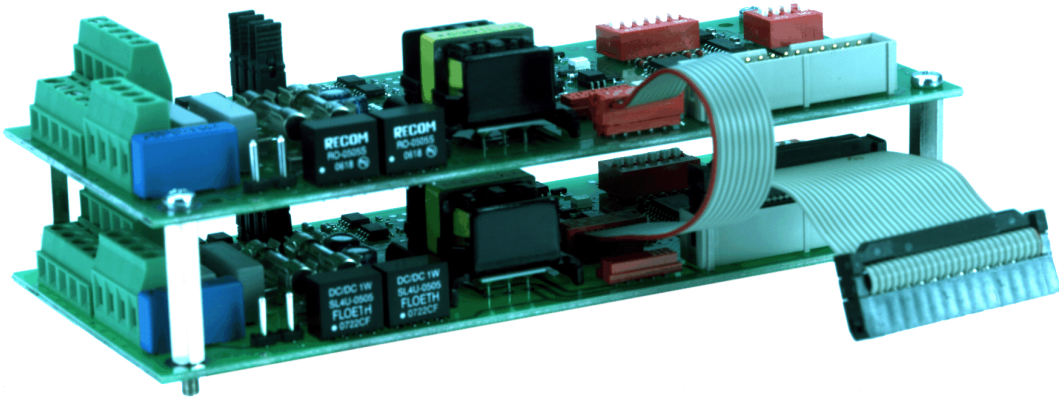
BU2: By the first (lower) communication module for connection to the second (upper) one.

ST102, ST103: RS 485 bus termination lower terminal strip.

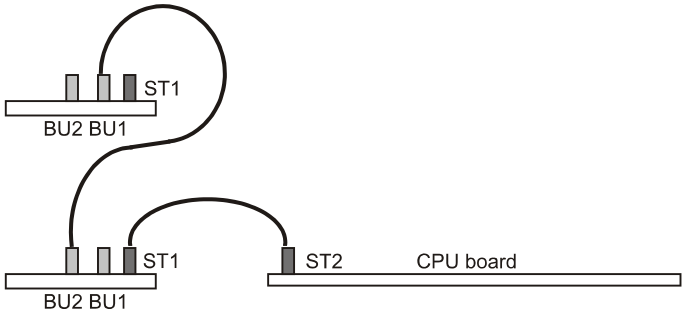
ST202, ST203: RS 485 bus termination upper terminal strip.

Caution! Malfunction possible!
Even lines that are not used, must be terminated!

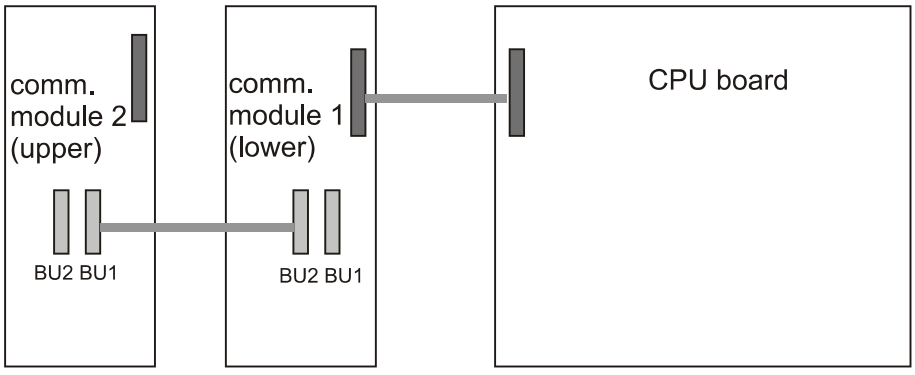
When two communication modules are to be fitted, install and connect the first module as described above. Install the second module directly above the first module.
Connect the two together using the attached cable between BU2 of the lower module and BU1 of the upper one. (See the diagram below.)



side view:



plan view:



9.4.1 Communication module information

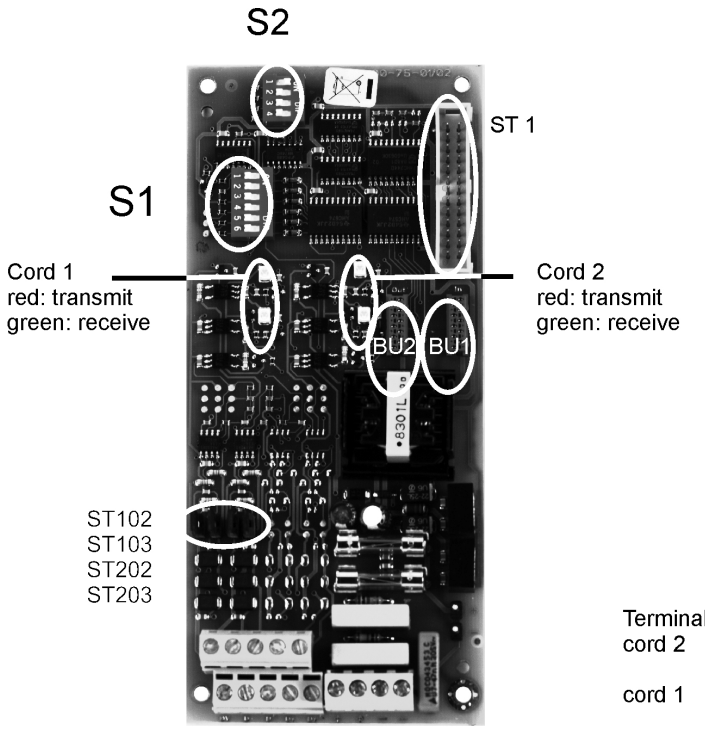
The communication module is an optional component enabling the connection of RS 485 modules. The board is installed on the free mounting surface. Each communication module is equipped with 2 floating RS 485 outputs.

If the potential has to be determined, a jumper can be placed to link from terminal 1 or terminal 6 to terminal "-".

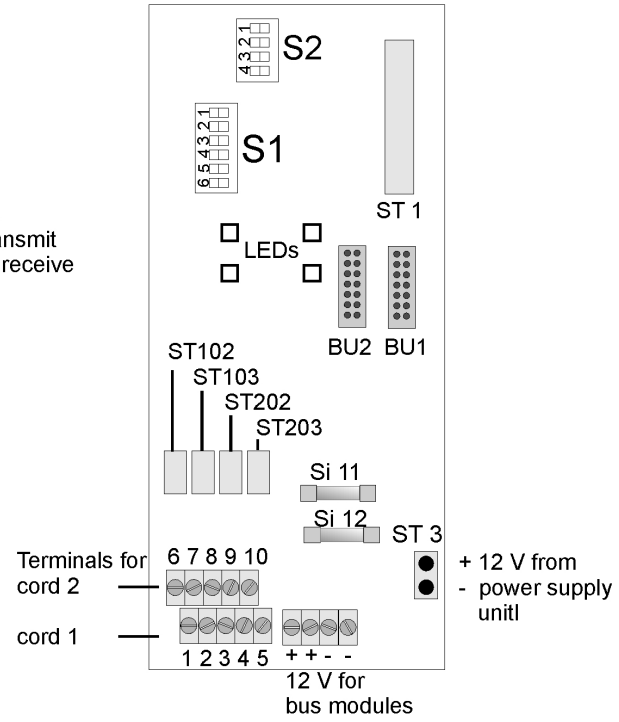
A maximum of 2 communication module boards can be installed (see previous page). This means that an ACS-8 can operate up to 4 separate lines (see chapter 8.3 Configuration examples).

Mounting information for the communication module:

Actual



schematic (simplified)



Fuses: Si 11: 1AT, external voltage for line 1 (cord 1)
Si 12: 1AT, external voltage for line 2 (cord 2)

DIP switches:

DIP switch S1 can be used to switch off selected bus lines allowing an additional security feature to function. This allows the ACS-8 to de-activate selected lines following a trigger event.

With all switches in the OFF position (factory setting) all the RS 485 lines are active. Any lines whose DIP switch is set to ON can be deactivated by the ACS-8. This prevents any tampering affecting the other data buses from the communication module.

Switch / line allocation:

Switch block	Switch	Line	Communication module	Terminals
S1	1	1	1	1, 2, 3
S1	2	2	1	6, 7, 8
S1	3	3	2	1, 2, 3
S1	4	4	2	6, 7, 8
S1	5	5	reserved, remains OFF	
S1	6	6	reserved, remains OFF	

DIP-switch 2 of the communication module has to retain its factory settings in the current version (see table). Additional planned features have not been implemented to date.

Switch block	Switch	Position	Function
S2	1	ON	Factory settings
S2	2	OFF	
S2	3	OFF	
S2	4	OFF	

Terminal assignment:

RS 485 bus	Terminal	Designation
1	1	0V
	2	D
	3	D*
2	6	0V
	7	D
	8	D*

9.5 Insert/change lithium battery

Danger!

The device contains a lithium battery.
To avoid the risk of fire or burns, the battery must not be damaged, short-circuited or reloaded. Do not contact it with fire or water. There is a risk of explosion if the battery is changed improperly.
Replace the battery only by the same or an equivalent type recommended by the manufacturer. Dispose used batteries according to EU guidline 2006/66 (see info next page).

A batteriy change must only be carried out by qualified personell introduced to the VDE regulations.

Danger of data loss / disruption in operation!
All data will be lost if the device is set to dead-voltage and the battery is removed. Data must be reloaded to the controller via the AC-software function "Load data". According to the amount of data, this procedure may vary in length of time. During this time the concerned doors are without any function.

If the power fails, the data is maintained by a lithium battery.
The life span of the lithium battery is approx. 3 years. If a power failure occurs for a lengthy period, the capacity of the battery is considerably reduced.
Since the status of the battery cannot be clearly determined it is recommended that the battery be changed **every two years.**

Lithium battery (type CR 2477N, 3 V 950 mAh) for data preservation in ACS-8 = item no. 018050.

"Battery empty" Message
The ACS-8 continuously checks the status of the lithium battery. If the voltage reaches a critical state, *MultiAccess for Windows or IQ MultiAccess* issues the "Battery empty" message and the "Tamper" LED of the ACS-8 lights up.

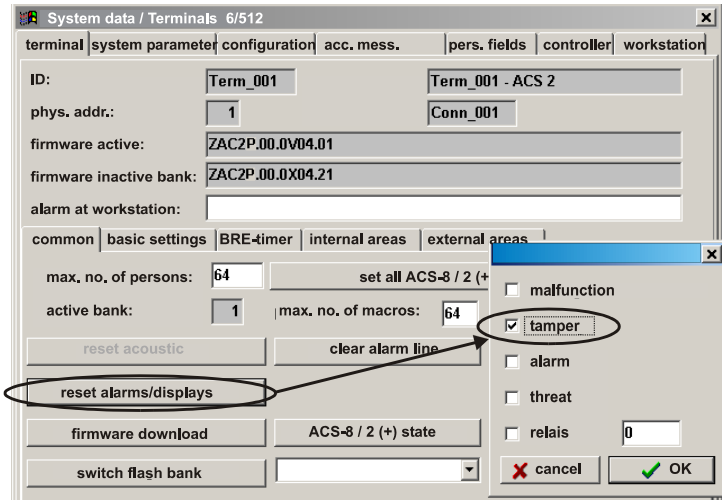
In this instance, the battery must be replaced **immediately**.

Procedure

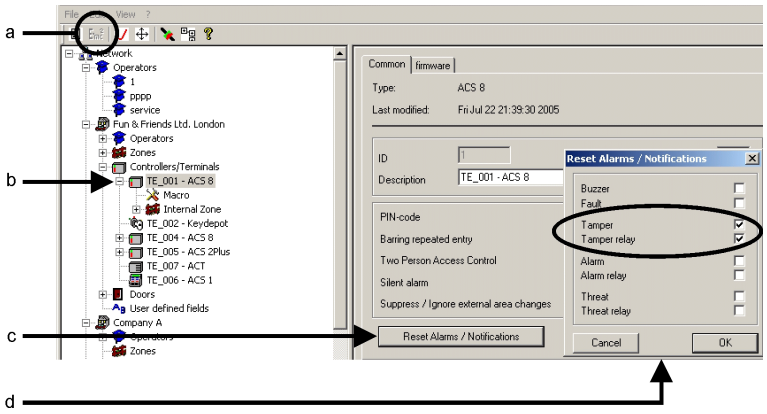
1. Open the device as described in chapter 8.2 ,steps 1 to 4.

   Bear in mind that the tamper switch is activated; you have to reset the tamper message of the respective controller in MultiAccess for Windows or IQ Multi Access.

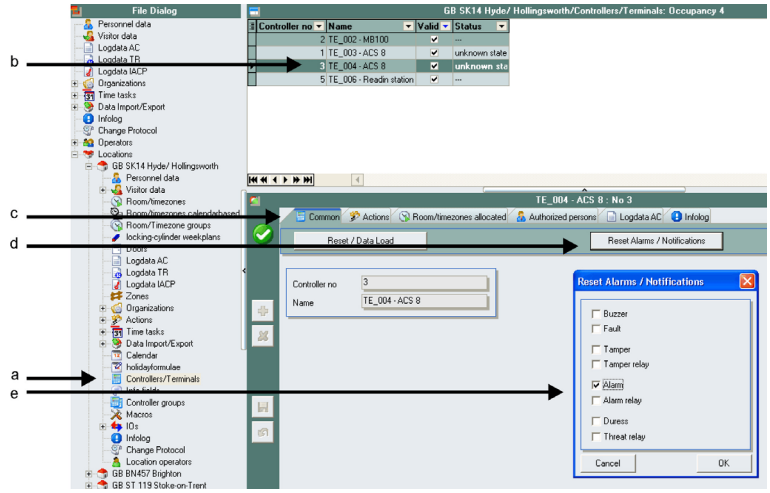
   Example in MultiAccess for Windows with ACS-2plus (ACS-8 is identical):
   - System data
   - System parameter
   - Terminal
   - Alarm/display reset



Example in IQ MultiAccess:
In IQ NetEdit:
a) Logical view
b) Select controller
c) Reset alarms/notifications
d) Select alarm to reset.

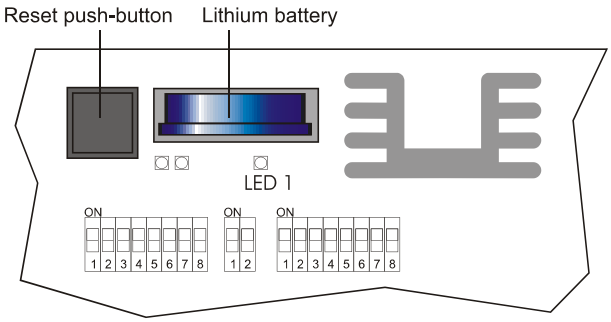


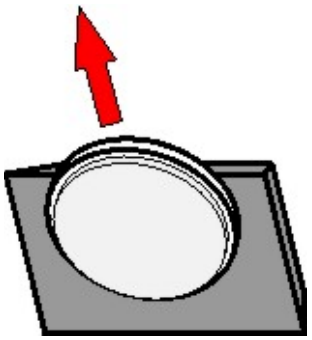
or in IQ MultiAccess (as of V7):
a) Controllers / terminals
b) Select controller
c)"Common" tab
d) Reset alarms/notifications
e) Select alarm to be reset



The "Tamper" LED of the ACS-8 extinguishes.

2. Pull lithium battery off plastic holder.





3. Insert new battery.

4. Reconnect the removed cables and close the device.MultiAccess for Windows or IQ MultiAccess displays "Battery ok". If necessary repeat "Reset Alarms".

Notes on environment / disposal

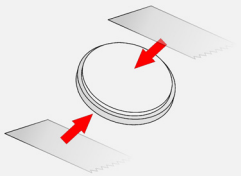
Batteries and recharchable batteries - even free from heavy metal - must not be disposed of in domestic waste. According to EU guidline 2006/66/EG users are obligated to return batteries for recycling. In Germany they will be accepted for free at each selling point; alternatively they can be dispensed in public storage vessels for old batteries or at public waste disposal authorities.

Outside of Germany please observe the local regulations on battery disposal.

Commercial batteries may contain heavy metal labelled by:

Pb for lead
Cd for cadmium
Hg for mercury

Please protect used lithium batteries (Li) against short-circuit by masking both terminals using adhesive tapes or by depositing them into the original packing.



9.6 DIP switches on the CPU board

Note: The settings described in the chapter ”Connection diagrams” refer to the DIP switches in this chapter. The settings described in chapter 9 refer exclusively to the DIP switches of the communication module.

(See chapter 1, Overview, and chapter 15, CPU component mounting diagram.)

9.6.1 S1 DIP switch

Table 1: addresses

1	2	3	4	5	Function
0	0	0	0	0	Address 1 = factory setting
1	0	0	0	0	Address 2
0	1	0	0	0	Address 3
1	1	0	0	0	Address 4
0	0	1	0	0	Address 5
1	0	1	0	0	Address 6
0	1	1	0	0	Address 7
1	1	1	0	0	Address 8
0	0	0	1	0	Address 9
1	0	0	1	0	Address 10
0	1	0	1	0	Address 11
1	1	0	1	0	Address 12
0	0	1	1	0	Address 13
1	0	1	1	0	Address 14
0	1	1	1	0	Address 15
1	1	1	1	0	Address 16
0	0	0	0	1	Address 17
1	0	0	0	1	Address 18
0	1	0	0	1	Address 19
1	1	0	0	1	Address 20
0	0	1	0	1	Address 21
1	0	1	0	1	Address 22
0	1	1	0	1	Address 23
1	1	1	0	1	Address 24
0	0	0	1	1	Address 25
1	0	0	1	1	Address 26
0	1	0	1	1	Address 27
1	1	0	1	1	Address 28
0	0	1	1	1	Address 29
1	0	1	1	1	Address 30
0	1	1	1	1	Address 31
1	1	1	1	1	Address 32

0 = OFF
1 = ON

Table 2: Protocol and Baud rate

6	7	Function	Connected to	Comment
0	0	Setup via terminal program	e. g. Event protocol (for ethernet)	Switch positions 1-7 OFF
0	0	Ethernet interface card, encrypted (Item no. 026840.30) Configuration mode (Description see documentation P55213-10-xxx)	RS 232 (ST1, socket)	Switch positions 1-5 ON
0	1	9-Bit-Protocol = factory setting		With these protocols, the baud rate is **fixed** set at 19200.
1	0	DIN-66090-Protocol	Interface converter COMx / X-Port / X-Port Pro	
1	1	RDT-Protocol	Modem ISDN card	

0 = OFF
1 = ON

Table 3: Service-Function

8	Function
0	Factory setting (service function not active... switch positions 1 - 7 according to table 1 and 2)
1	Service function (switches 1 - 7 see table 4)

Warning! **Switch 8 is reserved for service level functions and should not be changed from the factory setting of OFF. Changing the switch setting may cause loss of data.**

Do not change factory settings!

Table 4: functions with the service switch activated

1	2	3	4	5	6	7	8	Function
1	1	1	1	1	1	1	1	Bootstrap

If the switch 8 *ON state* is detected, LED 1 on the CPU board flashes green until the next reset is carried out.
The flashing green LED indicates that a function is in process. When this LED lights permanently, the function has been completed

Procedure of bootstrapping:

1. Set all DIP switches to ON
2. Reset (reset push-button)
3. LED 1 flashes (wait)
4. LED 1 lights permanently
5. Switch DIP S1 to the required position (baud-rate, address, protocol, etc.)
6. Reset (reset push-button)

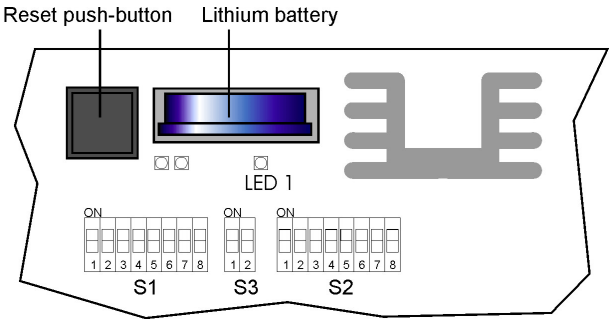


Table 5: Settings for ACS-8 Setup (See chapter **11**).

1	2	3	4	5	6	7	8	Function
0	0	0	0	0	0	0	0	Setup via Hyperterminal

An unintentional activation of the switch 8 can be ignored by resetting it to OFF (while LED 1 flashes). After the reset, the device does not switch to service mode.

A reset must be carried out for any changes in the switch settings to be effective. The controller must then be parameterized. (See operating manual for MultiAccess for Windows or IQ MultiAccess).

9.6.2 S2 DIP-switch

The settings of this switches depend on the used reader types (see chapter 17).

1	2	3	4	5	6	7	8	Designation	
1	x	x	x	0	x	x	x	Clock 1 (Pull down)	Factory setting
x	1	x	x	x	0	x	x	Data 1 (Pull down)	
x	x	1	x	x	x	0	x	Clock 2 (Pull down)	
x	x	x	1	x	x	x	0	Data 2 (Pull down)	
0	x	x	x	1	x	x	x	Clock 1 (Pull up)	
x	0	x	x	x	1	x	x	Data 1 (Pull up)	
x	x	0	x	x	x	1	x	Clock 2 (Pull up)	
x	x	x	0	x	x	x	1	Data 2 (Pull up)	

0 = OFF
1 = ON
X = any

9.6.3 S3 DIP-switch

1	2	Designation	
0	0	The current flash bank is automatically selected	Factory setting
1	0	Flash 1 always active	Only after consultation with factory support.
0	1	Flash 2 always active	
1	1	Flash 1 always active	

This switch block selects the firmware version. The factory setting ensures that the current version is always automatically loaded. (This function becomes valid only after a firmware update and is described in this context. It is not relevant to version 1).

9.6.4 S4 DIP-switch

This switch block is reserved for internal programming and test purposes. Therefore, the following factory setting should not be changed:

1	2	designation
1	0	factory setting

9.7 Memory extension

The ACS-8 is equipped with a 1MByte memory which is mounted on the CPU board.

The following additional memory extensions are available:

- 026596 1 MB RAM memory card
- 026597 2 MB RAM memory card
- 026598 3 MB RAM memory card

Only one slot is available for additional memory cards. The best memory extension size can be determined by the calculation described below.

9.7.1 Calculation of the memory requirements

The memory requirements depend on the type and number of cards used as well as on the number of bookings to be stored.

Use the table in the appendix to simplify the determination of the required memory and memory extension.

The following example explains the use of this table:

Calculating of memory requirements of ACS-2 plus / ACS-8

1. Memory requirements of the ID-cards

designation	no. of digits possible	no. of digits required	divided by no per BYTE	value	rounded to the next integer	x no. of ID-cards (max. 65.000)	memory requirements
Header	13	13	------	13	13		
ID no.	4-20		: 2 =		=>		
PIN-code	4-8		: 2 =		=>		
Version no.	0-2		: 2 =		=>		
R/T-zones	0-512		: 8 =		=>		
Indexing	0 / 6		-------		=>		
Macros	0 - 64		: 8 =		=>		
		memory requirements per ID-card				x	=

sub total 1

2. Memory requirements for BRE/ APB

Designation	no. of digits possible	no. of digits required	x BYTE	total	x no. of ID-cards (max. 65.000)	memory requirements
BRE	0-16		4			
APB	0 = no, 1 = yes →					
Fixed value on active APB, **or** active BRE, **or** active APB and BRE				+4		
memory requirements per ID-card					x	=

sub total 2

3. Memory requirements for bookings

Value	x no. of bookings	total	+ fixed value 45	= memory requirements
9	x	=	+ 45	=

sub total 3

total memory requirements:

4. Analysis of the required RAM-extension

	Standard-equipment	1 MB extension	2 MB extension	3 MB extension
free *	0.5 MB	1.5 MB	2.5 MB	3.5 MB
- required memory				

* = 0.5 MB memory are needed / reseved for internal purpose

The fields highlighted in grey must be filled in (ensure that the digits entered are within the limits indicated):

1. Calculation of the memory requirements for the cards

Header: This is a preset value using 13 bytes for each card.

ID no.:
- ❍ Enter the number of digits of the identification code to be used in the column '*no. of digits required*' (e.g. 20 in case of 20-digit coding according to Esser or DIN).
- ❍ Divide this number by 2 and enter the result in the column '*value*'. (This indicates the required number of bytes to hold two decimal (0-9) digits each).
- ❍ ID no.: if the result of the division is not an integer (e.g. 7.5), the result must be rounded up to the next integer (for a 'value' of 7.5, this would be 8) and entered in the column '*rounded to the next integer*'.

PIN-code:
- ❍ Enter the number of digits of the PIN code to be used in the column no. of digits required (the PIN code must be from 4 to 8 digits long).
- ❍ Divide this number by 2 and enter the result in the column 'value'. (This indicates the required number of bytes to hold two decimal (0-9) digits each).
- ❍ If the result of the division is not an integer (e.g. 2.5), the result must be rounded up to the next integer (for a 'value' of 2.5, this would be 3) and entered in the column '*rounded to the next integer*'.

Version no.:
- ❍ Enter the number of digits of the version number to be used in the column no. of digits required. Contactless / proximity cards use a unique number twenty digits long. In this case, no version number is required. In all other cases, a two digit version number is entered. It is recommended to enter 2. ?
- ❍ Divide this number by 2 and enter the result in the column '*value*'. (This indicates the required number of bytes to hold two decimal ()0-9 digits each)
- ❍ If the result of the division is not an integer (e.g. 0.5), the result must be rounded up to the next integer (for this example, to 1) and entered in the column '*rounded to the next integer*'.

R/T-zones:
- ❍ Enter the number of required room/time zones. Divide this value by 8 and round the result to the next integer. the ACS-8 stores only those room/time zones, to which doors are allocated controlled by this controller.

Indexing:
- ❍ If indexing is used, a fixed value using 6 bytes for each card must be reserved. If indexing is not ot be used, the value of this field is 0.

Macros:
- ❍ Up to 64 relays can be managed by the ACS-8 (using I/O-modules). Enter the number of relays to be used in the column '*no. of digits required*'.
- ❍ Divide this number by 8 and enter the result in the column value. (This results in the required number of bytes to hold the number.)
- ❍ If the result of the division is not an integer (e.g. 1.5), the result must be rounded up to the next integer (in this case to 2) and entered in the column '*rounded to the next integer*'.

Add the values entered in the '*rounded to the next integer*' columns and enter the total in the field 'memory requirements'.
Enter the required number of cards in the field to the right (up to 65000).
Multiply the values entered in the fields '*memory requirements*' and '*no. of ID-cards*' and enter the value in the field '*memory requirements*'.
Enter the value of the field '*memory requirements*' and also in the field '*subtotal 1*'.

2. Calculation of the memory required for APB / BRE

(For more information on the functions "barring repeated entry" and "anti pass back", please refer to the manual "Extended functions of MultiAccess for Windows" (P32201-46-0G0-xx) or "Extended functions of IQ MultiAccess (P03205-46-0G0-xx).**)**

- ❍ This section can be skipped if neither the "barring repeated entry" function nor the "anti pass-back" function is being used.

APB:
- ❍ Skip this line if APB is not being used. If APB is active, the number entered here is the number of door sides that use the APB feature.
- ❍ Multiply this number by 4 and enter the answer in the column '*total*'. (This is the required number of bytes for storing this information.)

BRE:
- ❍ Skip this line if BRE is not used. If BRE is active, Enter 1 in the field 'total'.

Fixed value: The value 4 has to be added if either of the options APB or BRE are active.

(If both, APB **and** BRE are active, only 4 is be added (not 8!))

- ❍ The memory requirement per ID-card is arrived at by totalling the column "total", and multiplying this with the number of ID-cards required. The result is then entered in the field "Memory requirement".

Repeat this procedure for field subtotal 2.

3. Calculation of the memory required for bookings

Booking: Each booking occupies 9 bytes. Multiply this value by the number of bookings to be stored and enter the result in the column total.

A unique fixed value of 45 bytes is required for the bookings. Add this value to the value of the field total and enter the result in the field memory requirements.

Enter the value of the field memory requirements in the field subtotal 3.

Add the values of the fields Subtotal 1, Subtotal 2 and Subtotal 3 and enter the result in the field '*Required total memory*'.

4. Analysis of the required RAM extension

Enter the value of the field total memory requirements, rounded up to the next whole number, in the 4 blank highlighted fields and subtract this value from the free memory space shown above. If the result of any of these subtractions is 0 or any positive value, a memory extension is required for that column.

Example: The memory requirements for an ACS-8 controller is calculated based on the following conditions:

- 10,000 ESSER-coded contactless / proximity cards
- 6-digit PIN code
- 20 room/time zones
- Antipassback control
- Control of 7 macros
- 100,000 bookings
- 5 timers for BRE

Calculation:

Calculating of memory requirements of ACS-2 plus / ACS-8

1. Memory requirements of the ID-cards

designation	no. of digits possible	no. of digits required	divided by no per BYTE	value		rounded to the next integer
Header	13	13	------	13		13
ID no.	4-20	**20**	: 2 =	**10**	=>	**10**
PIN-code	4-8	**6**	: 2 =	**3**	=>	**3**
Version no.	0-2	**0**	: 2 =	**0**	=>	**0**
R/T-zones	0-512	**20**	: 8 =	**2,5**	=>	**3**
Indexing	0 / 6	**0**	-------	**0**	=>	**0**
Macros	0 - 64	**7**	: 8 =	**0,875**	=>	**1**
		memory requirements per ID-card				**30**

x no. of ID-cards (max. 65.000)		memory requirements
x **10.000**	=	**300.000**

sub total 1: **300.000**

2. Memory requirements for BRE/ APB

Designation	no. of digits possible	no. of digits required	x BYTE	total
BRE	0-16	**5**	4	**20**
APB	0 = no, 1 = yes →			**1**
Fixed value on active APB, **or** active BRE, **or** active APB and BRE				**+4**
memory requirements per ID-card				**25**

x no. of ID-cards (max. 65.000)		memory requirements
x **10.000**	=	**250.000**

sub total 2: **250.000**

3. Memory requirements for bookings

Value	x no. of bookings	total	+ fixed value 45	= memory requirements
9	x **100.000**	= **900.000**	+ 45	= **900.045**

sub total 3: **900.045**

total memory requirements: **1.450.045**

4. Analysis of the required RAM extension

	Standard-equipment	1 MB extension	2 MB extension	3 MB extension
free *	0.5 MB	1.5 MB	2.5 MB	3.5 MB
- required memory	**1.5 MB**	**1.5 MB**	**1.5 MB**	**1.5 MB**

rounded 1.5 MB

* = 0.5 MB memory are needed / reseved for internal purpose

Result: A 1 MB memory extension is required.

If the memory space required is calculated to exceed the maximum available free memory space, alternative calculations using various lower values can be carried out. For example, the number of bookings to be stored can be reduced. Is it possible to switch less relays? Are all room schedules really required?

Approximate value

The standard memory of 1 MB (0.5 MB free) based on the calculation above is sufficient for approximately 1.500 cards and approximately 20000 bookings.

The required memory space for both of those values will be displayed by entering the max. ID card / max. areas in IQ NetEdit (for details see installation manual IQ MultiAccess, P32205-26-0G0-xx, additional tab).

9.7.2 Inserting / changing memory card

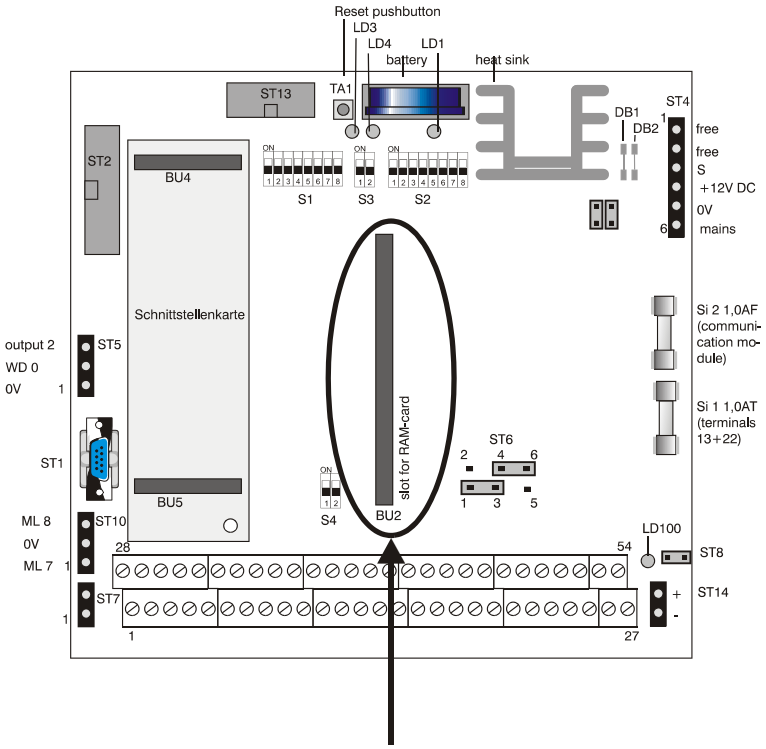
Caution! Data loss possible!

Never insert or remove the memory card while the ACS 2plus is powered up!
If the memory card is removed, all of the ACS-2plus data is irrevocably lost.

Danger of data loss / disruption in operation!
All data will be lost if the device is set to dead-voltage and the battery is removed. Data must be reloaded to the controller via the AC-software function “Load data”. According to the amount of data, this procedure may vary in length of time. During this time the concerned doors are without any function.

Procedure:

1. Switch the ACS-8 off.
2. Disconnect the CPU board from the power supply (remove the lithium battery, disconnect the battery and any emergency power supplies).
3. Observe antistatic precautions before removing the memory card from the antistatic bag.
4. Grip the memory card by its sides and avoid touching the connectors.
5. Insert the memory card. The slot is in the middle of the board.
6. Secure it with the 4 screws provided.
7. Bootstrap the device according to description on page 69 (table 3 and 4).
8. If the basic settings have been done via the setup (see chapter 11.1 varant 2), the setup must be repeated.
9. Run “Load data / parameterization” for the corresponding controller in the AC-software.



Memory extension slot

10. Determining the sizes of the power supply unit and the battery

10.1 Determining the size of the power supply unit

The ACS-8 part. No. 026585 is delivered with the power supply and charging unit 010690.02.
The factory settings of the DIP switches of this power supply unit are as follows:

S1/1	S1/2	S1/3	S1/4
ON	OFF	OFF	OFF

(The description of the settings can be found in the respective power supply unit documentation.)

If more power is required, the following alternative power supplies are available:
-012168 Power supply and charging unit, 80Ah, continuous current drain 3.5A can be used with part. No. 026575 - ACS 8 excluding psu.
-012170 Power supply and charging unit, 130Ah, continuous current drain 5A can be used with part. No. 026575 - ACS 8 excluding psu.

The DIP switches of these two power supply units must be set as follows:

S100/1	S100/2	S100/3	S100/4
OFF	ON	OFF	OFF

(The description of the settings can be found in the respective power supply unit documentation.)

The ACS-8 can physically hold:

1 x 018003 battery 12V 3.5Ah or
2 x 018002 battery 12V 2.0Ah

The following gives an example of how to calculate the current consumption of an ACS 8 controlling one door:

The ACS-8 controls one door.

Component	Current	Remark
CPU	200mA	Incl. alarm and tamper relay as these are usually energised.
Interface	200mA	Floating RS 485 interface
Reader (2x	140mA	Two contactless / proximity readers, each 70mA
Door strike	230mA	Esser DC fail save door strike
Total	770mA	
+10%	77mA	
Total	847mA ~ **850mA**	

Larger actuators (e.g. door strikes) or devices with higher current consumption can be supplied from external power supply units (see chapters 18.1 and 18.2: If this is the case, +12V DC and 0V are connected to the external power supply unit and not to terminals 45 and 46).

10.2 Determining the size of the battery

Recommendation: If power supply failure can occur at any time (e.g. on locations occupied 24 hours a day), then a backup time of 4 hours with 200 lock operations is recommended.

Assumption: The ACS-8 is controlling one door.

The door is opened 60 times within four hours.
The door release time is 10 seconds per opening (fail secure strike).

Component	Current consumption	Required Ah	Remark
CPU	200mA	0,8Ah	See previous page.
Interface	200mA	0,8Ah	See previous page.
Reader (2x)	140mA	0,56Ah	See previous page.
Door strike (1x)	230mA	0,038Ah	60 x 0,23A x 0,002777h (10s = 0,002777h)
Total	770mA	2,198Ah	
+10% reserve	77mA	0,223Ah	
Total	ca. 850mA	**2,4178Ah ~2,5Ah**	

Requirements of the power supply and charging unit and the battery:

1. Continuous current drain > = 850mA
2. Battery capacity >= 2.5Ah

In this case, the following must be selected:

010690.02 power supply/charging unit, 40Ah, continuous current drain 1.5A
018003 battery 12V/3.5Ah

Larger actuators (e.g. door strikes) or devices with higher current consumption can be supplied from external power supply units (see chapters 18.1 and 18.2: In this case, +12V DC and 0V are connected to the external power supply unit and not to terminals 45 and 46).

10.3 12V DC / 40 Ah power supply/charging unit, Art. No. 010690.02

- Fully electronic power supply/charging unit
- Voltage regulated
- Current limited
- Redundancy standby operation with battery monitoring
- Total discharge protection
- Charge monitoring
- Battery failure detection
- Up to 40Ah battery capacity

Directives for the power supply

- The power supply must be connected to the mains using a separate fuse. If the electrical installation is equipped with a residual current operated circuit-breaker (FI circuit-breaker), the power supply must also have its own residual current operated circuit-breaker. The fuse and the FI circuit-breaker should be located within the protected area if possible.

- If the power supply unit is not integral to the central unit, they should be mounted together to prevent any possibility of damage or interference with the interconnecting cable.

- The power supply unit should be connected to its own mains supply.

- Use only approved batteries with the power supply unit.

Mounting

Warning! Danger for man and / or device
Please note safety instructions!

Disconnect the unit from the power supply when installing the power supply.

When installing the power supply unit in the central housing, ensure that the isolating shield is placed between the bottom of the housing and the lower side of the board. Also ensure that the device is firmly screwed to the bottom of the housing.

The ground conductor connected to the supply circuit must be connected close to the connecting terminals of the supply voltage.

When connecting the power line (NYM 3 x 1,5 mm²) make sure that the minimum **air gaps (4mm)** and **creep distances (5mm)** between the electronic components or the peripheral devices and the power line are observed.

After installation, fit the covers supplied to prevent inadvertent manual contact with the connecting terminals.

Functional description

Two independent supplies are mounted on the mother board.

- **First output:**
  This supplies the central unit and the external circuits.
  - Central unit supply output, protected with 2.5A fuse (incl. external circuits)
  - External circuits output, protected with 2x1A fuses

- **Second output:**
  This is used to charge the batteries. The charging current is limited to 1.5A.
  The battery charging current is monitored and its temperature tracked using an NTC resistor.
  The fully charged voltage of the battery charging unit is factory set for Sonnenschein A500 series batteries.
  If it is necessary to change the setting, proceed as described in the chapter "Setting the fully charged voltage".

The supply voltage for the central unit and the external consumers must not be adjusted. These are tied to the battery charging current in order to avoid the large fluctuations that are liable to occur in the event of power failure.

Overvoltage protection:

The power supply unit is equipped with overvoltage protection. This is activated if the output voltage or the battery charging voltage **exceeds 17V DC** in case of a fault

Low voltage cut-off:

If, during battery operation, the battery voltage falls **below 10.5V**, the power supply to the central unit and the external consumers is switched off (cutoff relay).

This prevents unexpected operation due to undervoltage and the battery is protected from deep discharge.

The "!U<" warning signal is activated before the power supply is turned off (see description below).

Common faults:

The messages are issued via the outputs
- "Fault" (ST1/3), HIGH active and
- "Fault" (ST1/2), LOW active.

The following **causes of faults** are possible:

Power/ext. consumers/charging controller defective/
battery defective or missing/SE input

The type of fault is shown by the state of the LEDs located on the power supply board.

The S1 DIP switch allows certain causes of faults to be directed to the common fault output (see “connection diagram").

Fault U_ext. (ST1/7), output, LOW active.

This output is active when there is a fault on the external circuit outputs.

Fault SE (ST1/1), input, LOW active.

Fault outputs of other emergency power supply units can be connected to this terminal and cascaded if required.

Power (ST1/6), output , HIGH active.

This output is active when the power is on.

!U<: (ST1/8), output, LOW active.

Switch-off warning: This output warns against the imminent switching off of the power supply.

This output is low if the battery voltage of **10.8V is not reached**. Connecting this output to an AWUG would allow this information to be relayed.

U_bat <10.5V (ST3/2), output, HIGH active.

This output is set when the power supply is switched off (U_bat <10.5V).

TEST (ST3/1), input, LOW active.

This input makes it possible to carry out a functional test of the output U_bat <10.5V (ST3/2) by applying a 0V potential. LED3 must light up.

Danger of short circuit!
The "Test" input must only be connected to 0V by means of a switch/button or a relay.
Do not apply a HIGH potential!

RESET button

During initial commissioning, the line voltage must be present to ensure that the cutoff relay is in the operating state and that voltage is applied to the power supply unit output.

The reset button is required if the power supply unit is to be operated without line voltage (e.g. for test purposes). The reset button ensures that the cutoff relay is in the operating state.

Adjusting the charger float voltage

1. The power supply must be at its nominal operating temperature. This normally requires the power supply to be on for at least two hours with rated load and the housing fitted.

2. Connect the charged battery. A battery that is not fully charged causes an error in setting the charger voltage!

3. Adjust the voltage at the battery terminals, if required, using the PO4 potentiometer referring to the table below.

Warning! Destruction of device possible!

Ensure that only the PO4 potentiometer is adjusted...

1. After having measured the temperature

2. If the battery voltage deviates by >200mV from the nominal value, then adjust PO4 accordingly.

Sonnenschein accumulators of the **A500 series** (configuration on delivery)		Other accumulators	
T (°C)	U_L (V)	T (°C)	U_L (V)
0	14.50	0	14.10
+5	14.30	+5	13.95
+10	14.10	+10	13.75
+15	13.95	+15	13.60
+20	13.80	+20	13.50
+25	13.65	+25	13.45
+30	13.50	+30	13.40
+35	13.40	+35	13.35
+40	13.30	+40	13.30
+45	13.25	+45	13.25
+50	13.20	+50	13.20

External NTC resistor (Art. No. 010693)

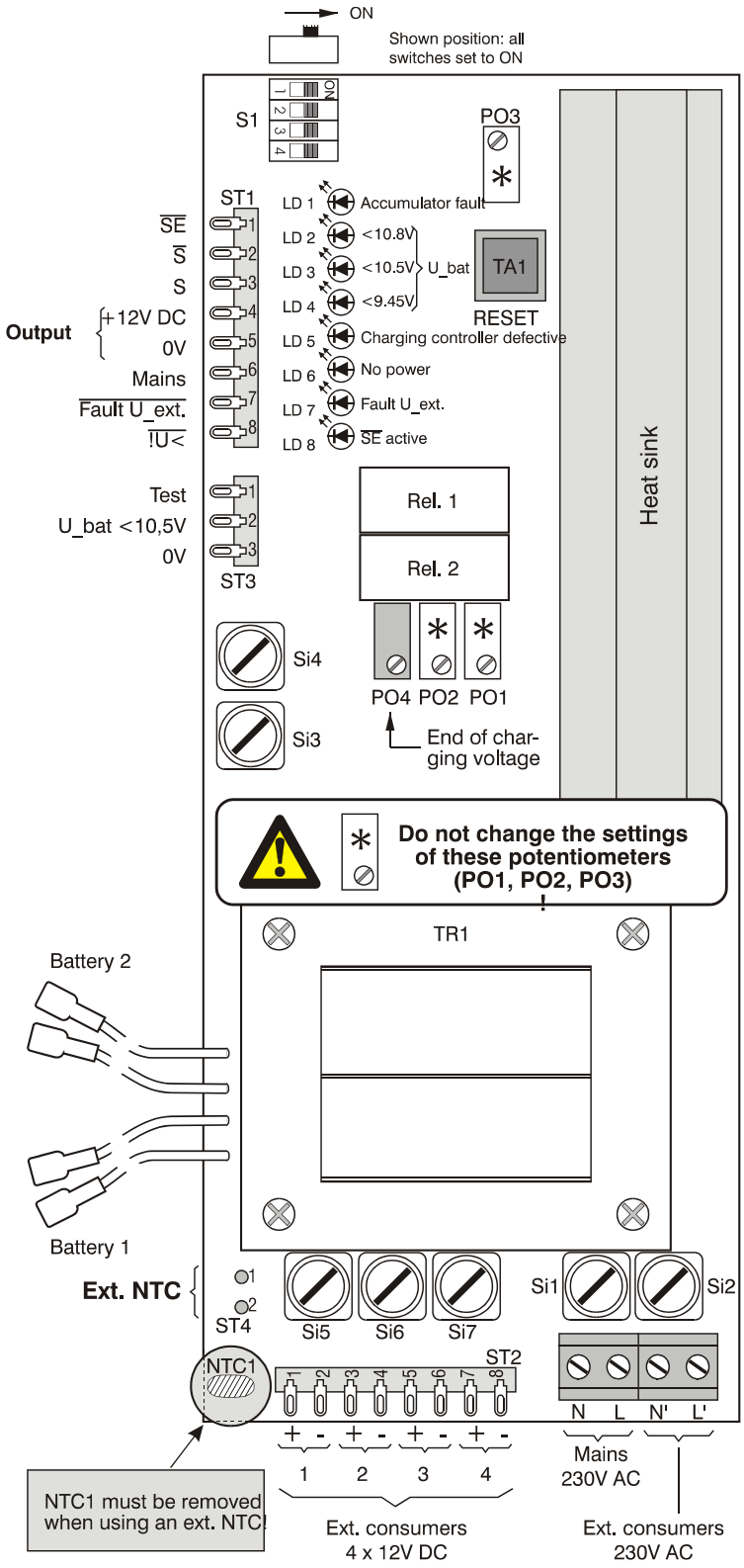
When using an **external NTC resistor**, NTC1, mounted on the printed circuit board, must be **removed** (pulled out).

The external NTC must be attached to the battery in an appropriate manner (e.g. with double-sided adhesive tape).

Solder its leads to the pins of ST4.

Note: An external NTC resistor is recommenced.
If the battery is located in a separate enclosure, then an external NTC resistor must be used.

Connection/component mounting diagram



S1 DIP-switch

S1 makes it possible to switch the fault messages to the collective fault. The corresponding switch must be set to "**ON**".

		Factory setting:
S1/1	Line failure	ON
S1/2	Fault ext.consumers	OFF
S1/3	Charging controller defective	OFF
S1/4	Battery defective (<9,45V)	OFF

LEDs:

LD1 Battery fault
LD2 U_bat <10.8V, cutoff warning
LD3 U_bat <10.5V, power supply switch-off
LD4 U_bat <9,45V, battery defective
LD5 Charging controller defective
LD6 No mains voltage
LD7 Fault ext. consumers
LD8 SE fault input activated

Potentiometer:

PO4 End-of-charging voltage

Fuses:

Si1 1AT
Primary power transformator
Si2 1AT
Ext. consumers 230V AC
Si3 5AT
Secondary power transformator
Si4 2.5AF
Output voltage 12V DC
Si5 3.15AF
Battery charge
Si6 1AF
Ext. consumers 12V DC (1 and 2)
Si7 1AF
Ext. consumers 12V DC (3 and 4)

11. Commissioning

During commissioning of the ACS-8, the following steps must be carried out:

1. The back-up battery must be inserted (see chapter 9.5).
2. Connection to the mains.
3. Reset using the S1 DIP switch (see chapter 9.6.1, table 4).The ACS-8 is reset to the initial state.
4. Checking or setting the necessary parameters using DIP switches or the ACS-8 setup.
5. Set the controllers in NetEdit / IQ NetEdit (see chapter 11.2 and installation manual NetEdit / IQ MultiAccess).
6. Reset the controller using the MultiAccess for Windows / IQ MultiAccess software (see user manual MultiAccess for Windows part B, chapters 5 and 6) and/or IQ NetEdit / IQ MultiAccess.

Please refer to the table in the appendix with the factory settings. These are valid after setting and resetting the controller.

11.1 ACS-8 setup

The ACS-8 is delivered with the factory settings (see factory settings in the following or in the appendix). This state must be checked and changed if necessary. This can be carried out in two ways...

Option 1: Setting using the S1 DIP switch (see chapter 9.6)

Procedure:
1. Setting the protocol
2. Setting the baud rate
3. Setting the address

The DIP switch settings are limited (as described in the tables in chapter 9.6).
ACS 8 setup using option 2 allows access to more setup features than are available with the DIP switches.

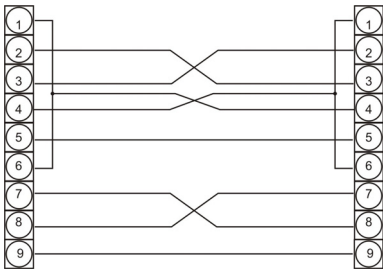
Option 2: Setting using ACS-8 setup

General description: The ACS-8 setup allows the current settings of the ACS-8 to be checked and to edited. Changes can also be carried out during normal use of the system without impeding operation.
The number of parameters that can be modified depends on the DIP switch setting of the S1 switch block.

Requirements:

Laptop/notebook
Terminal program (e.g. Hyperterminal, Telemate, etc.)
9-pole serial cable (socket – socket)

Cable assignment:

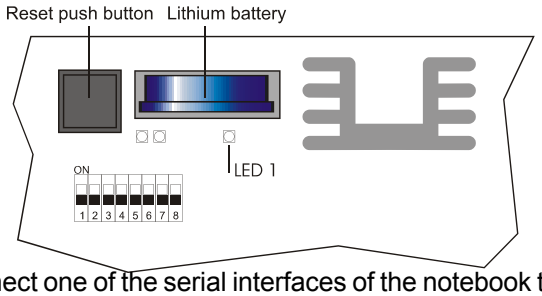


Procedure:

❍ Set switches 1 – 8 of DIP switch S1 to position OFF or 0

1	2	3	4	5	6	7	8	Function
0	0	0	0	0	0	0	0	Setup via Hyperterminal

❍ Press the reset button or momentarily disconnect the controller from the mains.



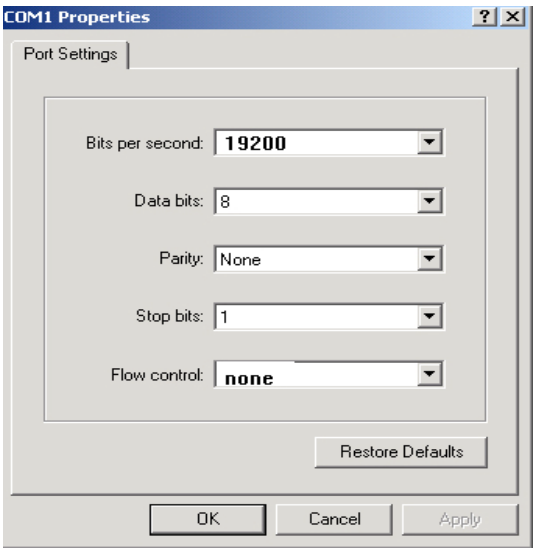
❍ Connect one of the serial interfaces of the notebook to the ST1 serial interface of the ACS-8 (see 16.1).

❍ Start the terminal program, e.g. Hyperterminal Start – Programs - Accessories - (communication with Windows 2000) - Hyperterminal

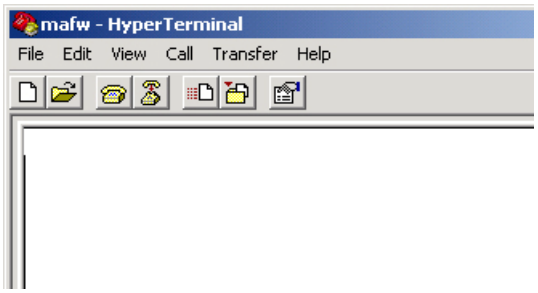
❍ Enter a unique name (e.g. ACS-8 setup) for New Connection and select the corresponding icon. Confirm with OK.

❍ In the following window under Connect select the interface of the notebook to which the cable is connected (COM1 in our example). Ignore the entries in the other fields.

❍ In the next window enter following settings and confirm with OK.



❍ An empty HyperTerminal box appears.



❍ Enter the following in lower case:

cea

and confirm with Enter. This input is not displayed on the screen. In case of false entries, press the backspace key several times to delete the keyboard - input buffer.

This will open the ACS-8 setup:

```
*******************************************************************************
**                          SETUP - ACS8                                     **
*******************************************************************************
Setup from: APPL.-Login.
Label:  [<no-name...>]
1. Communication
2. System
3. Save
4. Exit
No.:_
```

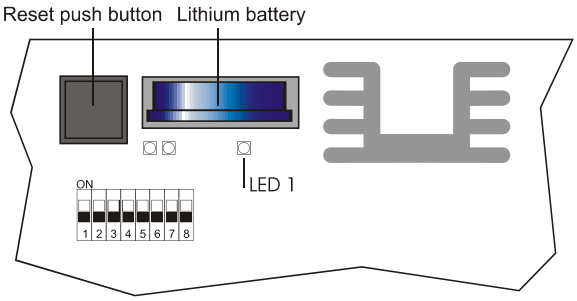
Meanings:

Setup from: Shows the mode by which the setup was called.

❍ APPL.-Login = Application login. The setup was called during the normal operation of the ACS-8.

❍ BOOT-Login The setup was called during reset of the ACS-8.

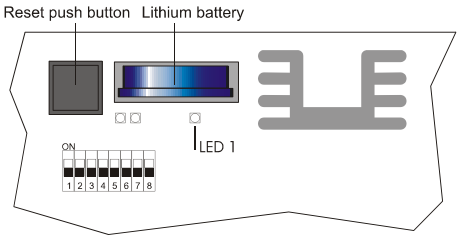
The entry **cea [Enter]** must be performed within 3 seconds of the start of the ACS-8 reset process. During this time the LED 1 lights green (located on the CPU board on the left-hand side of the heat sink, see 15.1).



If the entry **cea [Enter]** is not performed within the time limit during reset, the APPL.-Login is called.

ACS-8 resetting: either Interrupt the power supply momentarily (pull the power connector, deactivate the emergency power supply if necessary).

or Press the reset button



Normally, the APPL.-Login is sufficient.

Advantages: Normal operation is not affected.
Login does not need to be carried out within the 3 second time limit during reset.

Some DIP switch settings have priority and do not permit any changes to some settings of Communication - To Host (see **Dependencies** later in this chapter). The message ”Defined by DIP-Switch” displays if changes are attempted to these settings.

All peripheral devices connected to the affected ACS-8 are out of operation (the doors are closed) during BOOT-Login until the setup area is exited.

Label: Shows the designation of the current ACS-8.

Example: [<no-name...>] = no name was assigned.

If the controller already exists in NetEdit the assigned designation is shown under Label:.

Important: Use only unique designations!

The individual menu items:

General The last line is the dialogue line. Different entries are allowed depending on the cursor position. (Uses both upper and lower case letters.) When entering a character that is not allowed or when pressing the Enter key on its own, no modification is carried out. In this case, the program skips back to the next higher level (max. the main menu).
Erroneous entries can be deleted by individual characters using the backspace key.
To delete the character buffer press the backspace key at least 3 times.

1. Communication:

Currently, only option 1 *To Host* is available. The parameters used by the ACS-8 for communication with the host can be checked and edited. The current protocol is marked with “=>”. Other current values are shown in the Status line.

Example:

1. 9-bit-ZK/ZE Prot.
2. =>DIN prot.
3. RDT prot.
4. Event prot.

Status: Addr: 32; GAddr: 30; 19200 bauds
Change? Y/N:_

The current value is marked with “=>”. To modify the values enter ”y” and confirm with Enter. Then you can select one of the consecutive numbers.

Settings and their use:

9-bit-ZK/ZE prot.:	-----
DIN prot.:	Direct connection to RS232 (e.g. PC/notebook) or interface converter
RDT prot.:	For modem operation
Event prot.:	For network operation using an Ethernet interface

The following information can be checked and edited depending on the selected protocol:

Baud rate: The current value is marked with ”=>”. The value can be modified by entering ”y” and Enter (when the question Change? Y/N appears) and the required baud rate number (the factory setting is 19200).

Address: The current address and the permitted address range are displayed. The address can be modified by entering ”y” + Enter (when the question Change? Y/N appears) and the desired address (the factory setting is 32).

Group address: The current group address and the permitted address range are displayed. The address can be modified by entering ”y” + Enter (when the question Change? Y/N appears) and the desired address (the factory setting is 30).

Difference between address and group address:
The system can support up to 30 groups of 32 controllers (960 in all).
Address refers to the identifying number of any controller in a group (1 - 32).
Group address refers to the identifying number for each group (1 - 30)
(MultiAccess for Windows / IQ MultiAccess can currently manage a maximum of 512 controllers)). Combining the Group address and the address uniquely identifies every controller in the system.

Example:

Group address	addresses
1	1 - 32
2	1 - 32
3	1 - 32
4	1 - 32
etc.	
30	1 - 32

With the event protocol, the following fields must be checked or edited if necessary:

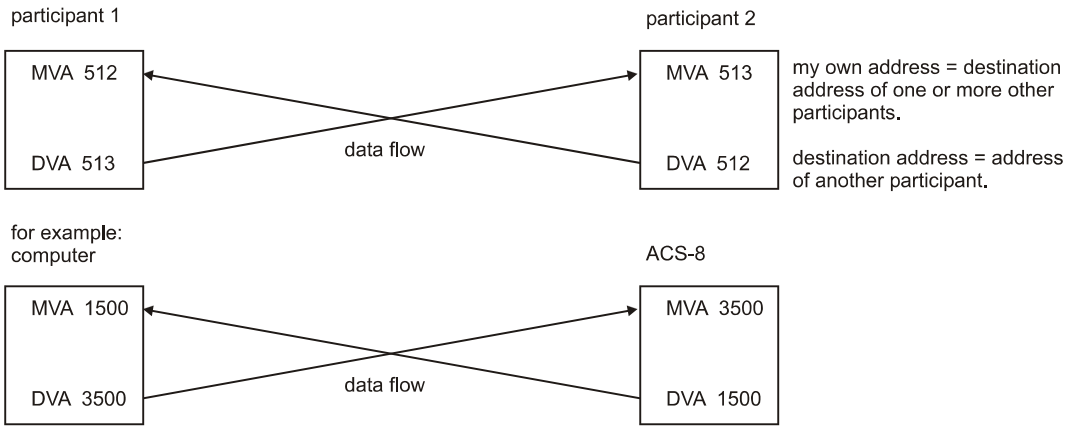
MVA: My virtual address
In case of the event protocol, the communication between the controller and the host is event-driven, i.e. as soon as a booking occurs on the controller, it is sent to the host. This improves the network loading by sending data only when there is new data to send.

Each controller requires a unique virtual address for identification.
The current value is shown and this value can be changed to one of the permitted values if required.

Each address must be unique in the network!

DVA: Destination virtual address
The event protocol makes it possible to assign a virtual destination address (the address to which the controller sends the data) to each controller.

Example:



The virtual address (MVA) of a participant can be imported from NetEdit.

Network device: In this field the network card used must be entered.

Example:
1=>W&T Com-Server
2 = Novar TR/AC Ethernet (Item no. 026840.29)
Change? Y/N:_

2. System: The items on this menu offer the following possibilities:

1. Software version
2. Init/Erase component
No.: _

Software version: This display is used for information only and is not editable. It shows the firmware version of the device.

Example:
Softw: ZACS8.01.00.00
Date: 02.01.02
Press <Enter>

This information should initially be checked since the functions described depend on the firmware.

Init / Erase component: This menu item makes it possible to delete or reinitialize the content of the error log file. This is located in a reserved internal memory area, in which irregular or fault events are listed. Access to this file is reserved for approved service personnel.

If this log file is to be cleared and a new one started, the previous content can be deleted using this function.

3. Save: If the modifications made are to be saved, this menu item must be selected before quitting the setup using the *Exit* menu option.

4. Exit: (See 3. Save.) If this menu item is selected without first saving the settings, all changes will be lost and the original settings are kept.

The setup and its consequences remain active until the Exit option is selected!

Settings for network connection using the Ethernet interface card:

- Event-protocol
- Baud rate 19200
- MVA (virtual address of the current controller to be found in NetEdit).
- DVA (virtual destination address of the workstation to which the controller communicates
= MVA of the corresponding workstation to be found in NetEdit).

Conditions for operation:

1. If either DIP switch 6 or 7 of switch block S1 are ON, then the DIP switch settings take priority over the software. An information warning message will appear on affected options in the program that are disabled by these switches.

   Example:
   1. 9-bit-ZK/ZE prot.
   2. DIN prot.:
   3.=>RDT prot.
   4. Event prot.

   Status: Addr: 32; 19200 bauds

   ***** Defined by DIP-Switch! *****

   Press <Enter>...

2. When using the interface of the ACS-8 controller for RDT, the interface is found to be already in use by the RDT protocol.

   Procedure:
   - Disconnect the RDT cable from the ACS-8
   - Connect the “setup“ cable
   - Carry out the boot login

11.2 Defining the controller in IQ NetEdit

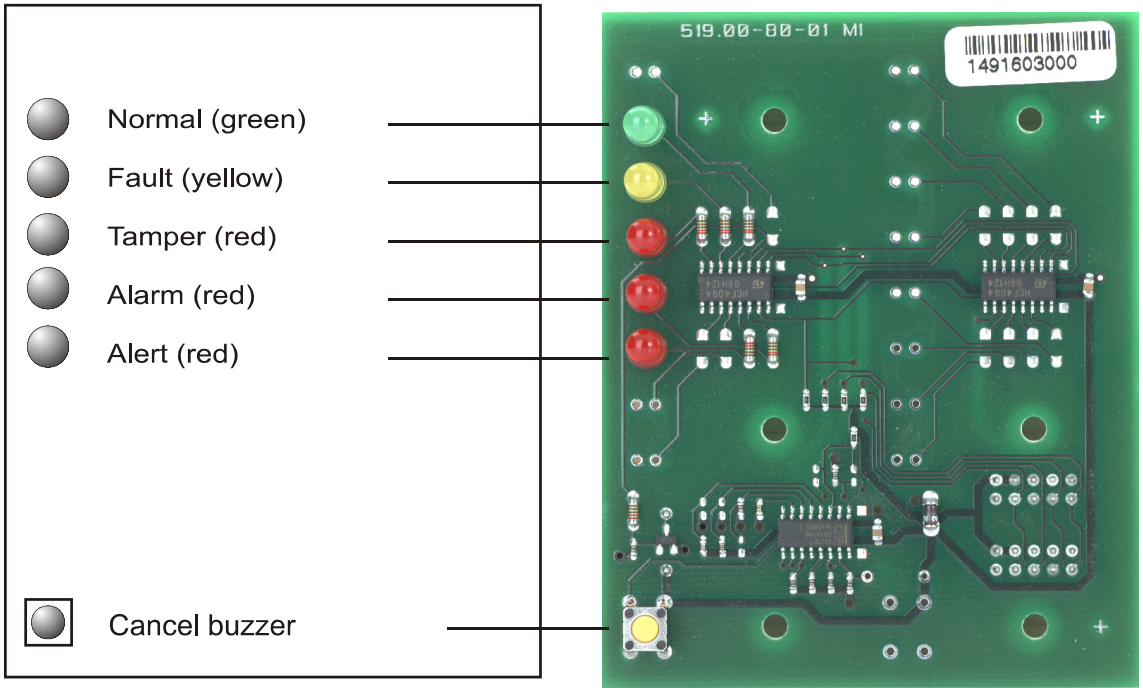
After hardware installation (mounting and wiring the controllers) and setting the hardware parameters (controller address, baud rate, protocol) using the DIP switches or the ACS-8 setup, the devices must then be defined in the access control software.

(See also chapter 9.6 = DIP switches and the corresponding documents of the used interface cards).

Transferring the hardware configuration to the access control software is done by a special configuration program which is part of the access control software. Detailed examples how to configer an ACS-8 controller can be found in the manual of the configuration software.

12. LEDs, buzzer and cancel buzzer push-button

The LEDs, the buzzer and the cancel buzzer push-button are located on the LED board in the housing cover.



For differentiation of the controller types ACS-2plus and ACS-8, the ACS-8 from firmware 7.00 on activates all LEDs and the buzzer while booting.

The functions of the individual LEDs are explained in the following.

The buzzer stop push-button makes it possible to reset the buzzer manually. To do so, press the push-button at least for 3 seconds with a suitable object.

Functions of the LEDs and the buzzer of ACS-8 and module bus participants[3]

LED/buzzer	State	Meaning	
Normal (green)	Off	No operating voltage	
	Slow flashing	Not parameterized	
	Fast flashing	Parameterization running	
	On	Ready	
Fault (yellow)	Off	No fault	
	On	Battery/battery fault Line failure Central reset	Without storing (except for central reset)
Tamper (red)	Off	No tamper	
	On	Tamper	With storing
Alarm (red)*	Off	No alarm	
	On	Number of incorrect attempts Unauthorized opening or door was open too long	With storing
Alert (red)*	Off	No message	
	On	Threat	With storing
Buzzer	Off	No message or manually reset	
	Fast interval	Tamper/alarm	With storing
	On	Line/battery/battery failure	Without storing

The cancel buzzer push-button makes it possible to reset the buzzer manually. To do so, press the push-button at least for 3 seconds with a suitable object.

* Not available at module bus participants (door module, input module, output module, in/output module).

Meaning of the LEDs of AC readers

LED colour	Basic state	After reading a data carrier	Meaning
yellow	on		Ready to read
yellow	off		- Device is dead voltage - Controller is not parapeterized - PIN- or door code entry is active
yellow	flashing		Reader is not allocated to any door
green	on		Permanent release
red	on		Permantent blocked
green		on	Door release
red		on	ID card not authorized
red		flashing	Read error

Additionally, the key and LED functions of the macro control of IQ MultiAccess are valid (see separate manual "Supplementary Functions of IQ MultiAccess", P32205-46-0G0-xx).

[3] Except potetial separation module. There the LEDs indicate the communication between ACS-8 and module bus participants.
For details see mounting and connection instaructions of potential separation module, P32508-10-002-xx.

13. Outputs

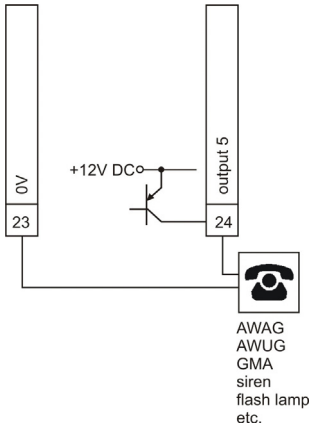
13.1 Semiconductor outputs

The ACS-8 board is has 3 transistor outputs:

The output 5 (terminal 24)
and output 6 (ST 5-3) are freely programmable using NetEdit.
The watchdog output (ST 5-2) signals (12V) when at least one watchdog reset has occurred since the last hardware reset.

Transistor common collector output.
Two states are possible:
- Transistor conducting (approx. 12V DC at the output).
- Transistor blocking (open output).

Limitations: Max. current carrying capacity = 50mA, current limited.



13.2 Relay outputs

The ACS-8 is fitted with 4 volt-free relay outputs with the following factory settings (see 15.1):

- 2 door strike relays

Fail secure door strikes can be checked for tampering (see also chapter 16.1).

- 1 tamper relay (Activated in case of tampering).
- 1 alarm relay (Energized during normal operation. It is de-energized in event of alarm or when the power is removed).

If the jumper ST8 is connected and a watchdog reset occurs, an alarm is triggered.

In event of an ACS-8 system failure, relays 1 and 2 are defined such that the doors remain closed. These relays can not be altered. The state of relay 3 (alarm) and relay 4 (tamper) is defined by the jumper ST16.

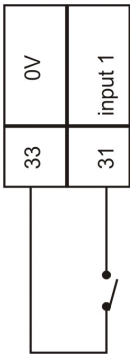
Set up the reset-condition of relay 3 and 4:
- With the reset button held down...
- Check, if relay 3 (alarm) reacts as required. Change jumper ST16 to 2-4 or 4-6 if necessary.
- Check, if relay 4 (tamper) reacts as required. Change jumper ST16 to 1-3 or 3-5 if necessary.
- Release reset button.

ST 16	Description
1 - 3	Relay 3 (alarm) is energized on system failure
2 - 4	Relay 4 (tamper) is energized on system failure
3 - 5	Relay 3 (alarm) is de-energized on system failure
4 - 6	Relay 4 (tamper) is de-energized on system failure

14. Inputs

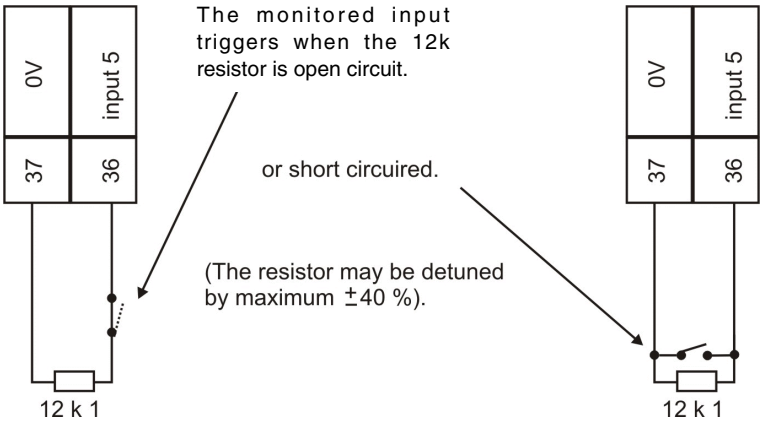
14.1 Digital inputs

The four digital inputs are freely programmable from NetEdit.



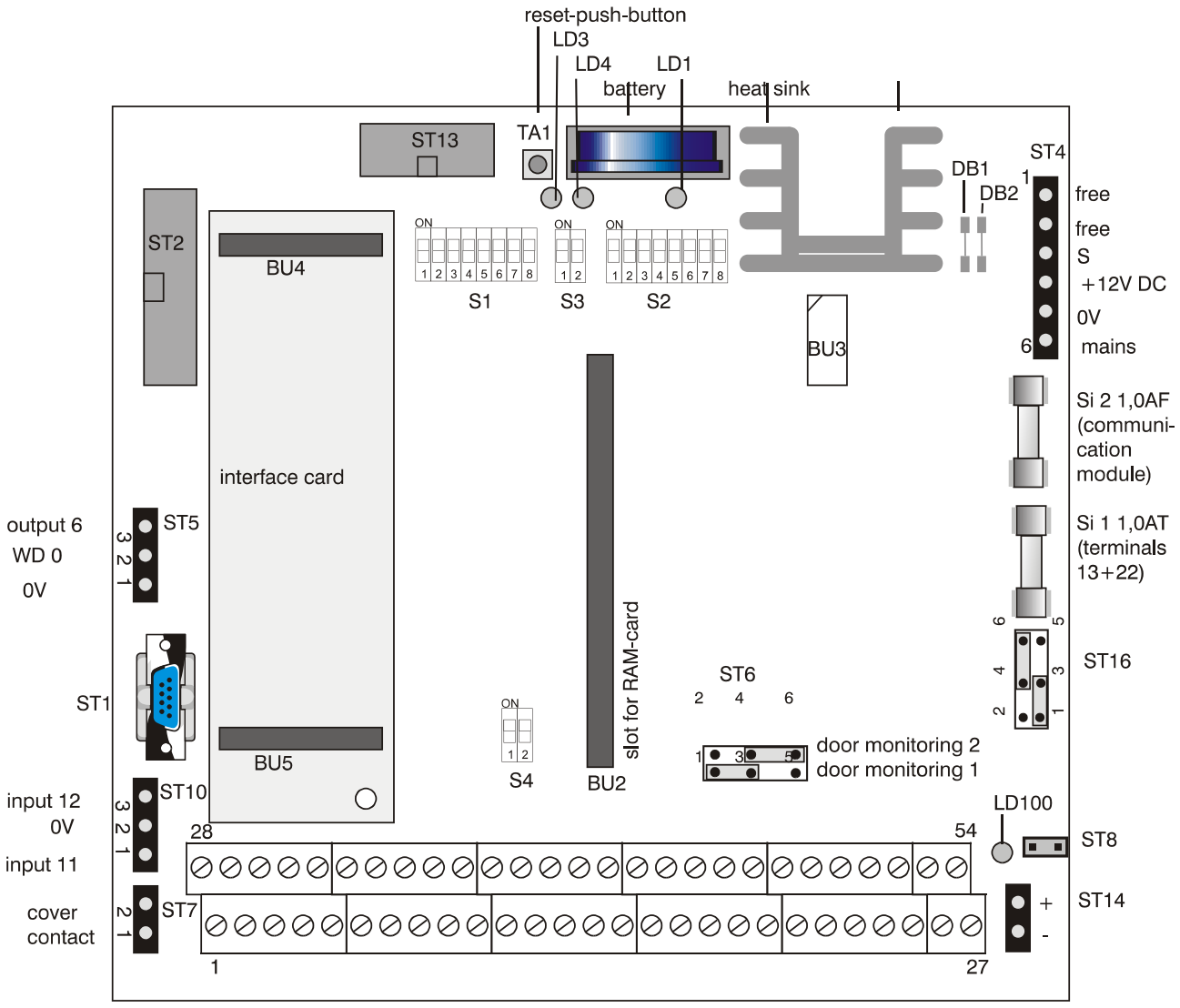
14.2 Monitored inputs

The eight monitored inputs are freely programmable from NetEdit.



15. Structure/diagrams

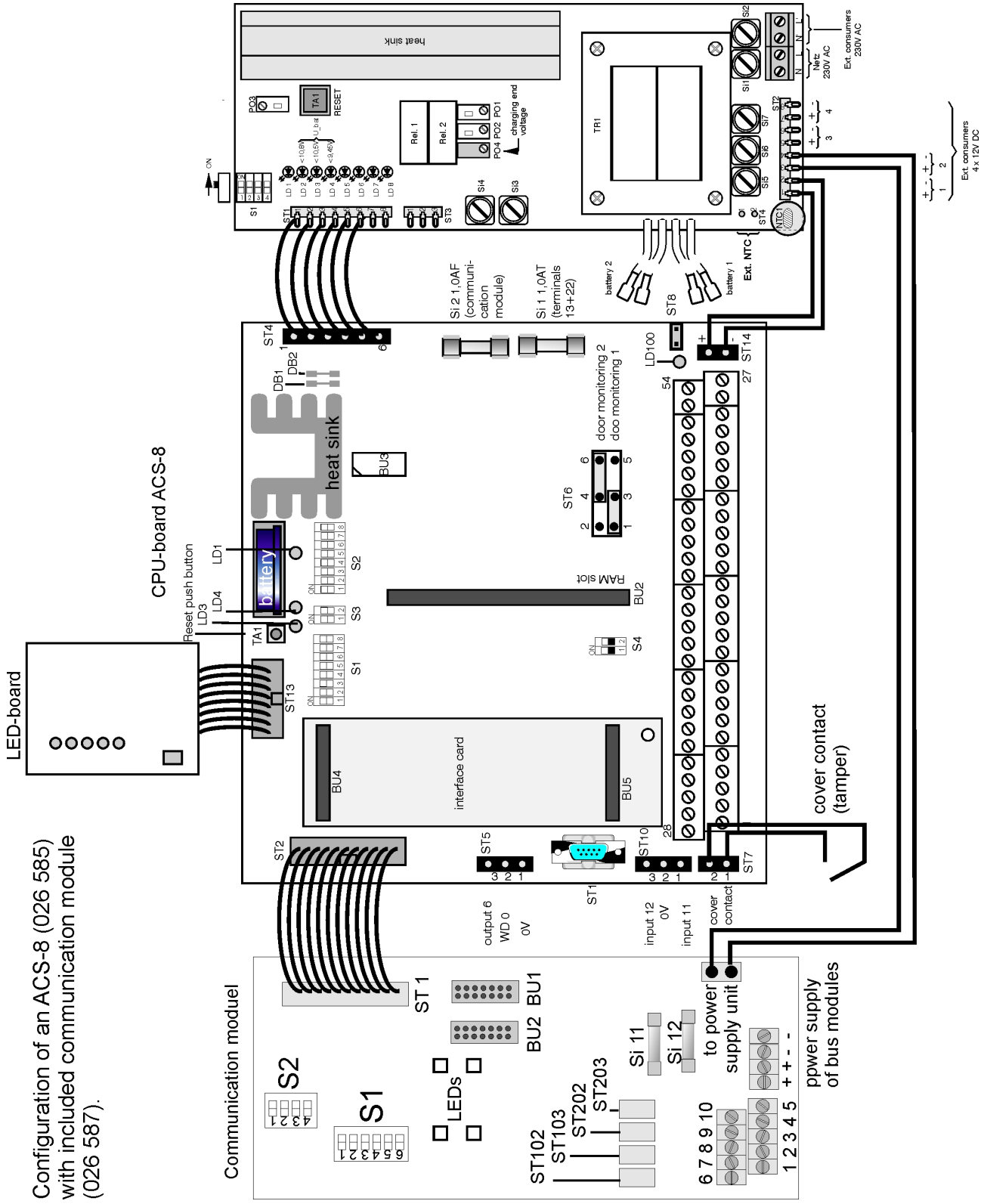
15.1 CPU component mounting diagram



S1, S2, S3, S4: see also chapter 9.6 = DIP switches.

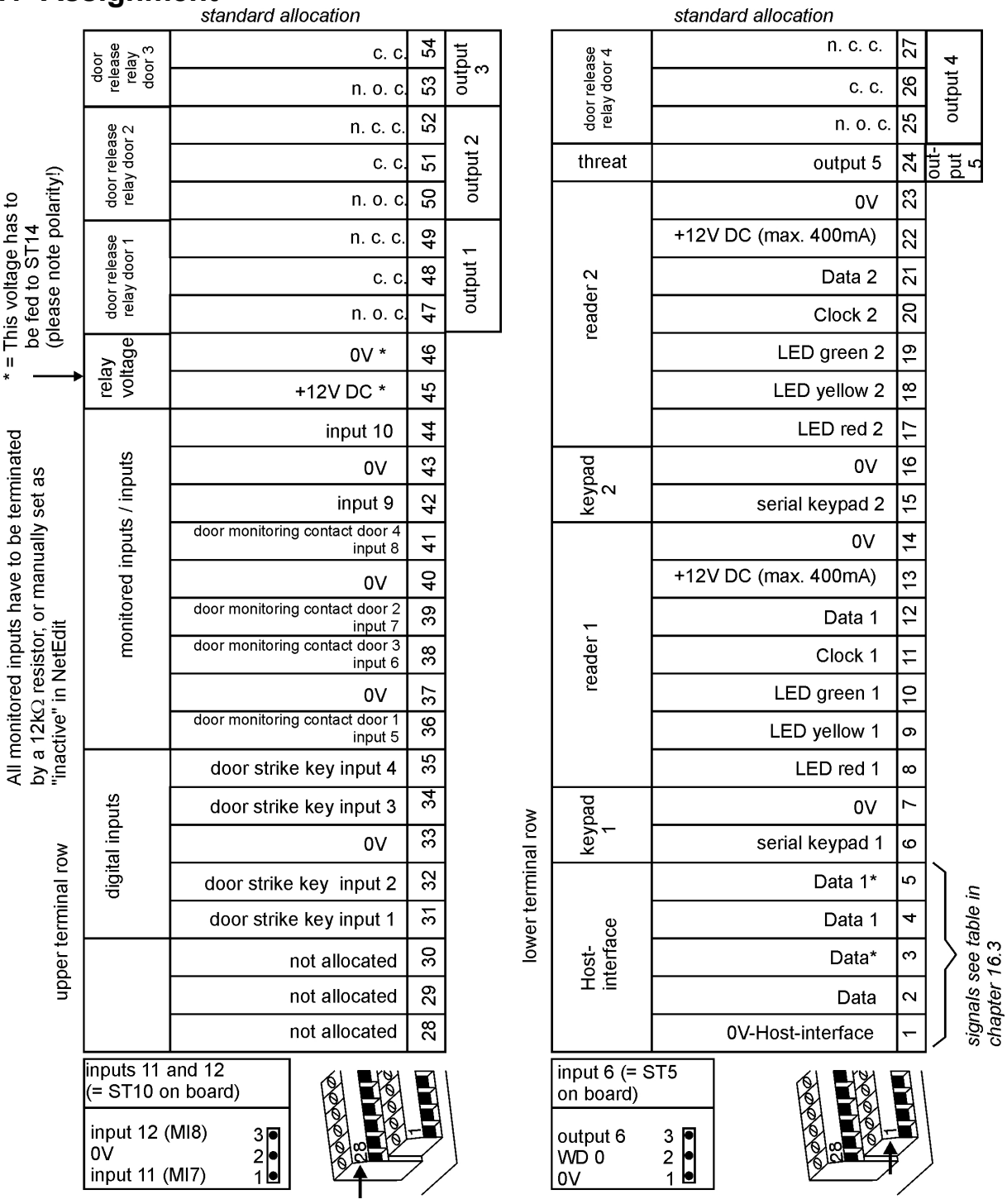
Number	Explanation
ST1	Expansion connector for the external modem certificated by Novar GmbH
ST2	Expansion connector for communication module
ST4	Connector of the power supply unit PIN 1+ 2 = FREE PIN 3 >1V->battery fault PIN 4 = 10-15V PIN 5 = 0V PIN 6 <1V-> power failure
ST5	Watchdog and danger signal output 12V semiconductor outputs, 50mA, short-circuit proof PIN 1 = 0V, PIN 2 = watchdog output, PIN 3 = output 6
ST6	Jumper for the door strike monitoring Jumper 1-3, or 2-4 = no door strike monitoringJumper 3-5, or 4-6 = with door strike monitoring (only admissible with connected door strike art. no. 019042 / 019042.01. Deactivate if other devices, such as a flash lamp, are connected to these outputs/relays).
ST7	Connection of the cover contact (Open = tampering)
ST8	Jumper used to connect the watchdog to the alarm relay.
ST10	Monitored inputs 7 and 8 / inputs 11 and 12 (terminate by 12 kOhm) PIN 1 = monitored input 7/ input 11 PIN 2 = 0V PIN 3 = monitored input 8/ input 12
ST13	Connector for LED board in the housing cover
ST14	Power supply connector for the controller voltage 45 and 46 (+12V DC, 0V)
ST16	Basic definition of the tamper and alarm relay (from PCB layout version no. 467.00-75-01/02) Jumper 1-3 = relay 3 (alarm) energized on system failure Jumper 2-4 = relay 4 (tamper) energized on system failure Jumper 3-5 = relay 3 (alarm) deenergized on system failure Jumper 4-6 = relay 4 (tamper) deenergized on system failure
BU2	Expansion connector for e.g. RAM cards
BU3	Service connector
BU4 and BU5	Slot for the host interface card
LD100	The LED lights up if a watchdog reset occurred previously
LD1	Software LED (see chapters 9.6.1 and 11.1)
LD3	If this LED lights up, then the ACS-8 runs from flashbank 1
LD4	If this LED lights up, then the ACS-8 runs from flashbank 2
Si1	1,0AT, fuse for the terminals 13 and 22
Si2	1,0AF, fuse for the communication module at ST 2
DB1 and DB2	Grounding/shielding (see chapter 5.1)

15.2 ACS-8-Structure



16. Connections

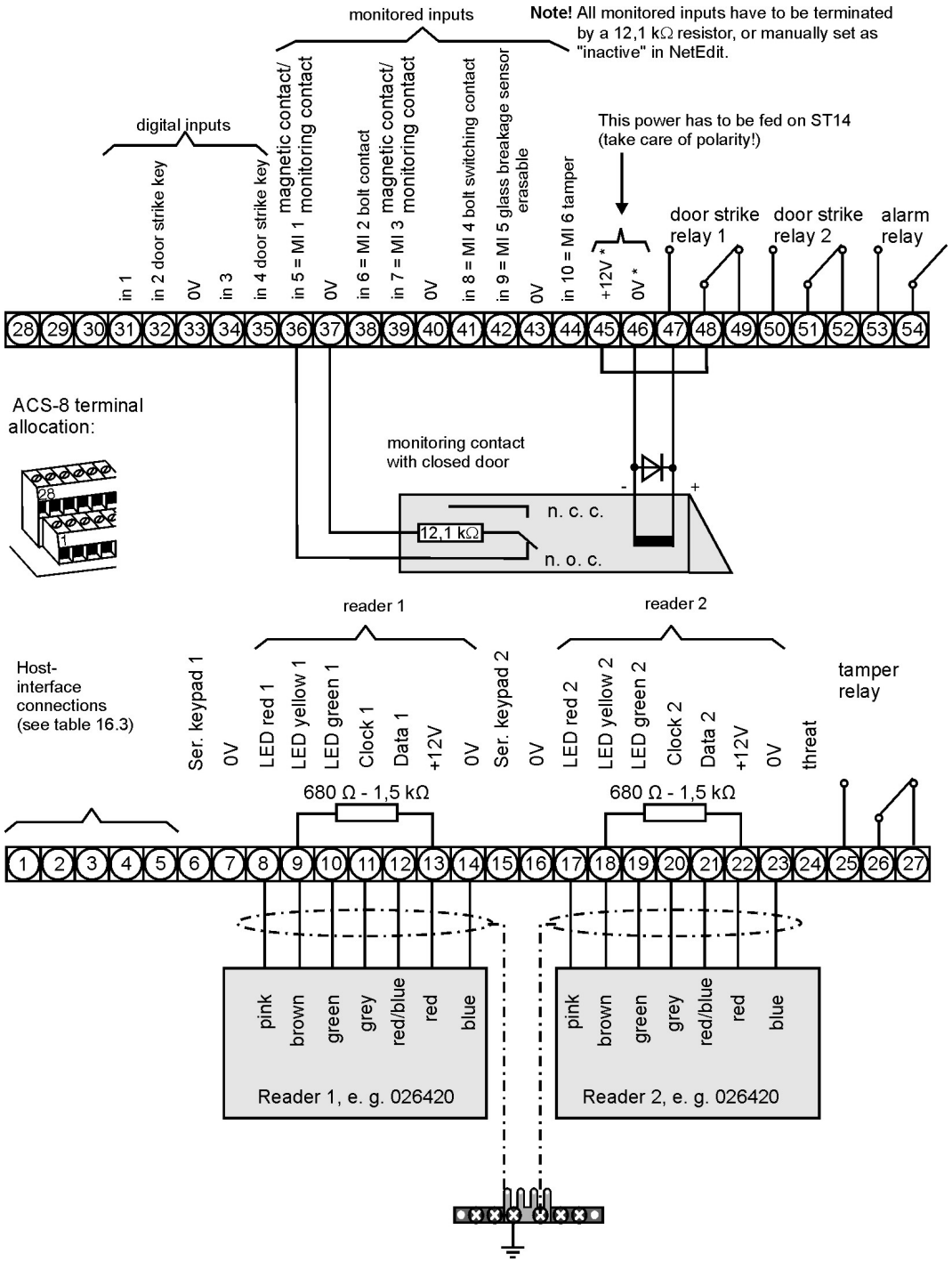
16.1 Assignment[4]



The readers for door 3 and 4 are to be connected via the module bus and must be used in RS 485 mode. If less than 4 doors are controlled via the onboard hardware, the free inputs and outputs can be used for other purpose, e. g. as alarm or tamper relay.

4 The standard factory settings of the inputs and outputs are detailed in this overview. However, different arrangements can be used if required. In this case, the new assignments for each ACS-8 controller should be filled on a copy of the empty terminal assignment table in the appendix and stored with the controller it relates to.

16.2 General connection diagram[5]



16.3 Pin assignment of the host interface connections

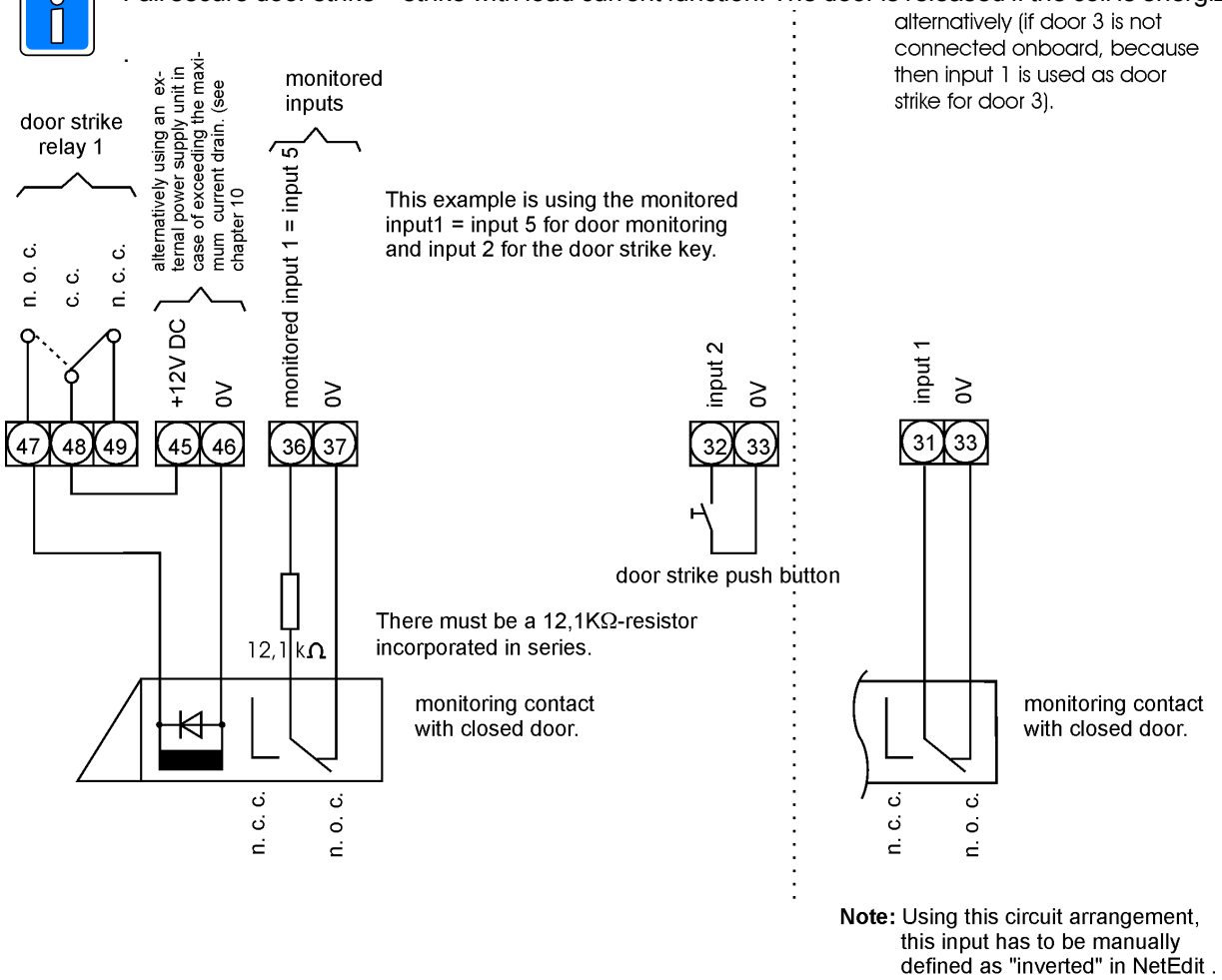
Pin	RS 232	RS 485 (3-wire)	RS 485 (5-wire)	Current-Loop
1	GND	GND	GND	T GND
2	TxD	D	D	T+
3	RxD	D*	D*	R+
4	-	-	D1	R GND
5	-	-	D1*	-

[5] Inputs 11 and 12 as well as watchdog and alert output see chapter 15.1 and 16.1

16.4 Connecting a door strike

16.4.1 Connecting a fail secure door strike

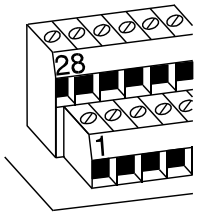
Fail secure door strike = strike with load current function: The door is released if the coil is energized



Tamper monitoring for the fail secure door strike is possible. For this, a DC door strike must be connected as shown above.

This function is not possible with a fail save door strike and a door strike supplied with alternating voltage or supplied by an external voltage source - not by the voltage source which supplies the ACS-8 -. The tamper monitoring for “door strike 1” and “door strike 2” must be deactivated otherwise this causes a failure on the ACS-8.

Terminal assignment ACS-8 :



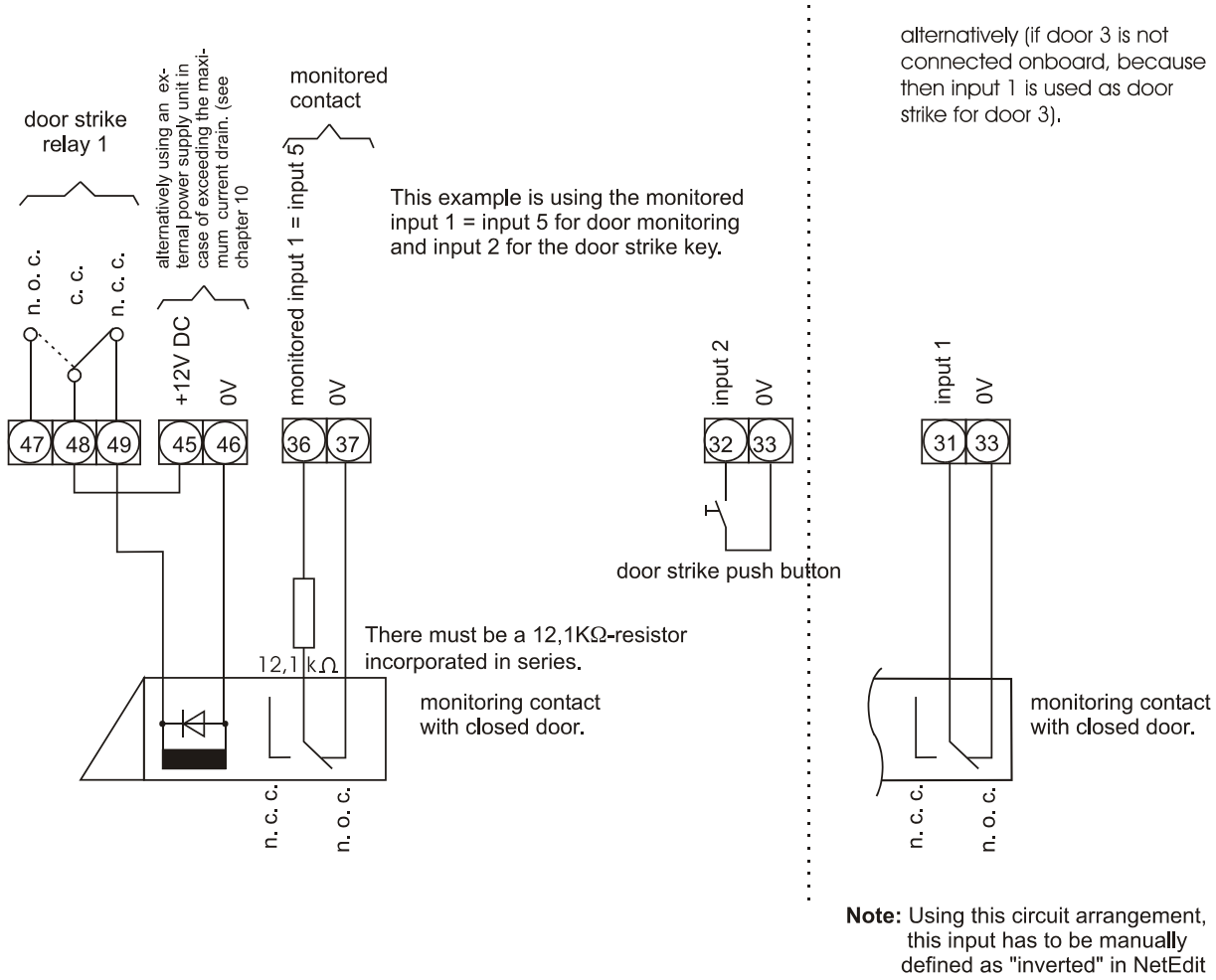
With tamper monitoring
for relay 1: jumper ST6 = 4 -6
for relay 2: jumper ST6 = 3 - 5

Without tamper monitoring (= standard)
for relay 1: jumper ST6 = 2 -4
for relay 2: jumper ST6 = 1 - 3

For relay 3 and 4 there is no tamper monitoring possible.

16.4.2 Connecting a fail safe door strike

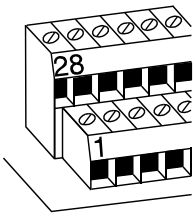
Fail safe door strike = no-load current door strike: The door is blocked if the coil is energized



The fail save door strike cannot be monitored for tampering.

Terminal assignment ACS-8 :

for relay 1: jumper ST6 = 2 -4
for relay 2: jumper ST6 = 1 - 3

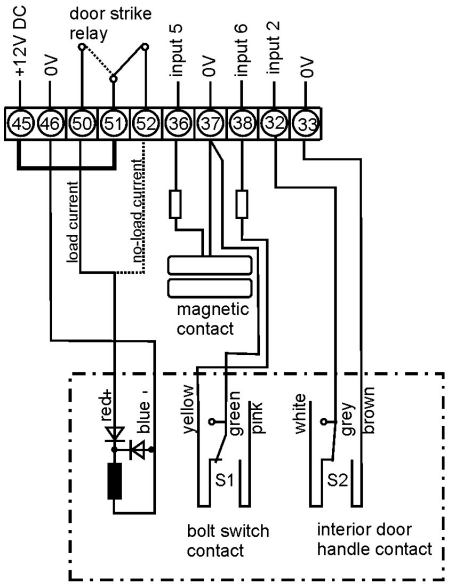


16.5 Electric safety lock

The electric safety lock is available in a conventionally connectable variant (809) as well as in a BUS version (809N).

16.5.1 Electric safety lock conventional connection

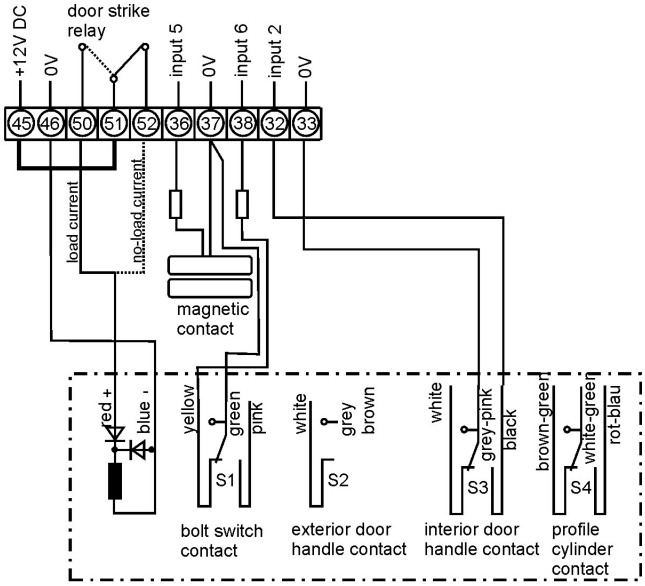
The differential monitored inputs (inputs 5 - 10) must be terminated with 12KΩ resistor. An additional third and/or fourth door can not be connected because input 6 is in use with this connection.



Electric safety lock 809
Standard version with two monitoring contacts.

S1:
Shown position = bolt extended.

S2:
Shown position = idle position. Switches when actuating the interior door handle and the coupled exterior door handle.



Electric safety lock 809
Expandable version with four monitoring contacts.

S1:
Shown position = bolt extended.

S2:
Shown position = idle position. Switches when actuating the exterior door handle.

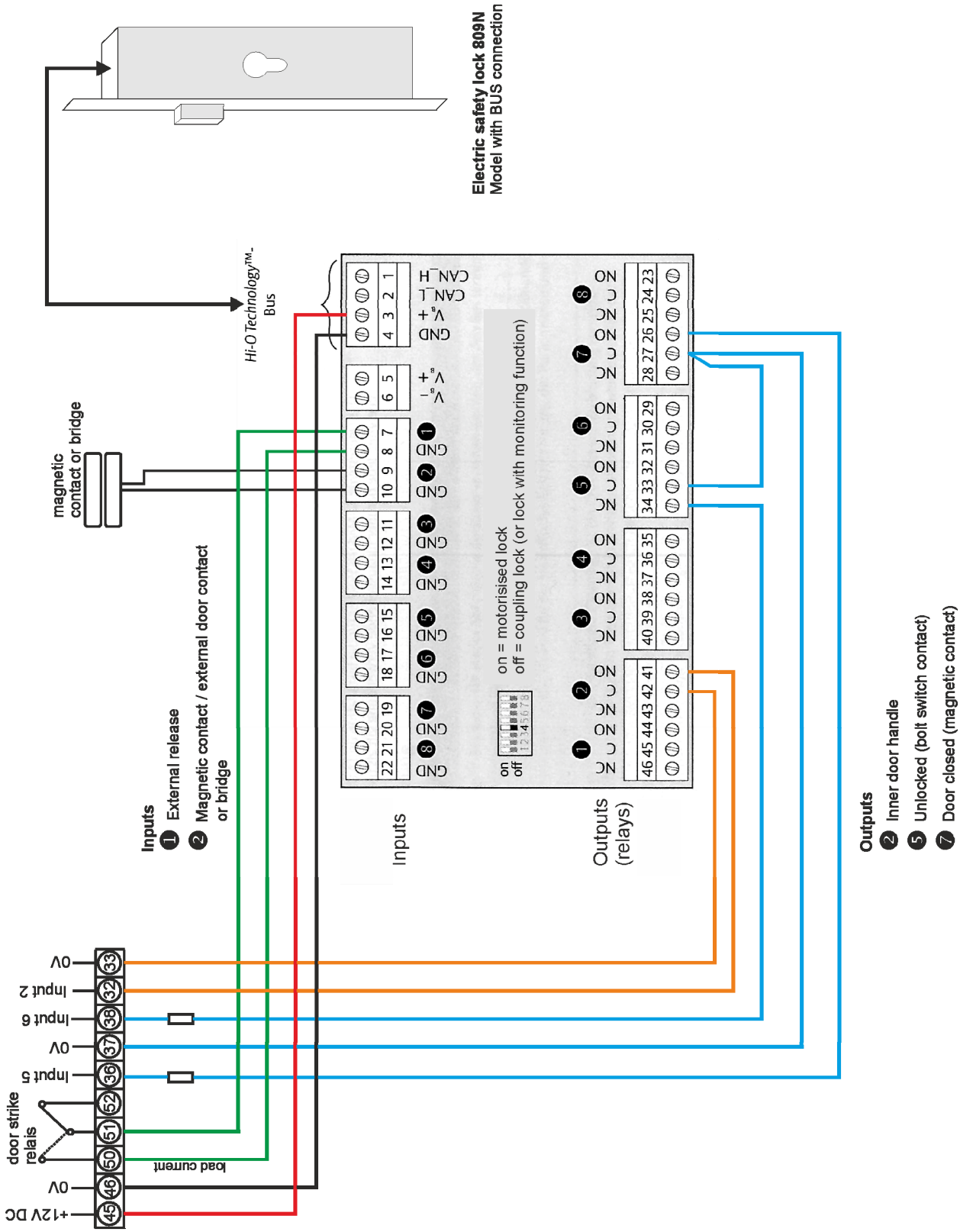
S3:
Switches when actuating the interior door handle.

S4:
Switches when actuating the profile cylinder.

Door monitoring
The interior door handle contact effects a door release through the ACS-8. The door can be opened without the error message “Unauthorized door release”.
An external contact, e.g. a magnetic contact, must be used for door monitoring. The state of the bolt switching contact is only polled when the intrusion detection system is “disarmed”. Its status is therefore shown only when the intrusion detection system is “disarmed”. The bolt switching contact alarm group does not trigger or store an alarm when the intrusion detection system is “armed”.

16.5.1 Electric safety lock conventional connection

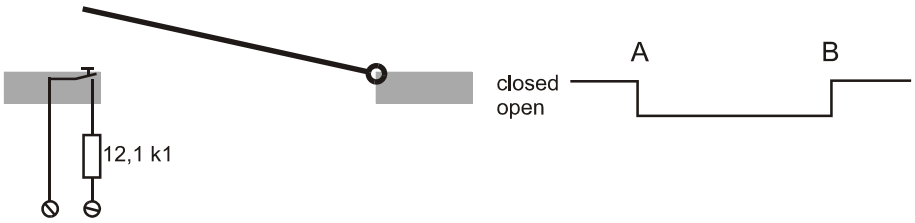
The differential monitored inputs (inputs 5 - 10) must be terminated with 12KΩ resistor.
An additional third and/or fourth door can not be connected because input 6 is in use with this connection.
The electrical safety lock is connected via the I / O module N5950. This module provides the BUS connection to the electric safety lock. The wiring to the ACS-8 is done as in the following wiring diagram.



16.6 Turnstile

An ACS-8 can administrate three types of turnstiles in addition to a standard door. The differences are the number, and/or. the type of evaluation of the monitoring contacts.

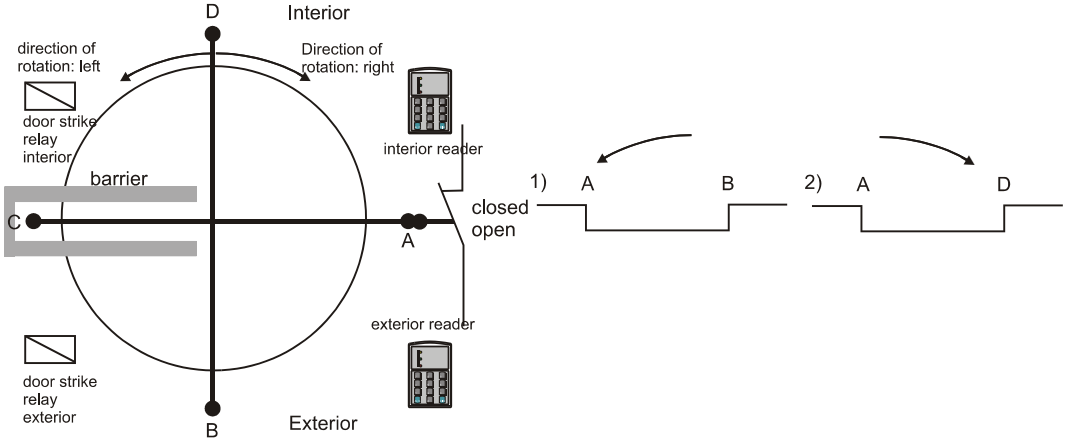
Diagram: Door monitoring via monitoring contact with a “normal” door:



With the door closed, the monitoring contact is closed too. The corresponding monitored input interprets a closed door by recognizing a resistance of 12KΩ. If the door is opened (A), the monitoring contact opens too and the door is detected as “open”. If the door is closed again (B), the monitoring contact closes and the door is detected as closed.

16.6.1 Turnstiles with one monitoring contact

The door monitoring of a turnstile with one monitoring contact is basically the same as a “normal” door.



In the rest position (corresponding to closed door) one of the actuators A to D holds the contact closed (this example uses contact A).

Case 1) Release from exterior reader. If the turnstile is moved anti-clockwise, the actuator moves away from the contact which then opens until actuator B closes it again.

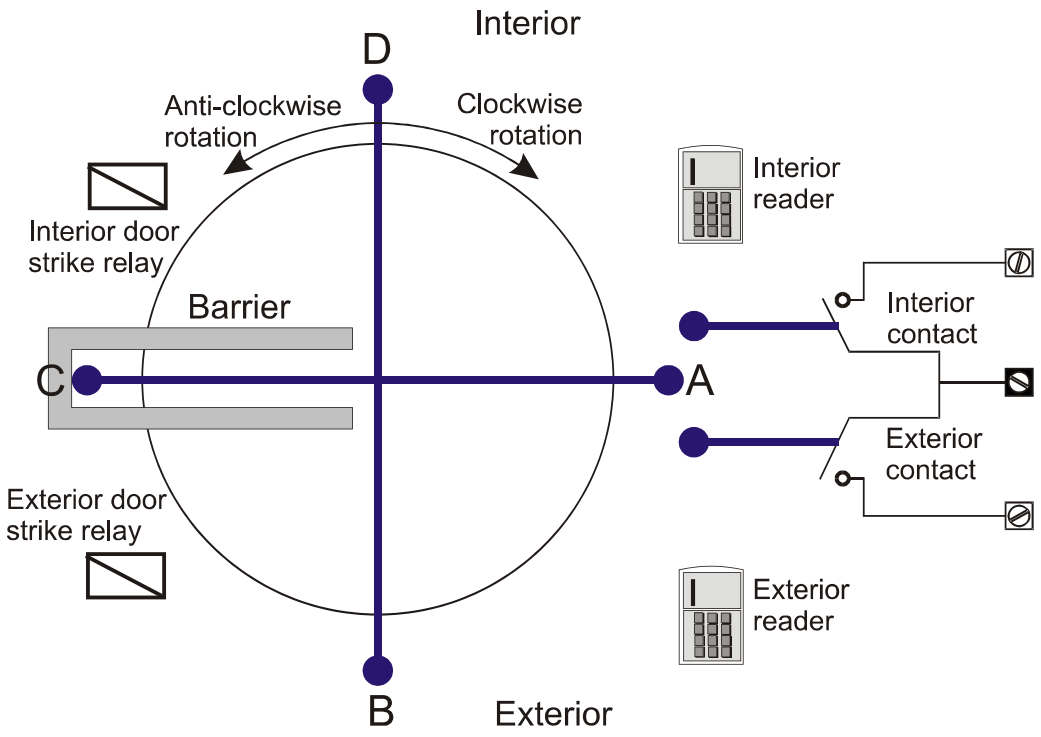
Case 2) Release from interior reader. If the turnstile is moved clockwise, the actuator moves away from the contact which then opens until actuator D closes it again.

With this type, the rotation direction cannot be evaluated. APB[6] is recognized by means of the reader on which the booking was entered. If a release should appear on both sides at the same time, both persons will be reassigned.

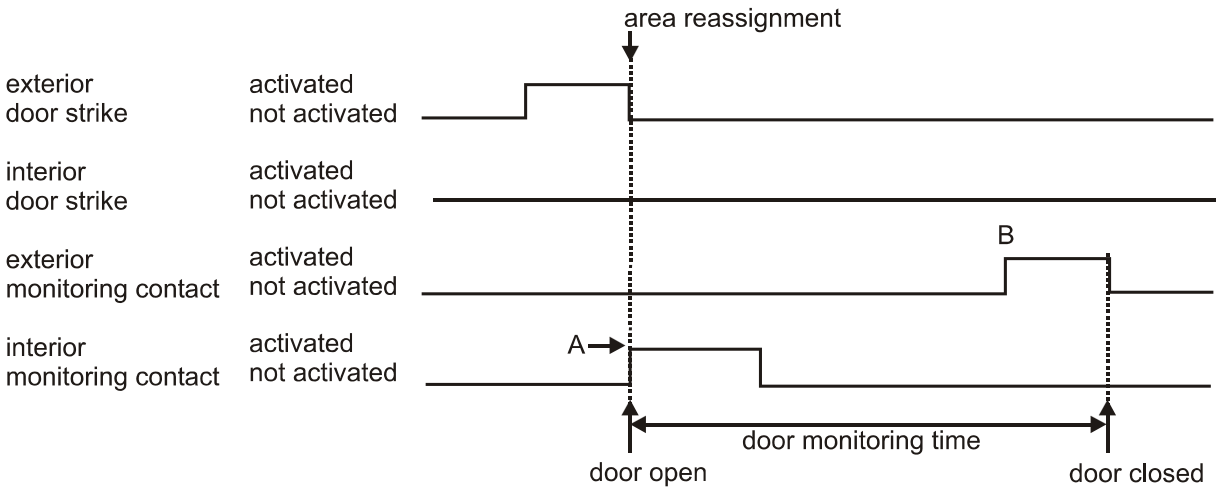
6 For further information concerning APB/BRE (anti pass back/barring repeated entry) see “Supplementary functions of MultiAccess for Windows” (P32201-46-0G0-xx) or “Supplementary functions of IQ MultiAccess” (P032205-46-0G0-xx).

16.6.2 Turnstile with two common monitoring contacts

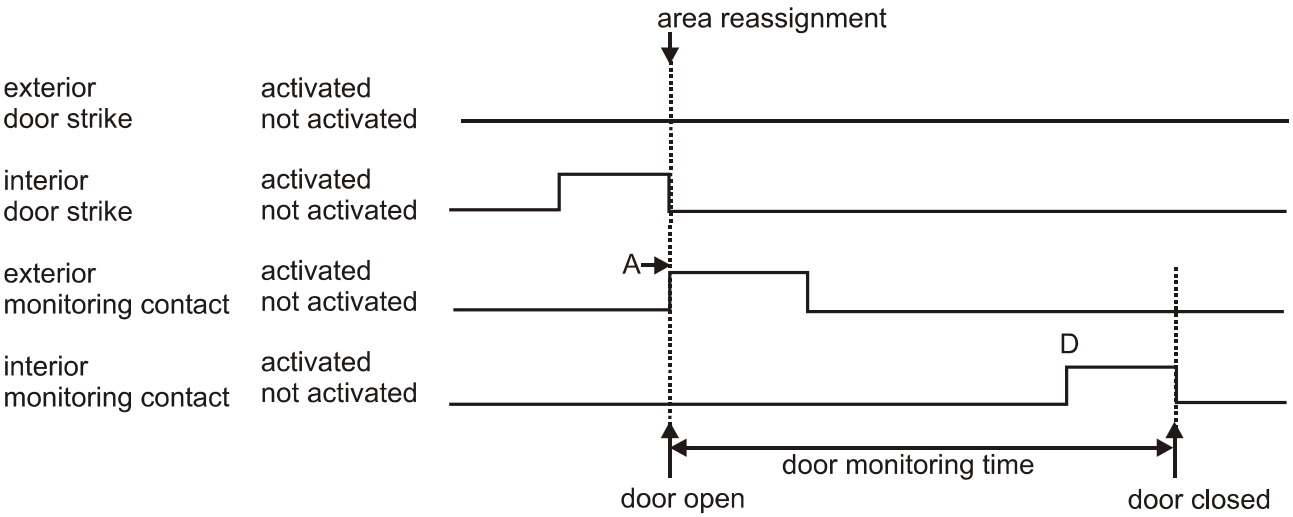
With this arrangement the rotation direction can be identified using the make and break sequence of the switches.



Clockwise: If actuator A rotates clockwise it will close the exterior contact. A moment later, the actuator A will move off the exterior contact and the contact will open again. As the turnstile continues to rotate, actuator D will close the interior contact and a moment later, it will move off the interior contact allowing it to open again.



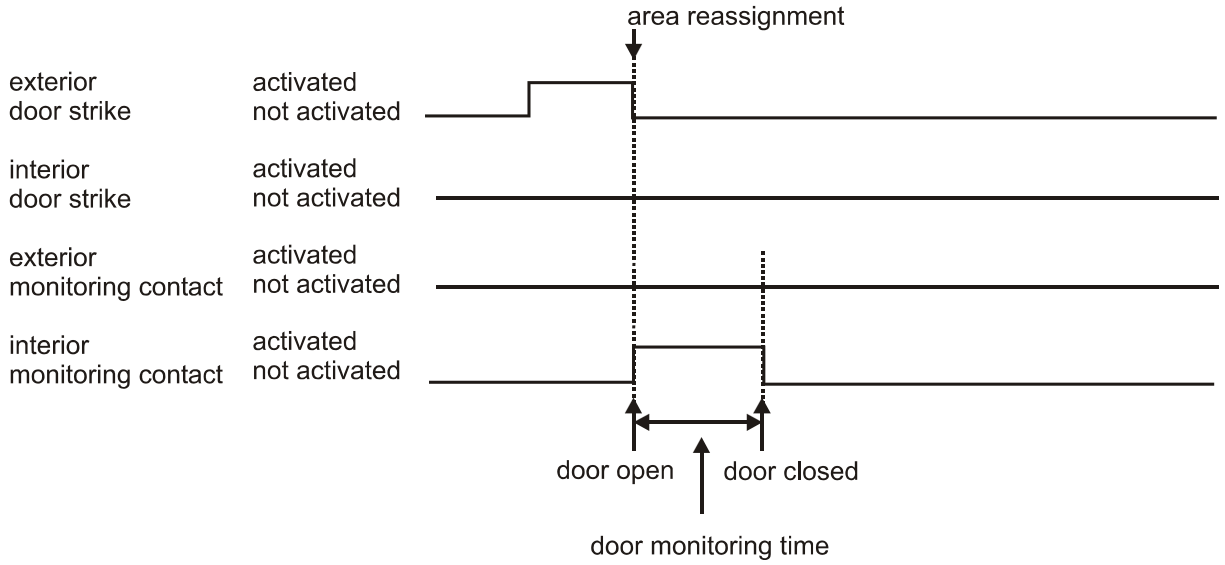
Anti-clockwise If actuator A rotates anti-clockwise it will close the interior contact. A moment later, it will move off the interior contact and the contact will open again. As the turnstile continues to rotate, actuator B will close the exterior contact and a moment later, it will move off the exterior contact allowing it to open again.



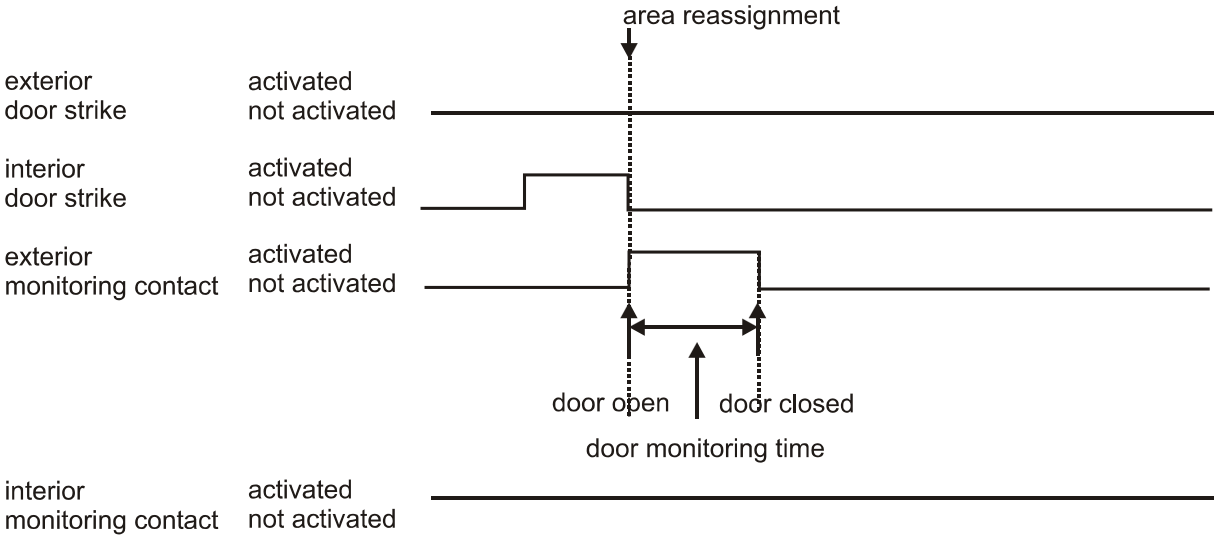
16.6.3 Turnstile with two separate monitoring contacts

In general this variant corresponds to 16.4.3, but the contacts which activate the monitoring contacts are located in a way which causes a different sequence of impulses:

Direction of rotation: left: = Exterior reader activated. The corresponding monitoring contacts gets activated (in our diagram the interior monitoring contact).

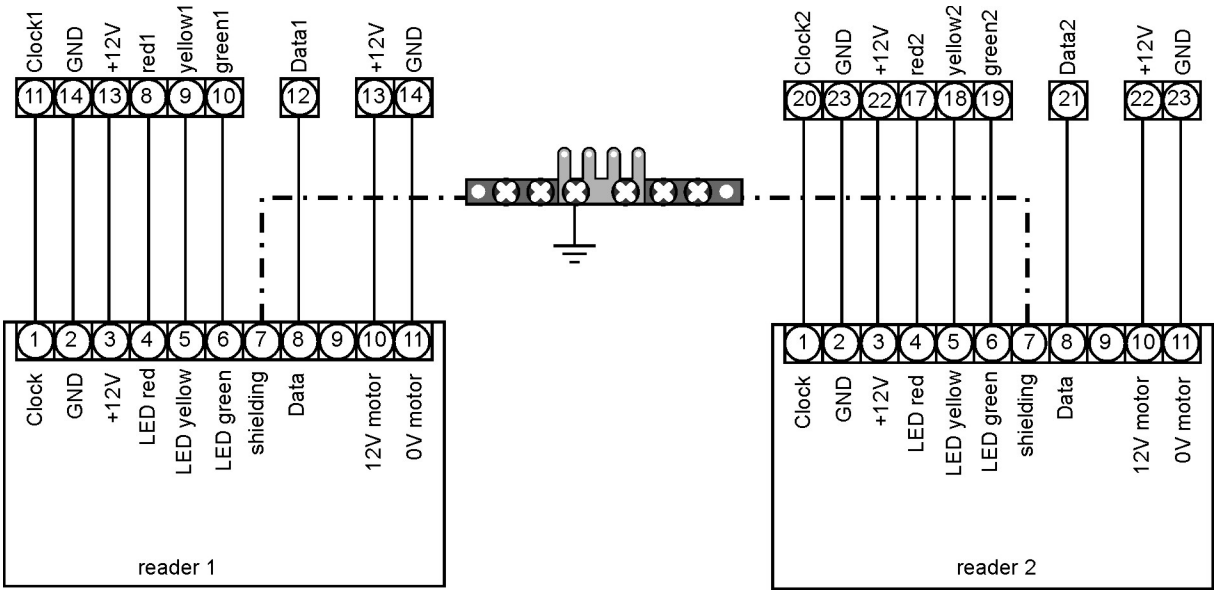


Direction of rotation: right: = Interior reader activated. The corresponding monitoring contacts gets activated (in our diagram the exterior monitoring contact).



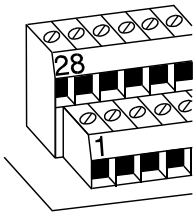
17. Connection diagrams

Connection diagram for:		
	026010.00	Magnetic card mortise reader, sm
	026016.00	Motorized magnetic card reader, sm
	026342.00	Chip card reader, sm
	026345.00	Chip card reader module for Siedle “Vario” System, item no. 027545 - 027548
	026053.00	Magnetic card swipe reader, sm



The terminals 10 and 11 of the reader must only be connected with motorized readers. If only one reader is used, this reader is always connected as reader 1.

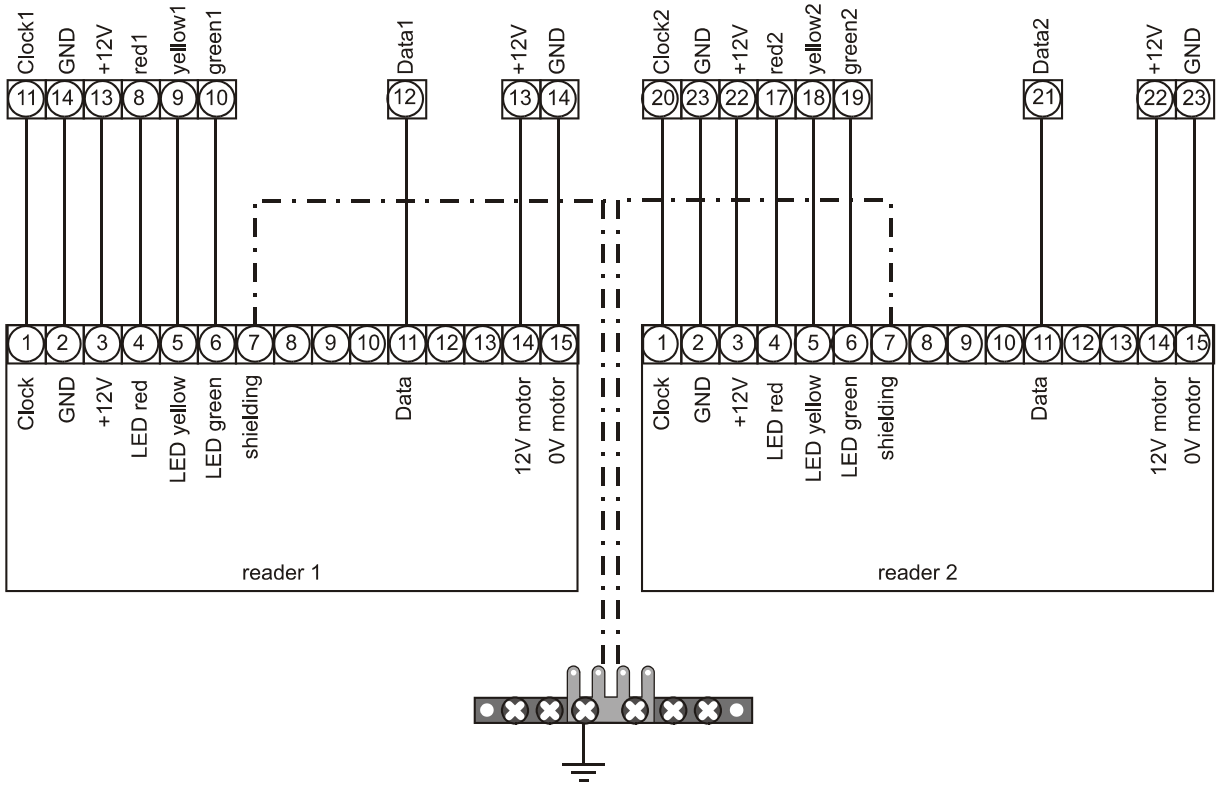
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

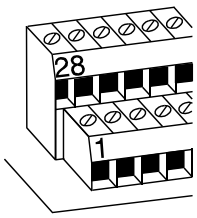
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	2601100	Magnetic card mortise reader, fm
	2601700	Motorized magnetic card reader, fm



The terminals 14 and 15 of the reader must only be connected with motorized readers. If only one reader is used, this reader is always connected as reader 1.

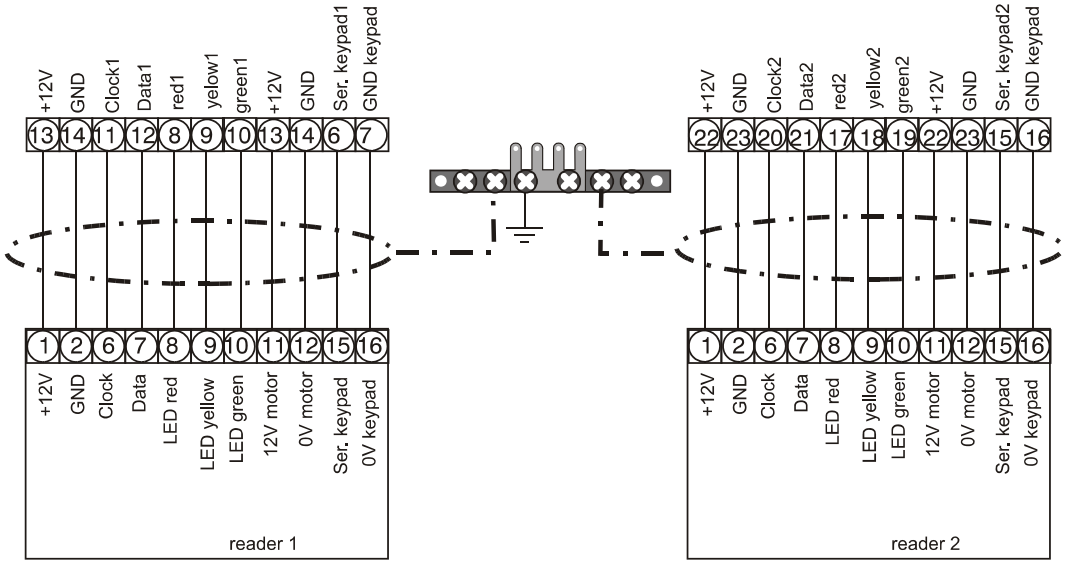
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

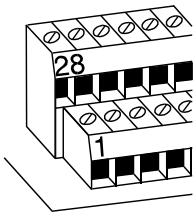
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	27710	Magnetic card mortise reader, sm, with keypad
	27711	Motorized magnetic card reader, sm
	27712	Magnetic card reader, sm
	27740	Chip card reader, sm, without keypad
	27741	Chip card reader, sm, with keypad



If only one reader is used, this reader is always connected as reader 1.

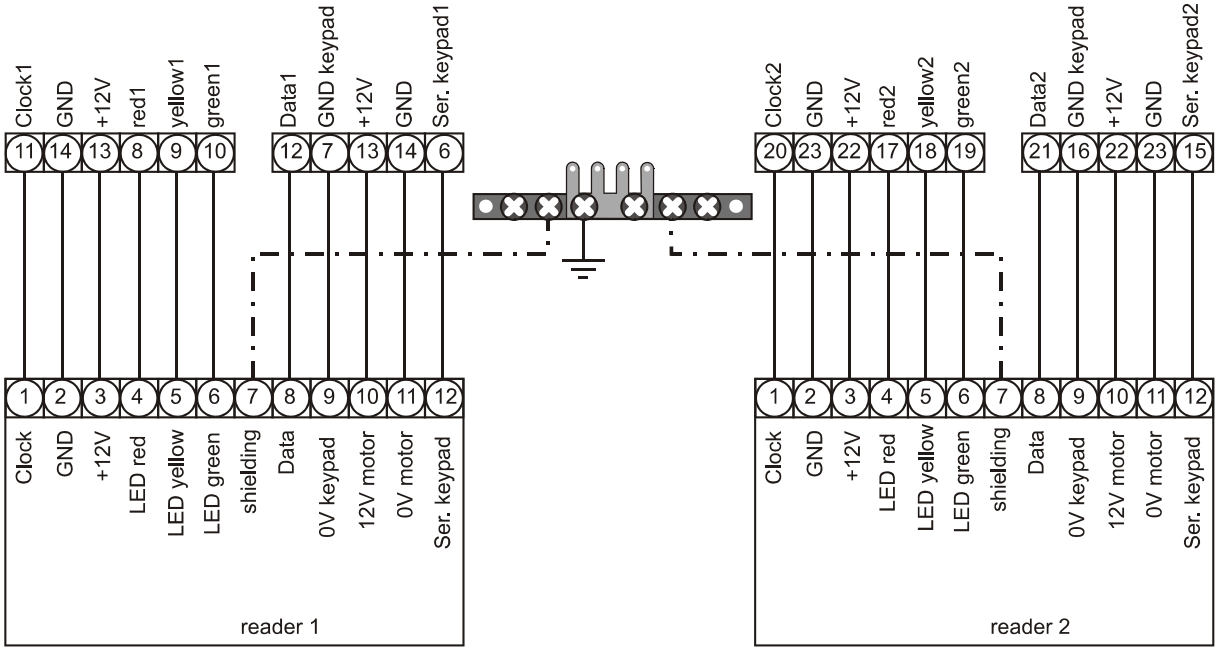
ACS-8 terminal assignment,



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

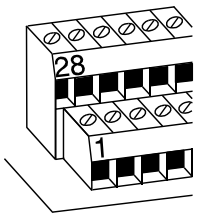
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for		
	2604600	Magnetic card mortise reader, sm, with keypad
	2604700	Motorized magnetic card reader, sm, with keypad
	2634300	Chip card reader, sm, with keypad
	2605400	Magnetic card swipe reader, sm, with keypad



If only one reader is used, this reader is always connected as reader 1.

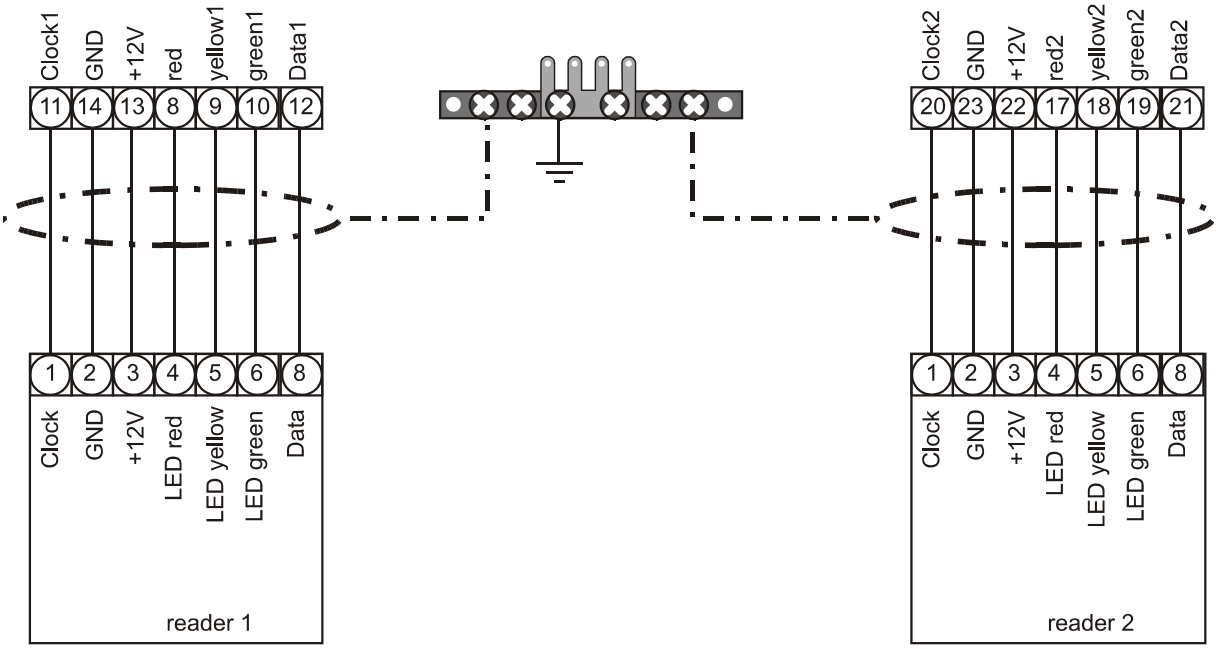
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

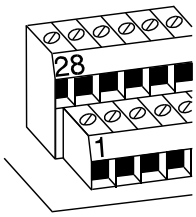
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	2634000	Chip card reader, fm
	2747010	Magnetic card reader module for Siedle “Vario” System, item no. 027545 - 027548
	27580	"Plug in" magnetic card reader



If only one reader is used, this reader is always connected as reader 1.

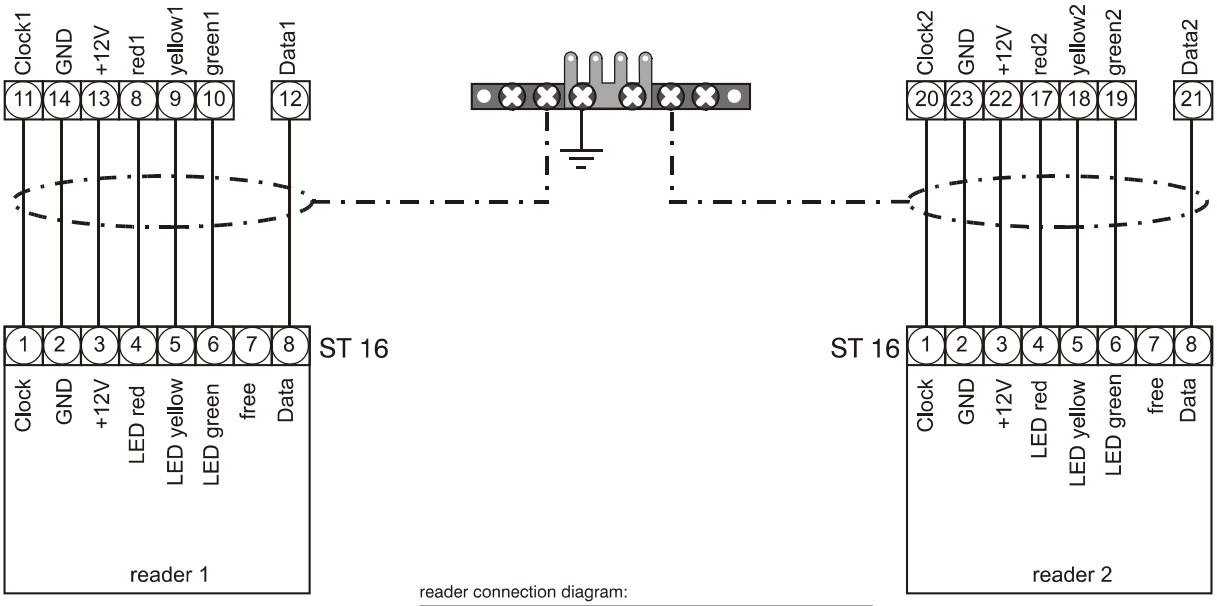
ACS-8 terminal assignment:



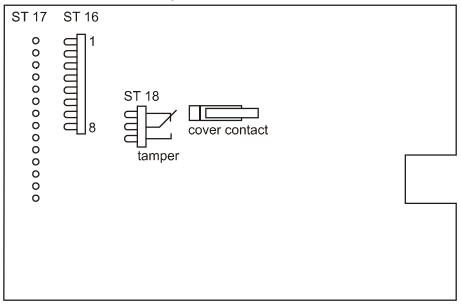
DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	2636600	Contactless reader, increased reading range
	2636610	Contactless reader, increased reading range

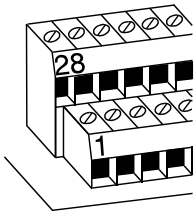


reader connection diagram:



If only one reader is used, this reader is always connected as reader 1.

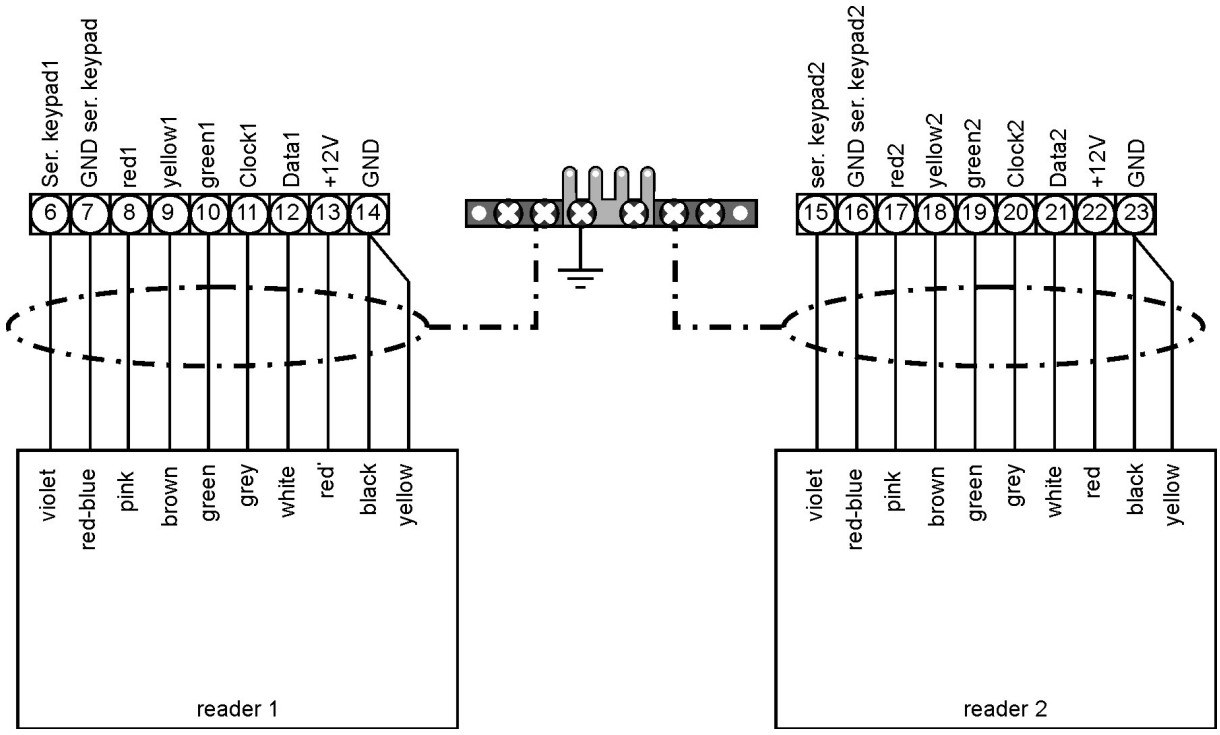
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

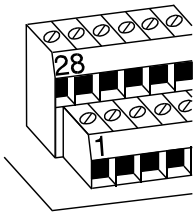
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	026383.00	Contactless reader, sm, with keypad



If only one reader is used, this reader is always connected as reader 1.

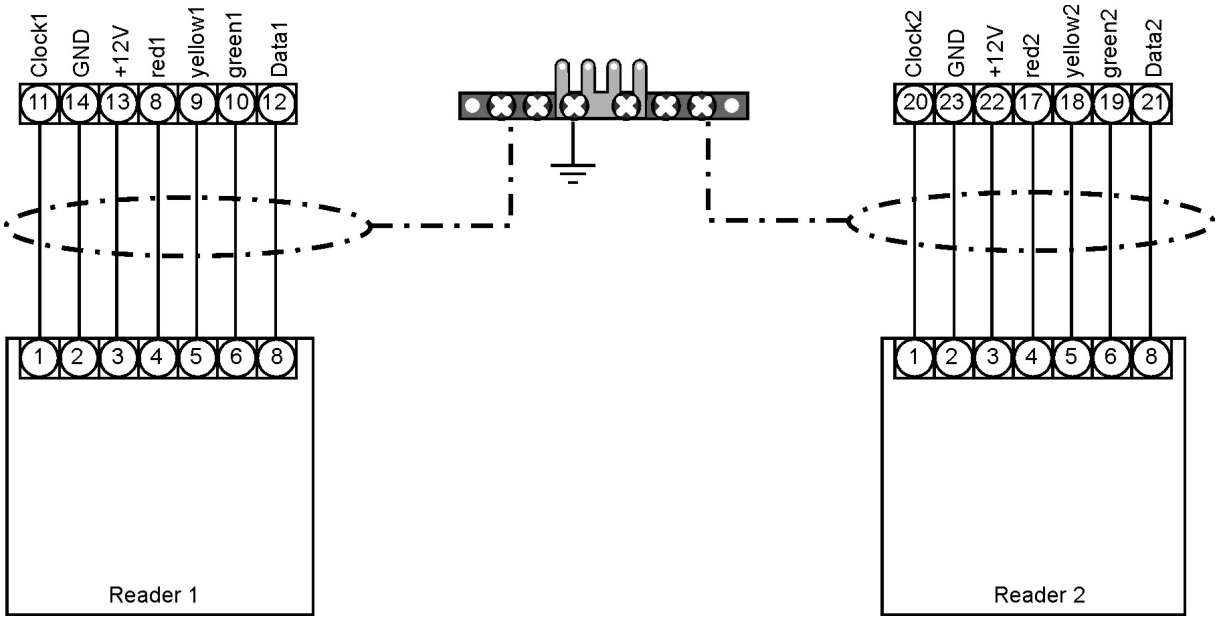
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

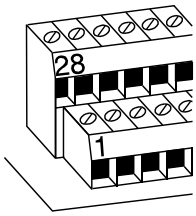
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	026387.00	Contactless reader, fm



If only one reader is used, this reader is always connected as reader 1.

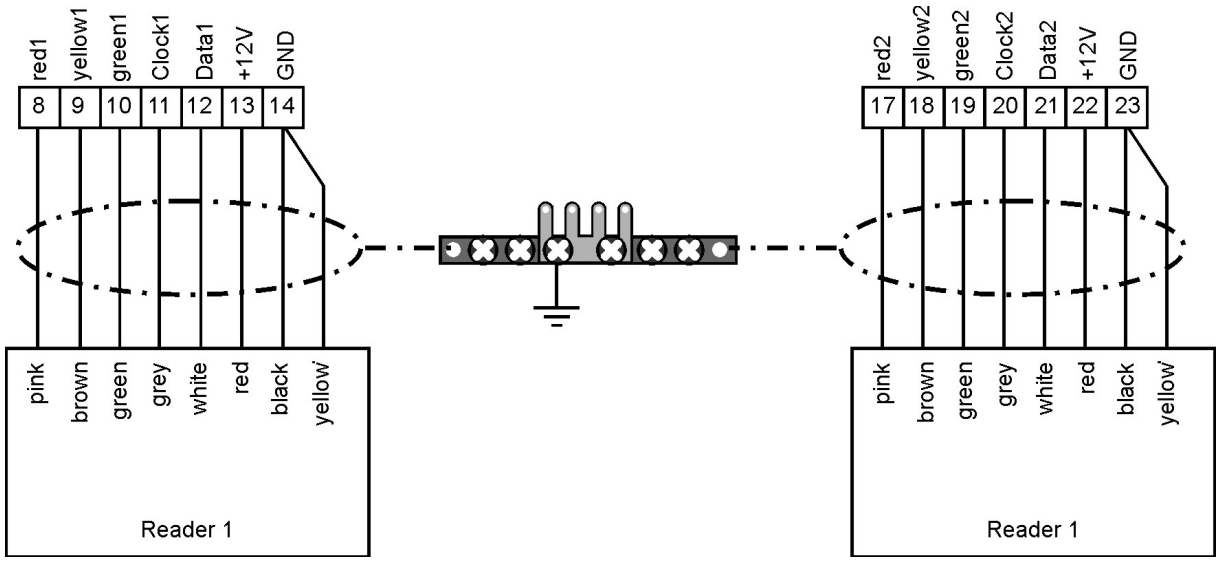
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

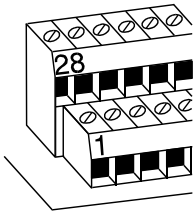
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	26492	Legic reader without keypad, sm
	26494	Mifare reader without keypad, sm
	26481	Contactless reader with keypad, sm
	2639000	Contactless reader, sm
	2639010	Contactless reader, sm
	26491	Legic reader with keypad, sm
	26493	Mifare reader with keypad, sm



If only one reader is used, this reader is always connected as reader 1.

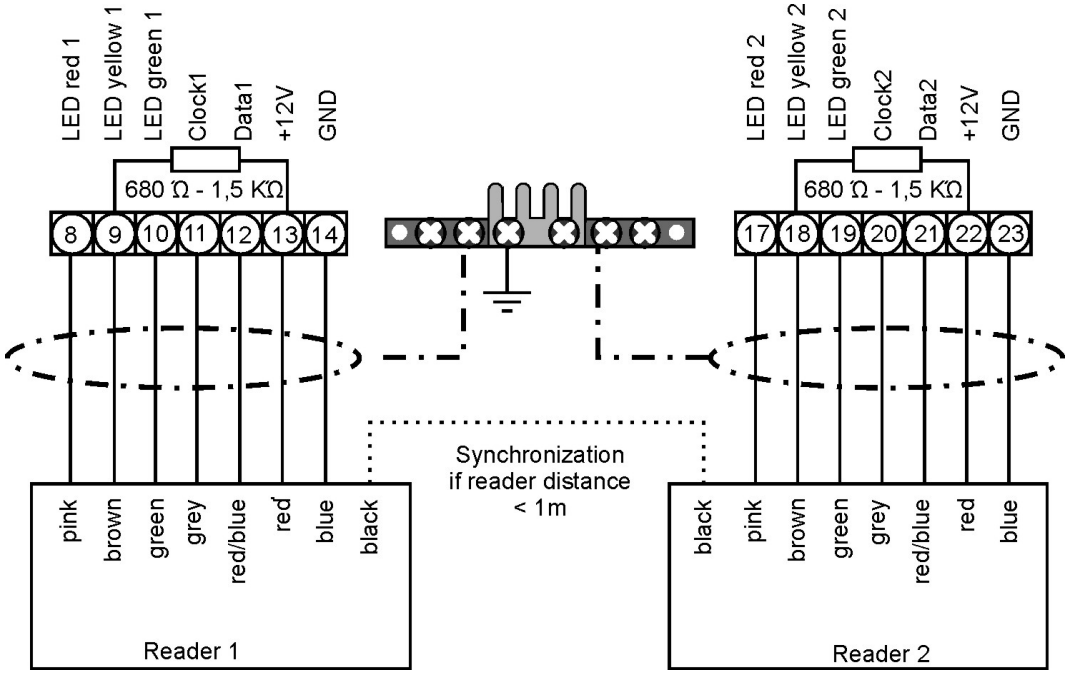
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

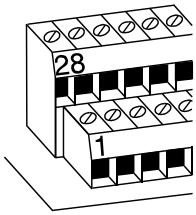
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	026420	Accentic reader proX2 without keypad
	026421	Accentic reader proX2 with keypad
	026422	Accentic reader mifare without keypad
	026423	Accentic reader mifare with keypad
	026424	Accentic reader Legic without keypad
	026425	Accentic reader Legic with keypad



If only one reader is used, it is always connected as reader 1.

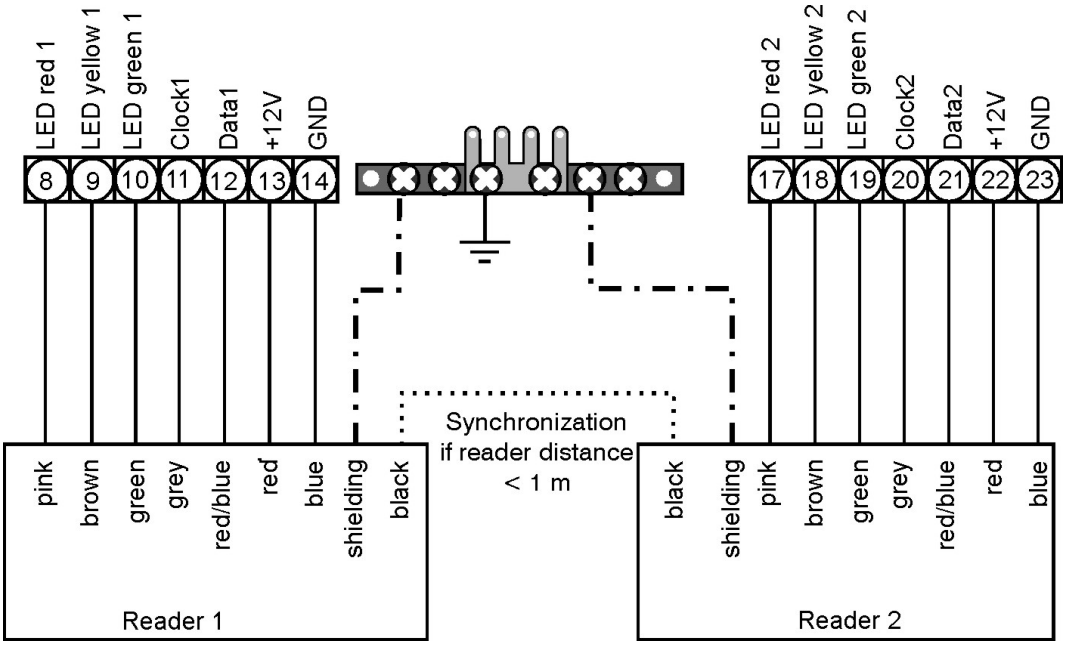
Terminal assignment ACS-8:



Settings of the DIP switches located on the CPU board of the ACS-8 (see chapter 8.5):

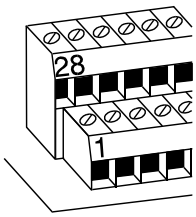
Switch block	DIP	Setting	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	29340	Accentic Fingerkey IK3
	29341	Accentic Fingerkey mifare



If only one reader is used, it is always connected as reader 1.

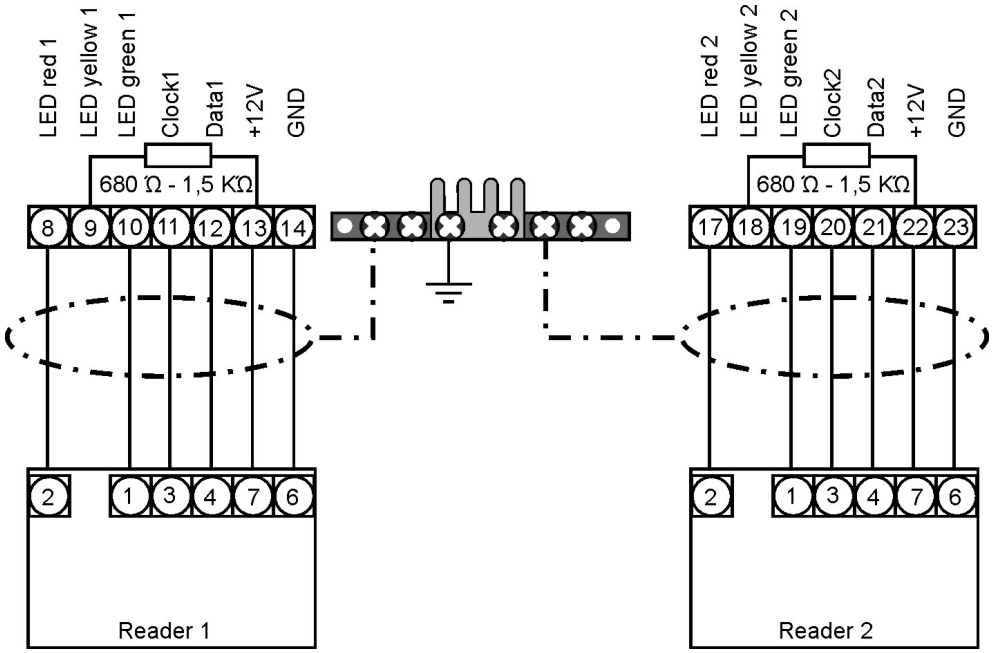
Terminal assignment ACS-8:



Settings of the DIP switches located on the CPU board of the ACS-8 (see chapter 8.5):

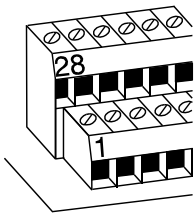
Switch block	DIP	Setting	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	27660	Insertic 50 reader proX1/2
	27662	Insertic 50 reader mifare
	27664	Insertic 50 reader Legic
	27666	Insertic reader proX1/2 without keypad
	27667	Insertic reader proX1/2 with keypad
	27670	Insertic reader mifare without keypad
	27671	Insertic reader mifare with keypad
	27676	Insertic reader Legic without keypad
	27677	Insertic reader Legic with keypad
	27676.10	Insertic reader Legic without keypad
	27677.10	Insertic reader Legic with keypad



Wird nur ein Leser verwendet, wird dieser standardmäßig als Leser 1 angeschlossen.

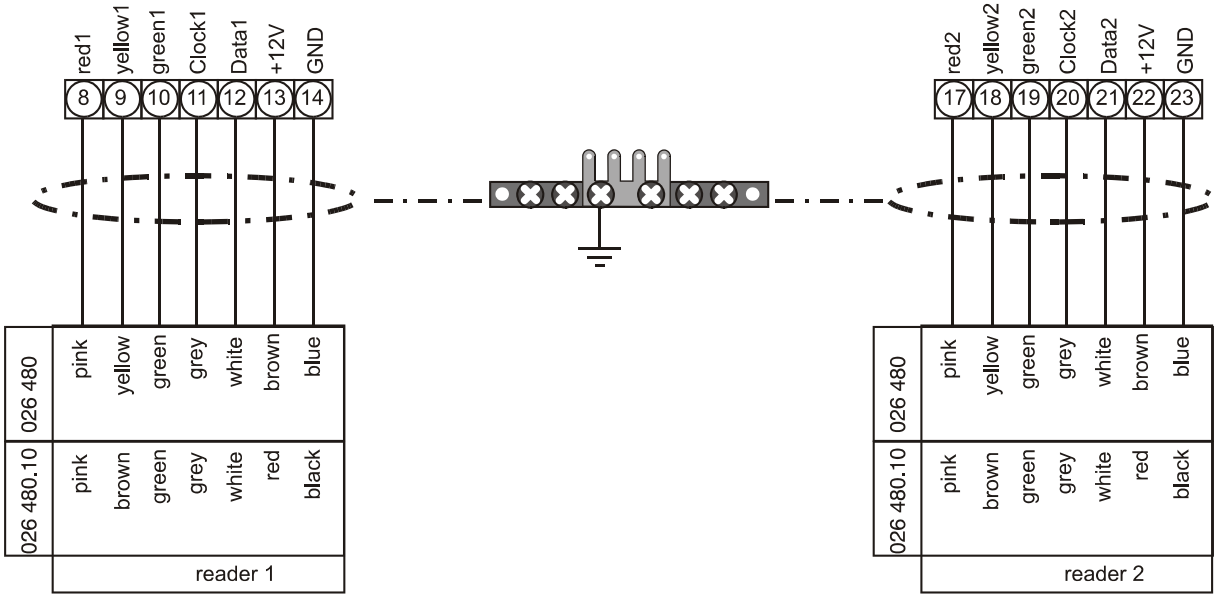
Klemmenbelegung ACS-8:



Stellung der DIP-Schalter auf der CPU-Platine des ACS-8 (vgl. Kap. 8.5):

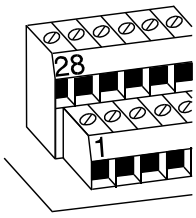
Switch-block	DIP	Position	Designation		Reader
S2	1	OFF	Clock 1	Pull down	1
	2	OFF	Data 1		
	3	OFF	Clock 2		2
	4	OFF	Data 2		
	5	ON	Clock 1	Pull up	1
	6	ON	Data 1		
	7	ON	Clock 2		2
	8	ON	Data 2		

Connection diagram for:		
	26480	Contactless reader, sm
	2648010	Contactless reader, sm



If only one reader is used, this reader is always connected as reader 1.

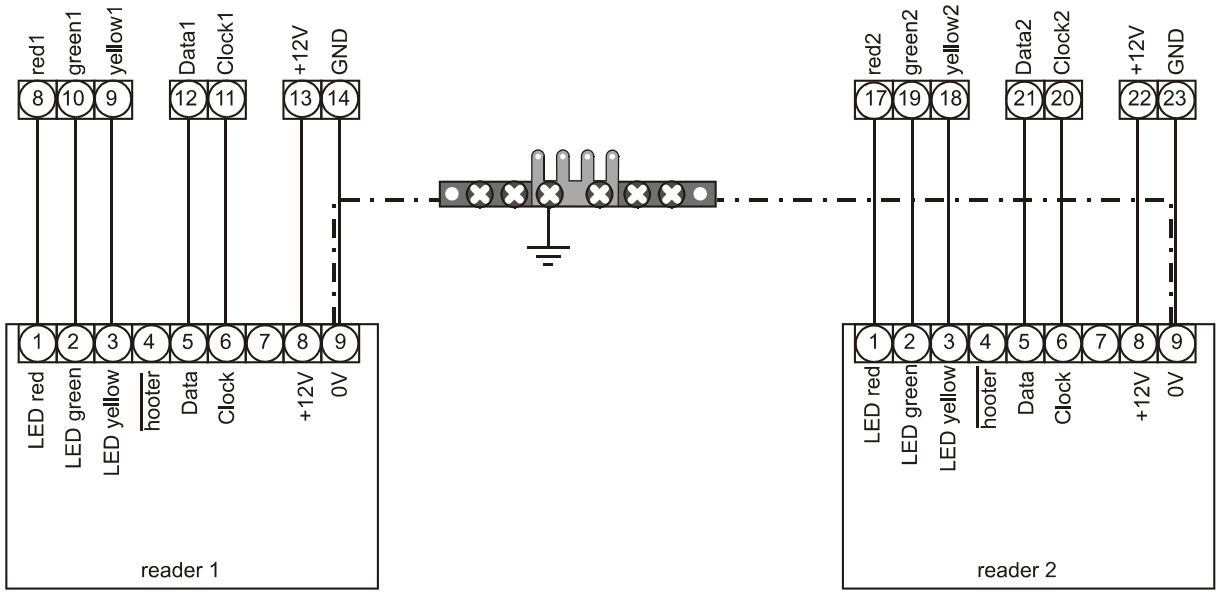
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

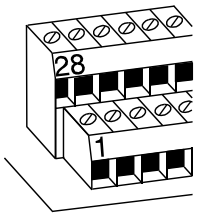
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	26484	Legic reader (Oris)
	26485	Mifare reader (Oris)



If only one reader is used, this reader is always connected as reader 1.

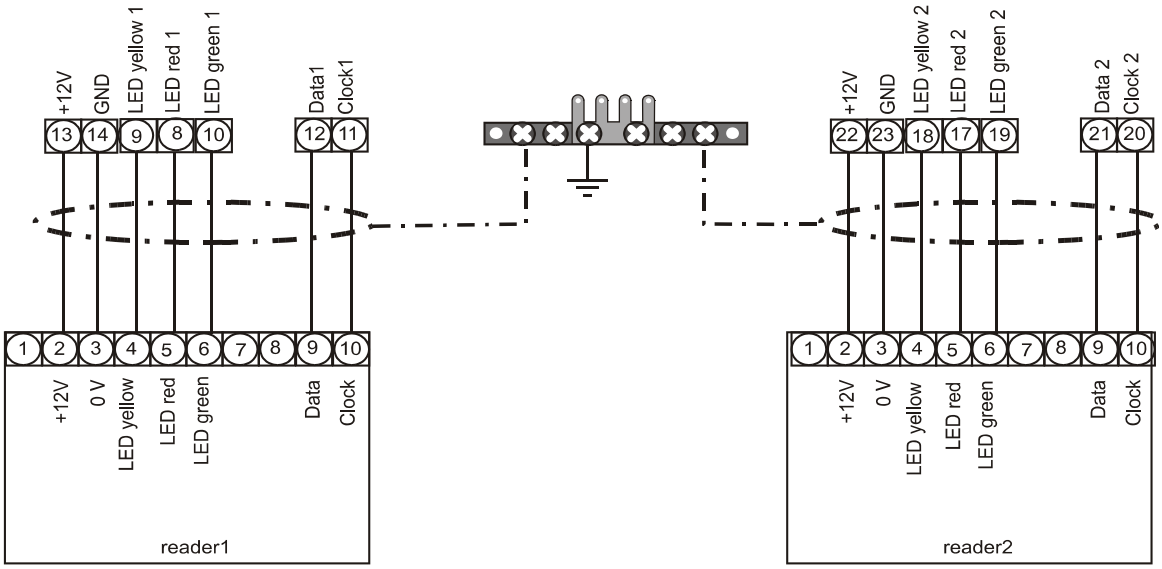
ACS-8 terminal assignment:



DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

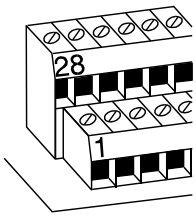
Switch block	DIP	Position	Designation		Reader
S2	1	OFF	Clock 1	Pull down	1
	2	OFF	Data 1		
	3	OFF	Clock 2		2
	4	OFF	Data 2		
	5	ON	Clock 1	Pull up	1
	6	ON	Data 1		
	7	ON	Clock 2		2
	8	ON	Data 2		

Connection diagram for:		
	027540 - 027543	proximity / contactless reader, Siedle



If only one reader is used, it is always connected as reader 1.

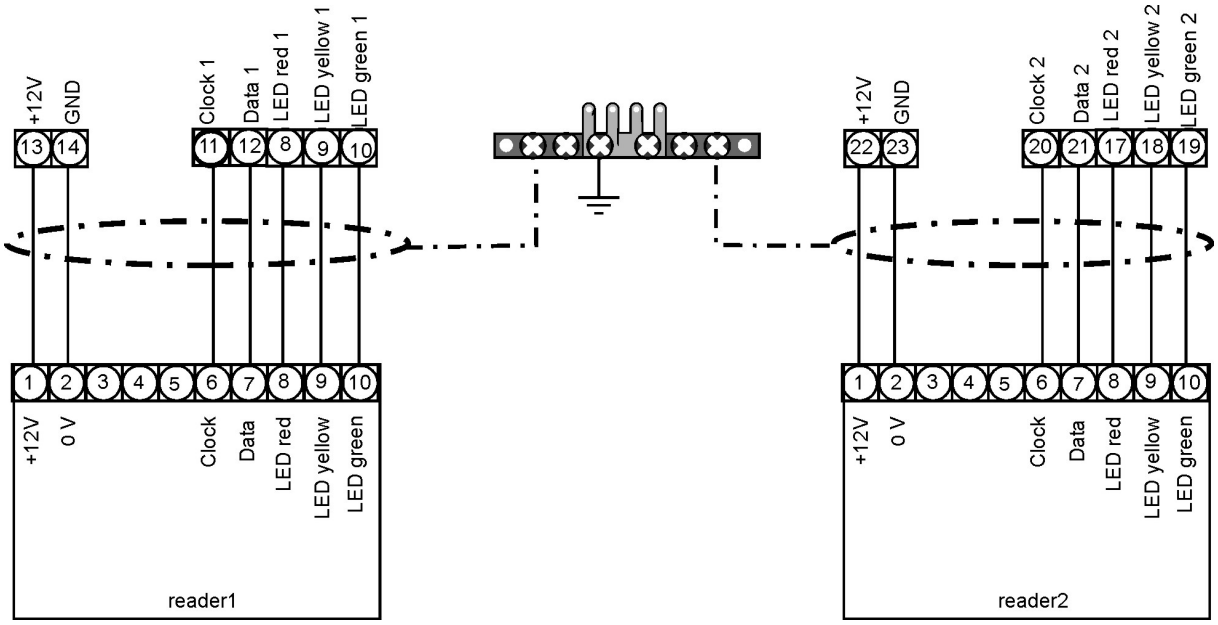
Terminal assignment ACS-8:



Settings of the DIP switches located on the CPU board of the ACS-8 (see chapter 9.6):

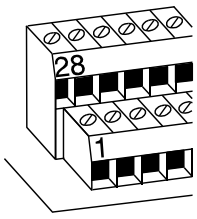
Switch block	DIP	Setting	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	023330 - 023343	contactless proX2 reader Siedle



If only one reader is used, it is always connected as reader 1.

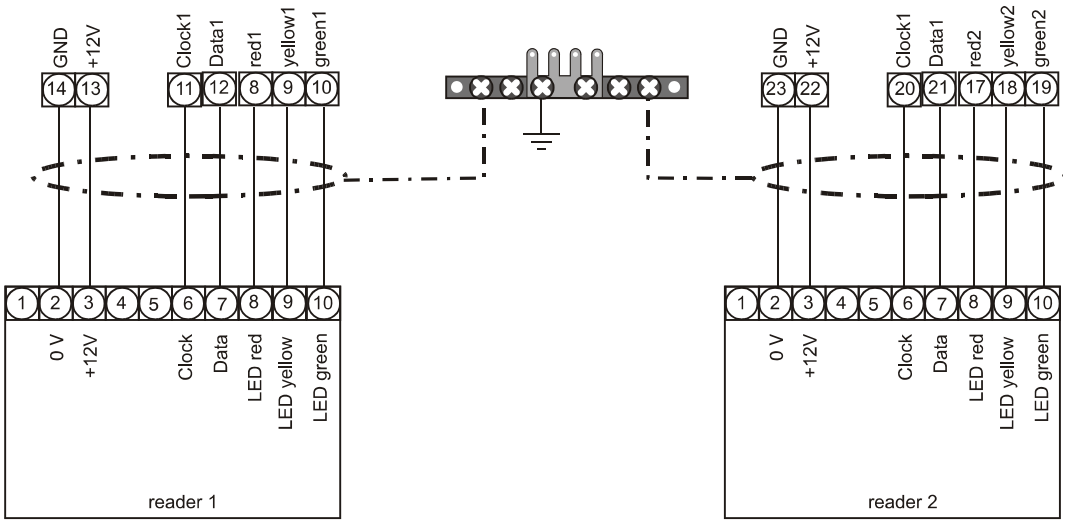
Terminal assignment ACS-8 :



Settings of the DIP switches located on the CPU board of the ACS-8 (see chapter 9.6):

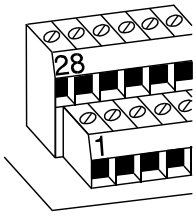
Switch block	DIP	Setting	Designation		Reader
S2	1	OFF	Clock 1	Pull down	1
	2	OFF	Data 1		
	3	OFF	Clock 2		2
	4	OFF	Data 2		
	5	ON	Clock 1	Pull up	1
	6	ON	Data 1		
	7	ON	Clock 2		2
	8	ON	Data 2		

Connection diagram for:		
	027575	Contactless reader “Plug in”
	027575.20	Contactless reader “Plug in”
	027577	Mifare reader “Plug in”
	027579	Legic reader “Plug in”



If only one reader is used, this reader is always connected as reader 1.

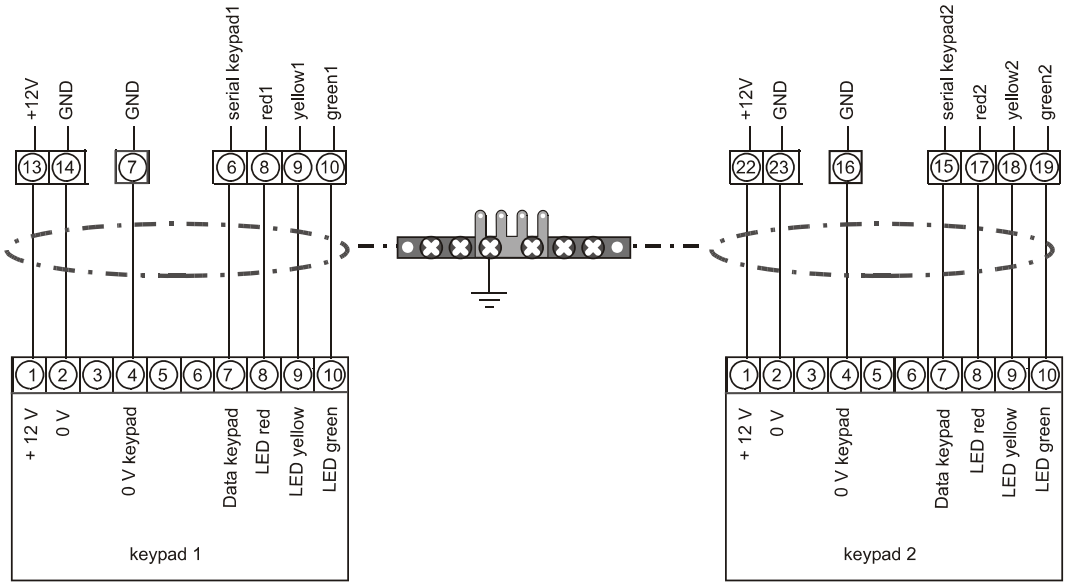
ACS-8 terminal assignment:



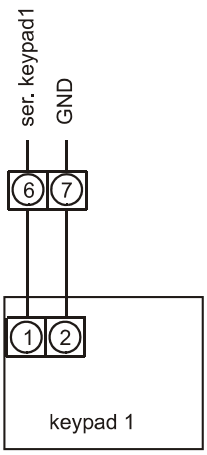
DIP switch positions on the CPU board of the ACS-8 (see chapter 8.5):

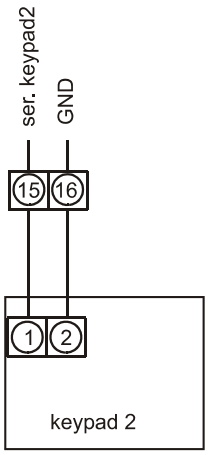
Switch block	DIP	Position	Designation		Reader
S2	1	ON	Clock 1	Pull down	1
	2	ON	Data 1		
	3	ON	Clock 2		2
	4	ON	Data 2		
	5	OFF	Clock 1	Pull up	1
	6	OFF	Data 1		
	7	OFF	Clock 2		2
	8	OFF	Data 2		

Connection diagram for:		
	027570.20	Keypad with analogue interface, “Plug in”

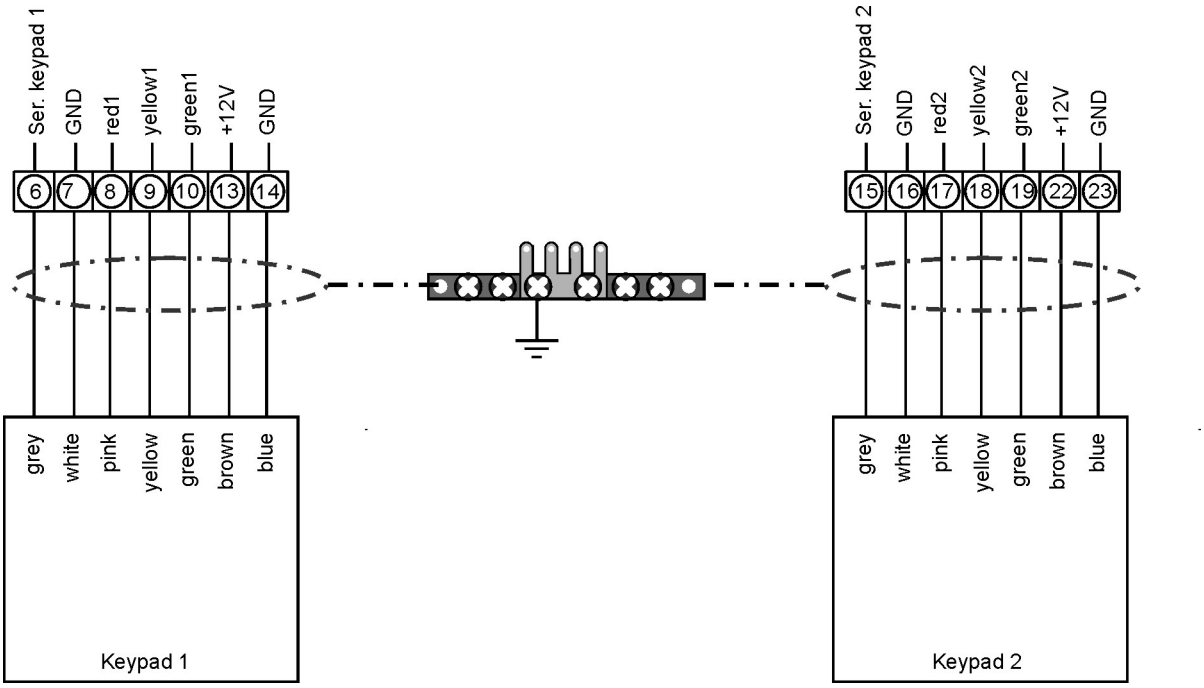


Connection diagram for:		
	026070.02	Keypad, sm housing
	026072.02	Keypad, fm housing
	026071.02	Keypad, sm housing, splashproof
	026073.02	Keypad, fm housing, splashproof





Connection diagram for:		
	026064	Keypad, sm plastic housing



Tabulation of the terminals of readers and keypads Part 1

No.	teader type	Item no.	2-wire-keypad. Data	0V	LED red	LED yellow	LED green	Clock - Data reader Clock	Data	12V	0V	Motor 12V	0V	Shielding	Type of DIP switch S2 on ACS-2/8
	ACS-2/2 plus/8 reader 1		6	7	8	9	10	11	12	13	14	13	14	Shield terminal bar	
	ACS-2/2 plus/8 reader 2		15	16	17	18	19	20	21	22	23	22	23	Shield terminal bar	
	Magnetic card readers														
1	Mortise reader s.m.	026 010.00	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2
2	Motorized reader s.m.	026 016.00	-	-	4	5	6	1	8	3	2	10	11	7	A1, A2
3	Swipe reader	026 053.00	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2
4	Mortise reader f.m.	026 011.00	-	-	4	5	6	1	11	3	2	-	-	7	A1, A2
5	Motorized reader f.m.	026 017.00	-	-	4	5	6	1	11	3	2	14	15	7	A1, A2
6	Mortise reader s.m. with keypad	026 046.00	12	9	4	5	6	1	8	3	2	-	-	7	A1, A2
7	Motorized reader s.m. with keypad	026 047.00	12	9	4	5	6	1	8	3	2	10	11	7	A1, A2
8	Swipe reader with keypad	026 054.00	12	9	4	5	6	1	8	3	2	-	-	7	A1, A2
9	Mortise reader f.m.	026 011.10	-	-	4	5	6	1	8	3	2	-	-		A1, A2
10	Motorized reader f.m.	026 017.10	-	-	4	5	6	1	8	3	2	14	15		A1, A2
11	Mortise readerr Plug-in	027 580	-	-	4	5	6	1	8	3	2	-	-		A1, A2
12	Mortise reader s.m.	027 710	-	-	8	9	10	6	7	1	2	-	-		A1, A2
13	Mortise reader s.m. with keypad	027 711	15	16	8	9	10	6	7	1	2	-	-		A1, A2
14	Motorized reder s.m	027 712	-	-	8	9	10	6	7	1	2	11	12		A1, A2
15	Reader module for Siedle	027 470.10	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2
16	Plug-in .	027 580	-	-	4	5	6	1	8	3	2	-	-	7	
	Chip card readers														
1	s.m.	026 342.00	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2
2	s.m. with keypad	026 343.00	12	9	4	5	6	1	8	3	2	-	-	7	A1, A2
3	f.m.	026 340.00	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2
4	f.m.	026 340.10	-	-	4	5	6	1	8	3	2	-	-		A1, A2
5	Plug-in	027 581	-	-	4	5	6	1	8	3	2	-	-		A1, A2
6	s.m.	027 740	-	-	8	9	10	6	7	1	2	-	-		A1, A2
7	reader module for Siedle	026 345.00	-	-	4	5	6	1	8	3	2	-	-	7	A1, A2

Tabulation of the terminals of readers and keypads part 2

No. reader type	Item no.	2-wire-keypad. Data	0V	Clock - Data reader LED red	LED yellow	LED green	Clock	Data	12V	0V	Motor 12V	0V	Shielding	Type of DIP switch S2 on ACS-8
Contactless /proximity readers														
1 S.m. with keypad	026 383.00	violet	red/blue	pink	brown	green	grey	white	red	black	-	-	shielding	A1, A2
2 F.m.	026 387.00	-	-	4	5	6	1	8	3	2	-	-	-	A1, A2
3 S.m.	026 390.00	-	-	pink	brown	green	grey	white	red	black	-	-	shielding	A1, A2
4 S.m.	026 480	-	-	pink	yellow	green	grey	white	brown	blue	-	-	shielding	A1, A2
5 S.m.	026480.10	-	-	pink	brown	green	grey	white	red	black	-	-	shielding	A1, A2
6 with increased range	026 366.00	-	-	4	5	6	1	8	3	2	-	-	-	A1, A2
7 for Siedle system Vario	027 540	-	-	5	4	6	10	9	2	3	-	-	-	A1, A2
8 Plug-in	027 575/77/79	-	-	8	9	10	6	7	3	2	-	-	-	A1, A2
9 Legic/mifare reader (Oris)	026 485/84	-	-	1	3	2	6	5	8	9				
10 Legic/mifare reader	026491- 494	-	-	pink	brown	green	grey	weiß	red	black	-	-	shielding	A1, A2
11 Siedle proX2	023330-343	-	-	8	9	10	6	7	1	2	-	-	-	D1, D2
12 Accentic	026420 - 425	-	-	pink	brown	green	grey	red/blue	red	blue	-	-	-	A1, A2
13 Fingerkey Accentic	029340/41	-	-	pink	brown	green	grey	red/blue	red	blue	-	-	shielding	A1, A2
14 Insertic / Insertic 50	026660/62/64 66/67/70/71/ 76/77	-	-	8	-	10	3	4	7	6	-	-	-	D1, D2
Keypads														
1 S.m.	026 070.02	1	2	-	-	-	-	-	-	-	-	-	-	-
2 S.m. water protected	026 071.02	1	2	-	-	-	-	-	-	-	-	-	-	-
3 F.m.	026 072.02	1	2	-	-	-	-	-	-	-	-	-	-	-
4 F.m. water protected	026 073.02	1	2	-	-	-	-	-	-	-	-	-	-	-
5 S.m. plastic housing	026 064	grey	white	pink	yellow	green	-	-	brown	blue	-	-	shielding	-
6 Plug-in	027 570.20	7	4	8	9	10	-	-	1	2	-	-	-	-

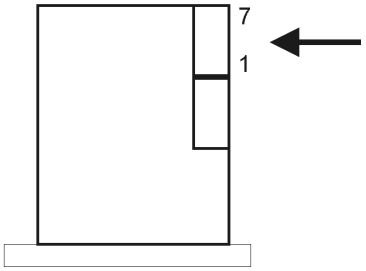
S2 DIP switch position	Type	
reader1	A1	Dip 1, 2 = ON, 5, 6 = OFF
reader 1	B1	Dip 1, 6 = ON, 2, 5 = OFF
reader 1	C1	Dip 2, 5 = ON, 1, 6 = OFF
reader 1	D1	Dip 5, 6 = ON, 1, 2 = OFF
reader 2	A2	Dip 3, 4 = ON, 7, 8 = OFF
reader 2	B2	Dip 3, 8 = ON, 4, 7 = OFF
reader 2	C2	Dip 4, 7 = ON, 3, 8 = OFF
reader 2	D2	Dip 7, 8 = ON, 3, 4 = OFF

All the other combinations are not allowed!

Tabulation of the terminals of bus readers and keypads

No. reader type	Item no.	RS 485 GND	D	D*	Power 12V	0V	Motor-Power 12V	0V	RS485 EN	Shielding
Comm-module	026 587	1	2	3	see label				-	Shield ter-
Comm-module	026 587	6	7	8	see label				-	minal bar
Traffic Point / RF Module	022963	3	A	B	1	3	-	-	-	-
Magnetic card reader										
1 Mortise reader f.m.	026 011.10	2	9	10	3	2	-	-	8	
2 Motorized reader f.m.	026 017.10	2	9	10	3	2	14	15	8	
3 Plug-in	027 580	2	9	10	3	2	-	-	8	
4 Mortise reader s.m.	027 710	3	4	5	1	2	-	-	7	
5 Mortise reader s.m. with keypad.	027 711	3	4	5	1	2	-	-	7	
6 Motorized reader s.m	027 712	3	4	5	1	2	11	12	7	
7 Reader module for Siedle.	026 470.10	2	9	10	3	2	-	-	8	Shielding
Chip card reader										
1 f.m.	026 340.00	2	9	10	3	2	-	-	8	
2 Plug-in	027 581	2	9	10	3	2	-	-	8	
3 s.m.	027 740 / 41	3	4	5	1	2	-	-	7	
Contactless reader										
1 s.m. with keypad	026 481	ye	bl	g/r	red	black	-	-	vio	Shielding
2 s.m.	026 390.10	ye	bl	g/r	red	black	-	-	vio	Shielding
3 s.m. small	026 480.10	-	bl	g/r	red	black	-	-	vio	Shielding
4 with increased reading range	026 366.10	1-1	1-2	1-3	1-3	1-2	-	-	1-4	-
5 Plug-in	027 575/79/77	2	4	5	3	2	-	-	1	-
6 Accentic reader	026 420-25 026 435-36	-	ye	white	red	blue	-	-	black	Shielding
7 Legic/mifare reader	026 491-494	ye	bl	g/r	red	black	-	-	vio	Shielding
8 Mid range reader	026 497	2	8+10	9+11	3	2	-	-	-	Shielding
9 Absorption reader module proX1 / mifare / Legic*	026440 - 442	-	1	2	7	6	-	-	-	-
10 Siedle proX2	023330 - 343	2	3	4	1	2	-	-	-	-
11 Insertic	027668 / 669 027672 / 673 027676 / 677	6	4	3	7	6	-	-	-	-
12 Insertic 50	027661/63/65	6	4	3	7	6	-	-	-	-
13 Fingerkey „Accentic“	029340 / 341	bl	ye	white	red	blue	-	-	vio	Shielding
14 ProX1-reader with Scramble keypad	026445 026445.10	6	4	3	7	6	-	-	-	-
Keypads										
1 Plug-in	027 570	2	4	5	3	2	-	-	7	-
Displays										
1 Plug-in	027 555	4	5	6	3	2	-	-	7	-

*) The absorption reader module has two unlabeled terminal rows close to each other. For the above mentioned connection the back right-hand terminal row is meant.



ye = yellow
bl = blue
g/r = grey/red
black = black
vio = violet

The control line (RS485 EN) is used only for connection to the POT module.

18. Connections/technical data

18.1 Connections 026580, ACS-8 12V version

Interface to the host system:	1 x interface slot. Optionally the following interfaces can be mounted: - RS232 interface (item no. 026840.03) - RS485 interface (item no. 026692, 026693) - Ethernet interface (item no. 026840.29) - Ethernet interface, encrypted (item no. 026840.30) - Current-Loop interface (item no. 026840.16)
Keypad:	2 x external keypads with 2-wire technique connectable. (The keypad can also be combined with a reader.)
Readers:	2 x external clock data readers connectable. Supported reader types: - contactless / proximity reader - magnetic card reader - chip card reader
Relay:	4 x relay, max. 1.25 A / 24 V DC (observe note of chapter 16.4.1!)
Output:	2 x transistor outputs 1 x watchdog output (transistor)
Inputs:	8 x monitored input inputs 4 x digital inputs (e.g. door strike key, monitoring contact)
Housing monitoring:	1 x cover contact (tampering)
Extensions:	1 x connector for the extension of the communication module (026587) and future applications. 1 x universal slot for RAM extension and future applications.

18.2 Connections 026585, ACS-8 230V version

Power supply/charging unit:	Part. No. 010690.02
Battery support:	1 x 018003 (3.5Ah) or 2 x 018002 (2.0Ah)
Other features:	as 026580

18.3 Connections 026575, ACS-8 230V version

Same connections as for 026585, but without installed 230V power supply unit.

The maximum current consumption from devices without integrated power supply unit depends on the external power supply used.

18.4 Technical data 026580, ACS-8 12V version

Rated operating voltage	12V DC
Operating voltage range	10V DC to 15V DC
Max. residual ripple of supply voltage	35 mV
Current (typical)	200 mA
Max. current consumption with U_b	400 mA
Operating temperature range	-0°C to +45°C
Storage temperature range	-25°C to +70°C
Protection class according to DIN 40050	IP40
Environmental class according to VdS	II
Contact rating of the relays	30V DC/1A
ACS-8 fuse Si1	1AT/250V
ACS-8 fuse Si2	1AF/250V
Dimensions of the housing in mm	250 x 210 x 100

If you use a 12V DC power supply, please observe that the output voltage must be free of ground potential.

18.5 Technical data 026585, ACS-8 230V version

Rated operating voltage	230V AC
Operating voltage range	230V AC -15% to +10%
Power frequency	40 - 60Hz
Power consumption	100 VA
Max. current drain	1.5A
Dimensions of the housing in mm	350 x 280 x 100
Short-time continuous current drain	2.2A (5 min. max.)
Max. charging current	1.5A
Battery capacity admitted by VdS	40Ah
Number of connectable batteries	Max. 2
Possible battery combinations	1 x 3.5 / 2 x 2.0 Ah to be integrated into device 2 x 10 / 2 x 16 / 1 x 25 / 1 x 40Ah separate case required
Current drain according to VdS for 60 hours:	approx. 650mA with 40Ah battery capacity

Permanent battery monitoring
Temperature-controlled battery charging current

Operating temperature range	0°C to +45°C
Storage temperature range	-25°C to +70°C
Protection class according to DIN 40050	IP40
Environmental class according to VdS	II
Dimensions of the board:	97.5 x 250mm

The other data are the same as for 026580.

Appendix

1. Master blank sheet for terminal assignment
(For the documentation of individual in- and output assignments deviating from the standard assignment)

2. Master blank sheet for the calculation of the memory requirements
(For the calculation of the memory requirements for the ACS-8 controllers)

3. Planning examples for the determination of cables to be used
(Detailed explanatory notes on the chapters 6.2.1 and 6.2.2 by means of practical examples).

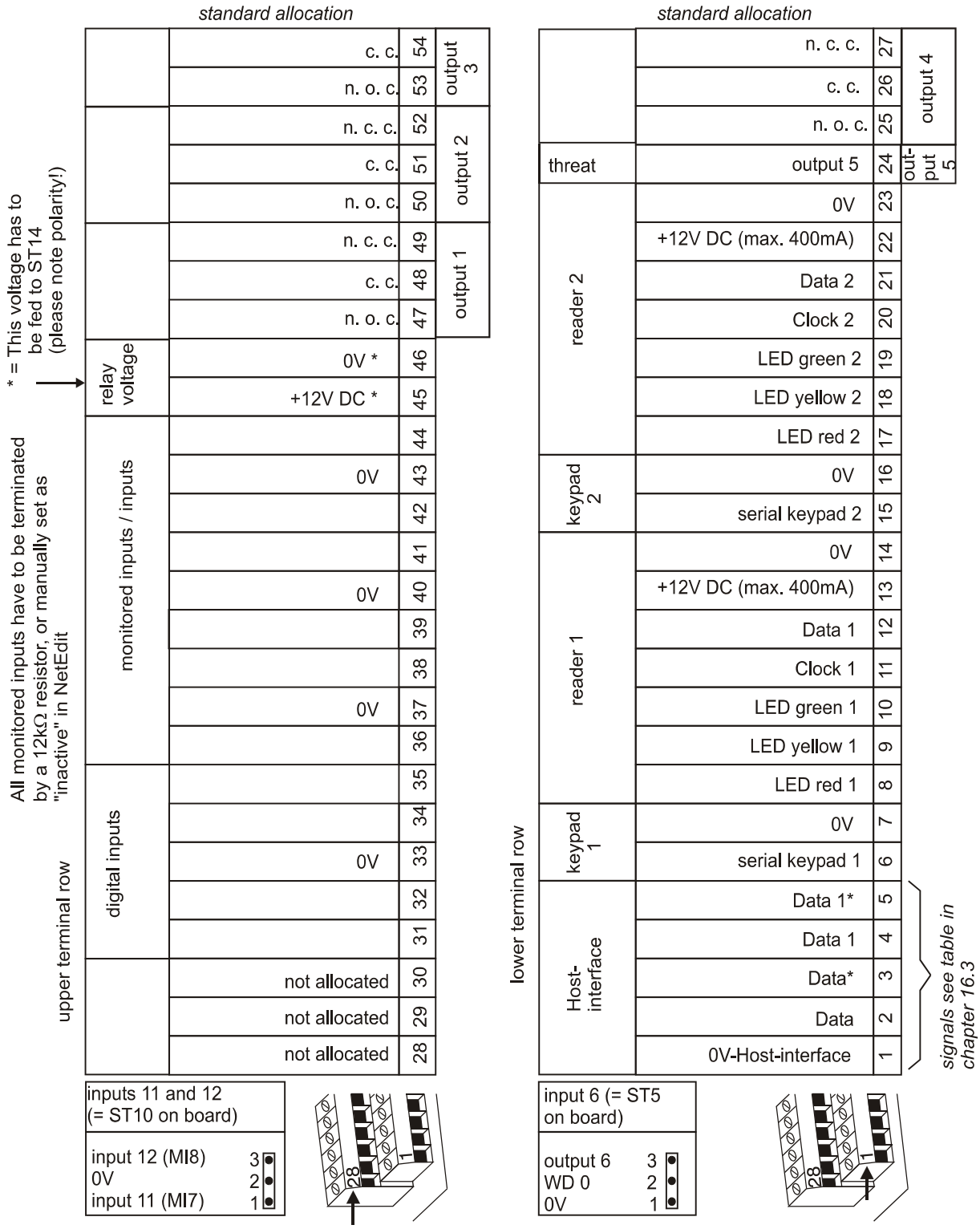
4. Factory settings

5. Index

Terminal assignments deviating from the standard assignments

Company:……

Device no.:……..Site:……..……



Calculating of memory requirements of ACS-2 plus / ACS-8

1. Memory requirements of the ID-cards

designation	no. of digits possible	no. of digits required	divided by no per BYTE	value	rounded to the next integer
Header	13	13	------	13	13
ID no.	4-20		: 2 =		=>
PIN-code	4-8		: 2 =		=>
Version no.	0-2		: 2 =		=>
R/T-zones	0-512		: 8 =		=>
Indexing	0 / 6		-------		=>
Macros	0 - 64		: 8 =		=>
		memory requirements per ID-card			

x no. of ID-cards (max. 65.000)	memory requirements
x	=

sub total 1

2. Memory requirements for BRE/ APB

Designation	no. of digits possible	no. of digits required	x BYTE	total
BRE	0-16		4	
APB	0 = no, 1 = yes →			
Fixed value on active APB, **or** active BRE, **or** active APB and BRE				+4
memory requirements per ID-card				

x no. of ID-cards (max. 65.000)	memory requirements
x	=

sub total 2

3. Memory requirements for bookings

Value	x no. of bookings	total	+ fixed value 45	= memory requirements
9	x	=	+ 45	=

sub total 3

total memory requirements:

4. Analysis of the required RAM-extension

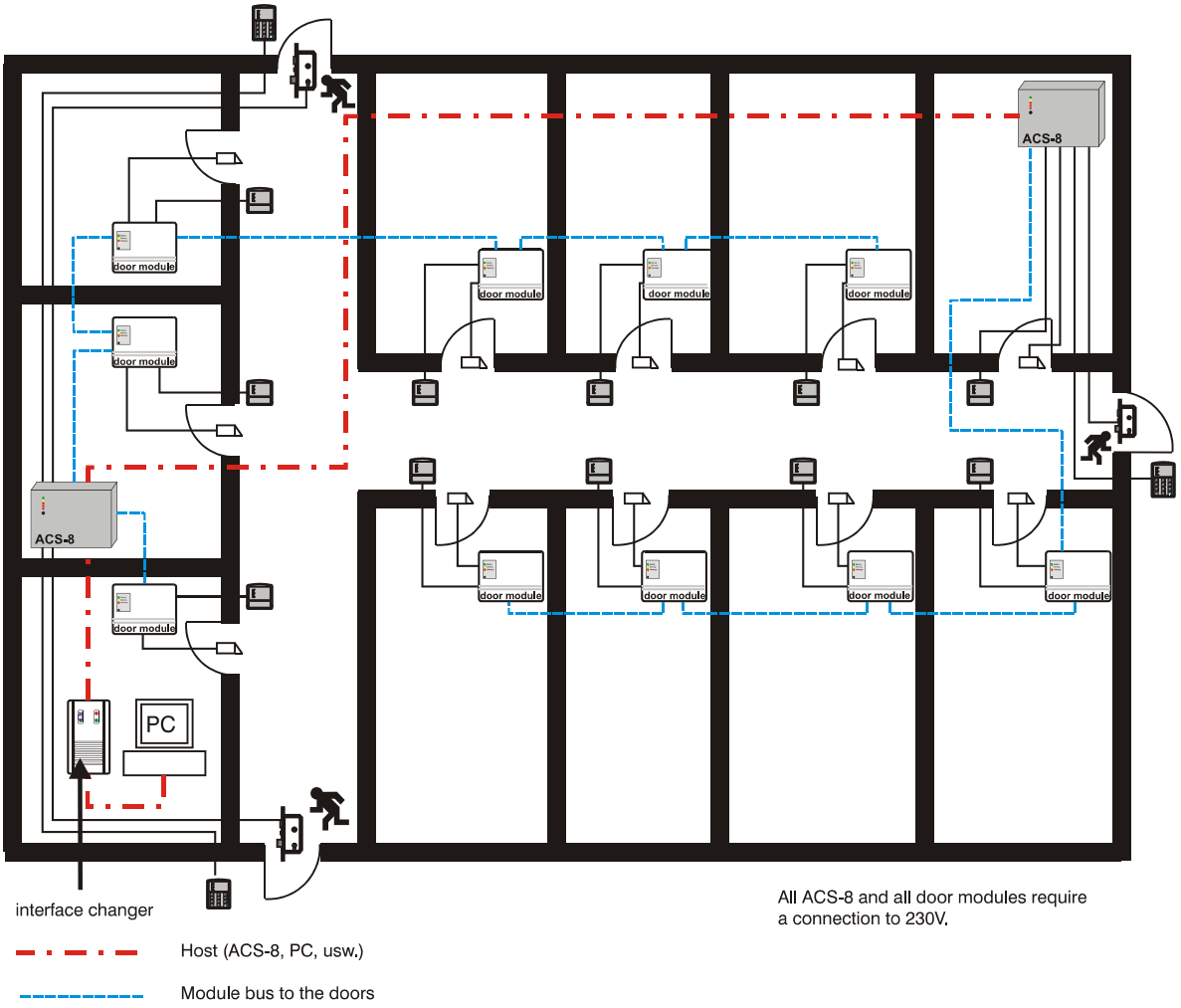
	Standard-equipment	1 MB extension	2 MB extension	3 MB extension
free *	0.5 MB	1.5 MB	2.5 MB	3.5 MB
- required memory				

* = 0.5 MB memory are needed / reseved for internal purpose

Planning examples

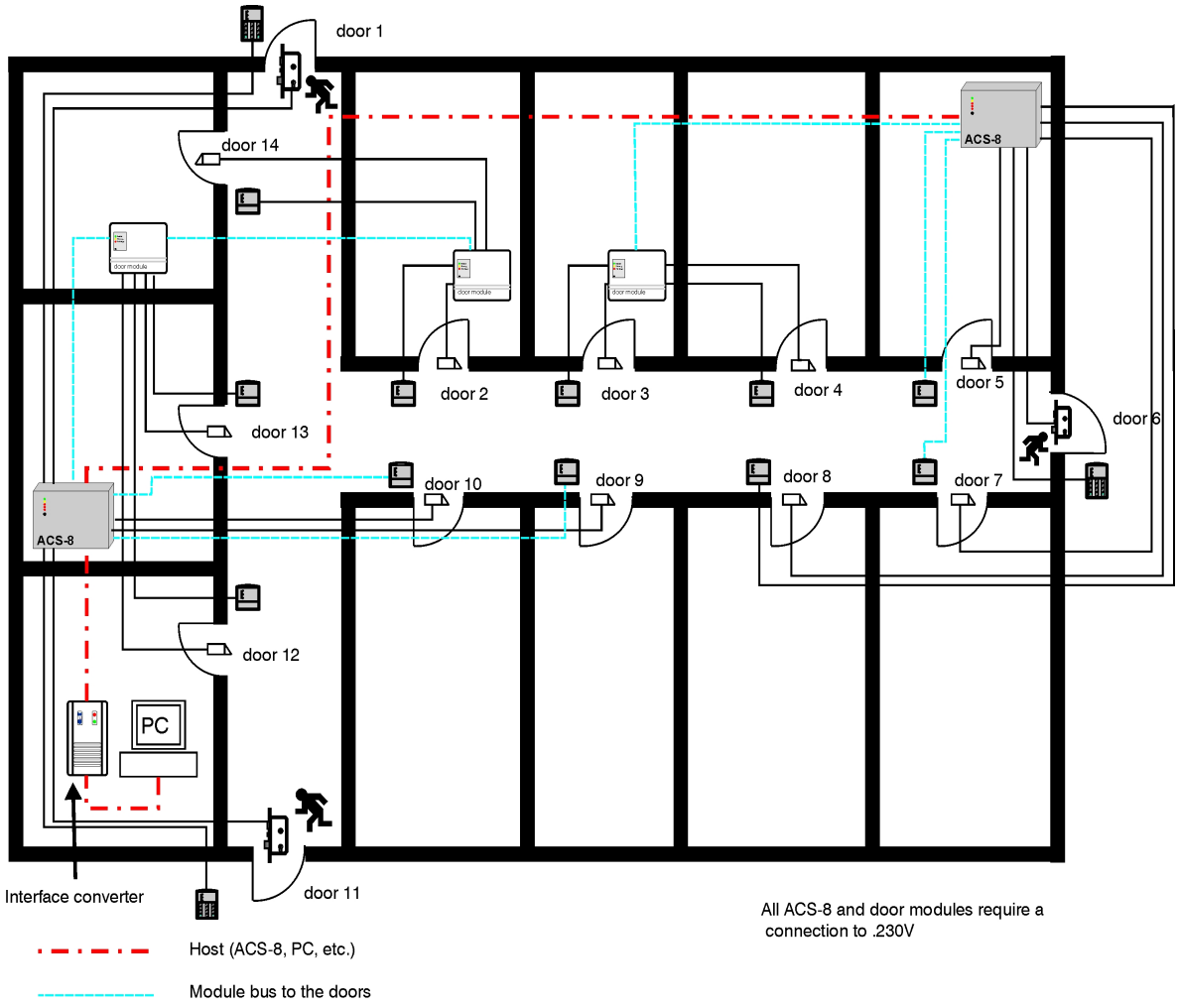
Problem:
14 doors
500 persons
PC required
Only access
Contactless / proximity cards / key ring
PIN code and self-locking locks on outside doors
Doors to be managed via the ACS-8
No additional requirements.

Solution 1a: for MultiAccess for Windows ACS-8 with door modules
(ACS-8 onboard 2 doors, door module onboard 1 door)



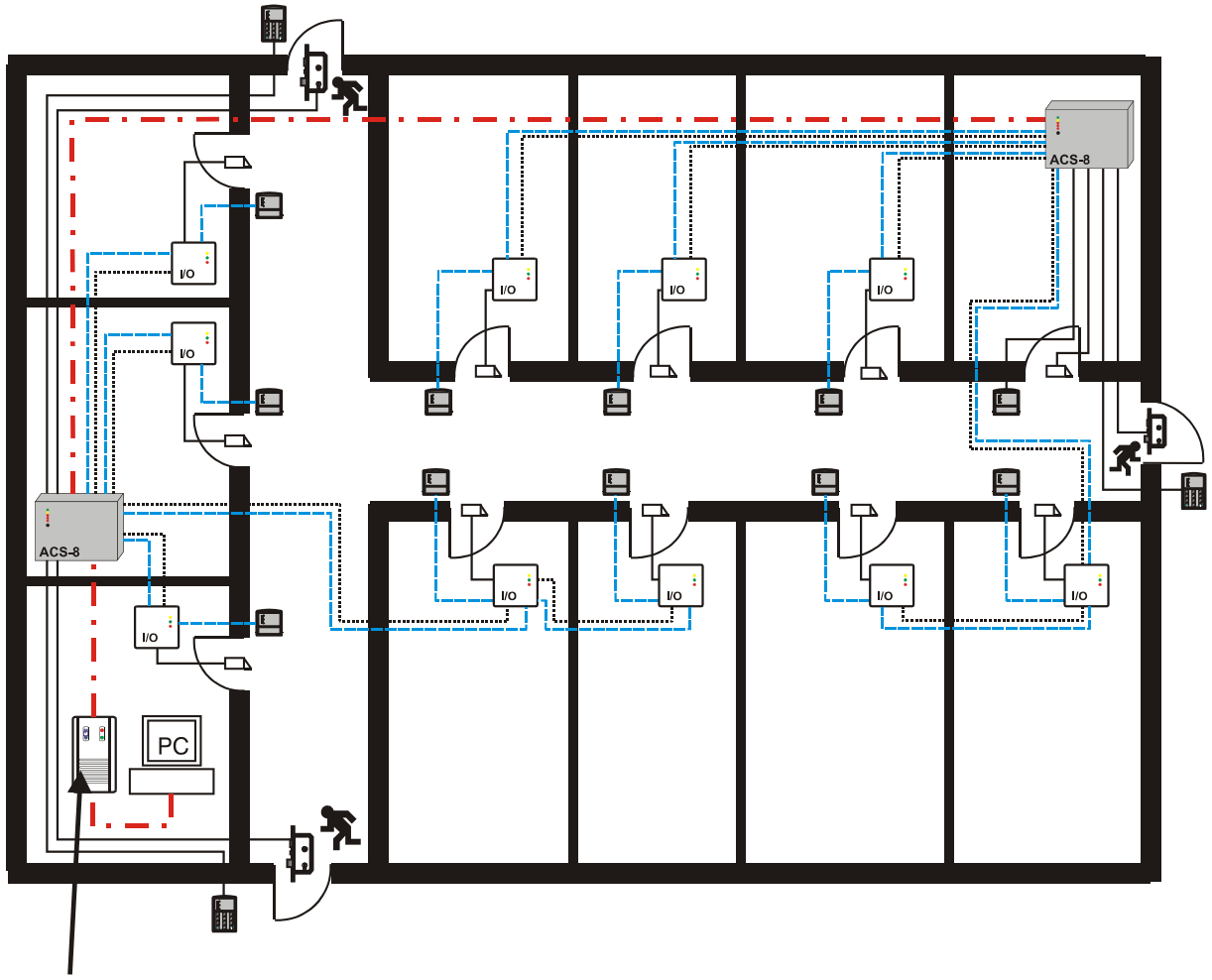
In this example, the device bus and the module bus are pure data lines.
Suitable cables: J-Y(St)Y to 40m, to 1200m Cat 5e.

Solution 1b: for IQ MultiAccess **ACS-8 with door modules**
(ACS-8 onboard 4 doors, door module onboard 2 doors)



In this example, the device bus and the module bus are pure data lines.
Suitable cables: J-Y(St)Y to 40m, to 1200m Cat 5e.

Solution 2a: for MultiAccess for Windows: ACS-8 with input/output modules
(ACS-8 onboard 2 doors)



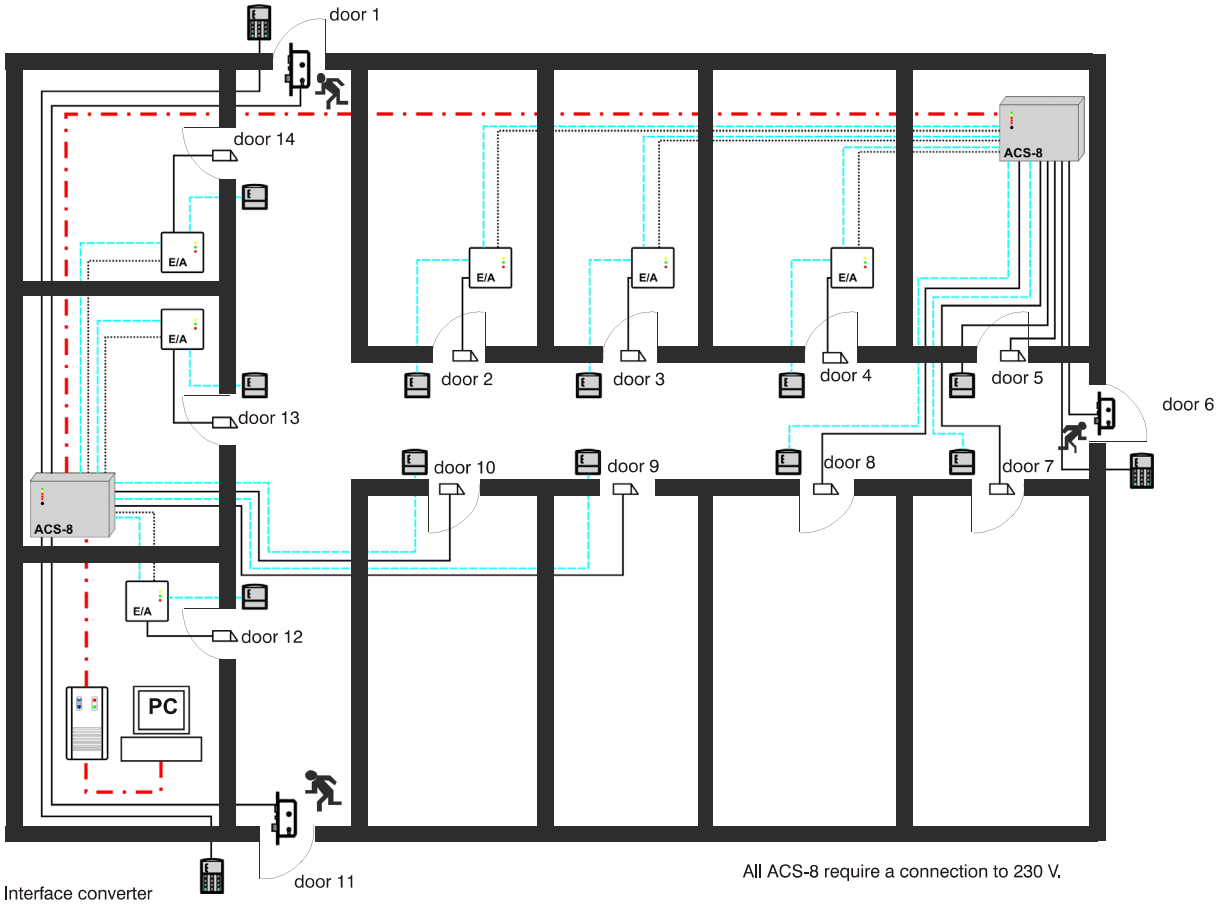
interface changer

Host (ACS-8, PC, etc.)

Module bus to the doors

power supply 12V for I/O-modules and door strikes

Solution 2b for IQMultiAccess: ACS-8 with input/output modules
(ACS-8 onboard 4 doors)



Devices required for this solution:

1 x 029602	Software IQ MultiAccess Basic Kit 500 IDs
1 x 026817.03	Interface converter
1 x 026809	Connection cable from PC tu interface converter
2 x 026575	ACS-8 basic system 230V without power supply unit
2 x 012170	Power supply 7 charge unit
2 x 026693	Interface RS485 with potential separation
4 x 026587	Communication module
6 x 026592	Input/output module
11 x 026480.10	Contactless reader without keypad
3 x 026481	Contactless reader with keypad
3 x 019050	E-safety lock, 65mm bolt
3 x 019072	Special steel fitting for E-safety lock
3 x 019222	External handle pins
3 x 019235	Internal handle pins
3 x 019204	Fixing screws
11 x 019040	Electrical load current security door strike, Universal

Identification medium:
500 x 026370.00 ID-card for contactless readers alternatively: 023100 key fobs for contactless readers

Calculation of the lines of the module bus connected to the ACS-8 when using in/output modules:

Given facts:

Current consumption of the contactless / proximity reader and the I/O-module = 300mA
Current consumption of a universal fail save door strike 019 040 = 240mA

$$R_{max.\ Line} = \frac{U_{drop}}{I_{module}} \qquad R = \frac{L}{\varkappa * A} \rightarrow L = R * \varkappa * A$$

$$\varkappa = 56 \frac{m}{\Omega * mm^2} \qquad A = d^2 \frac{\pi}{4}$$

Cat 5e = 8 x 0.51mm A = 0.2mm² per wire

J-Y(St)Y 2 x 2 x 0.6mm A = 0.28mm² per wire

J-Y(St)Y 2 x 2 x 0.8mm A = 0.5mm² per wire

NYM 5 x 1.5mm²

1. Calculation for systems with battery supply

$$R_{Line\ max.} = \frac{0{,}5V}{0{,}3A} = 1{,}67\Omega$$

1st case: BUS, door strike and module supply in one Cat 7 cable

$$L = 1{,}67\Omega * 56 \frac{m}{\Omega * mm^2} * 0{,}2mm^2 = 17{,}92m : 2 = \underline{8{,}96m}$$

2nd case: BUS in Cat 5e, door strike and module supply in one cable J-Y(St)Y 2 x 2 x 0.8mm

$$L = 1{,}67\Omega * 56 \frac{m}{\Omega * mm^2} * 0{,}5mm^2 = 44{,}8m : 2 = \underline{22{,}4m}$$

With cable J-Y(St)Y 4 x 2 x 0.8mm the wires can be doubled which leads to a doubling of the distance:
---> 44.8m

3rd case: BUS in Cat 5e, door strike and module supply in one cable NYM 5 x 1.5mm²

$$L = 1{,}67\Omega * 56 \frac{m}{\Omega * mm^2} * 1{,}5mm^2 = 140{,}28m : 2 = \underline{70{,}14m}$$

This is not a twisted pair and shielded cable!

2. Calculation for systems without battery supply

$$R_{Line\ max.} = \frac{2{,}5V}{0{,}3A} = 8{,}33\Omega$$

1st case: BUS, door strike and module supply in one Cat 7 cable

$$L = 8{,}33\Omega * 56 \frac{m}{\Omega * mm^2} * 0{,}2mm^2 = 92{,}96m : 2 = \underline{46{,}48m}$$

2nd case: BUS in Cat 5e, door strike and module supply in one cable J-Y(St)Y 2 x 2 x 0.8mm

$$L = 8{,}33\Omega * 56 \frac{m}{\Omega * mm^2} * 0{,}5mm^2 = 233{,}24m : 2 = \underline{116{,}62m}$$

With cable J-Y(St)Y 4 x 2 x 0.8mm the wires can be doubled which leads to a doubling of the distance:
---> 233.24m

3rd case: BUS in Cat 5e, door strike and module supply in one cable NYM 5 x 1.5mm²

$$L = 8{,}33\Omega * 56 \frac{m}{\Omega * mm^2} * 1{,}5mm^2 = 699{,}72m : 2 = \underline{349{,}86m}$$

This cable is not twisted in pairs and is unshielded!

Factory settings

List in alphabetic order:

Function	Factory setting	Switch block	DIP	Chapter	Table
Address	Address 1	S1	1 = OFF 2 = OFF 3 = OFF 4 = OFF 5 = OFF	961	1
Baudrate	19200	S1	6 = OFF 7 = ON	961	2
Clock/Data Mode	Clock 1 (pull down) Data 1 (pull down) Clock 2 (pull down) Data 2 (pull down)	S2	1 = ON 2 = ON 3 = ON 4 = ON 5 = OFF 6 = OFF 7 = OFF 8 = OFF	962	1
Flash bank	The current version must be used	S3	1 = OFF 2 = OFF	963	1
factory internal functions	not active	S4	1 = ON 2 = OFF	964	1
Protocol	9-Bit-Protocol	S1	6 = OFF 7 = ON	961	2
Service function	not active	S1	8 = 0	961	3

The factory settings support fail safe door strikes as well as fail secure door strikes.

Index

Honeywell Security and Fire Solutions

Novar GmbH

Johannes-Mauthe-Straße 14

D-72458 Albstadt

www.honeywell.com/security/de

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