ECKELMANN

Operating instruction

System Centre CI 4000 series

The central of the E*LDS system

The series includes the following expansion stages: CI 4000 / CI 4100 / CI 4400 / CI 4500

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You reach all relevant documents for this component directly using the QR code:

You reach all relevant documents for this component directly using the QR code:

https://edp.eckelmann.de/edp/lds/_a8DwY2ZwdN

Information on safety and connection instructions are described in detail in chapter ”Industrial safety notes”.

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1 Conventions

1.1 Explanation of “Safety Instructions and Hazard Warnings”

Safety instructions or hazard warnings are composed of four elements:

1. The pictogram "!" and the text at the edge of the page.
2. A short, concise description of the danger.
3. A description of the possible consequences.
4. A catalogue with measures for avoidance.

For example:

> **Warning of dangerous electrical voltage! Danger of electric shock! BEFORE** connecting and disconnecting, it must be checkedthat **no voltage is present** at the 230 V AC relay outputs!

1.2 Explanation of “General Instructions”

A general instruction is composed of two elements:

1. The pictogram "i" and the text "Info" at the edge of the page and
2. the actual text.

For example:

> Further information for the enclosure protection of the device is contained in the chapter “Technical Data”.

1.3 Warning Signs and Symbols Used

Explanation of the warning signs and symbols used for the safety instructions and hazard warnings in this documentation:

Attention symbol - warning of a general hazard

> **1. Hazard warning**
> The attention symbol indicates all safety instructions in this operating and service manual which result in danger to life and limb of persons if not observed. Carefully comply with the work safety instructions and proceed with special caution in these cases.
> **2. Attention**
> The attention symbol highlights guidelines, regulations, instructions and correct working procedures that must particularly be observed in order to prevent damage to and destruction of E*LDS components or any malfunction (for example to prevent damage to goods).

Failure to observe the attention symbol can result in personal injury (in extreme cases serious injuries or death) and/or material damage!

Voltage symbol - warning of dangerous electrical voltage

1. Warning of dangerous electrical voltage
This work safety symbol warns of hazards from dangerous electrical voltage, with possible consequences of serious injuries and death.
Failure to observe the voltagesymbol can result in personal injury (in extreme cases serious injuries or death) and/or material damage! If this symbol is seen, the operating manual must be consulted to find out the type of the potential HAZARD and the required actions for the avoidance of the HAZARD.
2. Symbol – warning of electrostatic sensitive components and control components
This symbol indicates electrostatic sensitive components and control components, see chapter Electrostatic sensitive components and control components (ESD) for details:

Note symbol

The note symbol highlights usage tips and other useful information contained in this operating and service manual.

Battery disposal symbol

Never dispose of this product with other domestic waste. Please inform yourself about the local regulations for the separated disposal of electrical and electronic products. The correct disposal of your old equipment protects people and the environment from possible negative effects.
Further information can be found in the chapter “Decommissioning and Disposal”:

2 Safety Information

⚠ The safety regulations, instructions and information described in this chapter must be strictly observed and complied with. During repairs on the entire E*LDS system, the accident prevention regulations and general safety regulations must be strictly complied with. Important information (safety instructions and hazard warnings) are indicated by appropriate symbols (see chapter Conventions. Follow these instructions in order to prevent accidents and danger to life and limb, as well as damage to the E*LDS system.

⚠ **Warning about dangerous electrical voltage! Danger of electric shock!** Beware of external voltage at the digital inputs and outputs! All device connections/male connectors must only be plugged in, unplugged and/or wired when **no voltage is present**.

- This operating manual is part of the device. It **must** be kept in the vicinity of the controller as well as for future use so that it can be consulted when required. The operating manual must be available for the operating and maintenance personnel **at any time** for the avoidance of operating errors, see chapter Requirements for the personnel.
- For safety reasons, the equipment must not be used for any applications other than described in the operating manual and only for the intended use, see chapter Intended Use.
- Before using the device, check whether it is suitable for your application with regard to its limit values.
- Note the maximum load of the relay contacts, see chapter Specifications of System Centre and SIOX.
- Before connecting the device, it must be checked whether the power supply is suitable for the device.
- When using uncoded plug connectors, it is possible to connect them so that there is a danger to life and limb! If this cannot be ruled out, coded plug connectors must be used.
- Specified environmental conditions (e.g. humidity and temperature limits) must be observed and complied with. Otherwise, malfunctions are possible (see chapter Specifications of System Centre and SIOX.
- Before switching on the device, check correct wiring of the connections.
- Opening the device is not authorised!
- Contact the supplier in the case of any malfunction.

⚠ 1. According to experience, transmission of alarms is not yet functional during commissioning (no telephone line laid etc.). It is strongly recommended in such cases to monitor the controller via the CAN bus using a system centre or an operator terminal and to enable transmission of alarms using a GSM modem via a mobile telephone system. In standalone operation, or as an alternative to monitoring with system centre / operator terminal, an available alarm contact on the controller must be used to realise transmission of alarms via a telephone network.
2. After the setting up of transmission of alarms or alarm signalling, this must be tested and checked for its function.

ⓘ For further information about the CAN bus, see the operating instruction "Basics and General Safety and Connection Notes".

⚠ Work on the electrical system may **only be performed by authorised specialist personnel** (according to the definition for specialists in DIN/VDE 0105 and IEC364, see Requirements for the personnel) and in accordance with the respective applicable

- VDE regulations
- Local safety regulations
- Intended use
- Five safety rules according to BGV A3
- ESD measures
- Operating instructions

2.1 Exclusion of liability for non-observance

This operating manual contains information about the commissioning, function, operation and maintenance of the controller and the associated components.

ⓘ A basic requirement for safe and trouble-free operation is **compliance with this operating manual**.

2.2 Requirements for the personnel

Special technical knowledge is required for planning, programming, installation, putting into service and maintenance work. This work must only be performed by trained or specially trained personnel. The installation, putting into service and maintenance personnel must have training which authorises interventions in the system and the automation system. The planning and programming personnel must be familiar with the safety concepts of automation technology. Specialist knowledge is required for work on electrical systems. Work on electrical systems must only be carried out by qualified electricians or persons under their guidance or supervision. In doing so, the respective applicable regulations (e.g. DIN EN 60204, EN 50178, BGV A3, DIN-VDE 0100/0113) must be observed. The operating personnel must be instructed in handling the system / machine and the controller and must be familiar with the operating instructions.

2.3 Intended Use

The controller is exclusively intended for the following use: The controllers in the CI 4000 series are intended for use as system centre of the E*LDS system in commercial and industrial refrigeration systems and building automation with the scope of functions and in accordance with the environmental conditions described in this operating manual.
Note the safety instructions and the instructions for installation and start-up, operation and maintenance. Start the commissioning and/or operation of the machine / system AFTERWARDS.
The safety and the function of the machine / system are only fulfilled with this intended use. Never use the machine / system, its components, assemblies or parts for any other purpose. The system must not be put into operation until conformity with the applicable EU Directives has been established for the entire installation.

2.4 Five safety rules according to BGV A3

The following rules **must be strictly observed**.
1. Disconnect: The entire system to be worked on must be disconnected from the power supply at all poles.

Warning of dangerous electrical voltage! Pay attention to possible external power supply! **BEFORE** connecting and disconnecting it must be checked that **no voltage is present** at the controller! All device connections / connectors may only be plugged in, unplugged and/or wired when no voltage is present.

2. Secure against restarting: Attach information signs to the disconnected operating equipment stating:

- What has been disconnected.
- Reason for the disconnection.
- Name of the person who made the disconnection.
- Restarting must be prevented using a suitable lock (e.g. padlock).

3. Establish absence of voltage (only by authorised specialist personnel):

- Check voltmeter just before use.
- Establish absence of voltage on all poles at the disconnection point.
- Establish absence of voltage on all poles at the place of work.

4. Ground and short-circuit: All electrical parts at the place of work must be grounded and then short-circuited.

5. Cover or shield live parts: If there is neighbouring live equipment in the work area, this must be covered using appropriate materials (e.g. insulation blankets / insulating plates).

2.5 Electrostatic sensitive components and control components (ESD)

> Electronic components and control components (e.g. circuit boards) are sensitive to electrostatic charges. Therefore, the guidelines for handling electrostatic sensitive components and control components must be strictly observed, see chapter ESD - guidelines for handling.

All electrostatic sensitive components and control components (referred to as "ESD" below) are labelled with the warning sign shown. Electrostatic charges arise from friction of insulating materials (e.g. floor covering, items of clothing made of synthetic fibres etc.).
Even small charges can result in damage to or destruction of components. Damage cannot always be established directly, but partially does not result in failure until after a certain operating time.

2.5.1 ESD - guidelines for handling

Only transport and store ESD in the protective packaging provided for this.
Avoid materials that can produce electrostatic charge such as

- plastic containers and tabletops
- synthetic clothing
- footwear with plastic soles
- transparent covers
- polystyrene packaging
- monitors etc.

Wear

- work clothing made of cotton
- ESD footwear with electrically conductive soles or leather soles

Use

- conductive floors
- ESD work places with the tools provided for them (earthed soldering irons, earthing wrist strap and similar)
- conductive ESD bags, conductive plastic containers, IC rods or cartons with conductive foam
- containers and worktops made of wood, metal, conductive plastics or paper bags.

2.6 Abbreviations used

DIN **D**eutsches **I**nstitut für **N**ormung e. V.
EGB **E**lektrostatisch **G**efährdete **B**auelemente oder Baugruppen
ESD **E**lectro-**s**tatic **d**ischarge (**E**lectro **S**ensitive **D**evices)
VDE **V**erband **d**er **E**lektrotechnik **E**lektronik Informationstechnik e.V.
IEC **I**nternational **E**lectric **C**ommittee
BGV A3 Berufsgenossenschaftliche Vorschrift für Sicherheit und Gesundheit bei der Arbeit (Employer's Liability Association regulations for health and safety in the workplace)

3 System centre system design

All explanations of the "System Centre CI 4000" named in this document also always describe all models of the system centre in the CI 4000 series. Any differences in function or features between these models are only explained where they have an effect. The main feature differences are described in more detail in chapter Expansion stages of the CI 4000 series.

CI 4000 series system centre with touchscreen.

3.1 Application

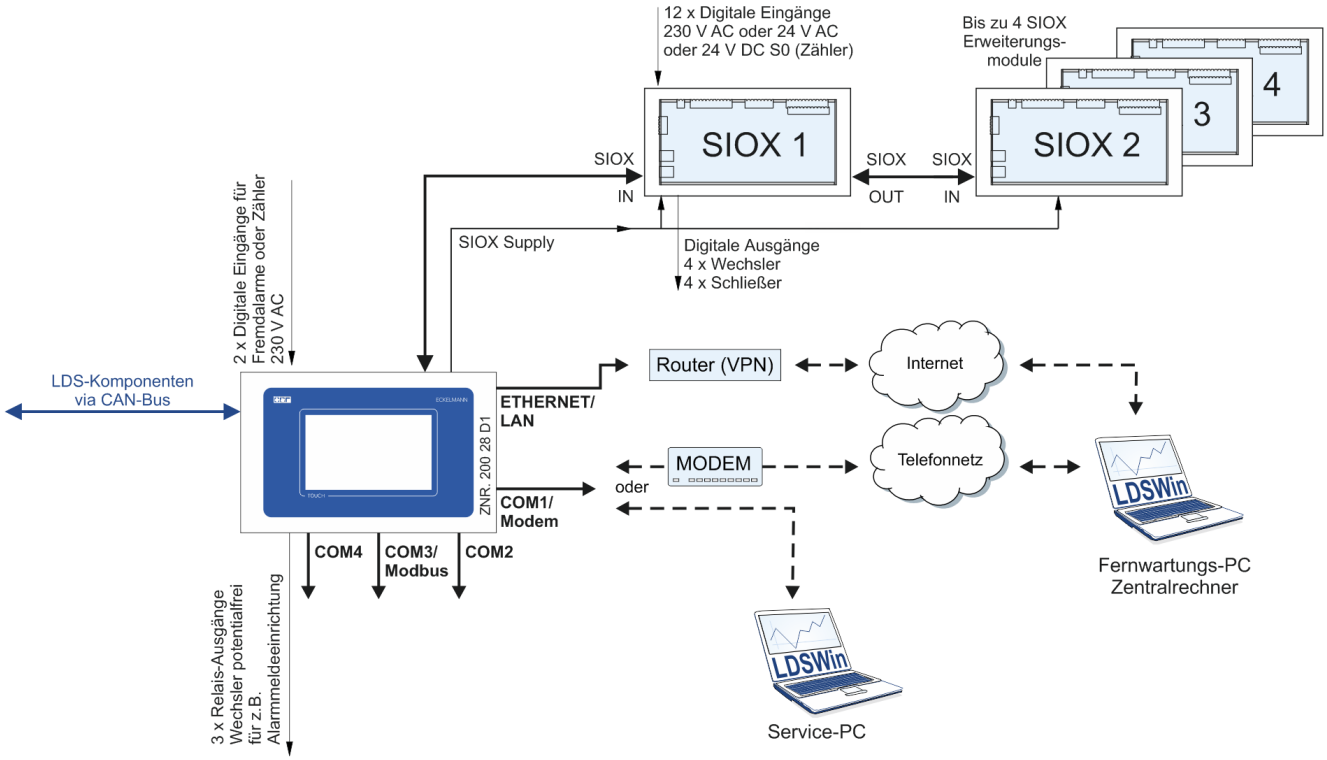
The system centres in the CI 4000 series are intended for installation in control panels. They are available in various expansion stages and their range of functions is enabled using licence codes. The system centres include the following models: CI 4000, CI 4100, CI 4400 and CI 4500; see chapter Tasks and functions for details about the functions. The system centre is the centre of the E*LDS system and is used for central parametrisation, configuration, display of operating data, messages and alarms of all E*LDS system components. It can be operated using the touch screen and/or remotely using a host system computer and/or service PC locally with the LDSWin PC software; for details see Operation and access to the system centre. The data for all connected E*LDS system components are exchanged via the CAN bus. Alarms and messages of E*LDS system components and the inclusion of external alarms from the installation and their retransmission by LAN, modem or SMS can be realised.

The system centre is equipped with internal storage for data archiving of operating data and states, alarms and messages, energy data or for logging of temperature and EU archives (HACCP). Optionally, up to maximum 4 extension modules (SIOX = Serial IO Extension) can be connected so that an additional 48 digital inputs and 32 relay outputs are available. Furthermore, the system centre has extensive wiring options and interfaces; see chapter Connections in the complete design for details of these.

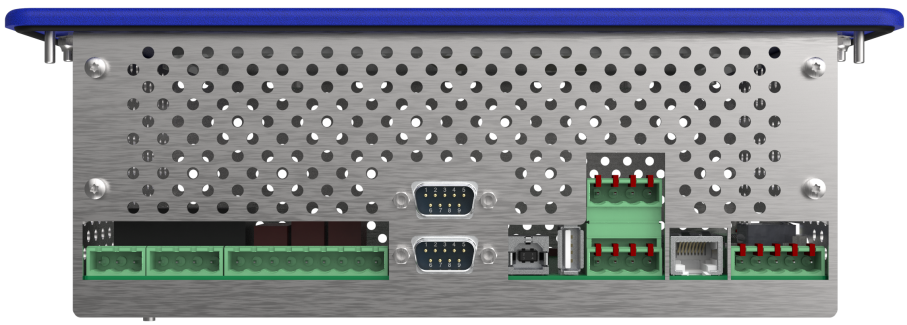
On account of its extended range of functions, the CI 4000 series is now designated as "system centre"; the earlier "store computer" designation is dropped. The system centres in the CI 4000 series are compatible with the CI 3000 and CI 3100 "store computers" and are intended as replacement device for these predecessor models.

The CI 4000 series does not have any direct interfaces to the old LDS1 system (VS 1000 / VS 2000 and CI 320 / CI 322)! LDS1 gateways that are connected via the COM3/MODBUS interface are required for the inclusion of LDS1 case controllers. For more details, see the “LDS1 Gateway” operating manual.

The system centre (complete design) in the E*LDS system:



3.2 Connections in the complete design



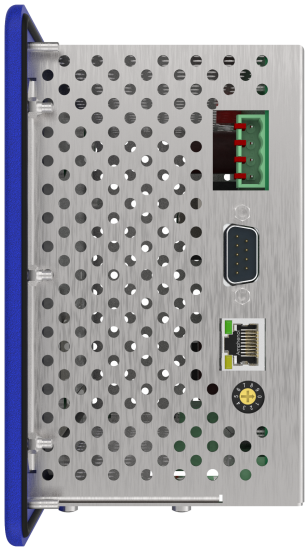
Inputs and outputs - bottom

- 2 x digital inputs 230 V AC, floating as alarm and signal inputs (external alarms) and meter reading
- 3 x relay outputs 230 V AC, floating:
  2 x bistable changeover contacts for signalling alarm of PRIO 1 and PRIO 2, e.g. for connection to a telephone dialling device
  1 x changeover contact (AUX) for, e.g. an audible signalling unit
- The system centre can be expanded with up to max. 4 SIOX extension modules. For each SIOX, 12 additional digital inputs (for meters, alarms etc.) and 8 additional relay outputs (for week timers, load shedding) are available.
  For details, see chapter SIOX extension module - for DIN rail mounting, page 47 DIN rail mounting - SIOX Extension Module.

Interfaces - bottom

- 1 x COMBICON terminal 91..95 (power supply) and 1 x RJ45 port (data cable) for connecting up to max. 4 optional SIOX extension modules.
- COM1 / modem port for remote access via modem using a host system or the connection of a service PC for serial direct cable connection
- COM2 - RS232 port for M-bus components (e.g. energy meters).
- USB Host/Slave
- CAN bus interface (CAN1) for connection of the E*LDS components
  e.g. case controllers in the UA 300 / UA 400 series, VS 3010, VS 3010 BS, VS 3010 CT, FS 3010, VS 300 pack controllers, PC-CAN bus adapter.
- CI 4500 only:
  - Second CAN bus interface (CAN2) for use as CAN bus repeater.

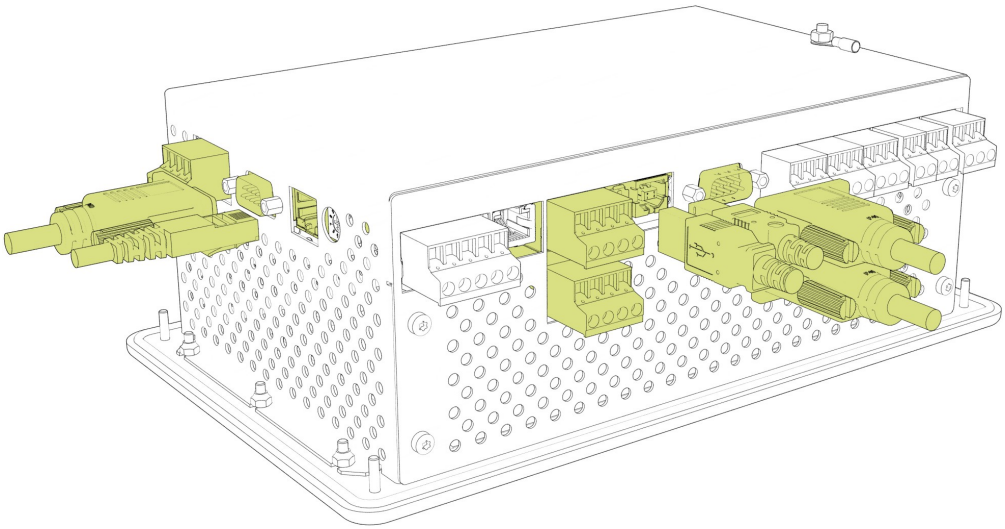
Interfaces - left side



- Only CI 4100 or higher:
  - COM3/MODBUS - RS485 interface on COMBICON terminal for direct connection of UA 30 Rx compact controllers / LDS1 gateways / Dixell
  so that the RS232 interface (COM2) can be used for external controllers.
  - COM4 - RS232 interface for Danfoss AHT / Wurm AHT external controllers
- Only CI 4400 or higher:
  - Ethernet / LAN

See chapter System centre tasks, page 18 for further information about configuration and range of functions System centre functions and see chapter Pin / terminal assignment system centre / SIOX, page 57 for the pin assignment System centre and SIOX connection / terminal assignment.

3.2.1 Communication interfaces



Interface	Type	Function	CI 4000	CI 4100	CI 4400	CI 4500
CAN bus 1	COMBICON	• First CAN bus segment (terminals 1..4)	X	X	X	X
CAN bus 2	COMBICON	• Second CAN bus segment (terminals 21..24)	-	-	-	X
COM1 / MODEM	RS232	• Modem • Serial direct connection for connection to LDSWin	X	X	X	X
COM2	RS232	• M-bus	X	X	X	X
COM3 / MODBUS	RS485	• UA 30 Rx • LDS1 Gateways • Dixell	-	X	X	X
COM4	RS232	• Danfoss AHT • Wurm AHT	-	X	X	X
Ethernet / LAN	RJ45	• Connection to Intranet / Internet	-	-	X	X
USB - Slave	USB 2.0 female connector B	• Direct connection for connection to LDSWin	X	X	X	X
USB - Host	USB 1.1 female connector A	• Firmware Update	X	X	X	X

For details, see chapter .Terminal assignment of communication interfaces v6.0.

3.3 Version dependencies for other E*LDS components

In order to guarantee faultless operation of the controller in the E*LDS system, the E*LDS components must have the following software versions:

- LDSWin
  Complete range of functions: from Version V2.4.6.4082 or higher. Current information can be found at www.eckelmann.de/ldswin..
- AL 300 Operator Terminal
  If a system centre in the CI 4000 series is present in the E*LDS system, the AL 300 operator terminals with the following version must be used:
  AL 300 V5.08 or higher
- UA 300 / UA 400 series case controllers
  All control components are compatible (all versions)

- UA 30 Rx series compact case controllers
  All control components are compatible (all versions)
- VS 301x series pack controllers
  All control components are compatible (all versions)
- WR 300 / WR 400 receiver module
  All versions are compatible

4 System centre functions

4.1 Tasks and functions

Functions starting with CI 4000 and higher

- Central parametrisation and configuration of all E*LDS components via the CAN bus / Modbus:
  all E*LDS components can be operated and configured remotely via the controller (see operating manual "Basics and general security and connection instructions").
- Central display of operating data, 24h lists, messages and alarms of all E*LDS components.
- Central and system-wide change of the user language during running operation.
- Monitoring of the CAN bus / Modbus and the operational readiness of all E*LDS components:
  appropriate alarms are generated in the event of faults and failure of the CAN bus / Modbus or failure of E*LDS components.
- Monitoring of external alarms and logging of meters via the two digital inputs or of up to 12 digital inputs using a SIOX extension module.
- Remote alarm signalling of the E*LDS system, alarm is signalled to fault indicator centre using modem, GSM, SMS, FAX and network.
- Alarm is signalled of alarms and messages of the controller and of the E*LDS system:
  - via two alarm contacts Prio 1 / Prio 2,
  - via audible internal signal generator (buzzer),
  - Via optional configurable multifunction relay AUX (parameter “Horn”) and
  - Alarm signalling by flashing the touchscreen when screensaver is activated.
- Control of up to 8 relay outputs of a SIOX extension module using week timers.
- Central time synchronisation (time server):
  The date and time can be adjusted system-wide using the controller. It also cyclically synchronises the internal clocks of all E*LDS components via the CAN bus. For this, the system centre has a real-time clock with power reserve that supports the automatic changeover between summer and winter time.
- Energy management:
  Electricity, water, gas, heat and event meters with pulse output (S0), can be connected or also M-bus meters using the M-bus gateway. The controller determines and archives the current output or the throughput and the daily energy requirement or consumption.
- Load shedding manager (LAM):
  The Load Shedding Manager can be configured for up to 20 shedding points and optimises the power consumption of the installation / building control system within a load optimising interval of 15 minutes.
- Remote maintenance of the installation / store via a central computer (PC) with the PC software LDSWin.

Functions starting with CI 4100 and higher

- Using the interfaces of the controller, UA 30 RC/RS compact controllers,
- LDS1 gateways and Dixell controllers (via RS485 COM3/MODBUS interface) and
- third party controllers from Danfoss AHT and Wurm AHT (via RS232 COM4 interface) can be integrated in the E*LDS system.

  A summary can be found in the chapter Communication interfaces.

Functions starting with CI 4400 and higher

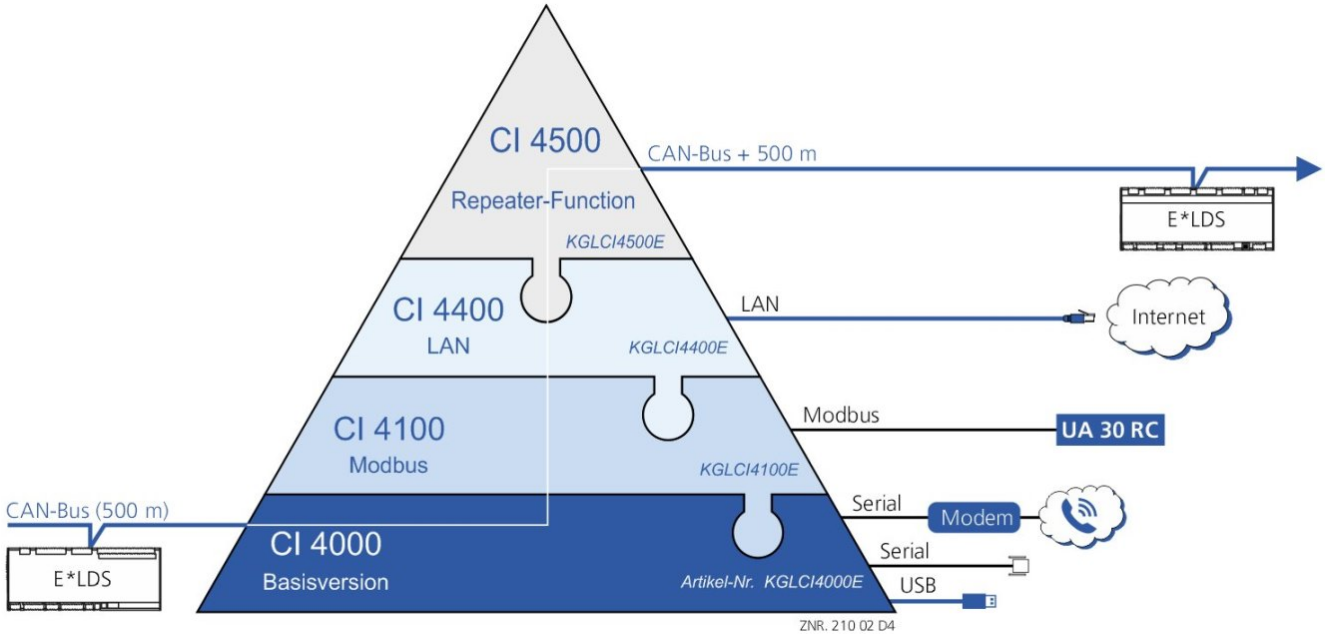
- Ethernet / LAN interface for faster data transfer.
- Automatic transmission of alarms via E-Mail.
- Automatic transmission of alarms via Pushover.

CI 4500 Functions

- Second CAN bus interface (CAN2) for use as CAN bus repeater; see chapter CAN bus - Connection of E*LDS Components.

> Further details about the current firmware can be found in E°EDP.

4.2 Expansion stages of the CI 4000 series



On the hardware side, the controller is always supplied in the complete design; on the software side, the individual expansion stages and the associated range of functions are enabled using a licence key, see chapter Menu 4-1-12 - System Upgrade.

Functions	CI 4000	CI 4100	CI 4400	CI 4500 (complete design)
One CAN bus segment (connection to CAN1 terminal) Support for up to 99 case controllers, 9 pack controllers and 4 receiver modules	X	X	X	X
USB Slave / Master	X	X	X	X
S0 meter, M-bus meter	X	X	X	X

Replacement for CI 3000 (2, 6, 16 MB) • without connected compact controllers • without LAN / Combi gateway	**X**	**X**	**X**	**X**
Load shedding manager and water stop	**X**	**X**	**X**	**X**
BCT (building control technology)	**X**	**X**	**X**	**X**
Replacement for CI 3000 (2, 6, 16 MB) / CI 3100 (6, 16 MB) • with connected compact controllers, Modbus interface for UA 30 Rx compact controller / LDS1 gateways / Dixell • without LAN / Combi gateway	**-**	**X**	**X**	**X**
Interface for Wurm / Danfoss third party controllers	**-**	**X**	**X**	**X**
Ethernet / LAN interface Replacement for CI 3000 / CI 3100 Store Computer with LAN / Combi gateway **IMPORTANT**: LAN / Combi gateway must be removed from the E*LDS system! Details for the exchange, repair and replacement of a CI 3x00 store computer can be found here.	**-**	**-**	**X**	**X**
Two CAN bus segments (connection to terminals CAN1 and CAN2) with repeater function	**-**	**-**	**-**	**X**

Summary	
CI 4000	S0 / M-bus meter, GLT, successor for CI 3000 (without Modbus compact controller)
CI 4100	CI 4000 + Modbus, successor for CI 3100 (with Modbus compact controller)
CI 4400	CI 4100 + LAN
CI 4500	CI 4400 + CAN bus repeater function

ⓘ It is possible to upgrade at any time, for example from CI 4000 to CI 4400. Only a new licence key that can be obtained from Eckelmann AG has to be entered for this in the menu 4-1-12. The part numbers of the individual expansion stages are listed in chapter System centre part numbers and accessories.

5 Function of System Centre

5.1 Starting Characteristics

The following are distinguished for any start-up of the controller:

- First start - Reset System
- Restart - Restart of the controller

5.1.1 First start - Reset System

⚠ **Risk of loss of data and the configuration!** All saved data and configurations of the system centre are irrevocably lost during deletion of the archives (operating and energy data), the alarm and message list as well as during reset to factory settings!

Reset to delivery condition (factory settings), see Menu 4-1-11 - Reset System:

- All data will be completely removed from the system!
- The system centre will be restarted twice

5.1.2 Restart - Restart of the controller

For a restart, the device is restarted with all configured parameters. A restart can be initiated using the following procedure:

- Menu 4-1-11 - Reset System or
- disconnection and reconnection of the power supply, see chapter Switching on system centre.

5.2 Configuration of the E*LDS system using the LDSWin PC software

The system centre and all components connected to it can be conveniently configured using a PC with the LDSWin PC software. This also includes the possibility to read out the configurations of all components and store them on the PC ("Save parameter sets" function). Thus, in the case of any required replacement of a component, the configuration can be written back to the replacement device. Further information for this can be found in the LDSWin operating instruction.

For local configuration, the system centre is connected via null modem cable (EAG No. PCZKABSER2) to the PC / laptop.

In addition, for the purpose of remote adjustment and maintenance, the system centre can also be operated using a PC via a modem and via a network. The system centre can be used for the storage of store-specific data from LDSWin so that the same layout can be used for different LDSWin installations.

ⓘ For more details, see chapter Configuration of the E*LDS system with service PC locally, page 44 Configuration of the E*LDS system using Service PC locally. The operating manual for the LDSWin PC sofware can be found in E°EDP.

A configurable TCP/IP port is used for the communication with LDSWIN. This can be freely selected from the range of free ports (1024 - 65535) in accordance with the network conditions. As standard, LDSWin uses the port 5000: 192.168.161.66:**5000** (see menu 4-1-5).

ATTENTION
The port configured in LDSWIN applies for all systems managed by LDSWIN. Therefore, configuration must be standardised here! Ports other than port 5000 should only be used in justified cases. If a connection is made via a firewall, the configured TCP/IP port must be opened for the TCP/IP service. In the event of incorrect port configuration, no communication between LDSWin and the System Centre is possible! The use of a “Well Known Port” (0-1023) can result in communication problems and should be avoided!

5.3 Modbus station monitoring

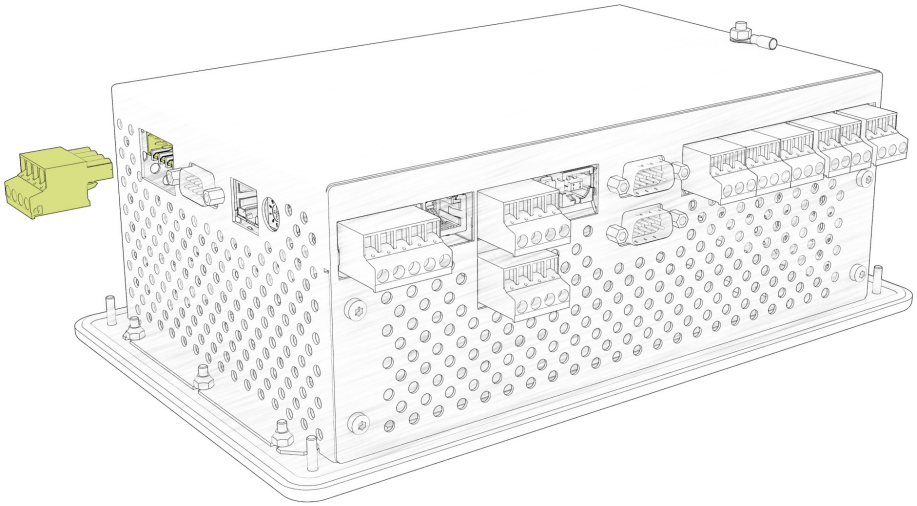
Only CI 4100 or higher
The controller cyclically checks the presence of all UA 30 RC / UA 30 RS case controllers, case controllers at LDS1 gateways and external controllers from third party providers once they have been detected in the system. If any component fails, this is detected by the station monitoring and the error message *"Computer fault Mxx"* is generated. Each new component connected to the Modbus is detected automatically by the system centre using "plug and play" and included in the station monitoring (see Menu 2-2).

The following Modbus nodes can be present in the E*LDS system:

Components	Modbus address	Max. number of components in the Modbus
Case controller UA 30 RC / UA 30 RS	1..50	50
Case controller via LDS1 gateway	1..48	
Case controller Dixell	1..50	

5.3.1 Integration of case controllers of the E*LDS system

Only CI 4100 or higher
The following case controllers can be integrated and archived in the E*LDS system via Modbus: Connection to the system centre is made via the COM3 / Modbus interface.



Compact case controllers
Supported controllers: UA 30 RC and UA 30 RS

The system centre is used for showing the status and for the configuration of the integrated compact case controllers M1..M50:
- See Menu 2-2 for the status and display of the temperature of the individual refrigeration points.
- See Menu 4-2 for configuration of name and position designation of the individual refrigeration points.

Case controllers of the LDS1 system:
Supported controllers: UA11 / UA111 / UA121 / UA131 / UA141 / UR141 / UA132

The system centre is used for showing the status and for the configuration of the case controllers M1..M48 integrated via the LDS1 gateway:
- See Menu 2-2 for the status and display of the temperature of the individual refrigeration points.
- See Menu 4-2 for configuration of name and position designation of the individual refrigeration points.
- See "LDS1 Gateway" operating manual for detailed information about the LDS1 gateway.

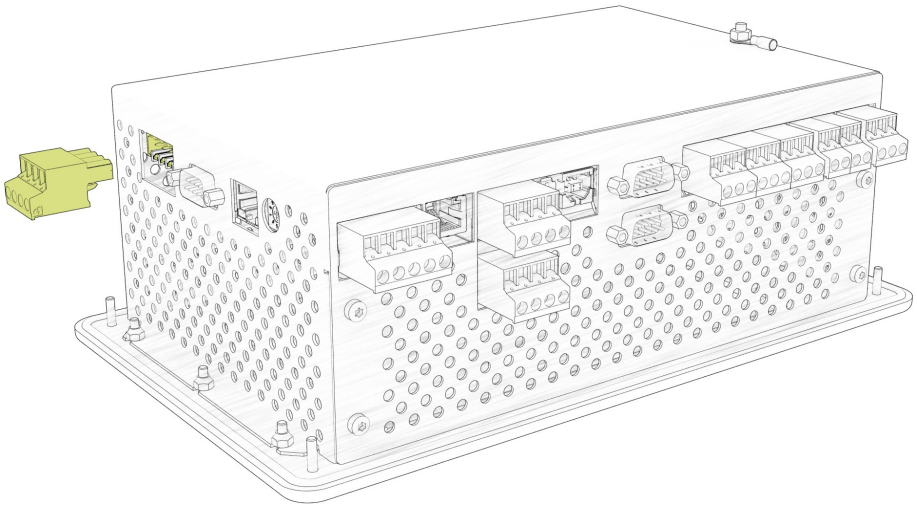
For detailed information, see chapter Connection of case controllers to Modbus.

5.3.2 Integration of external controllers

Only CI 4100 or higher
The following external controllers can be integrated and archived in the E*LDS system. Furthermore, the temperature archives (see Menu 4-2) of the following controllers can be viewed in the system centre.

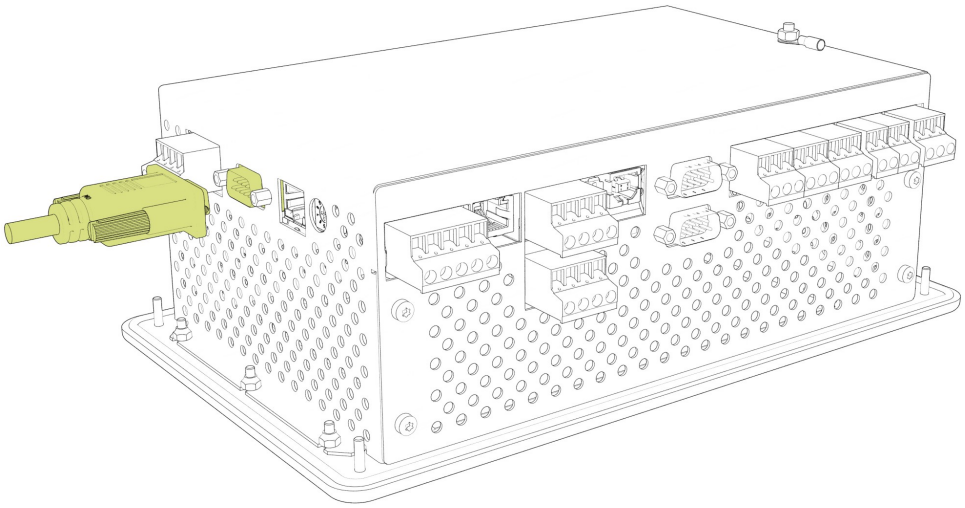
Compact case controller with Dixell controller
Connection to the system centre is made via the COM3 / Modbus interface.

Supported controllers: XR 135 RC / XR 155 C / XW 262 K / XW 562 K / XW 232 K / XW 270 K / XW 70 K / XW70iK / XR 50 CX:



For detailed information, see chapter Connection of case controllers to Modbus.

AHT cases
The connection of the AHT cases to the system centre is made via the COM4 interface:

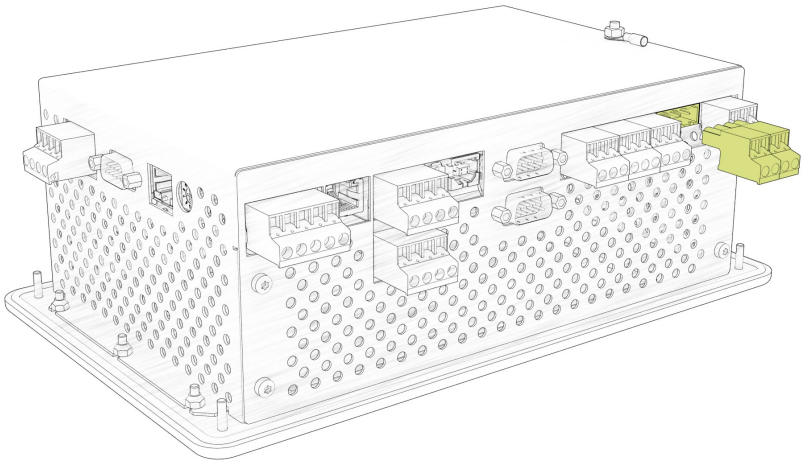


- **AHT cases with Danfoss controller**
  Supported controllers: 105N462x / 105N432x / EKC 404 A
- **AHT cases with Wurm controller**
  Not specified, simulated via Wurm Gateway

For detailed information, see "Connection of AHT cases in the E*LDS system" operating manual.

5.4 Digital inputs

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting it must be checkedthat **no voltage is present** at the 230 V AC digital inputs!



The controller has 2 floating 230 V AC digital inputs (IN1: A1/A2 and IN2 - IN2: B1/B2); for details, see chapter Terminal assignment of the digital inputs 230 V AC.

These can be configured for monitoring and alarm signalling of external maintenance groups / external alarms (Menu 4-1-2) and for special inputs (Menu 4-1-3) or also as Sync Input / meter inputs (Menu 4-1-1 / Menu 4-1-6); see also chapter SIOX - connection of energy, gas, water and event meters.

By using up to a maximum of 4 SIOX extension modules (see chapter SIOX - connection to the system centre), the number of inputs can be increased by another 48 digital inputs (12 digital inputs for each SIOX module, see Menu 4-1-1). Depending on the configuration and programming, the number of digital inputs can be even further increased by using a GLT / DCC controller.

5.4.1 Alarm and message inputs

Configuration

Digital inputs are available for recording alarms and messages. These are disabled at the factory and must be configured in Menu 4-1-2 before use so that they operate either according to the quiescent current or the operating current principle.

- **Quiescent current principle**: an alarm is triggered if the signal voltage is not present (quiescent current = Yes, low-active)
- **Operating current principle**: an alarm is triggered if the signal voltage is present (quiescent current = No, high-active)

Each alarm and message input can be assigned an individual, freely configurable 19 characters message text that is displayed in the message. The alarm signal can be delayed for a time that can be set between 0 and 255 minutes.

Each digital input also has an adjustable message priority of 0 .. 99.

- The lowest alarm priority (0,10,20,..90) is reserved for messages that are only recorded in the message list.
- Alarm priorities of 1 .. 99 (without 10, 20, .. 90) trigger alarms that are shown in the alarm list and forwarded via the configured alarm paths.

For detailed information, see chapter Priority Concept.

Alarm signalling failure! In the event of the failure of a SIOX extension module with connected external alarms, their monitoring also ceases. The failure of a SIOX extension module signals an alarm. But then no further alarm is generated if any of the affected digital inputs changes to the alarm status!

If a GLT controller is connected to the system centre, changes to the SIOX extension modules (e.g. configuration of the alarm outputs, meters etc.) using the LDSWin PC software can only be carried out with a GLT dongle.

It must be noted for GLT components in the 5000 family that configuration of an alarm or message input is in fact possible, but this remains **without function**!

5.4.2 Special inputs

Configuration

Digital inputs are available for the use of special functions. These are initially disabled and must be configured before use (Menu 4-1-3). Detailed information about the configuration can be found in the chapter Alarm and message inputs. The following special inputs are available:

Special input	Function
Shunt lock	Detects whether the store is open or closed (used for building control).
Emergency power supply	Detects whether an emergency power generator has been activated and can be used to reduce the load. The signal is currently only evaluated by the GLT. The emergency power supply for pack controllers and case controllers must be connected via the respective pack controller.
Sprinkler alarm	Detects the fire incident, and can be subsequently used e.g. to switch off the power supply.
Store lighting	Detects whether the store lighting has been switched off. Then a signal is transmitted via the CAN bus to the lighting management of E*LDS components.

Special input	Function
Toggle setpoint	Detects whether the setpoints should be toggled. Then a signal for the toggle setpoint is transmitted via the CAN bus.

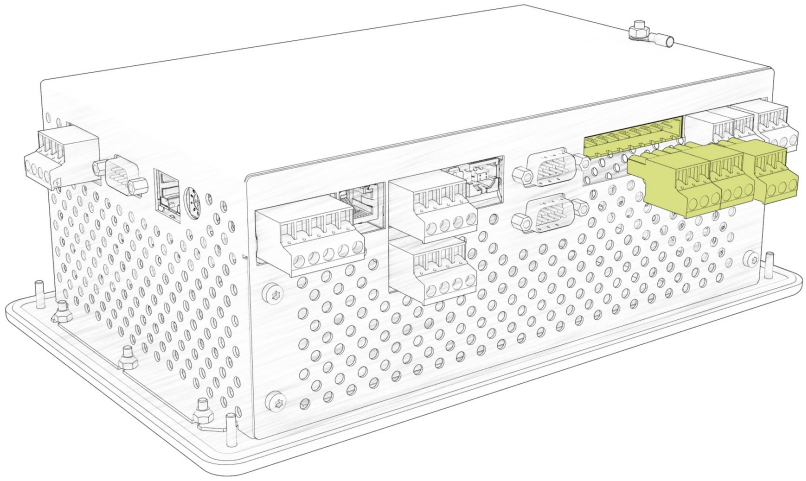
In order to use these functions, E*LDS components must be used that also support these functions. Details can be found in the operating manual of the respective E*LDS component.

Alarm signalling failure! In the event of the failure of a SIOX extension module with connected external alarms, their monitoring also ceases. The failure of a SIOX extension module signals an alarm. But then no further alarm is generated if any of the affected inputs changes to the alarm state.

It must be noted for GLT components in the 5000 family that configuration of a special input is in fact possible, but this remains **without function**!

5.5 Relay outputs

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting, it must be checked that **no voltage is present** at the 230 V AC relay outputs! Low voltage **and** safety extra-low voltage must **not** be applied together at the relay outputs 15/16/18, 25/26/28 and 35/36/38.



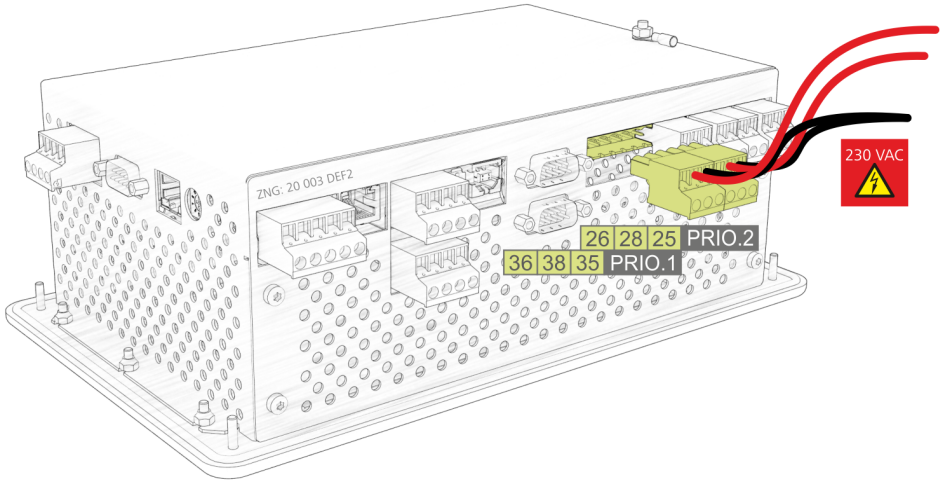
The controller has 2 relay outputs (floating relay contacts). These can be used for various applications.

- Alarm relays PRIO1 / PRIO2
- Multi-function relay AUX
- Relay outputs for week timers (only with SIOX extension module)

For details, see chapter .Terminal assignment of the 230 V AC relay outputs v6.0.

5.5.1 Alarm relays PRIO1 / PRIO2

The system controller has one relay output each (floating relay contacts) for the fixed alarm priorities X1 and X2 (terminal PRIO1: 35/36/38 - PRIO2: 25/26/28, see chapter Terminal assignment of the 230 V AC relay outputs).



The two relay outputs can be used, for example, to control a telephone dialling device. If an alarm with the priority X1 or X2 is generated by any of the E*LDS components, the assigned relay output of the corresponding priority is activated.

If the output was already active, this is deactivated for approx. 5 seconds and then activated again (changed last-in alarming) if at least 5 minutes have elapsed since the last activation of the alarm output.

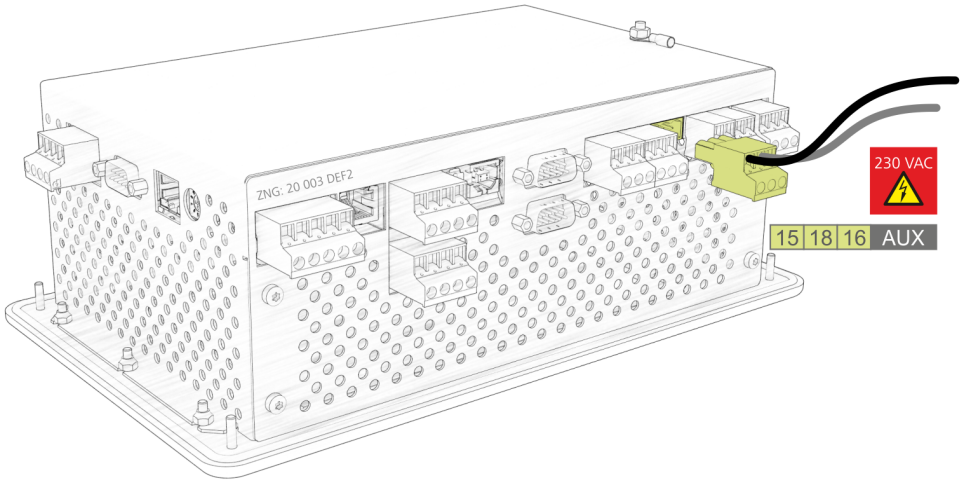
If 2 or more alarms occur within this wait time, the changed last-in alarming is postponed until the wait time has elapsed. The respective alarm outputs are automatically deactivated again when e.g. after pressing the Horn button (see chapter Menu 1 1 Alarms and messages), no alarms with the corresponding priority are contained in the alarm list.

The alarm outputs are self-holding with time-delayed automatic alarm signalling in the event of power failure. The current states of the outputs are maintained if the mains voltage of the controller is switched off for a short time. If the controller remains switched off for longer than approx. 5 minutes (absence of voltage), both relay outputs switch to the alarm state.

5.5.2 Multi-function relay AUX

Configuration

In addition to the prioritised Alarm relays PRIO1 / PRIO2 ones, the controller also has the changeover contact AUX (terminals 15/16/18, see chapter Terminal assignment of the 230 V AC relay outputs).



The relay output can be configured via Menu 4-1-7 (Other) with any of the following parameters for these functionalities:

Parameter	Function
Horn	For the connection of an external audible alarm transmitter (factory setting). The contact always switches if the internal buzzer of the controller also sounds (buzzer signals an alarm). If the internal buzzer falls silent, the contact also switches to the idle state; see also chapter Alarms and messages.
AUX relay Prio X3..X9	The multifunctional AUX relay has the same functionality as the two alarm outputs PRIO1 / PRIO2 in chapter Alarm relays PRIO1 / PRIO2, except that any desired message priority between X3,X4, …or X9 can be assigned to it. If an alarm with the priority X3,X4, … or X9 is received from an E*LDS component, the AUX relay output is only activated if the message priority corresponds with that configured here; see also chapter Alarms and messages.
Modem reset	For further information, see chapter Modem hardware reset.
GLT modem switching	For automatic modem switching to the building control (GLT) controller, see E*LDS booklet for wiring details.

5.5.3 Relay outputs for week timers

By using up to a maximum of 4 SIOX extension modules (see chapter SIOX - connection to the controller), the number of relay outputs can be increased by another 32 (8 relay outputs for each SIOX module, see Menu 4-1-1). Depending on the configuration and programming, the number of relay outputs can be even further increased by using a GLT / DDC controller.

Configuration

Week timers with up to 7 control times (see Menu 4-1-4) can be configured for each relay output. The control times can be set accurate to the minute and on individual weekdays or weekday groups.

Control times		authorised time period
Weekday	Mon, Tue, Wed, Thu, Fri, Sat, Sun	0:00 - 23:59
Weekday groups	Mon-Fri, Mon-Sat, Sat-Sun	Start earliest 0:00 End latest 23:59, but not until after start time The following applies: start time < end time Control times over a day change are **not** authorised: Example: Start 21:00 End 07:00!
	Mon-Sun (1 week)	0:00 - 23:59 Control times over a day change are authorised: Example: Start 20:00 End 08:00

ⓘ If the week timer should go over a day change (e.g. 20:00 - 8:00), it is only possible with individual days, e.g. Mon 20:00 - 23:59 and Tue 0:00 - 8:00 or with the Mon-Sun weekday group as 20:00 - 8:00!
Individual control times are also permitted to overlap:
1. Week timer Mon-Sun 20:00 - 08:00
2. Week timer Sun 00:00 - 23:59

In addition to the switching output, a passing contact, either as an alternative or in addition, can be defined for each relay output. The passing contacts switch on simultaneously with the switching output and switch off again after a duration of approx. 5 seconds. For connection details, see chapter .SIOX - Terminal assignment of the 230 V AC relay outputs v6.0.

It must be noted for GLT components in the 5000 family that configuration of a week timer is in fact possible, but this remains **without function**!

5.6 M-bus Interface for Consumption Data Capture

The M-bus (meter bus) is a fieldbus for the capture of e.g. gas, water or power consumption data. The data are transmitted serially from the connected meters (slaves / field devices) to an M-bus gateway (master) on a reverse-polarity protected twin wire cable. The M-bus gateway itself is connected to the COM2 interface of the system centre.

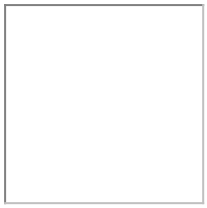
For detailed information, see chapter M-bus - Connection of gateways.

Daily consumption values are recorded for each M-bus meter in the system at the factory. The daily consumption values can be displayed in the menu 6-1. The option "Performance Calculation" must be set in the menu 4-1-6 for the display of a load profile (consumed capacity in the last 15 minutes). The load profile can then be displayed in menu 6-2.

Configuration of the measuring points

New measuring points connected to the M-bus are found using a scan process and included in the system. The scan process is started in menu 4-1-6 using the following button:

If new measuring points have been found by the scan process, these are then displayed in the list and can be configured. An overview of the supported M-bus meters can be found here:



https://edp.eckelmann.de/edp/lds/_dGFHqz89xb

5.7 Alarms and messages

The system centre is the collection point for alarms and messages of all E*LDS components in the system. The messages are listed in the alarm and message lists and can be called by the operator via Menu 1.
The alarm list provides a quick overview of all currently pending alarms; the message list shows the history of the faults that have occurred and been rectified as well as all logged events. The alarm and message lists can store 1000 entries. If the lists are full, the respective oldest entries are overwritten when new messages occur. The messages in the list are in the order of their occurrence.

The generated messages of the E*LDS components are sent via CAN bus with one of the following priorities --, 0..99 to the system centre.

Priorities	Function
---	No message is generated, no alarm is signalled
0, 10, 20,...90	Lowest priority, message entry only in the message list, no alarm is signalled
1, 11, 21,...91	High priority alarm - entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the alarm relay PRIO1, e.g. in the event of potential stock loss

Priorities	Function
2, 12, 22,...92	High priority alarm - entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the alarm relay PRIO2, e.g. for faults that Customer Service can rectify on the next day
3, 13, 23,...93 4, 14, 34,…94 5, 15, 25,…95 6, 16, 26,…96 7, 17, 27,…97 8, 18, 28,...98 9, 19, 29,...99	Low priority entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the multi-function relay AUX ONLY for one decade, e.g. X3

In addition to the two OFF-delay alarm relays **PRIO1** (1, 11, 21,...91) and **PRIO2** (2, 12, 22,...92), any alarm priority can be assigned to the **multi-function relay AUX** (e,g. parameter *PrioX3* for 3, 13,..93 or *PrioX8* for 8, 18,..98). The AUX relay is set to *horn* at the factory and can be configured in the Menu 4-1-7 (under "Other"). For further information about the priority concept, see chapter Priority Concept.

⚠ If the alarm signalling is carried out using a telephone dialling device using the provided OFF-delay alarm contacts PRIO1/PRIO2, these must be subjected to cyclical monitoring to ensure that the contacts also still signal in the event of power failure.

If the problem is rectified, the alarms in the alarm list can also be acknowledged there; for details, see chapter Acknowledgement of alarms and messages. The acknowledgement removes the alarms from the alarm list. The entries in the message list cannot be acknowledged or deleted. For each newly entered alarm, the audible signalling units (internal buzzer and optional external horn at the multi-function relay AUX) are activated; see chapter Multi-function relay AUX. The audible signalling units are switched off again by tapping the "Horn" button in the main menu; see chapter Menu 5 - Horn.

⚠ **Risk of failure of the alarm paths or alarm forwarding!** In systems with highly disrupted CAN bus communication (frequent messages of CAN faults or even CAN failures), it is not ensured that E*LDS components can successfully forward their alarms. In order to ensure correct functioning of individual alarm paths (e.g. via modem / relay contacts), these **must** be checked cyclically, for example by triggering test alarms (Menu 4-1-7 - Other). It must be generally ensured that alarms are signalled via **multiple, independent alarm paths**.

ⓘ Detailed information for the alarm and message texts of the system centre is provided in chapter Alarme und Meldungen.

5.7.1 Explanation of terms for "Alarms and Messages"

The following terms are used in connection with alarms and messages in this operating manual:

- receive time stamp ("incoming"): date with time of the alarm / message when this occurred (arrived).
- pending alarm / message: alarm / message still present (pending), the cause (defect, error, event) has not yet been rectified.
- send time stamp ("outgoing"): date with time of the alarm / message when this was rectified (departed).
- acknowledge: as well as the "receive time stamp", the alarm in the alarm list also has a "send time stamp" and can be acknowledged; see chapter Acknowledgement of alarms and messages, page 22 Acknowledgement of alarms and messages.

5.7.2 Acknowledgement of alarms and messages

Alarms are acknowledged by tapping the adjacent button in the alarm list; see Menu 1 - Alarms and messages.
The acknowledgement is performed system-wide. This means that all alarms and messages that can be acknowledged are acknowledged in all E*LDS components.

> Only those alarms and messages that have been registered as resolved, i.e. they have a so-called "send time stamp", can be acknowledged. Acknowledged alarms are removed from the alarm list afterwards. All previously acknowledged alarms and messages in the message list can be viewed for any subsequent searching for faults. For more detailed information, see Menu 1 - Alarms and messages.

5.7.3 Priority concept, page 23

Possible priorities for alarms and messages are --, 0, 1, 2 to 99. This priority range is divided into 10 alarm groups (decades 0..9):

Priorities	Function
--	No message is generated, no alarm is signalled
0, 10, 20,...90	Lowest priority, message entry only in the message list, no alarm is signalled
1, 11, 21,...91	High priority alarm - entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the alarm relay PRIO1, e.g. in the event of potential stock loss
2, 12, 22,...92	High priority alarm - entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the alarm relay PRIO2, e.g. for faults that Customer Service can rectify on the next day
3, 13, 23,...93 4, 14, 34,…94 5, 15, 25,…95 6, 16, 26,…96 7, 17, 27,…97 8, 18, 28,...98 9, 19, 29,...99	Low priority entry in alarm and message lists, remote alarm is signalled, local alarm is signalled (horn), triggering of the multi-function relay AUX (ONLY for one decade, e.g. X3)

This division into alarm groups (decades) facilitates maintenance group oriented alarm management. For more information, see chapter Extended alarm destinations 4..15, page 24 Extended alarm destinations 4..15.

Decade*	X0	X1	X2	X3	X4	X5	X6	X7	X8	X9
0..9	Message	Alarm	Alarm	Alarm			Alarm	Alarm	Alarm	Alarm
	No alarm is signalled	Remote alarm signalling Local alarm signalling								
	--	**PRIO1 Relay**	**PRIO2 Relay**	Multi-function relay AUX **Can ONLY be used for one decade, e.g. 3, 13, 23,...93**						

*:X0 stands for the alarms 0, 10, 20,...90
X1 stands for the alarms 1, 11, 21,...91,
X2 stands for the alarms 2, 12, 22,…92,
etc.

5.7.4 Remote alarm signalling

There are 15 alarm destinations (3 EASY alarm destinations and 12 extended alarm destinations; see chapter Menu 4-1-7 - Alarm Signalling) available for remote alarm signalling. These destinations can be:

- A PC with the PC software LDSWin
- E-Mail recipients
- SMS recipients
- FAX machine and/or
- AUX relay

> For SMS Text Message Transmission, the telephone numbers of the SMS providers must be activated in the telephone system otherwise no SMS text message transmission is possible: The following numbers are stored in the system centre and must be checked at the provider for their validity: D1: 0171-25 21 002 Anny Way: 0900-32 66 90 02 Source: MATERNAs Anny Way SMS-Dienst, http://www.sms-im-festnetz.de/sms/

5.7.4.1 EASY alarm destinations 1..3

The EASY alarm destinations 1..3 are mainly predefined and should be sufficient for most application cases. The alarm destinations are configured in Menu 4-1-7, see also chapter Menü 4-1-7 - Alarmierung for this.

EASY alarm destinations

1. **LDSWin**: Control centre as primary destination (LDSWin PC)
2. **LDSWin**: Fault service as primary destination or alternative destination for control centre (LDSWin PC)
3. **SMS Anny Way**: via the service provider Anny Way (http://www.sms-im-festnetz.de/sms/)

The following settings are possible for the alarm destinations, see Menu 4-1-7:

- description of the destination, e.. control centre,
- input of the telephone number of the destination,
- which priorities should be signalled: 1 or 2 or 1+2 and how should be signalled in a time range: never, within, outside or always

5.7.4.2 Extended alarm destinations 4..15

The extended alarm destinations provide significantly more options for differentiated remote alarm signalling as compared with EASY alarm destinations.

> The extended alarm destinations 4..15 are only displayed (read-only) in the system centre and can only be edited using the LDSWin PC software.

The alarm destinations are freely configurable in LDSWin and can be assigned to any destinations. Further information about the functions is contained in the chapter Priority concept.
The following settings are possible for these alarm destinations (these are only displayed in the system centre):

- Name of the alarm destination (freely definable)
- Destination type / service: LDSWin, SMS via D1, Anny Way or FAX
- Telephone number with entry whether outside line or internal call - function as primary or alternative destination
- If alternative destination,
- name of the primary destination

Individual priorities or priority groups can be assigned using the LDSWin PC software: Individual value or range with start and end values or ALL (without priority X9).
In this way, alarms and messages can be specifically signalled to the responsible fault service for the maintenance group. In this way, alarm signals are sent selectively, resulting in reduction of service and

maintenance costs and efficient service assignments.

Example: Procedure for configuration using the LDSWin PC software

1. **Specify alarm destinations**
   The refrigeration pack system should notify the service centre and the building control system should notify the caretaker.
2. **Specify the priorities and priority groups and assign them to the alarm destinations**
   Refrigeration pack system: Priorities 0..9Entire installation / building control systems: Priorities 10..99
3. **Set the priorities in the components accordingly**
   The meaning of the priorities X1 and X2 in combination with the alarm relay must be observed, see chapter Priority concep: components / controller of the refrigeration pack system signal with the priorities 0..9 components of the building automation (heating, air conditioning,..) with the priorities 10..99

> ⓘ The settings must be planned and entered carefully. In the event of incorrect configuration, there is potential for alarms to be sent to the wrong alarm destinations and not given the required attention there.

In order to illustrate the priority concept and the decades (priority groups), these are listed in the following table and explained using examples:

Vertical Maintenance-group-dependent allocation of alarm priorities X0..X9 in decades (priority groups)					
Refrigeration pack system X0	**Heating X1**	**Air conditioning X2**	**...**	**... X9**	**Horizontal Logical classification of alarms and messages for each alarm number.** **The alarm priorities listed on the left are**
0	1**0**	2**0**	...	9**0**	• interpreted as messages- registered in the message list • no alarm is signalled (no signal tone is sounded, buzzer)
1 **2**	1**1** 1**2**	2**1** 2**2**	...	9**1** 9**2**	• interpreted as alarm • registered in the alarm and message lists • alarm is signalled remotely by modem according to the configuration of the remote alarm signalling • alarm is signalled locally using horn and buzzer (system centre and operator terminal) • coupled with the two alarm relays and "PRIO1 and PRIO2" LEDs
3 ... **9**	1**3** ... 1**9**	2**3** ... 2**9**	...	9**3** ... 9**9**	• interpreted as Alarm- registered in the alarm and message lists • alarm is signalled remotely by modem according to the configuration of the remote alarm signalling • alarm is signalled locally using horn and buzzer (system centre and operator terminal) • the AUX relay is actuated depending on the configuration

5.7.5 Automatic transmission of alarms via Pushover

CI 4400 or higher

The controller provides the possibility to automatically forward alarms and messages in plain text from the E*LDS system via the "Pushover" message service (Menu 4-1-7). A user account must be created at "Pushover" (https://pushover.net/) to use this service. The following information is transmitted in the Pushover message :

- Name of the E*LDS component
- Position number (CAN bus address)
- Message text
- Priority
- Date and time of the receive or send time stamp

⚠ **Risk of the failure of alarm messages for Pushover and thus no alarm signalling in the event of problems!** It **cannot be ensured** that the Pushover message is delivered securely and promptly; therefore transmission of Pushover messages should not be configured as the only alarm path!

5.7.6 Automatic transmission of alarms via E-Mail

CI 4400 or higher

The controller provides the possibility to automatically forward alarms and messages in plain text from the E*LDS system via E-Mail (Menu 4-1-7). The following information is transmitted in the E-Mail message:

- Name of the E*LDS component
- Position number (CAN bus address)
- Message text
- Priority
- Date and time of the receive or send time stamp

⚠ **Risk of the failure of alarm messages for E-Mail and thus no alarm signalling in the event of problems!** It **cannot be ensured** that the E-Mail is delivered securely and promptly to the recipient, therefore transmission of E-Mail messages should not be configured as the only alarm path!

5.7.7 Automatic transmission of alarms via modem

The controller provides the possibility to automatically forward alarms and messages in plain text from the E*LDS system via a modem to various destinations (Menu 4-1-7). The following information is transmitted in the message:

- Store name
- Message text
- Date and time of the receive or send time stamp
- Priority
- Telephone number of the store
- Position number (CAN bus address) and
- the name of the E*LDS component

In addition to a PC with the LDSWin PC software, the sending of alarms as SMS to mobile telephones (see chapter Modem) and the sending of FAXes (see chapter FAX Transmission via ISDN Modem) are also supported.

Risk of the failure of alarm messages via SMS and thus no alarm signalling in the event of problems! It **cannot be ensured** that the SMS is delivered securely and promptly to the recipient, therefore transmission of SMS messages should not be configured as the only alarm path! It is also possible that a network operator or mobile telephone service provider can change its dial-up number or its dial-up procedure from time to time, thus generating **significant additional costs**. Precise information can be obtained from the respective mobile telephone service provider.

Up to 14 different PCs can be configured as fault signal receivers in the controller. The requirement for remote alarm signalling is that the LDSWin PC software is being used on the PCs.

In order to monitor the reliable operation of the automatic transmission of alarms, the message path must be checked regularly using the *check store computer* function provided by the LDSWin PC software.

5.7.8 Service Mode

During maintenance or service work on refrigeration pack systems, a series of alarms and messages is tripped whose forwarding to a control centre or fault service is not required. The controller can be put into the Service Mode for this purpose. During this time, any remote alarm signalling is suppressed for a specified time.

The submenu for activation of "Service Mode" is called using this button (see chapter Service Mode - Suppression of the remote alarm signalling).
The time period (1..255 minutes) after which the suppression of the remote alarm signalling should be automatically revoked can be selected in the submenu.

The Service Mode can only be activated / deactivated while logged in (store is then unlocked)! The activation and deactivation of the Service Mode are logged in the message list and also sent to all available operator terminals in the E*LDS system. The Service Mode can be revoked at any time by setting the time period to "0" minutes.

If alarms are generated during the time of the activated service mode, these are entered normally in the alarm and messages lists of the controller and operator terminal (if available). However, the horn, buzzer and alarm relays remain deactivated and no automatic transmission of alarms is triggered. In addition, no alarms are sent to any user PC in the installation connected by direct coupling, modem, LAN gateway, Combi Gateway or CAN bus – PC adapter.

If there are still unacknowledged alarms in the alarm list after the time of the Service Mode has elapsed, the audible warning devices and the alarm relays are activated and the alarms are forwarded using the automatic transmission of alarms!

5.7.9 CAN bus station monitoring

The controller cyclically checks the presence of all E*LDS components once they have been detected in the system. If any component fails, this is detected by the station monitoring and the error message *"Computer failure xxx"* is generated. Each new E*LDS component connected to the CAN bus is detected automatically by the controller using "plug and play" and included in the station monitoring (Menu 2).

The following CAN bus nodes can be present in the E*LDS system:

E*LDS components	CAN bus addresses	Max. number of E*LDS components in the CAN bus
Case controllers UA 300 and UA 400 series	1 .. 99	99
Pack controllers VS 3010 / VS 3010 BS / VS 3010 CT / VS 3010 WP / FS 3010 / VS 300 / VS 3010 C / VS 3015 C / VS 3015 CT	101 .. 109	9
System centre of the CI 4000 series	111 127	1 **system centre** and 1 integrated LAN gateway
AL 300 operator terminal	112 .. 116, 117 .. 120	9 or max. 5, if 4 receiver modules are present in the system.
Receiver module WR 300 for wireless sensors TS 30 W / TS 30 XW	117 .. 120	4 (only possible if NO AL 300 operator terminal uses these CAN bus addresses)
DDC modules of the GLT (building control)	122 .. 125	max. 4 if no Modbus TCP master gateways are present in the system.
LDSWin PC via CAN bus to PC adapter	126	1
LDSWin PC via LAN gateway (version 1.1c and higher)	126 or 127	1

ⓘ If the system centre fails or is switched off, the operator terminal (if present) with the lowest CAN bus address takes over the monitoring for the duration of the shutdown!

5.7.9.1 Alarm suppression during manual shutdown of case controllers

If a case controller is switched off, e.g. for cleaning purposes, or it has failed,, this is detected as failed by the station monitoring. The following symbol is then shown in the status bar at the top right in the display of the system centre:

If the user taps on this symbol within 5 minutes (see also chapter Status bar and quick info), he has the possibility to declare the refrigeration point in the following screen as, e.g. "switched off":

If the confirmation is made in good time (yellow "Switched off" button), the case controller concerned is removed from the monitoring and entered in the message list with the message "manual shutdown" and a yellow warning sign.

If the red "Failed" button has been pressed, an alarm is signalled that the case controller has failed and the message "Computer fault xx" with a red warning sign are entered in the alarm list.

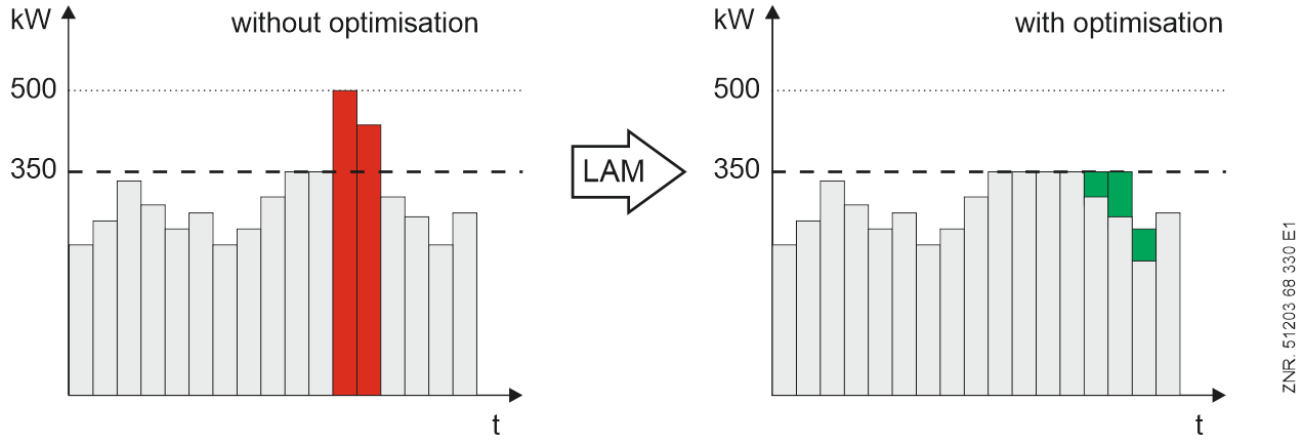
If a switched off or failed case controller is switched on again, this is automatically registered in the station monitoring again. After it has been switched on, the alarm of the failed case controller can then be acknowledged in the alarm list.

5.8 Energy management

If the digital inputs of the system centre and/or those of any of its SIOX extension modules for energy management are configured as S0 measuring points (Menu 4-1-6) or M-bus measuring points are used (Menu 4-1-6), energy consumption, capacity, water or gas consumption etc. can be recorded. During evaluation of the tariff signal provided by the power company, the work performed can be recorded, evaluated and displayed separately according to normal tariff and peak tariff. The recorded daily consumption is archived over one year and the capacity is archived over one week. These are displayed as graphs in Menus 6-1 and 6-2.

5.8.1 Load Shedding Manager (LSM)

The task of a load management system is to minimise the average recorded demand over a 15 minute period (and thus also the demand charge), without impairing operating processes. This means the load peaks should be kept as low as possible by briefly unloading or throttling appropriate consumers in peak periods and loading others in off-peak periods. It should mainly be ensured that the current capacity does not continuously / significantly exceed the specified maximum capacity (contract capacity). Consumers are unloaded using SIOX relay outputs and via DDC (Digital Direct Control).



The LSM operates as peak demand monitor whose control limits are oriented to the current power demand within a measured period. It compares setpoint and actual power at a fixed interval (15 minutes, synchronised with power company) and initiates the load shedding if required.
It shows 20 load shedding stages that are prioritised in ascending order starting with stage 1. If load shedding is required, Stage 1 is shed first. If insufficient reaction is caused as a result of this, the next Stage (2.. 20) is triggered. This strategy is continued until either the power consumption falls into the neutral zone or the highest load shedding stage is reached (escalation strategy).
After any restart, the LSM initially operates unsynchronised and sheds load when exceeding the maximum capacity. The energy and demand metering does not run synchronised with the power company until the next synchronising signal from the power company.
The available and appropriate consumers for the load shedding can be freely assigned to each load shedding stage. The LSM can act on any consumers on the building control system via floating relay outputs on its SIOX and via DDC (Direct Digital Control).
It is also expedient to set up a feedback signal via a digital input (parameter *Betriebseingang)* for individual consumers that are unloaded using SIOX relay outputs. The LSM can recognise whether the device is even in operation and contributing to the peak demand and whether the load shedding request has also been satisfied. For this operating mode, a digital input and relay output on the SIOX extension module (SIOX 1 .. 4) is required for each consumer . Each load shedding stage can be configured with the following parameters.

Shed load of the stage
The maximum electrical capacity of the stage must be configured using parameters (Leistung). The calculation of the stages to be shed is performed based on this parameter. Stages whose shed load has been parametrised to 0 are also shed according to their prioritisation (order). In doing so, unfavourable switching

actions can occur for a time interval. Therefore, a correct maximum shed load should be set for each load shedding stage used to guarantee optimum operation of the LSM.

Minimum operating time
A minimum operating time can be configured using this parameter. The minimum operating time specifies the time that a stage must at least be active before it is permitted to be shed again. If any time > 0 is parametrised, this is decisive whether any shedding for the stage is performed. If any limitation of shedding should not be used, this time must be parametrised with 0.

Minimum load shed time
A minimum load shed time can be configured using this parameter. The minimum load shed time specifies the time that a stage must at least be shed for. It may be loaded again afterwards. If the time is parametrised to 0, it has no influence on the function of the LSM.

Maximum time (load shed time
A maximum load shed time can be configured using this parameter. This time starts with the shedding of a stage. If the configured maximum load shed time is reached, the stage is loaded again irrespective of the current power demand and load shed state. The times are recorded and processed separately for each stage. With parametrisation to 0, this function is deactivated and the load shed time is not limited.

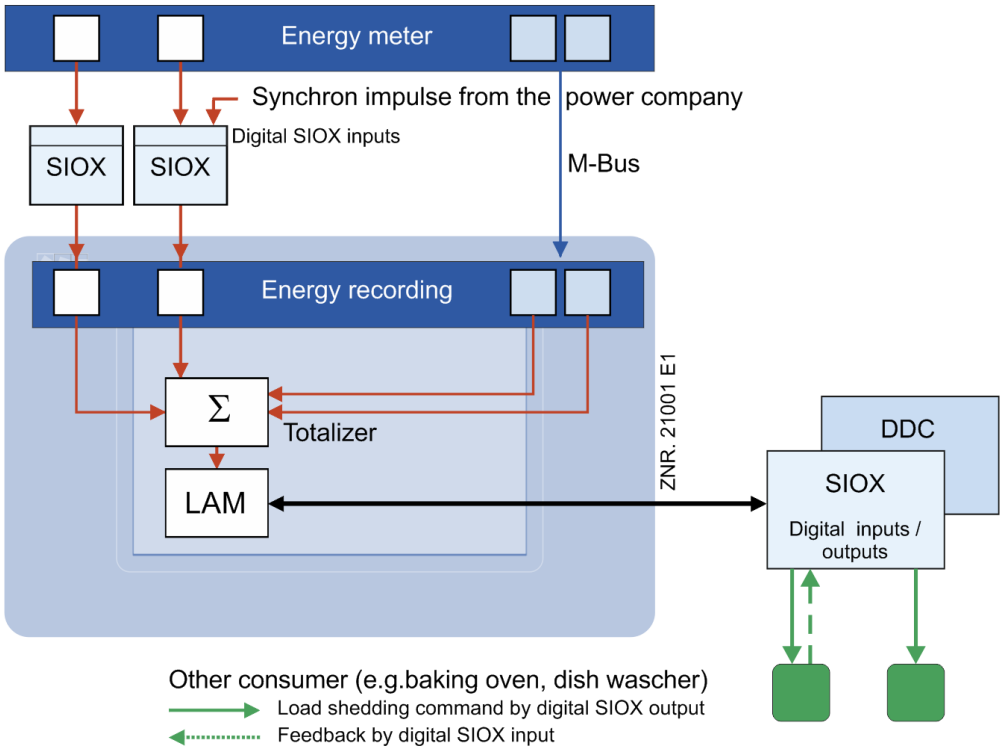
Load shed output
A load shed output must be configured for each load shedding stage. The appropriate consumer is shed using this. A stage or a consumer is shed using an active load shed output. If no output is configured for a stage, no shedding takes place for this stage.

Operating input (optional)
A digital input for signalling the operating state of the associated consumer can be used and configured for each load shedding stage. The operating input communicates the current operating status (ON/OFF) of the consumer of the respective load shedding stage to the LSM. With appropriate use of this input, the load optimisation can be significantly improved as the loading and unloading of capacity stages can be optimised by the LSM.
If this input is not configured for a stage, operation of the consumer is always assumed. The operating input only has an effect on the load shedding performance of the respective stage.

Power demand input (optional)
A digital input for signalling the power requirement of a consumer can be used and configured for each load shedding stage. The power demand input signals its power requirement for the respective shed load stage (requirement YES/NO) to the LSM and whether the total power is increased by its requirement in the case of an enable. With appropriate use of this input, the load optimisation can be significantly improved as the LSM can determine an optimum load shedding strategy.
If this input is not configured for a stage, power requirement of the consumer is always assumed. The power demand input only has an effect on the loading of the respective stage.

ⓘ Careful planning and corresponding putting into service are required for successful start-up and configuration of any load optimisation management. User and installation specific information of the system operator and information that can be obtained from the demand profile of the installation using the LDSWin PC software provide the basis for the planning. The correctness of the specified setpoints, i.e, the efficiency and reliability of the load optimisation system can be recognised / checked very well on these logs.

The following diagram gives an overview of how the load management affects the various consumers and on which paths the LSM and the consumers can communicate with each other via the CAN bus.



5.9 EU archives (HACCP)

Using the Menu 2-6 in the system centre, it is possible to access the temperature archives (e.g. for HACCP) of the temperature recording controller (e.g. UA 410 L) integrated in the E*LDS system.

In this way, it is also possible to view the temperature archives for up to one year in the past without the LDSWin PC software.

> ⚠ For temperature archives further in the past that should be shown, the temperature archives must be called cyclically and saved on a PC using the LDSWin PC software. A regular backup to a server is recommended for backing up the PC data.

The system centre automatically archives the current operating data of all components present in the E*LDS system.

Furthermore, it is possible to archive the temperatures and states of individual coldroom controllers in accordance with the EU Directive. The archived data can be read out via Menu 2-6 or via modem from a PC and displayed in a table or as a graph using the LDSWin PC software.

> ⓘ It is recommended to retrieve all operating data stored n the system centre cyclically (e.g. every 24 hours) using scripts from within the LDSWin PC software. This has the advantage that all relevant operating data (such as the legally required HACCP - Hazard Analysis and Critical Control Points) are backed up on a second system which can be used to provide a record of the temperatures if required.

5.10 24h list

Using Menu 3 in the system centre, it is possible to display the 24-hours lists of all case controllers present in the system. All temperature sensors without exception of the case controllers (E*LDS components and integrated external controllers) located in the E*LDS system are listed there together with their hourly temperature average value. For further details, see chapter Menü 3 - 24h-Liste.

6 System Centre Installation and Start-up

Important safety information! Before the installation and start-up, chapter Safety Information must be read carefully in its entirety and all safety instructions and hazard warnings must be observed. Any maintenance by the user is not intended as possible hazards from incorrect re-assembly cannot be ruled out. Opening the device is not authorised! Furthermore, it must be noted that the safety of the system or the installation in which the device is integrated is the responsibility of the creator of the system or installation. If the device is used in any way not specified by Eckelmann AG, the protection supported by the device can be compromised!

The user must be logged in at the system centre, see chapter Login to the system centre (unlocking), to be able to make changes to the system centre or to E*LDS components.

6.1 Installation - System Centre

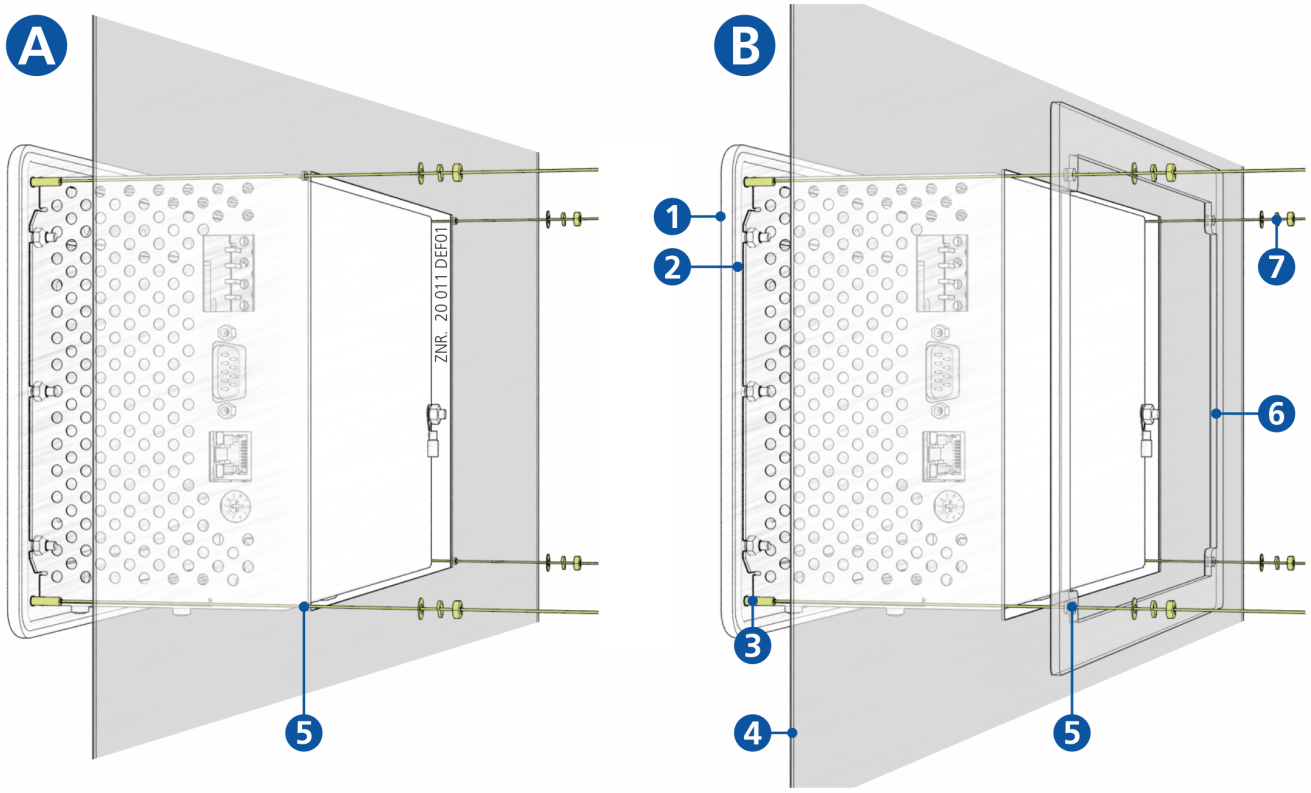
Important safety information! The controller is exclusively intended for installation in a switch cabinet! The specified mounting position is:
The controller must be mounted with the "Logo" and the lettering "ECKELMANN" facing upwards.

Specified mounting position:

The natural convection of the circulating air with free air exchange is sufficient to prevent overheating for the operation of the controller. A sufficiently large air inlet (min. 100 mm) under the device and an unobstructed air outlet above it **must** always be ensured. If this cannot be guaranteed, forced ventilation is required!

For the installation, the controller must be pushed from the outside through the mounting cut-out in the control panel (4). The following mounting possibilities can be realised:

- **Variant A**: **Complex control panel cut-out with drilled holes, no mounting frame required**.
  Mounting: The controller is screwed to the control panel using the four M3 stud bolts (3) and associated M3 nuts (7).
- **Variant B**: **Simple, rectangular control panel cut-out, mounting frame is required**.
  Mounting: The controller is screwed to the mounting frame (6) behind it using the four M3 stud bolts (3) and the associated M3 nuts (7):

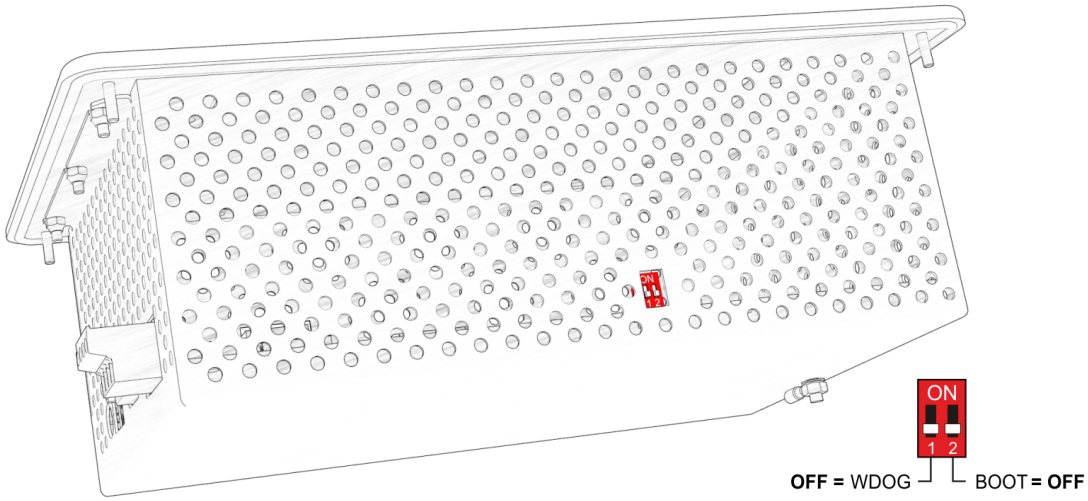


(1): Front panel
(2): Rubber seal
(3): 4 x stud bolt M3 x 10 mm
(4): Control panel with mounting cut-out
(5): 4 x drilled hole 4 mm
(6): 1 x mounting frame (part number KGLRAHMEN2, only required for variant B)
(7): 4 x M3: Washer / spring washer / nut

> The technical specifications for the dimensions for the mounting cut-outs for the variants A and B are shown in detail in chapter Control panel cut-out. For details about the wiring, see chapter System centre and SIOX connection / terminal assignment.

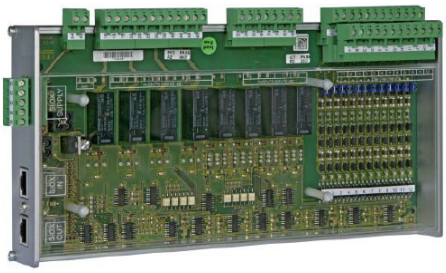
6.1.1 DIP Switches

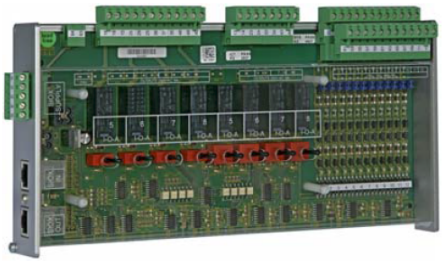
Default settings of the DIP switches
The WDOG and BOOT DIP switches are located on the top side of the system centre housing and **must** be set as follows for normal operation:



- **WDOG**: OFF - **MUST** always be set to OFF
- **BOOT**: OFF - **MUST** always be set to OFF

6.2 DIN rail mounting - SIOX Extension Module





SIOX Extension Module: without manual control switch / with manual control switch

A maximum of 4 SIOX (**S**erial **IO**E**x**tension) extension modules can be connected to the system centre. Each SIOX module extends the system centre by an additional 12 digital inputs and 8 relay outputs. The number of connected SIOX modules must be parameterised in menu 4-1-1.

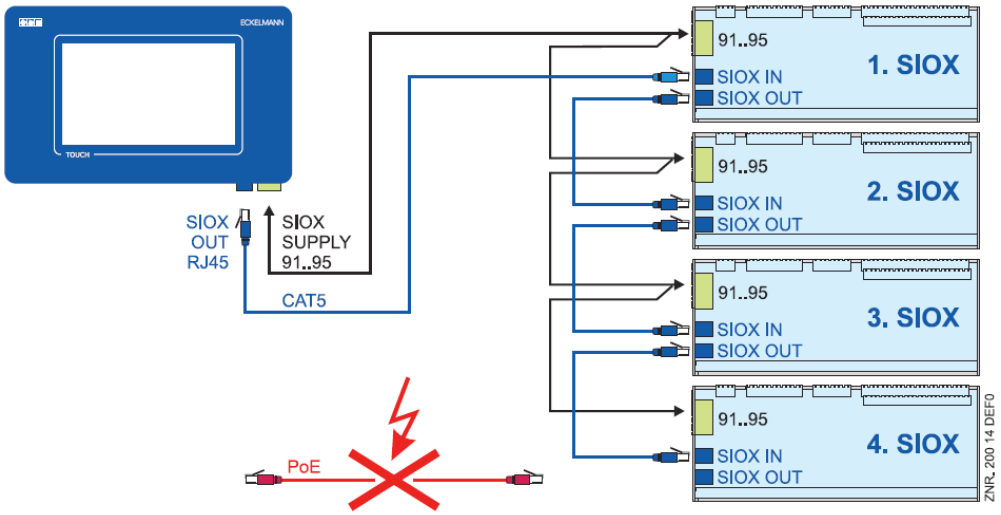
The SIOX modules are available in two versions:

- without manual control switch
- with manual control switch to be able to switch the relay outputs manually (see chapter SIOX manual / automatic mode selection)

The modules are connected to the system centre via SIOX power supply cables and SIOX data cables; see chapter SIOX - connection to the system centre.

6.2.1 SIOX - connection to the system centre

The individual SIOX extension modules are supplied with power from the controller via the terminals 91-95 (SIOX-SUPPLY) and connected to each other in series via SIOX data cables (SIOX OUT and SIOX IN using RJ45).



For further information, see chapters Terminal assignment of the SIOX interfaces and SIOX - Terminal assignment of the interfaces.

Danger of destruction of components! SIOX extension modules may **only** be connected to each other or the controller when no voltage is present! In the event of an Ethernet network cable with PoE (Power over Ethernet) being used instead of the SIOX data cable (RJ45) damage can occur to participating network devices!

SIOX power supply cables

- Shielded cables with cross section > 0.5 mm2 must be used for the 5 power supply cables (terminals 91-95). For example, the use of **LiYCY 4 x 0.75** mm2 with 25 ohm/km is recommended.
- Max. permitted cable length is 30 m.
- The power supply of the controller is designed for the connection of maximum 4 extension modules.

SIOX data cables

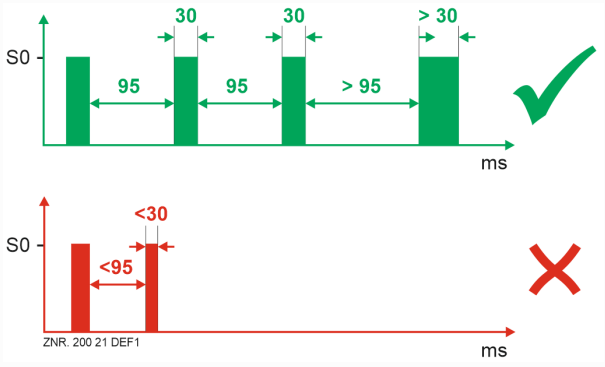
- The data cables (SIOX IN / SIOX OUT) should **not** be routed in the immediate proximity of high voltage or high frequency cables.
- When routing the cables, care must be taken to ensure that the minimum bending radius is complied with and that the cables are **not routed parallel** to cables which have the potential to generate strong **interference coupling**.
- Max. permitted data cable length is 30 m.
- CAT5 cables or better must always be used, see chapter Accessories for system centre v6.0. **ATTENTION: DO NOT** connect using the Ethernet network cable!

6.2.2 SIOX - configuration of the jumpers

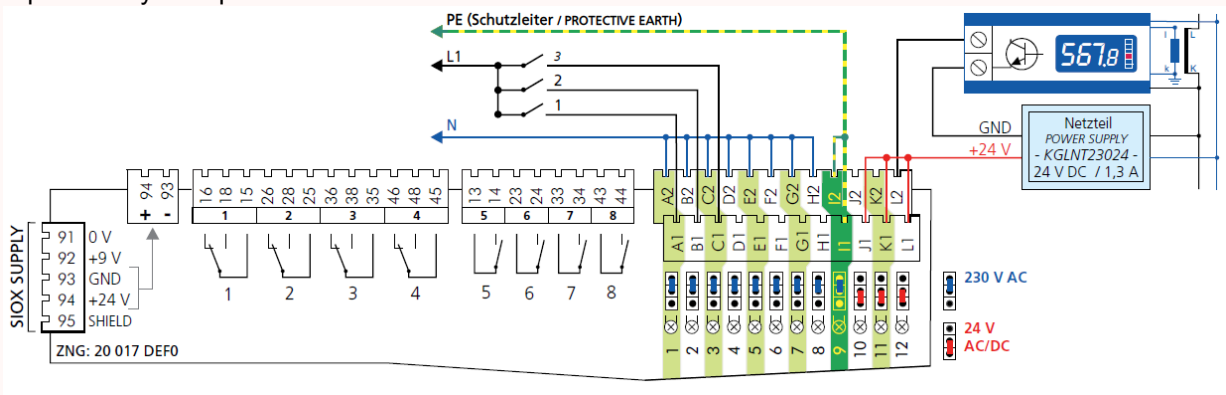
Configuration of the digital inputs

The 12 digital inputs (terminals A1 A2/ ... /L1, L2) of each SIOX extension module can be configured for 24 V AC/DC / 230 V AC using jumpers.

Special case: Acquisition of 24 V DC meter pulses (S0 interface)!
Conditions:
1. **GND of 24 V DC must** be applied at the terminal level (A2 .. L2)!
2. For counting S0 pulses, these must be at least 95 ms apart from each other. Faster pulse sequences will not be detected; the pulse width must be at least 30 ms.



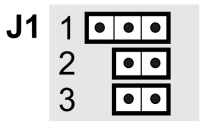
Warning about dangerous electrical voltage! Danger of electric shock! The configuration of the jumpers must **always** be performed when no voltage is present and with the connectors at the inputs (terminals A1, A2/ ... /L1, L2) detached as a voltage of 230 V AC can be present at these terminals under certain circumstances! If 230 V AC is applied to an input that has been configured for 24 V AC, this results in destruction of the extension module (SIOX)!
Wiring of the digital inputs:
230 V AC: The N conductor **must** be applied at a terminal level (A2 .. L2)!
24 V AC/DC: If 230 V AC **and** 24 V AC/DC inputs are needed on a SIOX module, these **must** be separated by an input connected to PE!



Note: In the example, the first 3 digital inputs (channels A / B / C - 230 V AC) of the SIOX extension module are used for installation monitoring and the last channel (L - 24 V AC/DC) is used as SO energy meter.

Configuration of the jumper J1

The jumper **J1** is located centrally under the casing cover of the SIOX extension module. The following settings are possible:



No.	Function
1	Currently has no function
2	Currently has no function
3	**Not jumpered = factory settings (open)**: The position of a manual control switch **acts directly** on the associated relay (ON/OFF/AUTOMATIC): the relays can be overridden manually. **Jumpered**: For special functions, the position of a manual control switch has **no** effects on the associated relay: only the controller can switch the relay. For details about the position of the manual control switch, see chapter SIOX manual / automatic mode selection

6.2.3 SIOX - connection of energy, gas, water and event meters

Warning about dangerous electrical voltage! Attention: external voltage! The configuration of the jumpers must **always** be performed when no voltage is present and with the connectors at the inputs (terminals A1, A2/ ... /L1, L2) detached as a voltage of 230 V AC can be present at these terminals under certain circumstances!

Only meters and dials with S0 interface are supported (reed contact or 24 V DC transistor output). In comparison with meters with reed contact (universal meter), attention must be paid to their polarity when connecting meters with transistor output. A 24 V DC power supply is needed for the power supply of the S0 interface.

The digital inputs needed for this must be configured as 24 V DC/AC inputs using jumpers; see chapter SIOX - configuration of the jumpers.

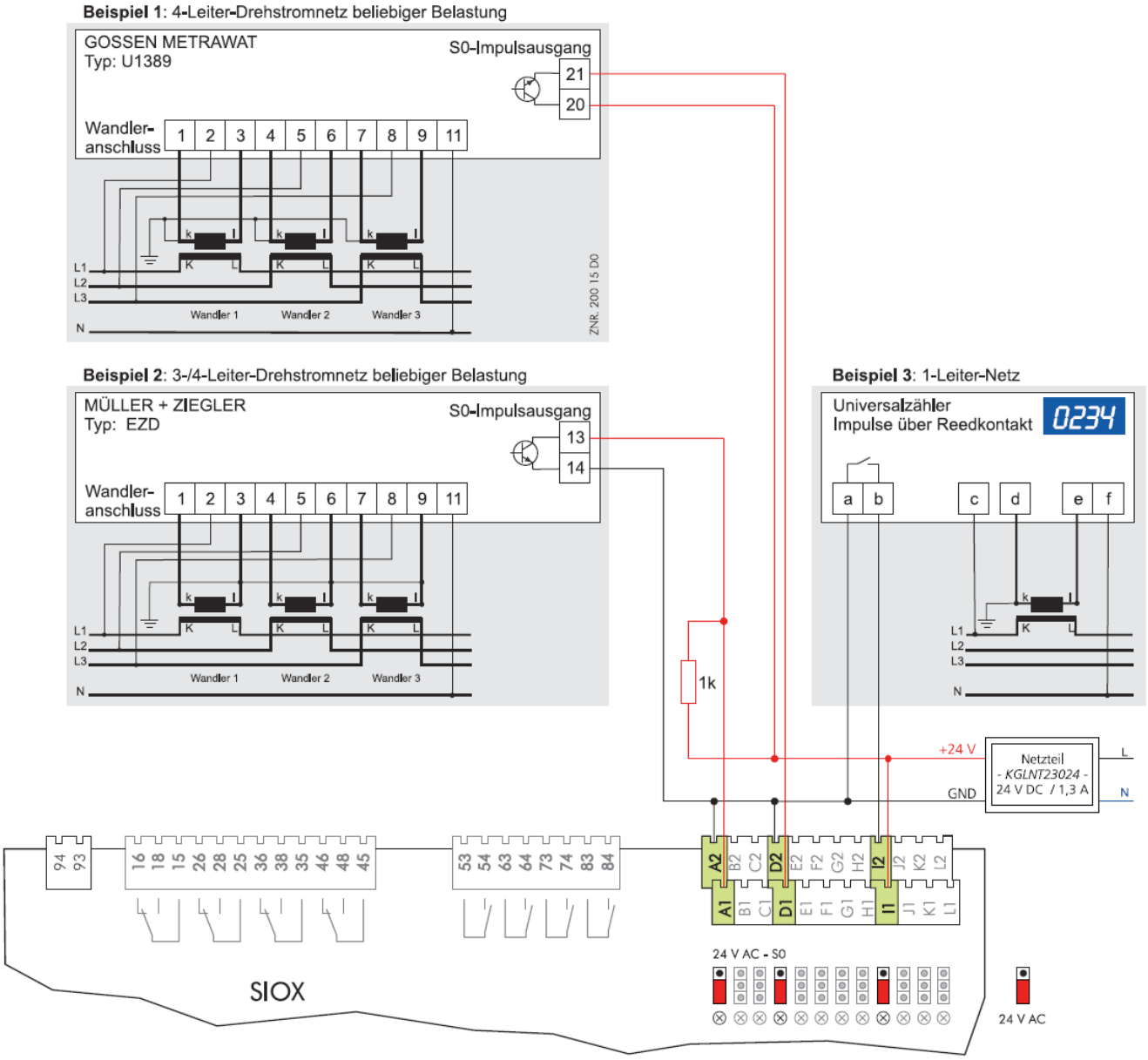
Configuration of meter and transformer constant (Menu 4-1-6):

1. Meter constant (pulses per kWh or m^3)
2. Transformer constant (conversion ratio of current transformer)
3. Unit (unit of measure) (kWh or m^3)

For further details, see chapter Calculation of consumption / power from meter values.

When using electronic meters, the settings with regard to their meter and transformer constants must be taken into account, otherwise the controller produces incorrect energy evaluation due to incorrect meter and transformer relationships!

Connection and wiring examples for energy, gas and water meters with a SIOX extension module:



6.2.3.1 Calculation of consumption / power from meter values

Settings on the controller
For the calculation of consumption and power using meter values of energy and quantity meters, the meter constant and transformer constant in the controller must be set in Menu 4-1-6.

A: Meter constant The meter constant is used for determining the energy quantity (consumption). The number of pulses per kWh is determined. The meter constant only needs to be set for pulse meters; M-bus meters do not have the meter constant!
Unit: pulses/kWh

B: Transformer constant Corresponds to the conversion ratio of the current transformer, i.e. the relationship of the current through the consumer (K/L) to the measuring current (k/l). The setting of the transformer constant for pulse meters can be adjusted in the controller. Settings for M-bus meters cannot be made in the controller as the necessary adjustments must strictly be made in the meter.

Unit: none

e.g. transformer with conversion ratio of 100:5

> The transformer constant **must** only be considered in the controller if the meter at the pulse output does not take account of the transformer constant! If the transformer constant has already been taken into account for the pulse output of the meter, a 1 **must** be entered for this in the controller. **Note**: Depending on the model and configuration, pulses at the meter output can differ from the consumption displayed in the meter display.

The basis for calculating consumption and power is explained in more detail below using an example:

Meter constant: 1000 pulses/kWh
Transformer constant: 20 (corresponds to the conversion ratio 100:5 of the current transformer)
Number of measured pulses: e.g. 600 pulses
Time of the pulse counting: e.g. 15 minutes = ¼ h = 0.25 h

Consumption calculation*
Consumption = number of pulses / meter constant * transformer constant
Consumption = 600 pulses * kWh / 1000 pulses * 20 = 12 kWh

Result: For the period of 15 minutes, consumption of 12 kWh has been determined.

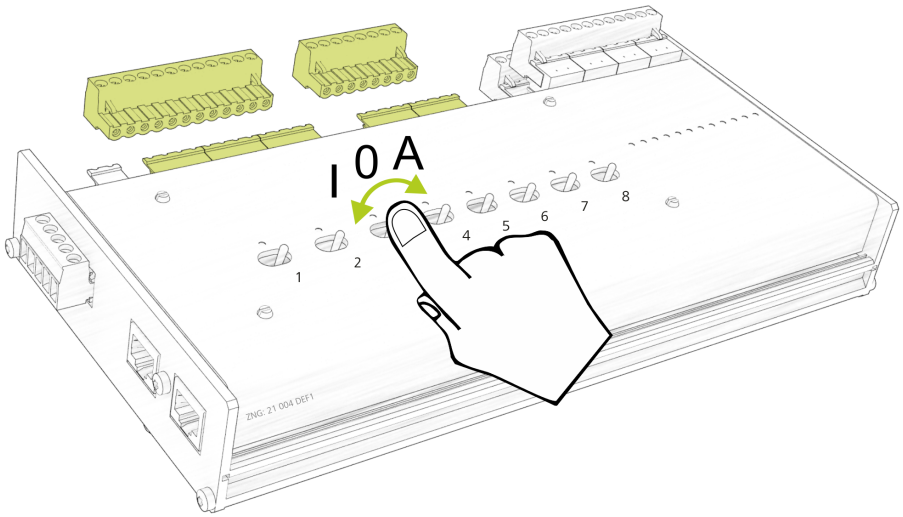
Power calculation*
Power = number of pulses / meter constant * transformer constant / time of the pulse counting
Power = 600 pulses * kWh / 1000 pulses * 20 / 0.25 kWh = 48 kW

Result: For the period of 15 minutes, power consumption of 48 kW has been determined.

* An analogous calculation method is used for the consumption or flow rate of gas or water (in this case in m^3 or litres).

6.2.4 SIOX manual / automatic mode selection

Depending on the design, the SIOX extension modules have manual control switches so that the 8 relay outputs can be overridden manually. The manual / automatic mode selection is realised at a relay level that is subordinate to the controller. The manual / automatic mode selection of each relay is performed via switches S1…S8 located on the printed circuit board:



The following switch positions are possible:

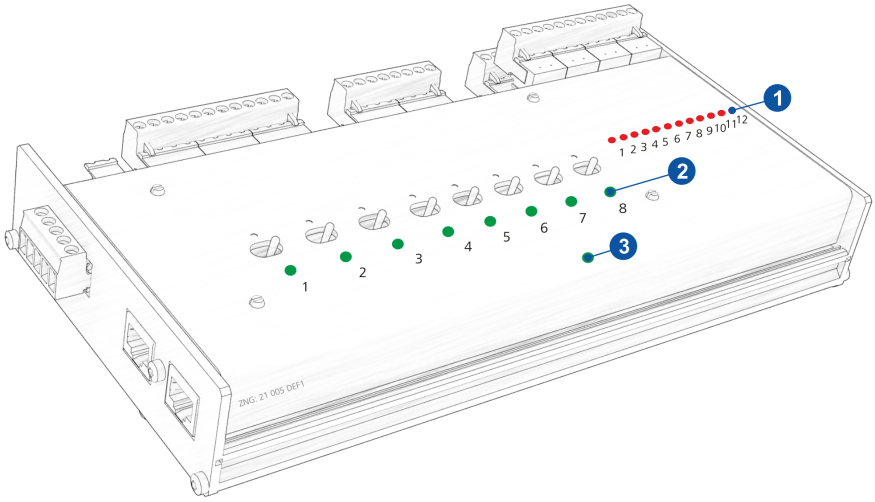
- **A: Automatic ON (default switch position)**
  If any switch is in the A position, the controller registers the logical AUTOMATIC OPERATION state:
  The connected equipment is controlled **as the software envisages (normal operation)**.
- **O: Manual OFF**
  If any switch is in the 0 position, the controller registers the logical MANUAL OPERATION OFF state:
  The connected equipment is **not controlled** - even if the software envisages this
  , e.g. light remains off continuously!
- **I: Manual ON**
  If any switch is in the I position, the controller registers the logical MANUAL OPERATION ON state:
  The connected equipment is **always controlled** - even if the software does not envisage this
  , e.g. light remains on continuously!

The "I: Manual OFF" and "I: Manual ON" positions override the state desired by the controller! A message is generated if the Manual OFF and Manual ON manual control switches are operated.

SIOX extension modules **without manual control switches do not have** this function!

6.2.5 SIOX - Status LEDs

Warning about dangerous electrical voltage! Danger of electric shock! The device must never be operated without its case. Before opening the case, the device must be disconnected from the power supply

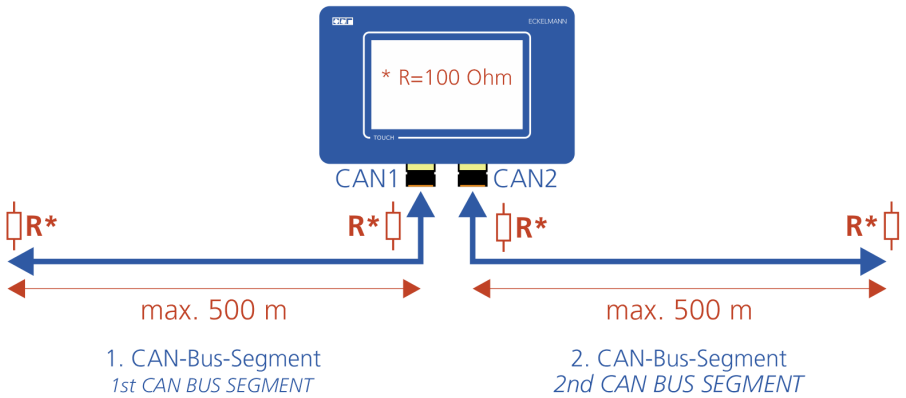


	Function	Colour	LED	Description
1	Digital inputs	red	LED1 .. LED12	On: Digital input is activated **ATTENTION DANGER TO LIFE: External voltage can be present at these terminals!**
2	Relay outputs	green	LED1 .. LED8	On: Relay is activated **ATTENTION DANGER TO LIFE: External voltage can be present at these terminals!**
3	Communication	green	LED1	Flashing: Communication to the system centre is OK. ON: Error - no communication! Check SIOX data cable if necessary. OFF: Error - no communication! Check SIOX data cable and SIOX power supply cables if necessary.

For information about exact terminal assignment, see chapter System centre and SIOX connection / terminal assignment.

6.3 CAN bus - Connection of E*LDS Components

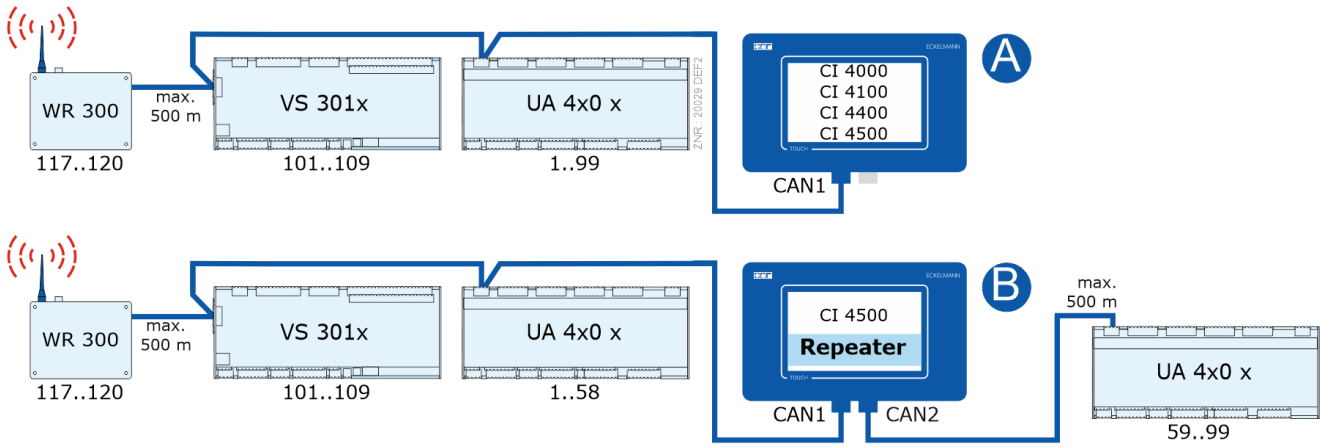
Depending on the expansion stage, up to two CAN bus segments can be connected to the system centre.



CAN1	**(A)** First CAN bus segment	Standard for up to 127 CAN bus nodes	--
CAN2	**(B)** Second CAN bus segment	**Only CI 4500** - System centre with repeater function, for up to a total of 127 CAN bus nodes on **both** CAN bus segments	Menü 4-1-5 - Schnittstellen

Setting the CAN bus address is not required as the CAN bus addresses **111 and 127** are permanently assigned to the system centre.

Example of possible CAN bus constellations:



For details about the connection, see chapter Terminal assignment of the CAN bus terminals.

ATTENTION

Damage to the installation and stock loss! If, when designing the system technology, the use of **pressure transmitters / temperature sensors** at the refrigeration points of the 2nd CAN bus segment (the one without pack controller) was **dispensed with**, we recommend in the unlikely event of a failure of the system centre to **reactivate it as quickly as possible**!

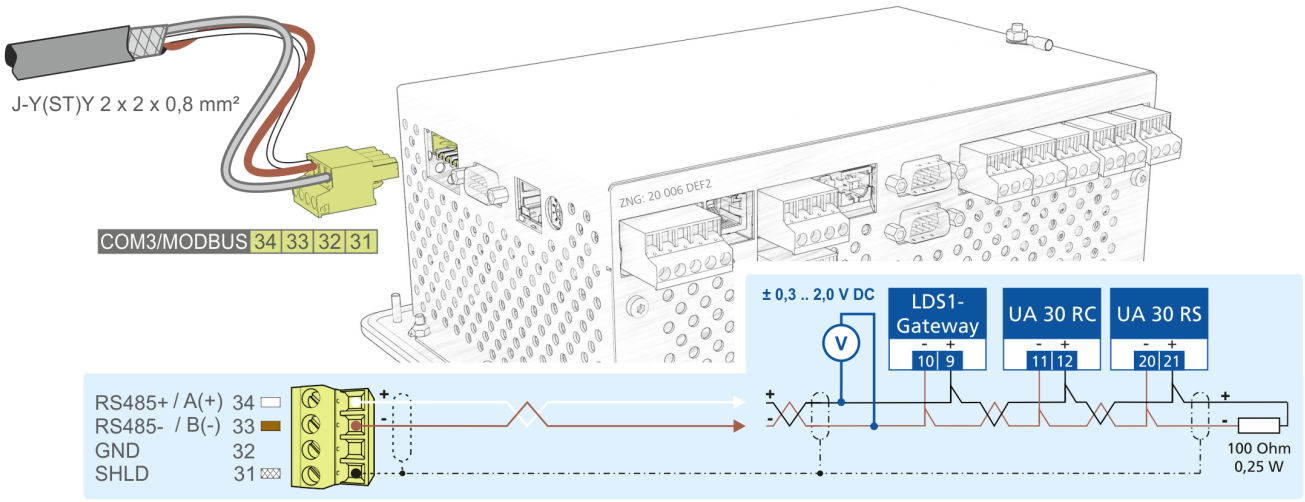
Practical tip:

- Until the system centre is reactivated again, a CAN bus repeater can be used as a **temporary solution** to exchange information (e.g. t_0 / suction pressure) between the two CAN bus segments CAN1 and CAN2.
- The evaporator input sensor R5.x should also be connected in the t_0 via CAN bus operating mode. This results in **improved emergency running characteristics** in the event of failure of the CAN bus transmission. In standalone operation (failure of the CAN bus and without local pressure transmitter) the sensors R5.x must be connected, see operating manual of the EEV controllers!

Each CAN bus segment can have a maximum length of 500 m; the specified cable type is **LiYCY (TP) 2 x 2 x 0.75 mm²**. For further information about the CAN bus, see the operating manual “Basics and General Safety and Connection Notes”.

6.4 Modbus connection of case controllers

Only CI 4100 or higher:
The "COM3/MODBUS" connection is used for the integration of RS485 controllers in the E*LDS-System.



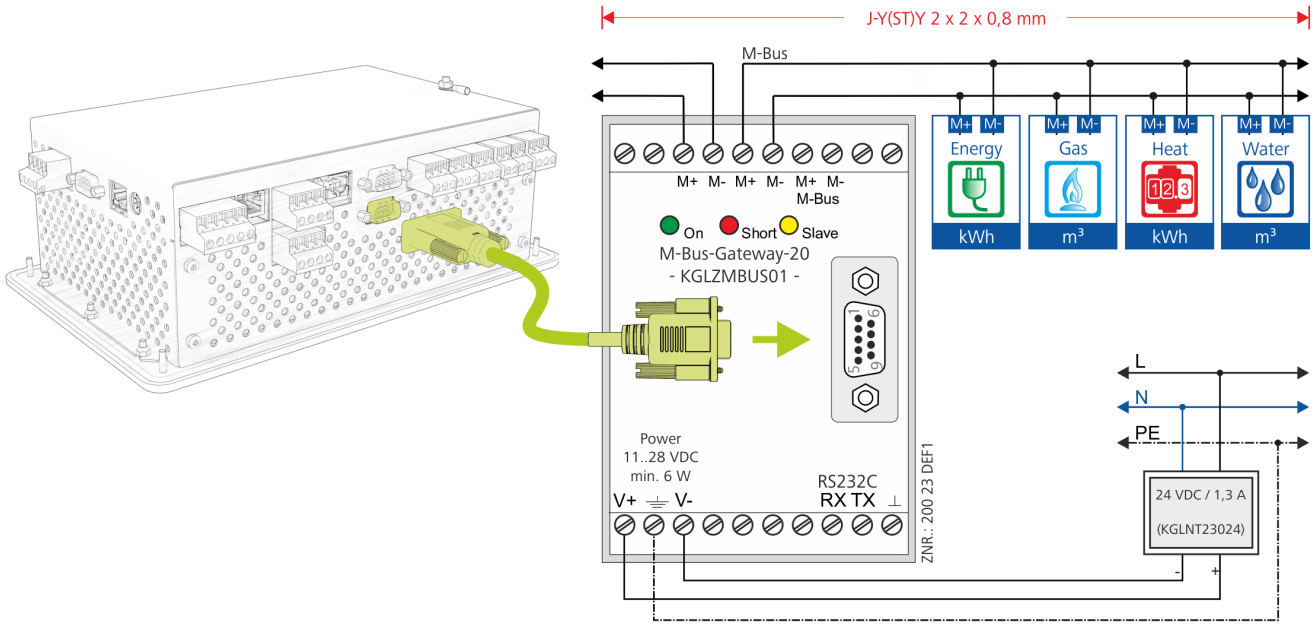
The following controllers are supported:

- UA 30 RC / UA 30 RS compact case controllers; for details, see chapter Integration of case controllers of the E*LDS system
- LDS1 gateways with case controllers of the LDS1 system
- Dixell controllers; for details, see chapter Integration of external controllers

For further details about pin assignments, see chapter Terminal assignment of the COM3 / Modbus terminals (RS485)

6.5 M-bus - Connection of gateways

M-bus meters such as energy, gas, heat or water meters can be connected to the system centre via the M-bus gateway. For this, the M-Bus gateway must be supplied with power via a 24 V DC power supply and connected to the COM2 interface using the serial cable included in the scope of delivery::



The following M-bus gateways are available:

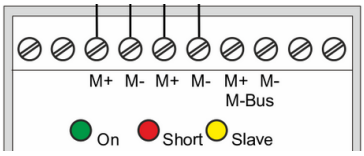
- for max. 20 M-bus meters
- for max. 60 M-bus meters

> The 3 terminal pairs M+/M- are used to distinguish between the M-bus cables. However the polarity for M-bus installations is completely unimportant! A power supply is required for both M-bus gateways. For details about the part numbers, see chapter .Accessories for system centre v6.0.

The following transmission rates and lengths are possible with the cable type **J-Y(ST)Y 2 x 2 x 0.8** mm:

Transmission rate	Number of M-bus meters	Length
2400 baud (fixed)	<= 10 <= 20	max. 5100 m max. 3200 m

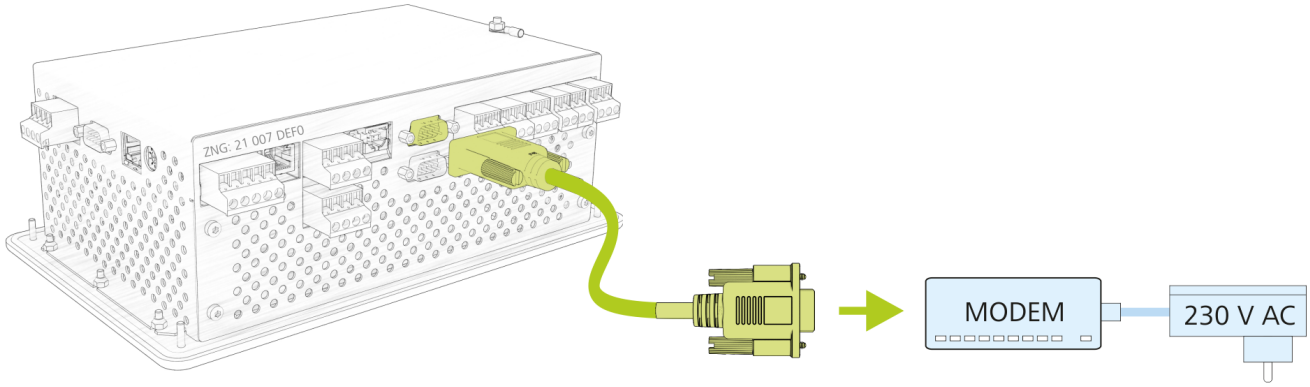
6.5.1 Status LEDs of the M-bus gateway



- Green: supply voltage 11..28 V DC is applied
- Red: overcurrent (short circuit on the cable)
- Yellow: terminal device transmitting

6.6 Modem

If a modem should be used for remote maintenance of the system centre and for the automatic transmission of alarms, this must be connected to the COM1 port.



The modem is configured in Menu 4-1-5 COM1 / MODEM.

> **Failure of transmission of alarms!** When using modems other than those obtained from Eckelmann AG, trouble-free operation of transmission of alarms and remote maintenance cannot be guaranteed! After installation of the system centre and the modem, as well as the configuration of the automatic transmission of alarms, the message path should be checked regularly by triggering test alarms (Menu 4-1-7 - Other).

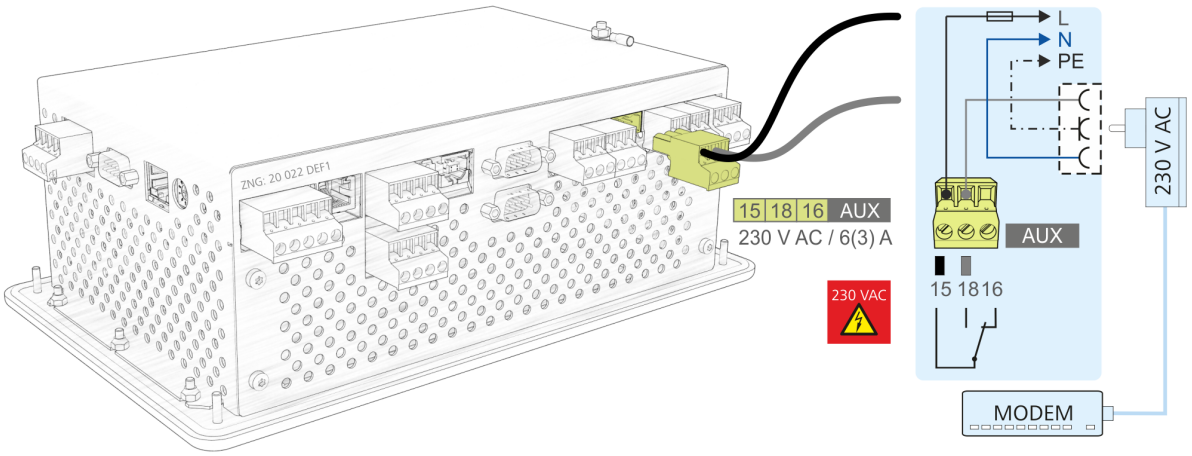
For trouble-free operation, only modems approved by Eckelmann AG are permitted to be used for operation at the system centre:

- **Analogue modem**: DEVOLO MicroLink 56 KI
- **Hybrid modem (analogue and ISDN)**: Blatzheim BM 33k6 ISDN pro
- **GSM modem**: CEP CT63; for detail, see chapter SMS Text Message Transmission via a GSM Modem

> Eckelmann AG recommends exclusive use of particularly robust and high quality modems. Furthermore, approved simpler consumer modems can only be used if the availability of the modem-related function is not a priority. For these modems, the **modem hardware reset should be activated** to improve the permanent operational readiness; see chapter Modem hardware reset.

6.6.1 Modem hardware reset

In the event of unreliable modems, it is possible to carry out a restart or reset by switching off the power supply. The floating contact of the multifunction relay *AUX* (terminals 15, 16, 18) can be used for this as interrupt switch for the modem power supply:



In order to do this, the following settings must be configured in Menu 4-1-7 under “Other”:

1. The function of the multifunction relay AUX must be set to *modem reset*.
2. If this setting has been selected, the system centre checks the availability of the modem and initiates a modem hardware reset automatically as required.
3. If a modem hardware reset is needed, the system centre now switches off the modem for a short time (approx. 10 seconds) and then switches it on again.

For details, see .Terminal assignment of the 230 V AC relay outputs v6.0.

6.6.2 SMS Text Message Transmission via a GSM Modem

With the GSM modem, an SMS text message is sent in the same way as with a mobile telephone. As no additional (land line) services are needed from the telephone provider, it is quicker and more reliable than a conventional modem. When using a GSM modem, the following points must be considered, and in this order:

1. In addition to the main telephone number (telephony), the SIM contract of the GSM modem must also have its own telephone number for data services (data service). Prepaid contracts are therefore generally not suitable!
2. Connect the GSM modem to COM1/Modem.
3. Enter the **PIN** of the GSM modem in Menu 4-1-5 - COM1/Modem.

> ⓘ Entry of incorrect PIN numbers can result in card blocking! If the existing GSM modem including the SIM card has to be replaced with a new one, the old PIN in the system centre **must** be deleted before the installation of the new GSM modem!

6.6.3 FAX Transmission via ISDN Modem

If the FAX transmission of alarms and messages is also needed as well as the alarm type on a PC with the LDSWIN PC software or the sending of SMS messages, an analogue modem must be installed in the system.

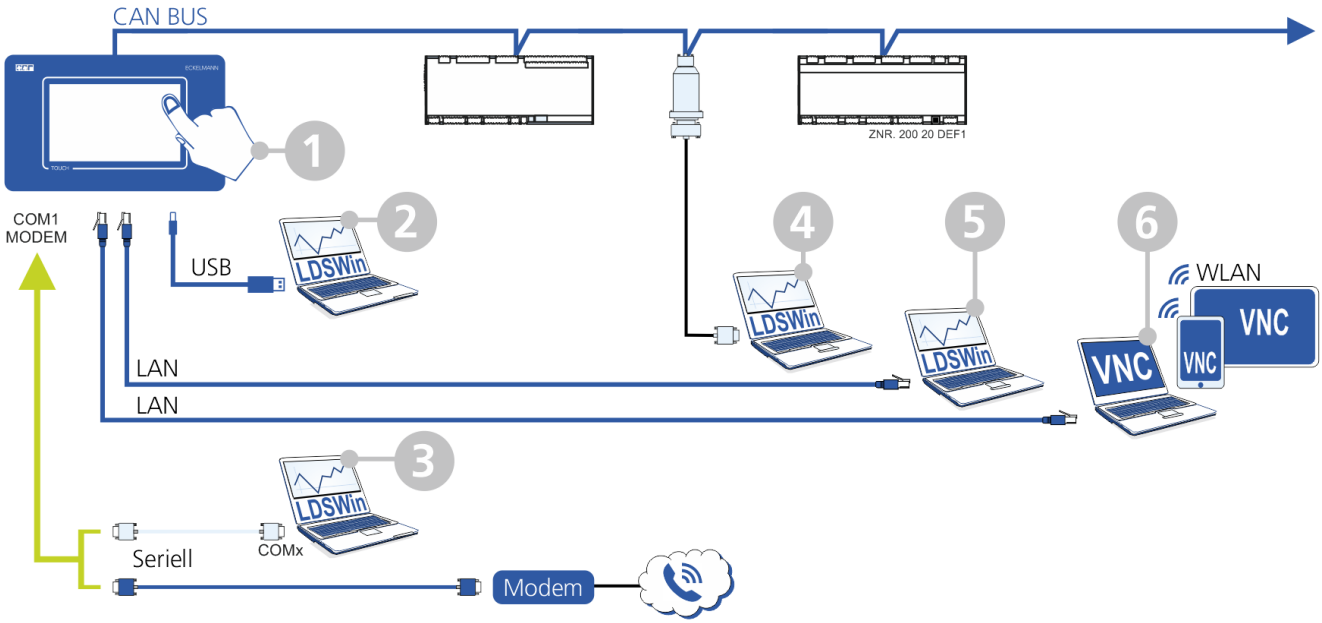
6.7 Switching on system centre

The system centre is switched on by applying the mains voltage to the N, L and PE terminals and to PE on the M4 screw. For details, see chapter Terminal assignment of the 230 V AC power supply.

> ⓘ A short beep sounds approx. 2 minutes after switching on and the display of the main menu to check the function of the internal audible alarm transmitter. The buttons can possibly be greyed out during the start phase as a check of the data integrity is performed in the system centre under certain circumstances.
> **Note:** Operation of the buttons is locked out during this check as the end of the reorganisation is waited for.

6.8 Configuration of the E*LDS system using Service PC locally

The local configuration of E*LDS components can either be done directly on the device or using a service PC (on which the LDSWin / VNC software is installed).



1. **Using touch screen** Input directly on the device; for details see Operation and access to the system centre.

2. **Using serial connection to the USB slave port**, a more detailed description for "PC direct connection via USB to the system centre" can be found in E°EDP. The USB interface can be configured in Menu 4-1-5 .

3. **Connection via the COM1/MODEM interface of the system centre**
   A null modem cable (EAG No. PCZKABSER2) is needed for the connection of the system centre to the serial port of a PC.. For this, the modem cable must be detached from the system centre to then connect the null modem cable within 2 minutes to the port labelled with COM1/MODEM for the connection to the PC and the LDSWin PC software must be started.
   If the system centre neither detects a Modem, page 45 Modem nor is in "*direct cable connection operating mode*", the alarm *Modem Fault* is triggered after 2 minutes have elapsed. The *Modem Fault* alarm is suppressed while the LDSWin PC software is on-line via the null modem cable. The modem monitoring is activated in Menu 4-1-5 .

   > ⓘ The system centre is only in "*direct cable connection operating mode*" if the LDSWin PC software is also actually on-line! Simply connecting the null modem cable is not sufficient!

   As soon as the LDSWin PC software goes on-line, the system centre automatically switches from the "*mode m operating mode*" to the "*direct cable connection*" operating mode and the "*Direct cable connection*" message is registered in the alarm list.

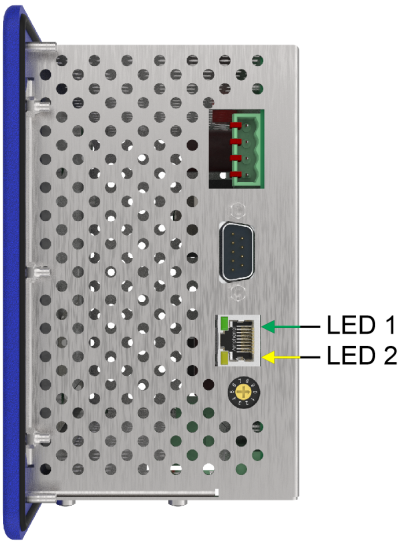
   > ⚠ **Interruption of transmission of alarms!** The automatic transmission of alarms is interrupted for the duration of the direct cable connection. New alarms are then notified directly to the connected Service PC. After restoration of the normal condition, the system centre transmits all notified alarms during the direct cable connection to the specified alarm destinations as usual.

4. **Connection via CAN bus to PC adapter:** the CAN bus to PC adapter has been designed for use in the E*LDS system. It forms the interface between a service PC and the CAN bus to be able to communicate with the E*LDS components. For more information about the CAN bus to PC adapter, see its operating manual.

5. 5. / 6. **Via LAN connection** using LDSWin or VNC.
   The operating manual for the LDSWin PC software and a more detailed description for "PC direct connection via network" can be found in E°EDP.

For details about VNC, see chapter Remote operation of the system centre using VNC (Virtual Network Computing).

6.8.1 Status LEDs Ethernet



Function	Colour	LED	Description
Ethernet	green	LED 1	▪ ON: Ethernet connection present ▪ Flashing: data transfer
	yellow	LED 2	▪ ON: 100 MBit/s ▪ OFF: 10 MBit/s

ⓘ Information for the precise terminal assignment can be found in chapter System centre terminal diagram.

6.9 Special function for commissioning

- **Test alarms**
  For checking the alarm paths, a "test alarm" with the priority 1..99 can be triggered in Menu 4-1-7.
  For further details, see Menu 4-1-7 - Alarm Signalling - Other
- **Reset system**
  In the Menu 4-1-7 - Alarm Signalling - Other, page 111, Menü 4-1-7 - Alarmierung the following functions are available using the "Reset system"* button:
  - Perform restart of the device
  - Delete the operating data archives of the controller
  - Delete the energy archives
  - Delete the alarm and message lists
  - Delete the 24h list
  - Reset to the factory settings of the system centre

6.10 Care instructions for front panel and touch screen

⚠ Moist cleaning is only permitted on the front side of the front panel and touch screen! Aggressive cleaning agents are also not permitted to be used!

The front panel and the touch screen should be cleaned with a spray-dampened soft microfibre cloth and soapy water or with a commercially available suitable cleaning cloth for LCD screens.

6.11 Battery replacement

No battery replacement for the controller by the user is envisaged as the battery service life is designed for greater than 10 years. If the "*battery voltage*" message is displayed, the controller must be sent to Eckelmann AG to guarantee correct replacement of the battery. Opening the device is not authorised, see chapter System Centre Installation and Start-up!

ⓘ Replacement of the battery after expiry of the warranty is subject to a charge.

⚠

The device contains a lithium battery (for details, see chapter Disposal) that must be disposed of separately!

Never dispose of this product with other domestic waste. Please inform yourself about the local regulations for the separated disposal of electrical and electronic products and batteries. The correct disposal of your old equipment protects the environment and people against possible negative consequences.

6.12 Firmware Update

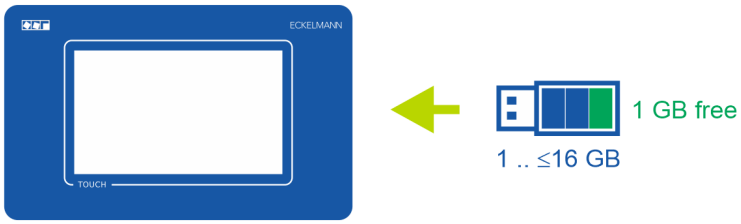
The system centre is supplied with the current firmware, ready for operation. Future software versions can be loaded into the system centre as required by means of a firmware update, and thus updated.

ⓘ A software update must only be performed by trained personnel or at the factory by the manufacturer. Further details about the current firmware can be found in E°EDP.

Damage to the system and stock loss! Before the firmware update, the affected system component or the system must be brought into a safe state as the shutdown of the controller during the firmware update can have undesired effects on the system component and/or the system.
Caution: data loss! The loading of software via firmware update must not be interrupted at any time. The mains plug and the USB stick must not be disconnected during the firmware update. It must be ensured that power is supplied throughout the entire procedure. Any interruption of the firmware update can result in an inoperative controller. In some cases, a change of the firmware version can result in the loss of all the specified setpoints in the system centre. As a precaution, the settings should therefore be backed up by saving them using the LDSWin PC software before the replacement. After the firmware update, the saved settings can be reloaded into the system centre from LDSWin.

6.12.1 Performing firmware update

Using a USB stick locally on-site



Requirements for applying a firmware update:

- The new firmware must be available; this is usually provided as a compressed ZIP archive, e.g. at https://edp.eckelmann.de/edp/lds/_a8DwY2ZwdN.
- The ZIP- archive (it contains the directory "*CI4000*") must be unpacked using a PC into the root directory of a USB stick (1 GB .. <=16 GB with 1 GB free space).
- The USB stick for the firmware update and the configuration data **must be formatted with FAT32** as file system!
- The requirements are met if the unpacking and copying to the USB stick has taken has taken place as follows:
  The directory, e.g. *F:\CI4000* exists on the USB stick (if "F" is the drive letter for the plugged-in USB stick).

Execution of the firmware update locally on-site:

- For details, see chapter Menu 4-1-9 - Firmware Update

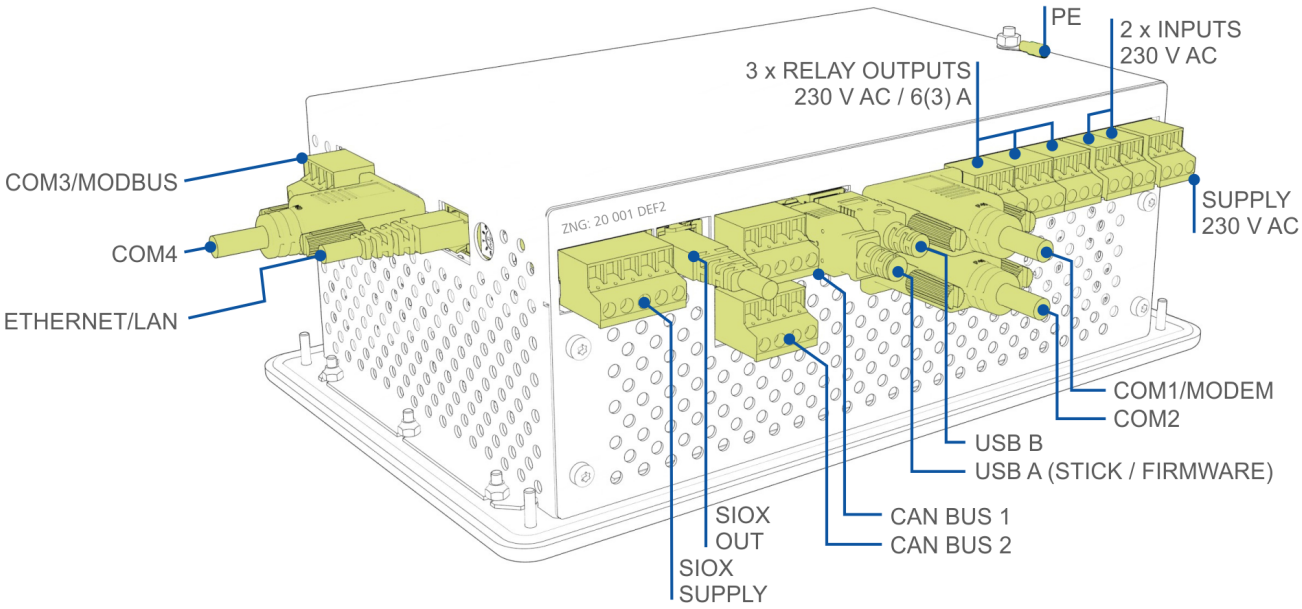
7 System centre and SIOX connection / terminal assignment

- System centre terminal diagram
- SIOX extension module terminal diagram

7.1 System centre terminal diagram

Warning about dangerous electrical voltage! In order to guarantee reverse polarity protection, only coded mating connectors may be used on the control component connections.

The following figure shows the system centre in its complete design:

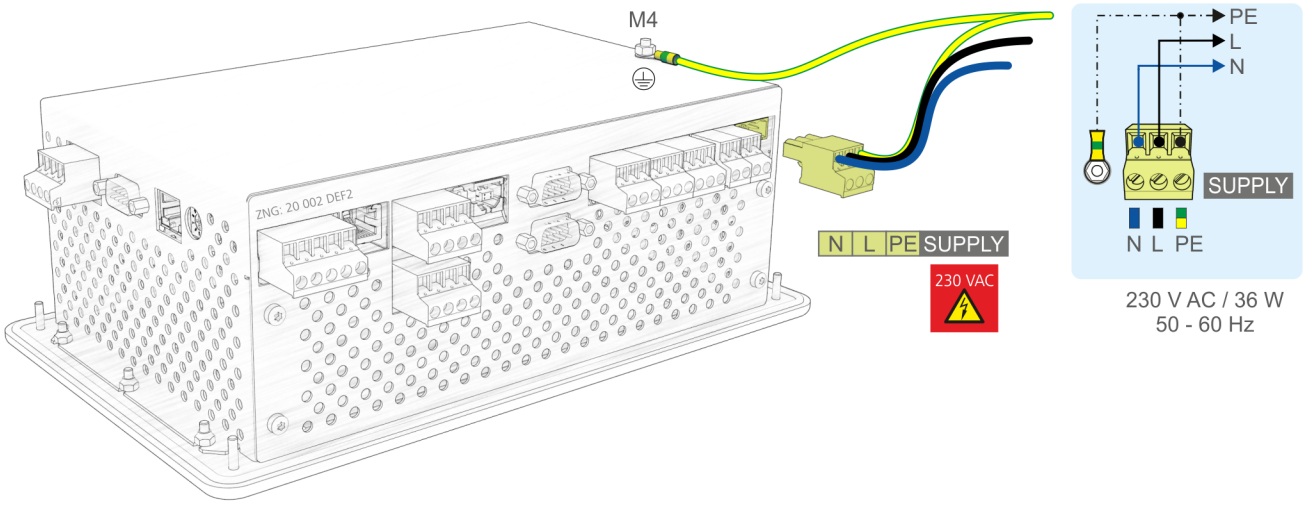


The detailed description of the connection and terminal assignments of the system centre and its components is shown on the following pages.

7.1.1 Terminal assignment of the 230 V AC power supply

The connection is used for the power supply of the system centre and is located at the bottom on the device.

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting it must be checked that the 230 V AC power supply cable is **disconnected from the power supply**! The controller is only permitted to be connected to the intended mains power supply!



Terminal No.	Function
N, L, PE	230 V AC power supply (*SUPPLY*): Neutral conductor, phase 230 V AC, PE (ground conductor)
PE on grounding screw M4	PE (ground conductor) with ring cable lug on device cage

Warning about dangerous electrical voltage! Instruction for protective earthing: The ground conductor **must** also be connected to the grounding screw M4 on the rear side of the device cage using a ring cable lug.

Connection to the power supply

In order to fuse the mains power line, a circuit breaker with the following characteristics **must** be used:

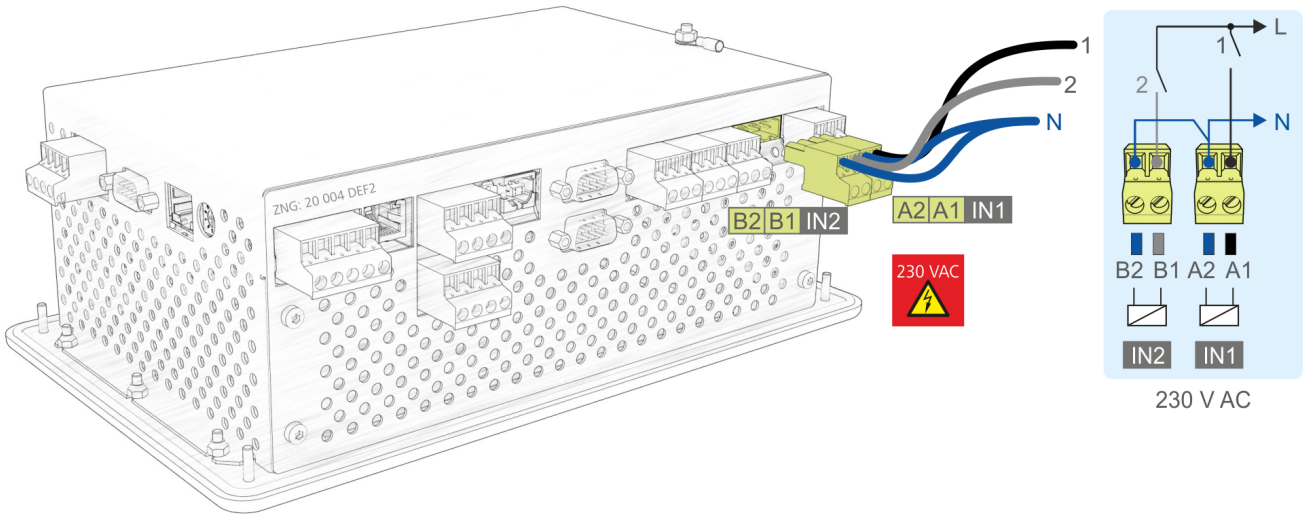
- Rated current for 230 V AC: 6 A
- Tripping characteristic (typical): B

Requirements for the connection cable
As the system centre does not have an integrated disconnecting device in the form of a power switch, the following must be implemented:
a) a switch or circuit breaker must be installed in the system or building installation,
b) this must be suitably positioned and easily accessible for the user and
c) this must be labelled as disconnecting device for the device.

7.1.2 Terminal assignment of the 230 V AC digital inputs

The two digital inputs are designed for installation monitoring, for special inputs and as measuring points (meter inputs) and are located at the bottom on the device.

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting it must be checkedthat **no voltage is present** at the 230 V AC digital inputs!



Terminal No.	Function
A1, A2	Digital input 1 (IN1), 230 V AC (floating)
B1, B2	Digital input 2 (IN2), 230 V AC (floating)

For details about the configuration, see chapter .Digital Inputs v6.0.

7.1.3 Terminal assignment of the 230 V relay outputs

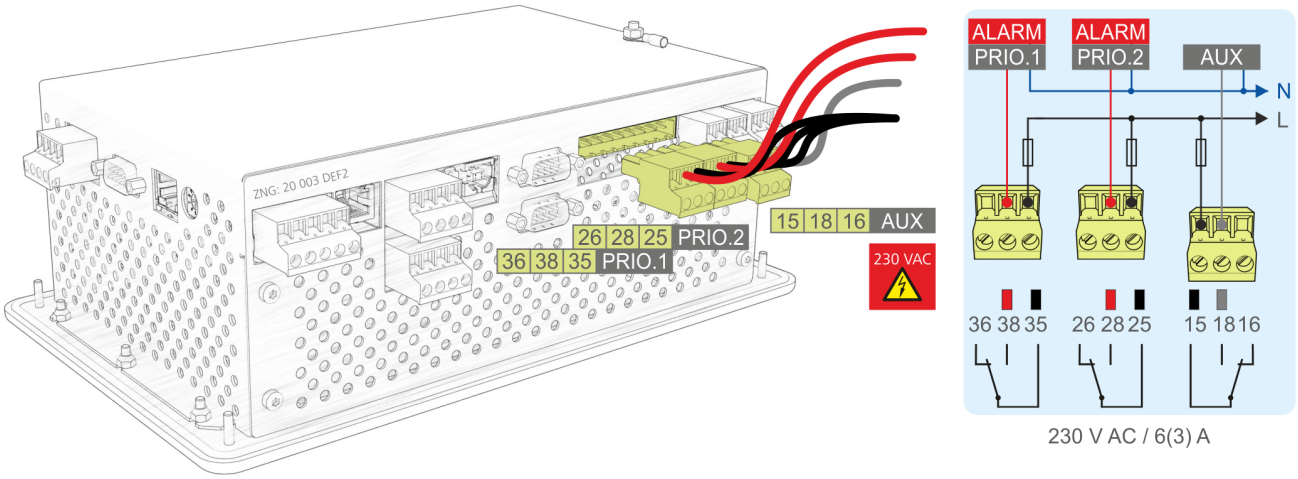
The two relay outputs PRIO1/PRIO2 can be used for sending alarms with these priorities. The multifunctional relay AUX can be freely configured (see table). The terminals are located at the bottom on the device.

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting, it must be checked that **no voltage is present** at the 230 V AC relay outputs! Low voltage **and** safety extra-low voltage must **not** be applied together at the relay outputs 15/16/18, 25/26/28 and 35/36/38.

If the alarm signalling is carried out using a telephone dialling device using the provided OFF-delay alarm contacts PRIO1/PRIO2, these must be subjected to cyclical monitoring to ensure that the contacts also still signal in the event of power failure.

In order to fuse the supply line and relay outputs, a circuit breaker with the following characteristics **must** be used for each relay output:

- Rated current for 230 V AC: 6(3) a
- Tripping characteristic (typical): B



Terminal No.	Function
15 (common) 16 (normally closed contact) 18 (normally open contact)	Multifunction relay AUX: can be configured using Menu 4-1-7 as • horn • additional alarm relay with the priority PrioX3, PrioX4, PrioX5, PrioX6, PrioX7, PrioX8 or PrioX9 • Modem hardware reset, or • for switching the modem to the DDC (T-connector required)
25 (common) 26 (closed in the alarm state) 28 (open in the alarm state)	Alarm relay PRIO2: Alarm for messages with priority 2 (PRIO.2)
35 (common) 36 (closed in the alarm state) 38 (open in the alarm state)	Alarm relay PRIO1: Alarm for messages with priority 1 (PRIO.1)

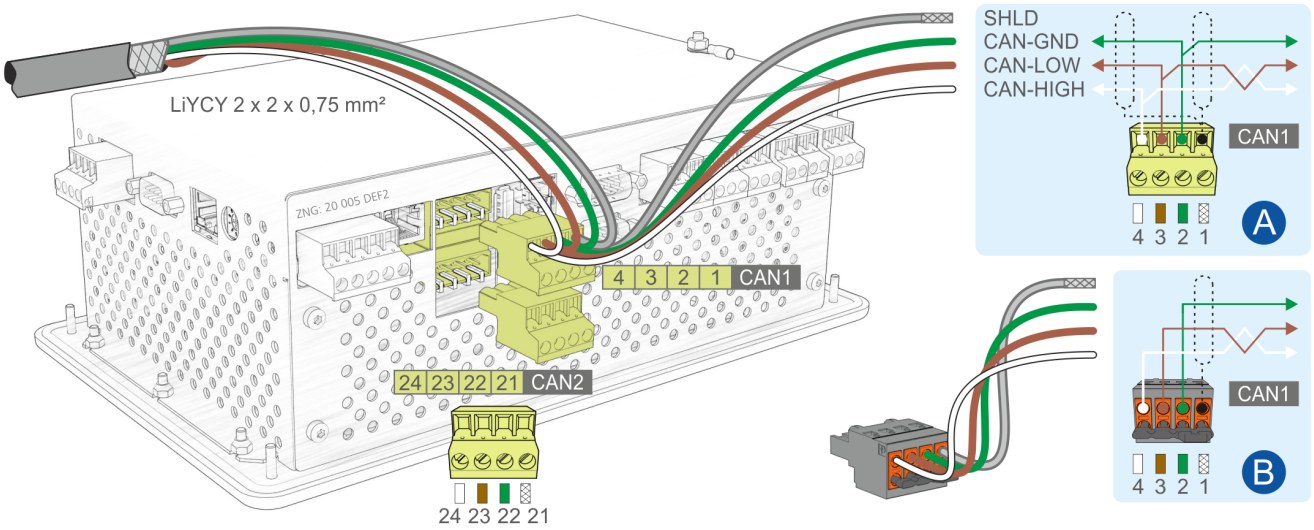
For details about the configuration, see chapter Relay Outputs.

7.1.4 Terminal assignment of the CAN bus terminals

The terminals for the connection to the first CAN bus segment CAN1 (standard) and second CAN bus segment CAN2 are located on the device at the bottom. See chapter CAN bus - Connection of E*LDS Components for further details about the range of functions of the two interfaces.

DANGER
Warning about dangerous electrical voltage! If mains voltage is connected to the CAN bus terminals, this will result in the destruction of all components connected to the CAN bus!

CAN bus supply lines must be shielded (cable type: **LiYCY 2x2x0.75 mm^2**)! As a general rule, care should be taken to ensure that signal cables and cables carrying mains voltage are routed in separate cable channels.
Wiring Variant A: Device is a node in a CAN bus segment with other devices before and after this, **no terminating resistor** required.
Wiring Variant B: Device is at the start / end of a CAN bus segment, **terminating resistor required**.
Recommendation: Use of the terminal set for CAN bus termination; see chapter Zubehör für Systemzentrale.



Connection to the CAN bus, shown here using the first CAN bus segment (CAN1) as example. This also applies for the second CAN bus segment (CAN2).

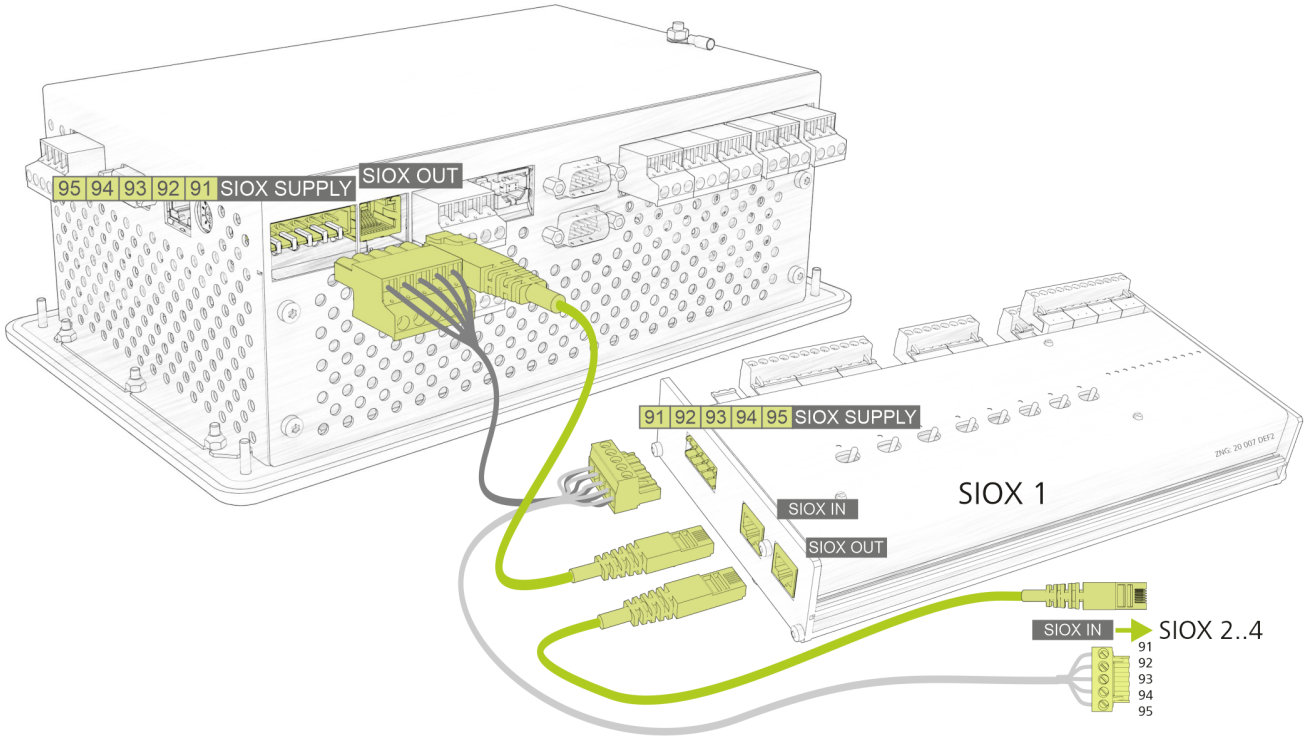
CAN1 - First CAN bus segment Standard				**CAN2 - Second CAN bus segment Only CI 5500: Repeate function**		
Terminal No.	**Function**	**Wire colour**		**Terminal No.**	**Function**	**Wire colour**
1 2 3 4	SHLD (Shield) CAN-GND CAN-LOW CAN-HIGH	shield green brown white		21 22 23 24	SHLD (Shield) CAN-GND CAN-LOW CAN-HIGH	shield green brown white

For details

, see chapter CAN bus - Connection of E*LDS Components and operating manual “Basics and general safety and connection instructions”.

7.1.5 Terminal assignment of the SIOX interfaces

The interfaces for the connection of up to 4 SIOX extension modules to the system centre are located on the device at the bottom. The number (1..4) of extension modules is defined in Menu 4-1-1. With each additional SIOX, the system centre is extended by 12 digital inputs (e.g. for system monitoring or for energy meters) and 8 relay outputs (e.g. week timers or for load shedding).



Danger of destruction of components! SIOX extension modules may only be connected to each other or the system centre when **no voltage is present**! In the event of an Ethernet network cable with PoE (Power over Ethernet) being used instead of the SIOX data cable (RJ45) damage can occur to participating network devices! Only components approved by Eckelmann AG may be connected to the SIOX extension bus (terminals SIOX OUT / SIOX IN or terminals 91..95)!

Terminal No.	Function
Power supply - SIOX SUPPLY *	
91 92 93 94 95	Ground of 9 V +9 V DC Ground of 24 V +24 V DC SHLD (shield)
Data port - SIOX OUT *	
RJ45 female connector	Data cable output for the connection of the first SIOX extension module

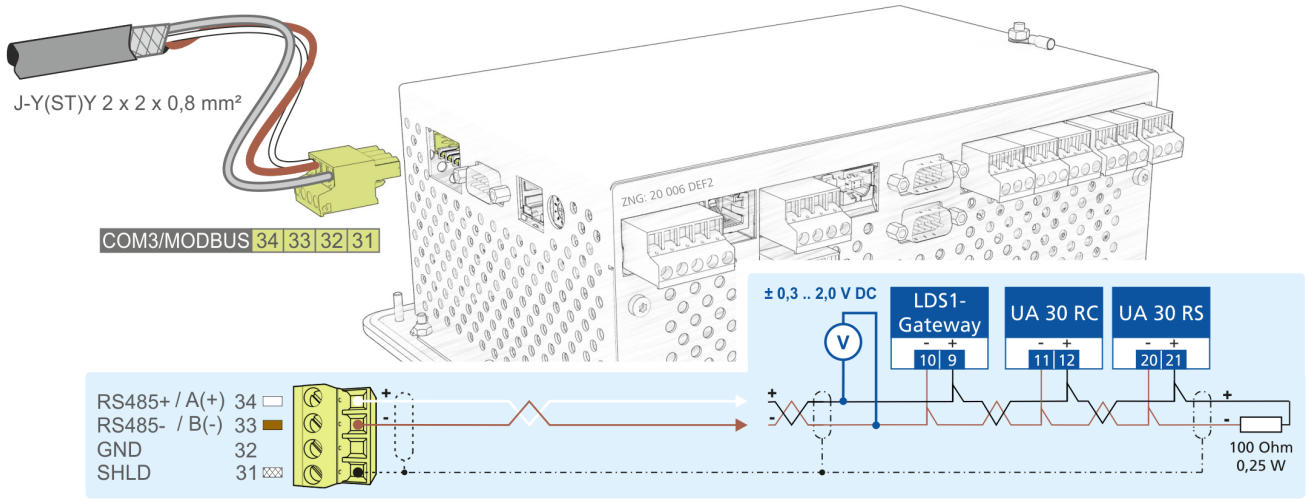
*** Recommendation:** SIOX supply cables and SIOX data cables are available as accessories for the connection, see chapter .Accessories for system centre v6.0.

7.1.6 Terminal assignment of the COM3 / Modbus terminals (RS485)

Only CI 4100 or higher:
The connection is used for connecting UA 30 / Dixell controllers and LDS1 gateways in the E*LDS system and is located on the left side of the device. The COM3 / MODBUS interface is configured in Menu 4-1-5.

Warning about dangerous electrical voltage! If mains voltage is connected to the Modbus terminals, this will result in the destruction of all components connected to the Modbus!

Modbus supply lines must be shielded (cable type: J-Y(ST)Y 2x2x0.8 mm^2)! As a general rule, care should be taken to ensure that signal cables and cables carrying mains voltage are routed in separate cable channels

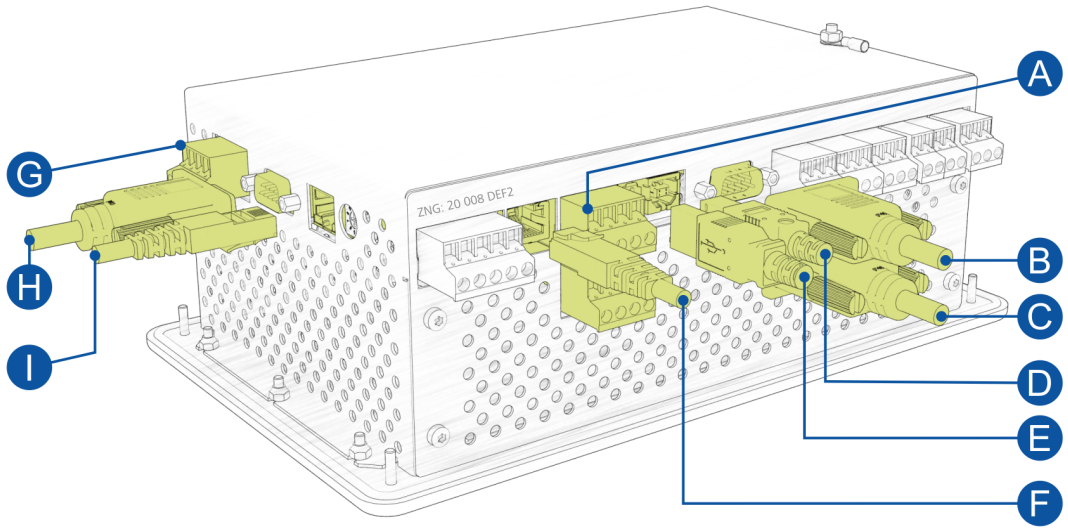


COM3 / Modbus (RS485 via COMBICON terminal block)		
Terminal No.	**Function**	**Wire colour**
34* **33*** 32 31	RS485 + RS485 - GND SHIELD (Shield)	white brown green shield

* A terminating resistor of **100 ohms is already permanently installed** (integrated) between terminals 33 and 34 in the system centre.
Thus, any termination at these terminals must **not** be performed, i.e. is not required!
A terminating resistor of 100 ohms **must** only be installed **at the end of the Modbus** (see illustration, on the right)!

7.1.7 Terminal assignment of communication interfaces

The functions of the communication interfaces are configured in Menu 4-1-5.



Interfaces at the bottom on the device			
Interface	**Designation**	**Type**	**Function**
A:	CAN bus	CAN1 / CAN2 COMBICON terminal blocks	Connection of the system centre to • the first CAN bus segment via CAN1, • the second CAN bus segment via CAN2 (CAN2 only for CI 4500 or higher). For details, see chapter Terminal assignment of the CAN bus terminals.
B	COM1 / MODEM	RS232 Sub-Min-D (male)	For connection • of a null modem cable for the connection of the PC software LDSWin or • of a modem. For details, see chapter Configuration of the E*LDS system using Service PC on-site.
C	COM2	RS232 Sub-Min-D (male)	M-bus (CI 4100 or higher) For details, see chapter M-bus interface for consumption data capture.
D	USB - Slave	USB 2.0 female connector B	• For connection of a USB cable for the connection of the PC software LDSWin; for details, see Configuration of the E*LDS system using Service PC locally.
E	USB - Host	USB 1.1 female connector A	• For plugging in a USB stick for a firmware update; for details, see chapter Firmware Update.
F	SIOX data cable	RJ45 female connector	• Data cable for SIOX extension modules **ATTENTION: DO NOT** connect using the Ethernet network cable! For details, see chapter SIOX - connection to the system centre
Interfaces on the left on the device			
G	COM3/ MODBUS	RS485 COMBICON terminal block	For the connection of UA 30 / Dixell controllers and LDS1 gateways (CI 4100 or higher). For details, see chapter Terminal assignment of the COM3 / MODBUS terminals (RS485).
H	COM4	RS232 Sub-Min-D (male)	For the connection of external controllers (Danfoss AHT / Wurm AHT) For details, see chapter Integration of external controllers.

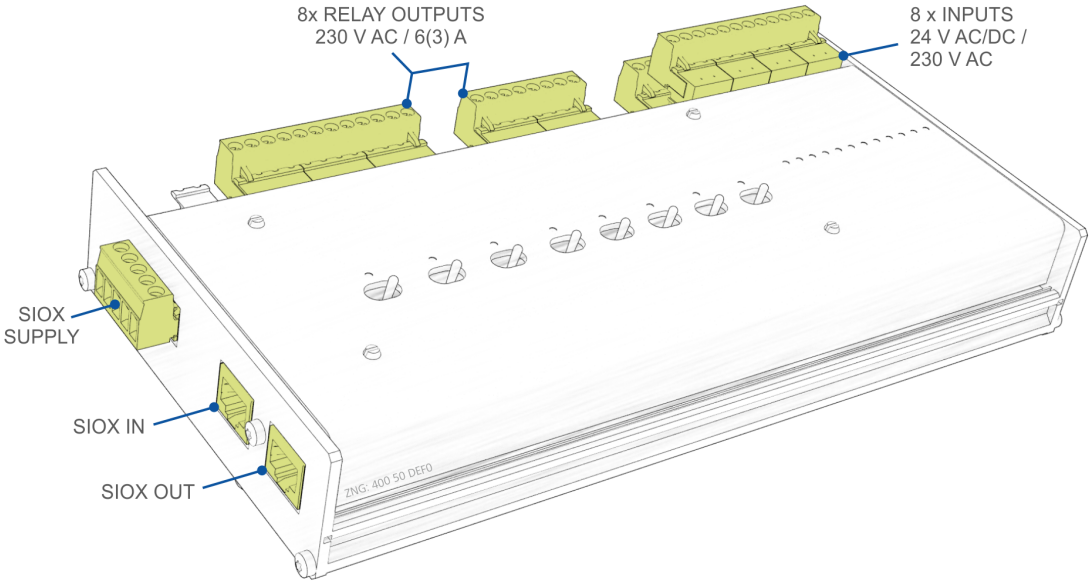
I	ETHERNET/ LAN	RJ45 female connector	Ethernet / LAN interface (CI 4400 or higher) for the connection of the PC software LDSWin

For details about dependencies in the expansion stages, see chapter Communication interfaces.

7.2 SIOX extension module terminal diagram

Warning about dangerous electrical voltage! In order to guarantee reverse polarity protection, only coded mating connectors may be used on the control component connections.

The following figure shows a SIOX (**S**erial **IO** E**x**tension) extension module with switches:

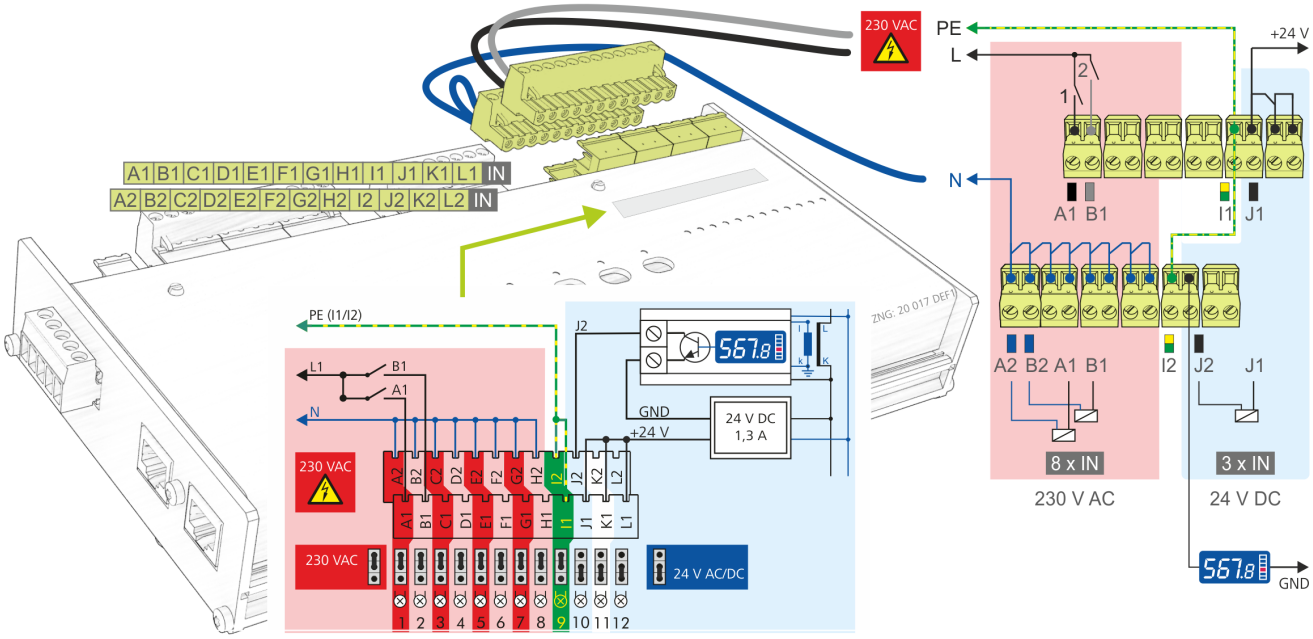


The description of the connection and terminal assignments for the digital inputs, the relay outputs and the SIOX interface is provided on the following pages. For detailed information about the connection, configuration and special features of the SIOX extension module, see chapter DIN rail mounting - SIOX extension module.

7.2.1 SIOX – Terminal assignment of the 24 V AC/DC / 230 V AC digital inputs

There are 12 floating digital inputs (24 V DC/AC / 230 V AC) available per SIOX extension module for system monitoring and/or as measuring points (meter inputs).

Warning about dangerous electrical voltage! Danger of electric shock! The configuration of the jumpers must **always** be performed when no voltage is present and with the connectors at the inputs (terminals A1, A2/ ... /L1, L2) detached as a voltage of 230 V AC can be present at these terminals under certain circumstances! If 230 V AC is applied to an input that has been configured for 24 V AC, this results in destruction of the extension module (SIOX)!
Wiring of the digital inputs:
230 V AC: The N conductor **must** be applied at a terminal level (A2 .. L2)!
24 V AC/DC: If 230 V AC **and** 24 V AC/DC inputs are needed on a SIOX module, these **must** be separated by an input connected to PE! For more details, see chapter SIOX - configuration of the jumpers.



Note: The digital inputs of the SIOX extension module in the example are used / configured as follows:

- The first 8 digital inputs A2..H2 have been configured for 230 V AC using jumpers.
- Ideally, A2..H2 are connected to N.
- The first two digital inputs A1/A2 and B1/B2 are used for system monitoring.
- The ninth digital input I1/I2 is connected to PE for the electrical isolation of the high / low voltage side.
- The 3 digital inputs 10..12 have been configured for 24 V AC/DC using jumpers.
- The tenth digital input (J1/J2) is used as 24 V DC energy meter.
  Note: A power supply (part number KGLNT23024) may be required for the supply of the meter.

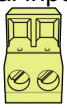
⚠ Detailed safety instructions and information for the configuration of the jumpers for the digital inputs are provided in chapter SIOX - configuration of the jumpers.

Digital input	Terminal No.		Function
	Without switch *	With switch *	
1	A1, A2	50, 51	• Alarm and message inputs (e.g. for detection of external alarms) • Meter inputs for energy, gas, water and event • Meter inputs for recording of the high and low tariff (HT/LT) • Synchronisation inputs for acquisition of the synchronisation pulse of the power company
2	B1, B2	52, 53	
3	C1, C2	54, 55	
4	D1, D2	56, 57	
5	E1, E2	58, 59	
6	F1, F2	60, 61	
7	G1, G2	62, 63	
8	H1, H2	64, 65	
9	I1, I2	66, 67	

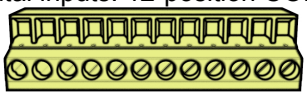
Digital input	Terminal No.		Function
	Without switch *	With switch *	
10	J1, J2	68, 69	
11	K1, K2	70, 71	
12	L1, L2	72, 73	

*** COMBICON terminal blocks of the extension modules**

- **Without switch**
  - Digital inputs: 2-position COMBICON terminal blocks

12 x 

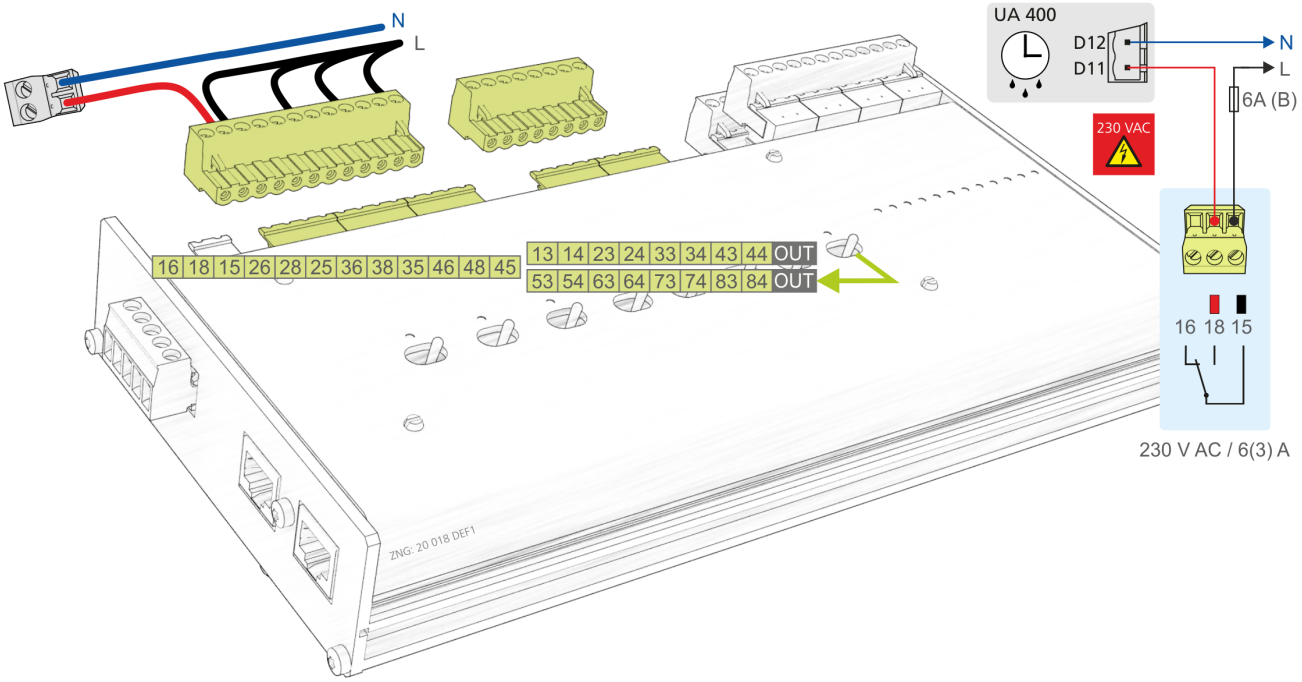
- **With switch**
  - Digital inputs: 12-position COMBICON terminal blocks

2 x 

7.2.2 SIOX - Terminal assignment of the 230 V AC relay outputs

There are 8 relay outputs available for each extension module. For example, the outputs can be used as week timers (e.g. for defrosting, lighting, car park lighting) or for energy management (e.g. load shedding or for enabling of consumers). For extension modules with manual control switches (see picture), the outputs can be switched manually; for details, see chapter SIOX manual / automatic mode selection. The week timers are configured in Menu 4-1-4.

Warning about dangerous electrical voltage! Danger of electric shock! BEFORE connecting and disconnecting, it must be checked that **no voltage is present** at the 230 V AC relay outputs! Low voltage **and** safety extra-low voltage must **not** be applied together at all relay outputs!



In order to fuse the supply line and relay outputs, a circuit breaker with the following characteristics **must** be used for each relay output:

- Rated current for 230 V AC: 6(3) a
- Tripping characteristic (typical): B

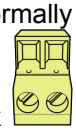
Note: In the example here, the first relay output of the SIOX extension module is used as a defrost timer for a case controller. For further details about the configuration of the SIOX, see chapter SIOX - connection to the system centre.

Relay output	Terminal No.		Function
	Changeover contacts		
	Without switch *	With switch *	
1	16, 18, 15		• Week timers (e.g. for defrosting, lighting, car park lighting) or • for load shedding
2	26, 28, 25		
3	36, 38, 35		
4	46, 48, 45		
	Normally open contacts		
	Without switch *	With switch *	
5	53, 54	13, 14	
6	63, 64	23, 24	
7	73, 74	33, 34	
8	83, 84	43, 44	

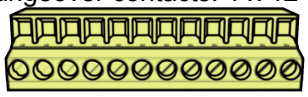
*** COMBICON terminal blocks of the extension modules**

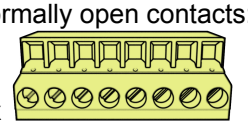
- **Without switch**
  - Changeover contacts: 4 x 3-position COMBICON terminal blocks

    4 x
  - Normally open contacts: 4 x 2-position COMBICON terminal blocks

    4 x 

- **With switch**
  - Changeover contacts: 1 x 12-position COMBICON terminal block

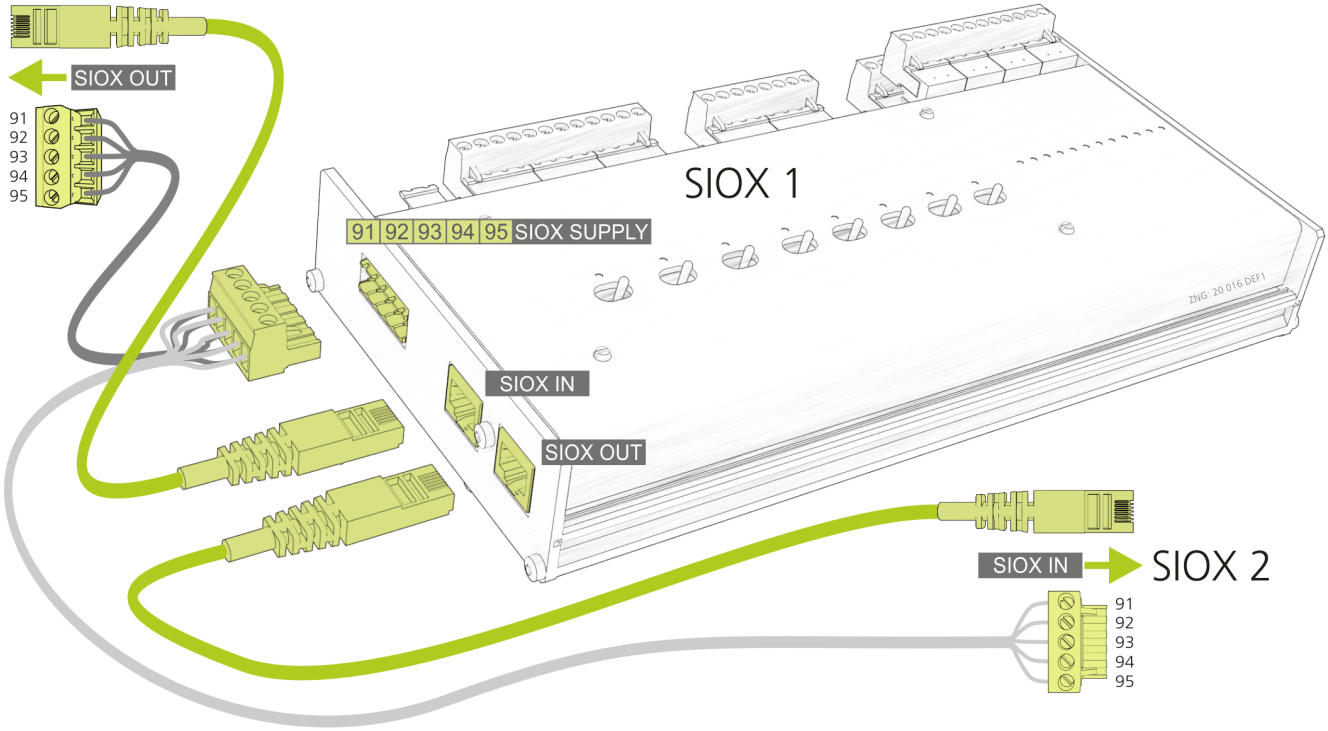
    1 x 
  - Normally open contacts: 1 x 8-position COMBICON terminal block

    1 x 

7.2.3 SIOX - Terminal assignment of the interfaces

The SIOX supply cables and the SIOX data cables are used for the the connection of a SIOX extension module to the system centre and/or to another SIOX. The interfaces are located on the left on the device.

> ⚠ **Danger of destruction of components!** SIOX extension modules may only be connected to each other or the system centre when **no voltage is present**! In the event of an Ethernet network cable with PoE (Power over Ethernet) being used instead of the SIOX data cable (RJ45) damage can occur to participating network devices! Maximum 4 extension modules can be connected to the system centre. Only components approved by Eckelmann AG may be connected to the SIOX extension bus (terminals SIOX OUT / SIOX IN or terminals 91..95)! The total length of the cabling for the SIOX cables and the SIOX data cables is maximum 30 m in each case!

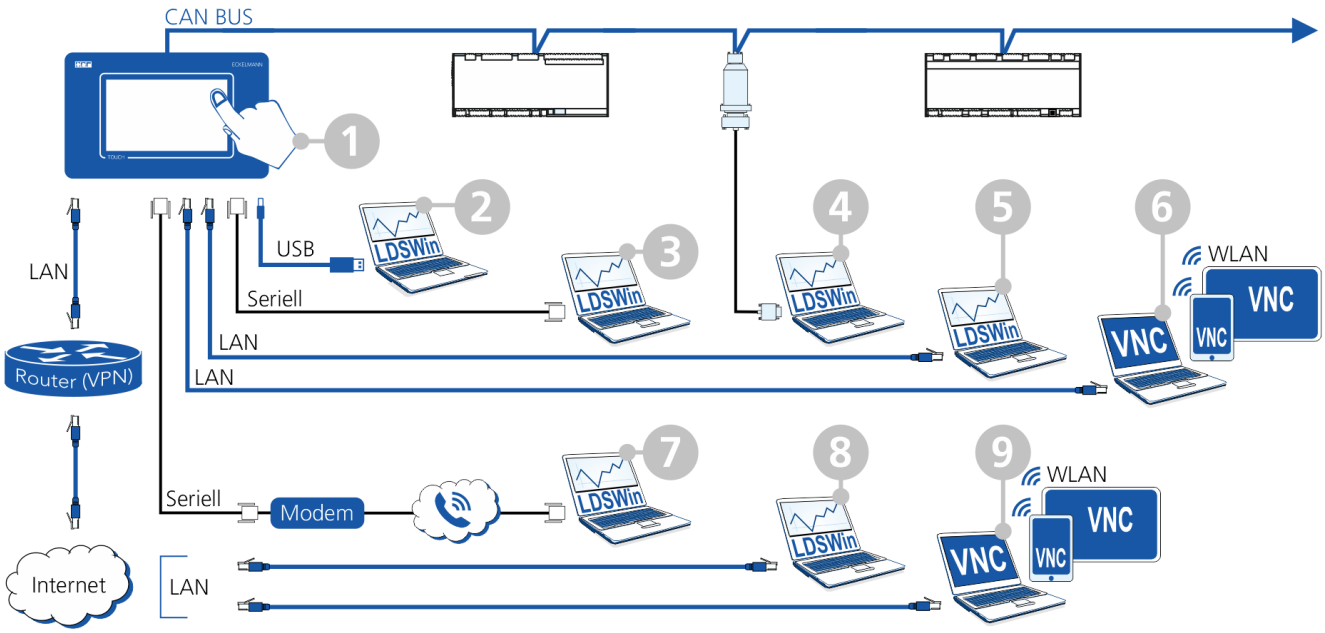


Terminal No.	Function
Power supply - SIOX-SUPPLY *	
91 92 93 94 95	Ground of 9 V +9 V DC Ground of 24 V +24 V DC SHLD (shield)
Data port - SIOX IN *	
RJ45 female connector	Input of the SIOX data cable from the system centre (connection "SIOX OUT") or from a previous SIOX (connection "SIOX OUT")
Data port - SIOX OUT *	
RJ45 female connector	Output of the SIOX data cable to the next SIOX (connection "SIOX IN")

Terminal No.	Function
SIOX 24 V DC - no function **WARNING:** These terminals must **not be used to supply any external consumers** (e.g. energy meters)! **Practical tip:** A separate power supply (part number KGLNT23024) **must** be used for the supply of external consumers; see chapter .Accessories for system centre v6.0	
93 94	Ground of 24 V DC +24 V DC

*** Recommendation:** SIOX supply cables and SIOX data cables are available as accessories for the connection, see chapter .Accessories for system centre v6.0.

8 Operation and access to the system centre



The following possibilities for the operation of and access to the system centre[1)] are available:

No.	Access via		Operation via	Type of connection
1	Local [1)]	Machine room	Touch screen	Direct input using the touch screen of the device. For details, see ▪ Layout of the touch screen ▪ Login to the system centre (unlocking) ▪ Remote control of E*LDS components (terminal mode)
2			LDSWin[2)]	Serial connection via the USB Slave port (type B) A detailed description for "PC direct connection via USB to the system centre" can be found in E°EDP.
3				Serial connection via the COM1 interface[1)]
4		Machine room and in the entire system		Connection via CAN bus to PC adapter. A detailed description can be found in E°EDP.
5				LAN connection. A detailed description for "PC direct connection via network" can be found in E°EDP.
6			VNC[3)]	LAN connection with VNC, see Remote operation of the system centre using VNC (Virtual Network Computing) A detailed description for "PC direct connection via network" can be found in E°EDP.

No.	Access via		Operation via	Type of connection
7	Remote	Refrigerated display case manufacturer & Service, store operator, supply chains, remote maintenance centres & emergency services	LDSWin[2)]	Remote access via modem at the COM1 interface
8				Via Internet and LAN connection
9			VNC[3)]	Via Internet and LAN connection using VNC; see Remote operation of the system centre using VNC (Virtual Network Computing)

ATTENTION

Violation of data protection! The Combi-Gateway is not equipped with any security mechanisms for the encryption of communication via the LAN interface. For this reason, connections should only be established in secure networks. For communication via public or insecure networks, additional security components (e.g. VPN router etc.) should be used. The Combi-Gateway should never **be directly connected to the Internet!**

[1)] Not all possibilities for operation and access can be used **simultaneously**!
Further details for local operation can be found in chapter Configuration of the E*LDS system using service PC locally, page 44 Configuration of the E*LDS system using Service PC locally.

[2)] LDSWin - Further details for local operation can be found in chapter Configuration of the E*LDS system using the LDSWin PC software.

[3)] VNC - For details, see Remote operation of the system centre using VNC (Virtual Network Computing).

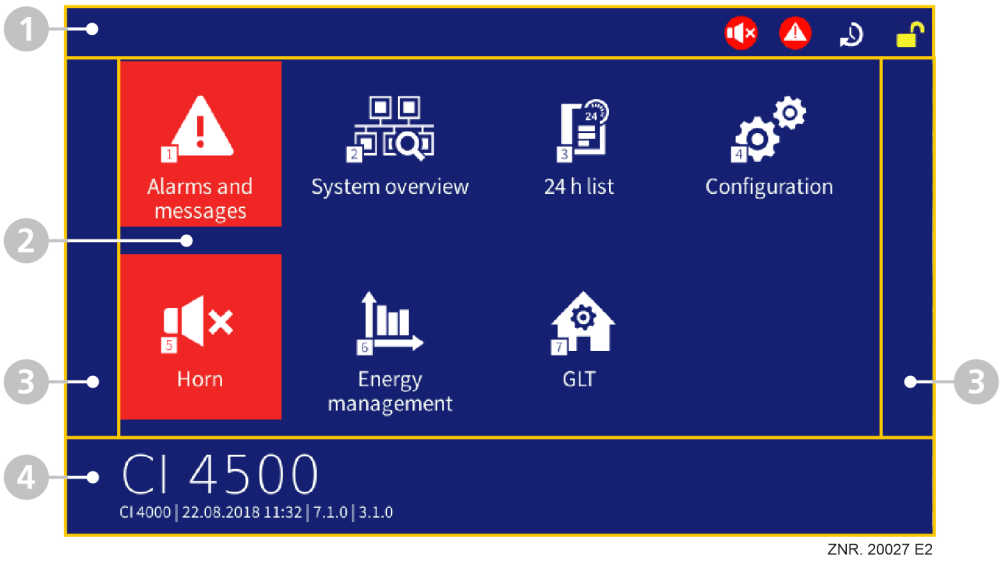
The system does not support communication via a proxy server.

9 Menus of the system centre

9.1 On-site at the device

9.1.1 Layout of the touch screen

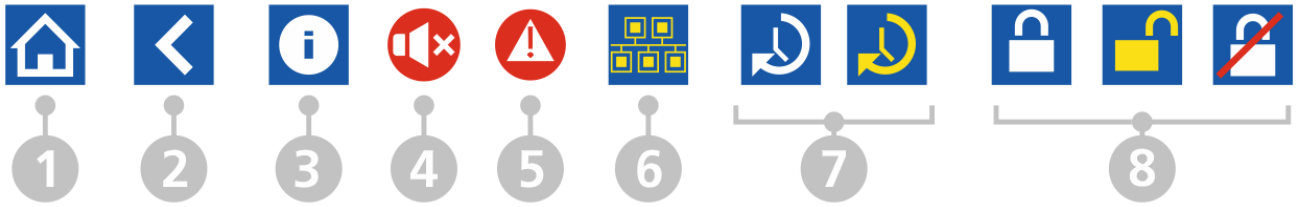
The touch display of the system centre is divided into various fields for different functions, for example here the main menu:



1. **Status bar and quick info:** Menu numbers and titles of the displayed menus or entry screens. The Info/ Help button and the two quick access buttons for acknowledgement of the alarms and for calling up the alarm list (in red here) and the list of unloaded / failed case controllers (in yellow here) can also be found here. The buttons for service mode and for logging in to the system centre are placed next to them.
   For details, see chapter Status bar and quick info, Status bar and quick info.
2. **Main menu and central controls:** Area for display of all menus, entry screens, dialogue fields, lists and diagrams. Also the display of the on-screen keyboard for input of parameters.
   For details, see chapter Main menu and central controls and On-screen keyboards for input of parameters, On-screen keyboards for entry of parameters.
3. **Navigation and other:** Depending on the respective menu or screen, these areas are provided for navigation (paging up, down, right and left), acknowledgement of alarms or for selection of the views in lists.
   For details, see chapter Navigation and other, Navigation and other.
4. **Info area (only in the main menu) and central controls** as well as buttons for saving, applying or for adding new entries.
   For details, see chapter Main menu and central controls.

> ⓘ If the touch screen is black (screen saver is active), it can be activated again by simply tapping on it. If the display is flashing (one second on and 5 seconds off), there are pending alarms. The screen saver is not active if nodes have the "unknown" status.

9.1.1.1 Status bar and quick info



Button No.	Function
1	Home - display main menu, only visible in submenus
2	Back - one menu level back, only visible in submenus Exception: If the diagram of the 24h list is open, this button jumps back to the main menu! If you would only like to return to the table form view of the 24h list, the button at the bottom left in the navigation area must be tapped.
3	Call of context-related information and explanations for the respective displayed menu or entry screen,only visible if information is available.
4	Audible alarm (internal buzzer or optional external horn on the AUX relay); to switch off alarm, see chapter Menu 5 - Horn.
5	There are pending alarms and messages! Tap to open alarm and message list, see chapter Menu 1 1 Alarms and messages.
6	Display list of failed refrigeration points (only visible if refrigeration points have failed). By tapping on the refrigeration points shown in the list, they can be 1. defined as unloaded: refrigeration points that have either been switched off, e.g. for cleaning, and should be switched on again later, or 2. are defined as failed: if the cause for why refrigeration points have failed is unknown, e.g. when a fault is present. For details, see chapter Alarm suppression for manual shutdown of case controllers.
7	Service mode for suppression of remote alarm signalling. The following displays are possible: • white: activation of the service mode by entry of a time in the range of 0 - 255 minutes NOTE: This button is not displayed until **after** successful login to the device. • yellow: indicates that Service Mode is activated. For details about Service Mode, see chapter Service Mode - Suppression of remote alarm signalling.
8	Login to the system centre (unlocking) • white: login possible • yellow: user is logged in • white and red crossed out: a login or logout is not possible. For details, see chapter Login to the system centre (unlocking).

9.1.1.2 Main menu and central controls

Button No.	Function
1	Create new entry (e.g. a new run time or week timer).
2	Open the entry screen or symbol for editing. Parameters are displayed or can be edited, configured or changed and entries can be added or deleted. Among other things, this symbol is also visible in lists to obtain detailed information.
3	Open remote control of components, see chapter Remote control of E*LDS components (terminal mode).
4	Save and close entry screens and dialogues.
5	Entries are applied and saved; however the entry screen remains open.
6	Close entry screen without saving; entries already made are discarded.
7	Deletion of an entry from a list (e.g. deletion of a digital input).
8	Symbol "List is currently being updated automatically" (e.g. in the alarm list).
9	Refresh button, e.g. to search for new M-bus meters.
10	• Field with status messages in the node list, see Menu 2-2 or • Button for tripping events (e.g. for tripping a test alarm, see chapter Menu 4-1-7 - Alarm Signalling).

The Info field in the main menu contains

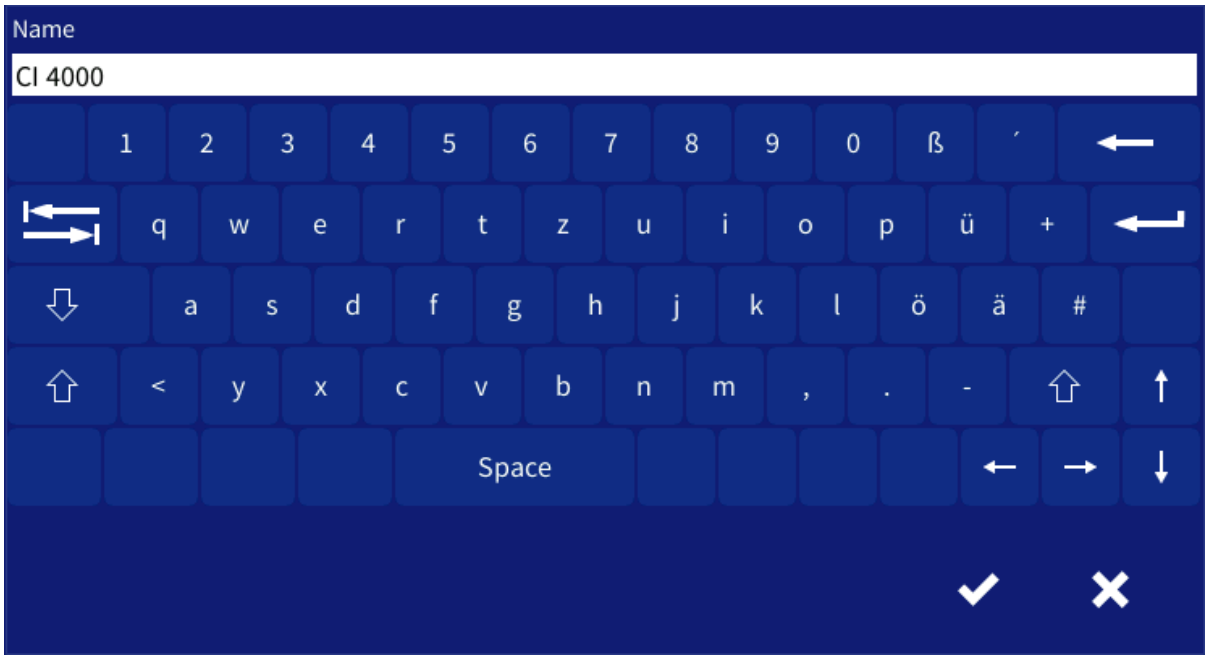
- the designation of the expansion stage of the system centre (e.g. CI 4000, CI 4100 …; for details, see chapter Expansion stages of the CI 4000 series).
- The designation of the store (e.g. "Wiesbaden store") is also shown underneath in small font, see Menu 4-9.
- The date, current system time as well as the date and version of the system centre firmware version are shown next to it.

ⓘ Detailed descriptions for the individual menus and entry screens and their parameters are shown in chapter Menus and entry screens of the system centre.

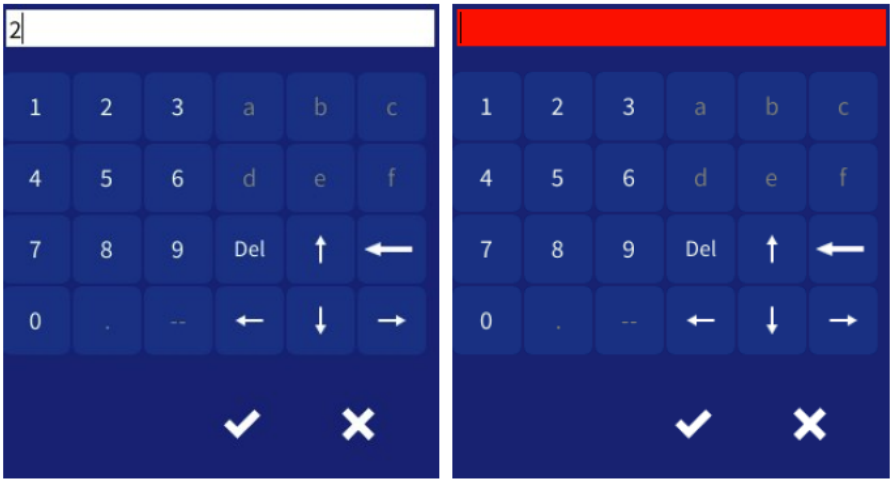
1 On-screen keyboards for entry of parameters

There are different keyboards in the system centre depending on the entry screen. An entry is saved by tapping the tick or cancelled with **X**.
The following keyboards are available:

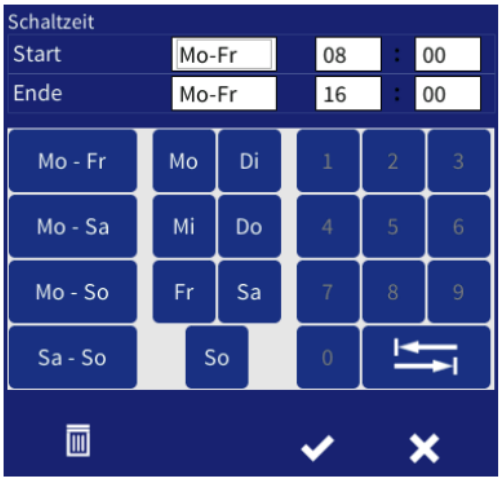
1. Universal keyboard for the entry of text, special characters and numbers:



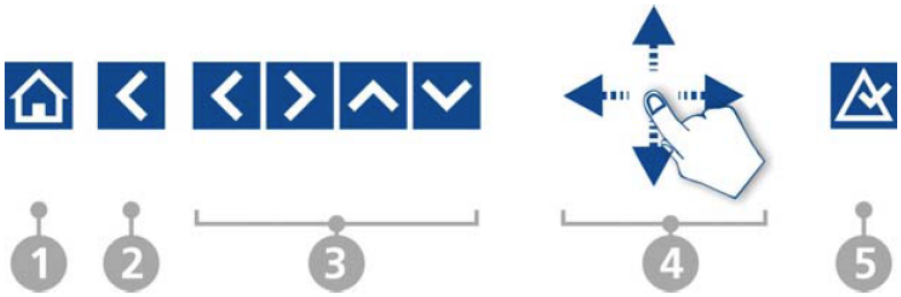
2. Numeric keypad for the entry of numbers with plausibility check (left). If the entry field has a red background (right), the input value is not plausible or not permitted and must be corrected. Depending on the parameter, characters are partially greyed out to prevent inadmissible input.



3. Special keyboard for convenient input of time ranges, e.g. for week timers:



9.1.1.3 Navigation and other



Button No.	Function
1	Home - display main menu, only visible in submenus
2	Back - one menu level back, only visible in submenus Exception: If the diagram of the 24h list is open, this button jumps back to the main menu! If you would only like to return to the table form view of the 24h list, the button at the bottom left in the navigation area must be tapped.
3	For scrolling left, right, up or down in lists, e.g. the alarm or 24h list Note: these buttons are shown if necessary
4	The touch screen can also be swiped (not possible in the 24h list, energy lists, EU archive and remote control).
5	Acknowledgement of alarms (only in the alarm list)

The display may have more icons than fit on the view and shows a list so that the views can be changed between by swiping right/left and up/down or by tapping buttons. If necessary this is also indicated by arrow buttons for right/left or up/down.

Other elements

- Buttons to display other time periods in the 24h list; for details, see Menu 3, chapter Menu 3 - 24h List:

- Buttons to display other time periods (weeks, months, years) in the consumption list; for details, see Menu 6-1, chapter Menu 6 -1 - Consumption:

- So-called tab buttons for changing the view between alarm and message list are placed at the bottom left of the navigation bar; see chapter Menu 1 - Alarms and messages.

9.1.2 Login to the system centre (unlocking)

These buttons are used for logging in and logging out at the system centre (unlocking / lock-down).

Symbols	Description
	If the lock is closed (white), nobody is logged in (system centre locked down); inputs or changes to the configuration of E*LDS components are **not** possible. Login: Tap on symbol and enter user details / password.
	If the lock is open (yellow), a user is logged in (system centre is unlocked); inputs or changes to the configuration of the system centre or to E*LDS components **can be made**. Logout: Tap on symbol and log out.

The screen contains the following parameters:

Login	Description	Input	Default
User name Password	The user name and the associated password must be entered previously to login to the system centre. See chapter Menu -6 8.7- Users for details about the user management. The following users are created at the factory: • **Standard** User name: **Service** Password: **0000** Equivalent in CI 3x00: Menu 9-3 and "Enter" • **Extended rights** e.g. for configuration of a UA 410 E controller or for performing a firmware update User name: **Master** Password: **0000** Equivalent in CI 3x00: Menu 9-3 and input date backwards • **Administrative rights** e.g. for restore of the factory settings User name: **Admin** Password: **0000** Equivalent in CI 3x00: not available	See description	-

ⓘ If the display is not touched for a period of 15 minutes, open entry screens are closed automatically and the main menu of the system centre is displayed again. Any running entry by a user is cancelled and inputs already made are discarded.

After the login, another symbol is shown automatically on the left next to the padlock; this symbol is used in the service mode for suppression of the remote alarm signalling.

Symbols	Description
	The remote alarm signalling is active if the symbol is white.
	If the symbol is yellow, the remote alarm signalling has been deactivated for a duration selected by the user; see chapter Service Mode - Suppression of the remote alarm signalling.

9.1.2.1 Service mode - suppression of remote alarm signalling

After the login, another symbol is shown automatically on the left next to the padlock; this symbol is used in the service mode for suppression of the remote alarm signalling.

Symbols	Description
	This button is not displayed until **after** successful login to the device. The remote alarm signalling is active if the symbol is white. The symbol must be tapped to activate the suppression of the remote alarm signalling.
	If the symbol is yellow, the remote alarm signalling has been deactivated for a duration selected by the user and remains visible in the display until the delay time has elapsed.

The screen contains the following parameters

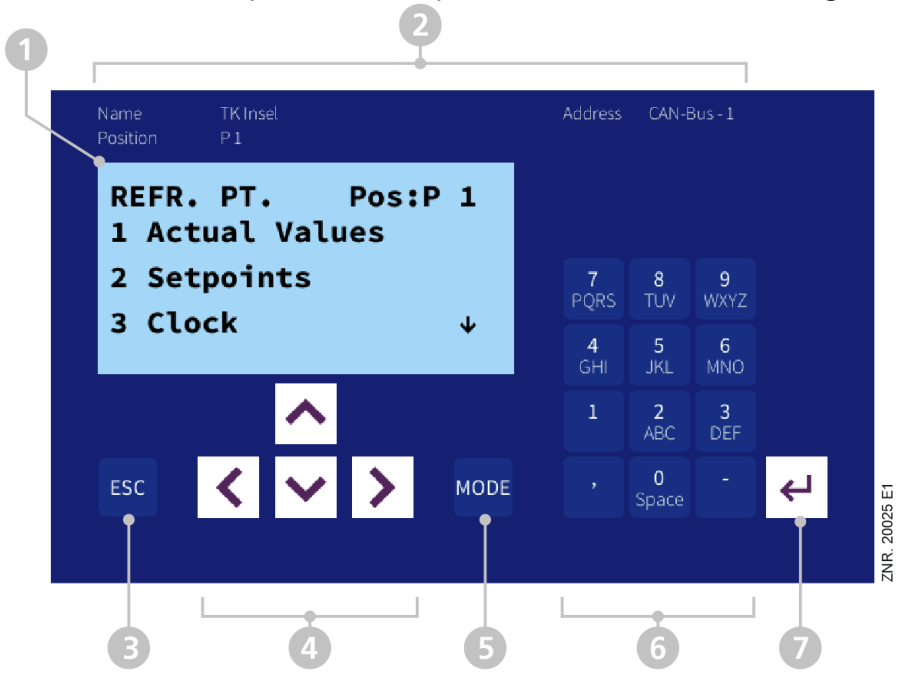
Login		Input	Default
Delay [min.]	Input of the delay time for suppression of the remote alarm signalling. The symbol is yellow if service mode has been activated. Service mode is deactivated again by input of 0 minutes, the symbol becomes white again and all alarms are then forwarded again immediately via modem, network, relays or horn!	0, 1..255	60

ⓘ The service mode can also still be active (yellow symbol) if the system centre is locked down. See chapter Service Mode for further details about the suppression of the remote alarm signalling.

9.1.3 Remote control of E*LDS components (terminal mode)

The remote control in the respective menus must first be called up to display (Read only - Menu 2-2, 2-3, 2-4, 2-5) or configure (Menu 4-2, 4-3, 4-4, 4-9) an E*LDS component. Pressing the "Remote Control" button opens terminal mode using which the selected E*LDS component can now be communicated with directly.

The remote control (terminal mode) screen looks like the following:



1. "Terminal Display" (4 lines of 20 characters) for display of the menu of the E*LDS component (the arrow buttons must be used for paging; "swiping" cannot be done in this screen!). A menu item, e.g. "Setpoints", is called up by pressing the "2" button on the "keyboard"
2. Name, position designation and CAN bus address of the E*LDS component
3. ESC button to go back one menu level in the E*LDS component or to exit entries without saving
4. Cursor buttons for navigation within the "Terminal Display" for left, right, up and down
5. MODE button, e.g. for toggling upper / lower case during text input (button is green if it has been pressed)
6. Alphanumeric keyboard for calling menus (e.. "2" calls up "Setpoints") or for input of setpoints etc.
7. ENTER button for confirmation of entries in the "Terminal Display"

> ⓘ Changes in terminal mode are effective immediately on the E*LDS component! Detailed descriptions for the respective E*LDS component, its parameters and functions can be found in its operating instructions. See chapter Operation in terminal mode for a detailed description for operation in terminal mode. Remote control can be exited again using the "Back" button.

9.1.3.1 Operation in terminal mode

Menus
A menu contains a selection list with maximum ten menu items. Other submenus or operating screens can be provided after the selection of a menu item.

Selection of the menu items
Each line of this selection list in the display has a digit between 1 and 9 as well as 0 (for menu item 10) with the associated name of the corresponding menu item. The various menu items can be selected directly by tapping the numeric buttons 1 to 9 and 0. If a menu provides more than 3 submenus, the cursor buttons can be used for paging in the menu to display the remaining menu items.

> ⓘ A menu item does not have to be displayed to select it using a numeric button.

Operating screens
An operating screen contains values for output and/or values for input. More values for output and/or input can

be available than can be shown on the display. In this case, these values can be displayed by scrolling. If an operating screen contains several pages, these can be paged through.

> ⓘ If it is possible to scroll or page in a menu or an operating screen, this is indicated by direction arrows on the right in the display.

Scrolling

Using the cursor buttons (^) and (v), scrolling can
-be done line by line, e.g. for selection of a variable in a row from a list of predefined variables.
-be done in blocks so that values can be displayed that cannot be shown due to the limited display capacity of the screen.

Paging

If an operating screen contains multiple pages, these can be paged through using the cursor buttons (<) and (>). In menus that provide more than 3 submenus, the cursor buttons (^) and (v) can be used for paging to display the remaining menu items.

Input of values and text

Using the cursor buttons (^) and (v) the required line is selected that must then be confirmed using the ENTER button. The cursor jumps to the input field. Using the cursor buttons (^) and (v) or digit buttons, values can now be entered and changed. If the cursor buttons (^) and (v) are kept tapped, the adjustment is made in high speed mode.

Text input

For fields that enable input of texts, the text input is also possible using the alphanumeric keyboard. Letters are generated by multiple tapping of the digit buttons. Confirm with the ENTER button to apply the entered values / text. Upper case and lowercase can be toggled by tapping the MODE button.

ENTER button	Letters / characters
0	äöüß0 space character
1	1
2	abc2
3	def3
4	ghi4
5	jkl5
6	mno6
7	pqrs7
8	tuv8
9	wxyz9
-	. _ -
,	Insert space character

> **Tip**: The parameters of the case controller for name, position and priority can be very comfortably configured using the configuration screen in the respective submenu of the E*LDS component (e.g. Menu 4-2, 4-3 or 4-4).

Delete input text
The MODE button and - must be tapped simultaneously to delete the complete text line. A character is deleted using the button combination MODE and , .

Cancelling an entry
The entry of a value can be cancelled by tapping the ESC button. The value is not applied.

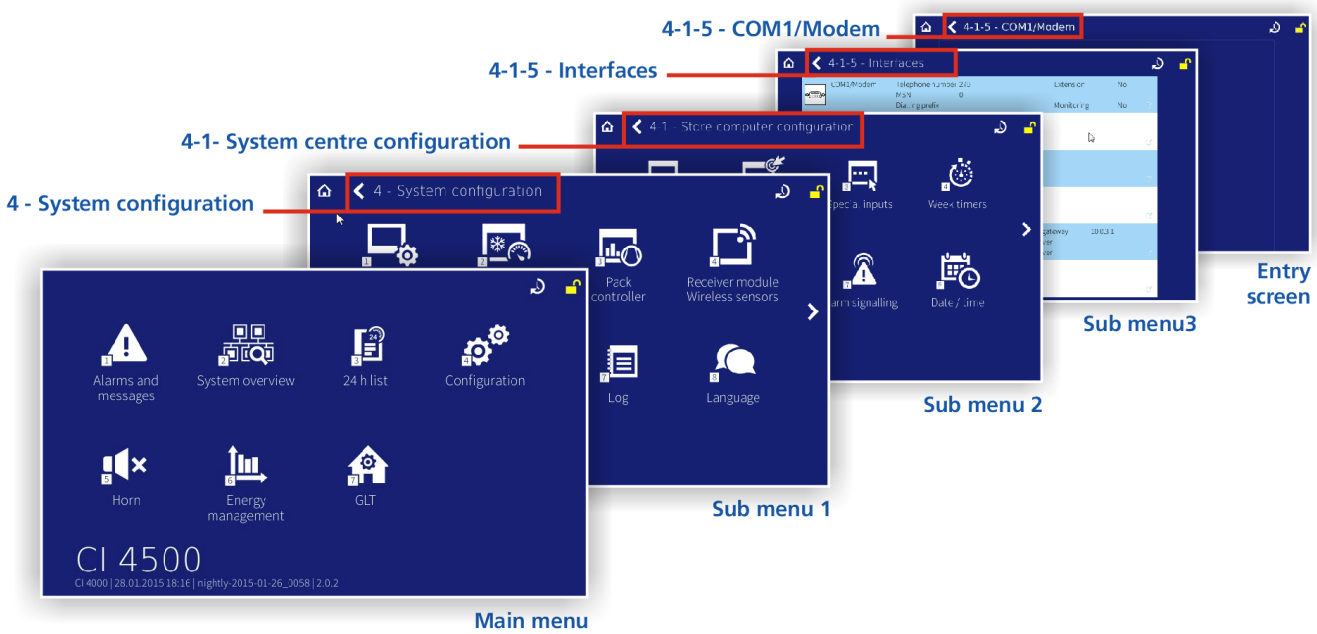
Exit from the menus and operating screens
Tap the ESC button to exit from menus and operating screens. This returns to the next higher-level menu.

> If no button has been tapped for a period of 10 minutes, the terminal mode is ended automatically and the main menu is displayed. Any running entry by a user is cancelled and inputs already made are discarded.

Exit from terminal mode
The terminal mode is ended using the "Back" button at the top left and the entry screen of the selected E*LDS component is displayed again. The main menu is displayed by tapping the "Home" button; see chapter Status bar and quick info, page 71 Status bar and quick info.

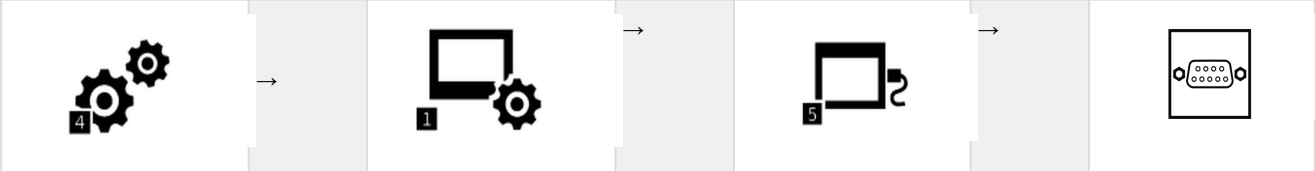
9.1.4 Specification of the numbering of menus and entry screens

Every submenu or entry screen has a title at the top left and is identified by prepended unique numbering. Furthermore, all buttons of the main menu and the submenus each have an individual number of 1, 2, ..x at the bottom right to be able to reference the corresponding menus or entry screens in the operating manual.



Explanation of the numbering - For example, if the menu "*4-1-5 - Interface - COM1/Modem*" is referenced in the operating manual, the entry screen for configuration of the COM1/Modem port is called as follows:

Main menu		Submenu 1		Submenu 2		Submenu 3
Tap icon 4 - Configuration *		Tap icon 1 - System centre		Tap icon 5 - Interfaces		Tap COM1/Modem list



* Login to the system centre is required, see chapter Login to the system centre (unlocking).

ⓘ In this operating manual, all references to menus or entry screens and their functionalities and/or the parameters to be set there use the type of numbering presented here.

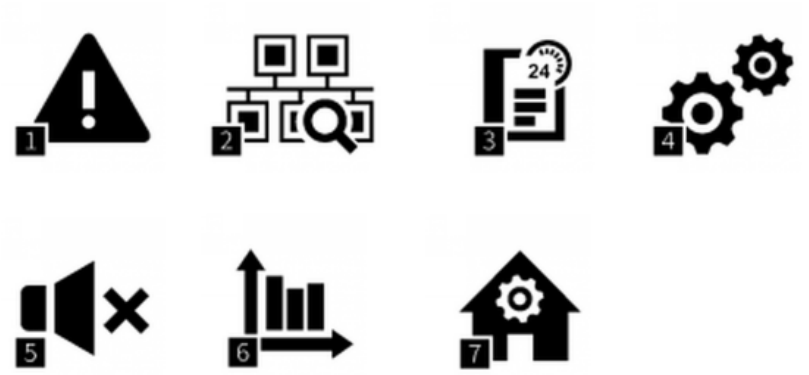
9.1.5 Overview of the menu tree

ⓘ The user must first be logged in at the system centre, see chapter Login to the system centre (unlocking), to be able to make changes to the system centre or to E*LDS components

Main menu	Submenu 1	Submenu 2	Submenu 3	Menu number
1 Alarms and messages	**1 - Alarms and messages**			
	• Current alarms • Message list	-	-	**1**
2 System overview	**2 - Overview and monitoring of the system (read-only!)**			**2**
	1 - Node overview	Node overview	-	2-1
	2 - Case controllers	Case controller overview	Detailed information	2-2
	3 - Pack controllers	Overview of pack controllers	Detailed information	2-3
	4 - Receiver module wireless sensors	Overview of receiver module wireless sensors	Detailed information	2-4
	5 - Other LDS components	Overview of other components	Detailed information	2-5
	6 - EU archive	Overview of EU archives	Detailed information EU archive (HACCP)	2-6
	7 - Signal inputs	Overview of signal inputs	-	2-7
	8 - Special inputs	Overview of special inputs	-	2-8
	9 - General information	-	-	2-9
	10 - Log	-	-	2-10
3 24h list				
	Overview of 24h list	Temperature data of a refrigeration point	-	**3**
4 Configuration	**4 - Configuration System**			**4**
		Configuration	**Configuration System**	**4-1**
	1 - System Centre	1 - Configuration	System centre configuration	4-1-1
		2 - Signal inputs	Signal inputs	4-1-2

		3 - Special inputs	Special inputs - shunt lock - emergency power operation - sprinkler alarm - store lighting - setpoint toggle	4-1-3
		4 - Week timers	Week timers	4-1-4
		5 - Interfaces	Interfaces - COM1/Modem - COM2 - COM3/MODBUS - COM4 - Ethernet - USB	4-1-5
		6 - Measuring points	Measuring points	4-1-6
		7 - Alarm is signalled	- Pushover service - Pushover alarms - E-Mail (SMTP) service - E-Mail (SMTP) alarms - LDSWin - SMS - Anny Way - Voice mail - Time ranges - Special days - Other - Multi-function relay AUX - Test alarm	4-1-7
		8 - Date / time	Date / time	4-1-8
		9 - Firmware Update	-	4-1-9
		10 - System Information	-	4-1-10
		11 - System Reset	-	4-1-11
		12 - System Upgrade	-	4-1-12
	2 - Case controllers	Configuration Case controllers	Detailed information Remote control	4-2
	3 - Pack controllers	Configuration Pack controllers	Detailed information Remote control	4-3
	4 - Receiver module Wireless sensors	Configuration Receiver module Wireless sensors	Detailed information Remote control	4-4
	5 - General information	-	-	4-5
	6 - Users	-	-	4-6
	7 - Log	-	-	4-7
	8 - Language	-	-	4-8
	9 - Other LDS components	-	Detailed information Remote control	4-9
5 Horn				**5**
Switch-off of the horn - only if this is active (the symbol is red)	-	-	-	-
6 Energy Management	Energy Management			6
	1 - Consumption	Graphic	-	6-1
	2 - Load Profile	Graphic	-	6-2
7 BCS				**7**
	-	-	-	-

9.1.5.1 Main menu



Brief description of the buttons

Main menu	
1 Alarms and messages	List of the current alarms and messages
2 System overview	Overview and monitoring of the installation and all E*LDS components
3 24h list	Display of the 24h list(s)
4 Configuration	Configuration of the system
5 Horn	Switch-off of the horn - only if this is active (the symbol is red)
6 Energy Management	Energy Management
7 BCS	Overview of GLT / RLT (building control / room, air. temperature)

1 Menu 1 - Alarms and messages

Tapping this button opens the alarm list screen; this does not show any entries then. The "Current Alarms" view is displayed as default. Use the left "Message List" "tab" button to change to the message list. The message list contains all messages and current alarms with the priority 0..99 that have been listed by the system centre from connected E*LDS components system-wide and the activated external alarms signalled via the digital inputs.

If any E*LDS component signals an alarm, the button in the main menu changes to red. Tapping this button opens the alarm list screen in which the current alarms or alarms that can be acknowledged are now listed.
The current alarms (only priority 1..99) are shown in the alarm list until they are signalled as rectified and have been acknowledged by the operator.

This symbol must be confirmed for the acknowledgement of the rectified alarms. Acknowledged alarms are automatically moved into the message list, forming the history of the alarms that have occurred in the installation.

The screen contains the following information

Incoming: Date and time of alarms and messages as they occurred (receive time stamp).

Outgoing - in the alarm list: If any red alarm symbol can be seen in this column, this means that alarms with the priority 1..9 are still pending, the faults have not yet been rectified and these alarms cannot be acknowledged! On the other hand, if there is a date and time in this column, the problems or causes of the alarm have been rectified and the alarm has gone and can be acknowledged using the acknowledge button in the right area. These alarms are then removed from the alarm list; however they are always still in the message list.

Outgoing - in the message list: If any red alarm symbol can be seen in this column, this means that alarms with the priority 1..9 are still pending, the fault has not yet been rectified. Alarms and messages with priority 1..99 can only be acknowledged in the alarm list. If any yellow symbol can be seen in this column, this means these are messages with the priority 9 and the messages do not yet have a send time stamp. Yellow symbols are only displayed in the message list. The message receives a "send time stamp" if it has been rectified. The message remains in the message list until 1000 entries is exceeded.

Node: Designation of the E*LDS component that has signalled the alarm (e.g. "Deep freeze room 2").
Error Item ID: Identification of the Item ID (e.g. location) of the alarm to be better able to assign and locate an error.

Item ID: Item ID designation (e.g. room position and type of the refrigerated case etc.) of the E*LDS component.

Address: Interface (e.g. CAN bus / Modbus segment) / address of the E*LDS component.

Message: Error number, alarm or message text of the E*LDS component.

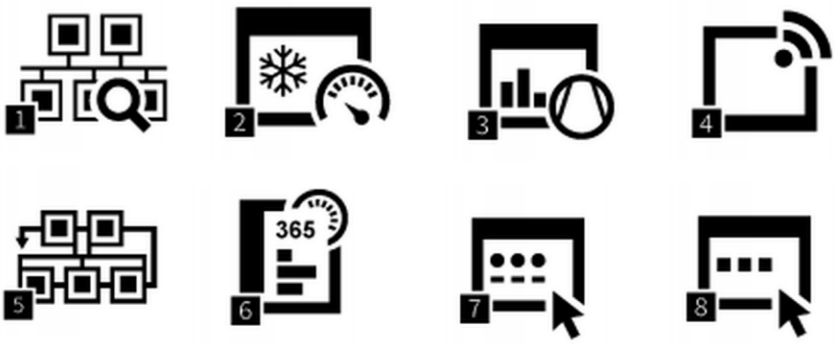
Priority: Message priority of the alarm (1..99) or message (0, 10, 20,..90).

> The views of the two lists can be alternated by tapping the tabs in the bottom left area. The lists can be paged through by tapping the up / down buttons. If the Refresh button is displayed in the right navigation bar, this means that the respective list is currently being updated automatically. If the message "*Data retrieval delayed, please wait..*" is displayed, it can be helpful to change back to the main menu and call up the alarm / message list again.

2 Menu 2 - Overview and monitoring of the system (read-only!)

This button is used to call up the submenu for the system overview and the most important information (name, position, address) and the status. In the submenu, the most important status (e.g. display of the current operating and temperature statuses of the individual refrigeration points, pack controllers etc.) can be viewed (not configured) using the remote control for each E*LDS component..

The submenu contains the following buttons, here the buttons 1..8 in the first menu screen:



Buttons 9..10 in the second menu screen:

> The two views can be alternated by swiping left / right or by tapping the left / right buttons.

Brief description of the buttons

2 - Overview and monitoring of the system (all menus are "read-only!")	
1 Node overview	Node overview of all the E*LDS components in the system.
2 Case controllers	Overview of all case controllers
3 Pack controllers	Overview of all pack controllers
4 Receiver module wireless sensors	Overview of all receiver modules and wireless sensors
5 Other LDS components	Other components of the E*LDS system
6 EU archive	EU archive
7 Signal inputs	Status of the signal inputs of the system centre
8 Special inputs	Status of the special inputs of the system centre
9 General information	Currently has no function
10 Log	Log of the installation

1 Menu 2-1 - Node Overview

List of all available components in the E*LDS system with node and position designations. Also display of the assigned CAN bus address, controller type, firmware version and the priority. The status is also visual.

> ⓘ Unloaded refrigeration points that have been taken out of the node monitoring (e.g. in the event of manual shutdown) are counted in the failed nodes.

2 Menu 2-2 - Case controllers

List of all available case controllers in the E*LDS system. If a case controller is selected, the following information can be retrieved via the corresponding screen: node and position designations, message priority, CAN bus address, serial number, firmware version, "Integrated via" (connected to CAN bus terminal) and pack number ((membership of pack x).

Diverse statuses and operating states are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

Remote control using terminal mode

Tapping the *Remote Control* button opens the terminal mode screen. In the terminal mode, all parameters of the case controller can be viewed, but **not** changed (read-only). For more information, see chapter Remote control of E*LDS components (terminal mode).

> The case controller is configured in Menu 4-2.

3 Menu 2-3 - Pack controllers

List of all available pack controllers in the E*LDS system. If a pack controller is selected, the following information can be retrieved via the corresponding screen: node and position designations, message priority, CAN bus address, serial number, firmware version, "Integrated via" (connected to CAN bus terminal) and pack number (designation of the pack).

Diverse statuses and operating states are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

Remote control using terminal mode

Tapping the *Remote Control* button opens the terminal mode screen. In the terminal mode, all parameters of the pack controller can be viewed, but **not** changed (read-only). For more information, see chapter Remote control of E*LDS components (terminal mode).

> The pack controller is configured in Menu 4-3.

4 Menu 2-4 - Receiver Module Wireless Sensors

List of all available receiver modules for wireless sensors in the E*LDS system. If a receiver module is selected, the following information can be retrieved via the corresponding screen: node and position designations, message priority, CAN bus address, serial number, firmware version, "Integrated via" (connected to CAN bus terminal) and pack number ((membership of pack x). The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

Remote control using terminal mode

Tapping the *Remote Control* button opens the terminal mode screen. In the terminal mode, all parameters of the receiver module including the associated wireless sensors can be viewed, but **not** changed (read-only). For more information, see chapter Remote control of E*LDS components (terminal mode).

> The receiver module including the associated wireless sensors is configured in Menu 4-4.

5 Menu 2-5 - Other Components Overview

List of all other E*LDS components in the E*LDS system. If a component is selected, the following information can be retrieved via the corresponding screen: node and position designations, message priority, CAN bus address, serial number, firmware version, "Integrated via" (connected to CAN bus terminal) and pack number ((membership of pack x). The assigned CAN bus address, diverse statuses and operating statuses are also displayed. The following components are displayed:

- CI 4x00
- Operator terminals (e.g. AL 300)
- CI 4x00 LAN gateway (software module)

Diverse statuses and operating states are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

Remote control using terminal mode

Tapping the *Remote Control* button opens the terminal mode screen. In the terminal mode, all parameters of the component, if possible, can be viewed, but **not** changed (read-only). For more information, see chapter Remote control of E*LDS components (terminal mode).

6 Menu 2-6 - EU Archive

If the EU archiving has been configured for a coldroom controller and an assignment of the temperature sensors there to the sensors of a UA 300 L / UA 410 L is made, an EU archive is created for this sensor pair. The available EU archives are displayed using this button. A 24h list with temperatures in °C in 15 minutes grids from 0:00 to 23:00 of the required day is displayed.

> ⓘ The days can be changed between by pressing the left / right button; the archive has a storage depth of one year.

7 Menu 2-7 - Signal inputs

This button is used to call up the signal and alarm inputs of the system centre. All important parameters and the status of the digital inputs are displayed there.

The screen contains the following parameters:

Signal inputs	
Message text	Message text of the signal input (digital input)
Priority XX	Priority of the signal / alarm input
Delay time [Min.] XX	Delay time of the signal / alarm in minutes
Quiescent current (low-active) X	Alarm is signalled if - quiescent current = Yes: (signal voltage not present, low-active) - quiescent current = No: (signal voltage is present, high-active)
Input X	Connection of the input[1)]
Status XX	Current status of the input: OK = light grey: no signalling Wait = yellow: signalling, delay time running, message = green: no alarm alarm = red: signalling, alarm / message has been tripped

[1)] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1st extension module, inputs 1 .. 12
SIOX2 2nd extension module, inputs 1 .. 12
SIOX3 3rd extension module, inputs 1 .. 12
SIOX4 4th extension module, inputs 1 .. 12

DDC1 1st GLT DDC module 1
DDC2 2nd GLT DDC module 2
DDC3 3rd GLT DDC module 3
DDC4 4th GLT DDC module 4

Note: GLT = Building Control System and DDC = Digital Direct Control

ⓘ The digital signal and alarm inputs are configured using Menu 4-1-2. Further information about the functions is contained in the chapter Digital inputs.

8 Menu 2-8 - Special Inputs

The digital special inputs of the system centre are called up using this button. All important parameters and the status of the inputs are displayed there.

following special inputs are available:

- shunt lock
- emergency power supply
- sprinkler alarm
- store lighting
- setpoint toggle

ⓘ As the display for all special inputs is identical, the explanations are provided using the example of the “shunt lock”.

The screen contains the following parameters:

Special inputs	
Shunt lock	Predefined designation of the special input (digital input)
Priority XX	Priority of the signal / alarm input
Delay time [sec.] XX	Delay time of the signal / alarm in seconds
Quiescent current (low-active) X	Alarm is signalled if - quiescent current = Yes: (signal voltage not present low-active) - quiescent current = No: (signal voltage is present high-active)
Input X	Connection of the input [1)]
Status XX	Current status of the input: OK = light grey, no signalling Waiting = yellow: signalling, delay time running, Message = green: no alarm Alarm = red: signalling, alarm / message has been tripped

[1)] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1. extension module, inputs 1 .. 12
SIOX2 2. extension module, inputs 1 .. 12
SIOX3 3. extension module, inputs 1 .. 12
SIOX4 4. extension module, inputs 1 .. 12

DDC1 1. GLT DDC module 1
DDC2 2. GLT DDC module 2
DDC3 3. GLT DDC module 3
DDC4 4. GLT DDC module 4

Note: GLT = building control and DDC = Digital Direct Control

> ⓘ The digital special inputs are configured using Menu 4-1-3. Detailed description of the functions can be found in chapters Digitale Eingänge.

9 Menu 2-9 - General Information

The screen for general information of the store is called using this button.

The screen contains the following parameters:

General information	Read only!
Operating time of the system centre	Years / days /hours
Operating time of the display	Years / days /hours
System up time	Years / days / hours / minutes / seconds

General information	Read only!
"Information for open source software" button	QR code with specification of the hyperlink where further information about the use of Open Source software components (Licence Reports) is described in detail for the present product: Link to E°EDP of Eckelmann AG: https://edp.eckelmann.de/edp/lds/_V0brLLadsi

10 Menu 2-10 - Log

Using this button, the entries for the installation stored with the LDSWin PC software (e.g. last service, cleaning, refrigerant etc.) are displayed.

3 Menu 3 - 24h List, page 97

Display of the 24h list. All temperature sensors without exception of the case controllers (E*LDS products and integrated external controllers) located in the E*LDS system are listed here together with their hourly temperature average value. All case controllers can be considered within one day by tapping the up/down buttons. Tapping on a row shows a graphical display of the day. Individual days can be changed between by tapping the left/right buttons.

The screen contains the following parameters:

24 h list	
Date	Date of the 24h list
Position	Position designation of the case controller
Sensor	Designation of the temperature sensor
8 hours time range	Columns of the displayed 8 hours time range with status indication The following times are displayed in detail in the columns: 00:00 to 07:00, 08:00 to 15:00 or 16:00 to 23:00

The 24h display is divided into three time ranges of 8 hours each that can be displayed alternating between 0:00 to 7:00, 8:00 to 15:00 and 16:00 to 23:00 using the buttons on the bottom left edge of the screen. The 8:00 to 15:00 time range is the default while the other time ranges are zoomed out. Tap any of the corresponding buttons to zoom in to the time range.

4 Menu 4 - Configuration System

> Calling this submenu is only possible if the user has the necessary user rights for it. Otherwise, the "Configuration" button is greyed out. Further information is contained in the chapter Login to the system centre (unlocking) .

All entries are limited to plausible values; incorrect entries are prevented or marked red if necessary and any saving is not possible. The desired configuration can be saved using the "Save" button if the input is plausible. Any response is then only displayed if saving is not possible.

The submenu for configuration of the system is called using this button. All E*LDS components of the system can be configured in the submenus.

The submenu contains the following buttons, here the buttons 1..8 in the first menu screen:

Button 9 in the second menu screen:

> The two views can be alternated by swiping left / right or by tapping the left / right buttons.

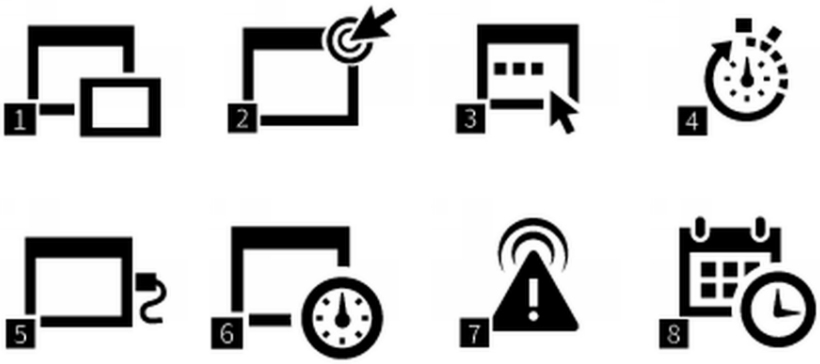
Brief description of the buttons

4 - Configuration System	
1 System centre	Configuration of the system centre
2 Case controllers	Configuration of all case controllers
3 Pack controllers	Configuration of all pack controllers

4 - Configuration System	
4 Receiver module wireless sensors	Configuration of all receiver modules and wireless sensors
5 General information	General system information
6 User	Configuration of the user management
7 Log	Log of the system centre or the installation
8 Language	Settings of the language displayed in the E*LDS system
9 Other LDS components	Configuration of other E*LDS components in the E*LDS system

1 Menu 4-1 - System centre

The submenu for configuration of the system centre is called using this button.
The submenu contains the following buttons, here the buttons 1..8 in the first menu screen:



Buttons 9..11 in the second menu screen:

ⓘ The two views can be alternated by swiping left / right or by tapping the left / right buttons.

Brief description of the buttons

4 - Configuration System Centre	
1 Expansion	Configuration for expansion of the system centre
2 Signal inputs	Configuration of the digital alarm and signal inputs
3 Special inputs	Configuration of the digital special inputs
4 Week Timers	Configuration of the relay outputs for week timers
5 Interfaces	Configuration of the interfaces

4 - Configuration System Centre	
6 Measuring points	Configuration of the measuring points
7 Alarm is signalled	Configuration of the alarm signalling
8 Date / time	Setting of date and time
9 Firmware Update	Update of the firmware and the bootloader
10 System Information	System information
11 System Reset	Reset system
12 System upgrade	System upgrade

Menu 4-1-1 - Expansion System Centre

The entry screen for expansion of the system centre is called using this button.

The screen contains the following parameters:

Expansion System Centre		Entry	Default
Number of SIOX modules X	Number of connected SIOX extension modules	1 .. 4	0
Number of GLT PLC modules X	Number of available DDC modules in the system (X = 1 .. 4, read-only) Note: Only visible if DDC modules are also connected!	0..4	0
Operating mode for the 2nd CAN bus interface	Setting of the operating mode for the 2nd CAN bus interface	--, repeater	--
Sync input	**Specification where the sync input for energy record is applied[1].**	**-**	**Sync input**
Module	Module [1] to which the message / alarm signal is applied	SIOX1 ..SIOX4	-
Submodule XX	Submodule [1] to which the message / alarm signal is applied; this is ONLY visible if module=DDC1..DDC4 has been selected	1..4	-
Input XX	Input [1] to which the message / alarm signal is applied	1..12	-

[1] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1st extension module, inputs 1 .. 12
SIOX2 2nd extension module, inputs 1 .. 12
SIOX3 3rd extension module, inputs 1 .. 12
SIOX4 4th extension module, inputs 1 .. 12

DDC1 1st GLT DDC module 1
DDC2 2nd GLT DDC module 2
DDC3 3rd GLT DDC module 3
DDC4 4th GLT DDC module 4

Note: GLT = Building Control System and DDC = Digital Direct Control

Menu 4-1-2 - Signal Inputs

This button is used to call up the list of the digital alarm and signal inputs of the system centre. All important parameters and the status of the inputs are displayed there. Alarm and signal inputs can be added using the "New entry" button. Already added digital inputs can be selected and configured using the corresponding screen or deleted again. See chapter 4.2.1 for details.

The screen contains the following parameters:

Signal input		**Eingabe**	**Vorgabe**
Message text	Freely editable message text of the digital input	max. 19 characters	-
Priority XX	Priority of the signal / alarm input	0..99	0
Delay time [Min.] XX	Delay time of the signal / alarm in minutes	0..255	1
Quiescent current (low-active) X	Alarm is signalled if - quiescent current = Yes: (signal voltage not present, low-active) - quiescent current = No: (signal voltage is present, high-active)	Y/N	Y
Signal input			
Module	Module [1] to which the message / alarm signal is connected	SIOX1 ..SIOX4	-
Submodule XX	Submodule [1] to which the message / alarm signal is applied; this is ONLY visible if module=DDC1..DDC4 has been selected	1..4	-
Input XX	Input [1] to which the message / alarm signal is applied	1..12	-
Status XX	Current status of the input: OK = light grey, no signalling Waiting = yellow: signalling, delay time running, Message = green: no alarm Alarm = red: signalling, alarm / message has been tripped	–	-

[1] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1. extension module, inputs 1 .. 12
SIOX2 2. extension module, inputs 1 .. 12
SIOX3 3. extension module, inputs 1 .. 12
SIOX4 4. extension module, inputs 1 .. 12

DDC1 1. GLT DDC module 1
DDC2 2. GLT DDC module 2
DDC3 3. GLT DDC module 3
DDC4 4. GLT DDC module 4

Note: GLT = building control and. DDC = Digital Direct Control

ⓘ Only those SIOX modules and GLT PLC modules are provided for selection that have been configured accordingly in screen 4-1-1! A description of the functions can be found in chapters Digital inputs.

Menu 4-1-3 - Special Inputs

The special inputs of the system centre are called up using this button. See chapter Special inputs for details. All important parameters and the status of the inputs are displayed there. The required special inputs can be selected and configured using the corresponding screen. Special inputs are permanently predefined in the system centre and cannot be deleted or added; it is only possible to delete their configuration.

The following special inputs are available:

- shunt lock,
- emergency power supply
- sprinkler alarm
- store lighting
- setpoint toggle

ⓘ As the configuration for all special inputs is identical, the explanations are provided using the example of the “shunt lock”.

The screen contains the following parameters:

Special inputs		**Eingabe**	**Vorgabe**
Message text	Shunt lock (predefined designation of the special input)	-	Shunt lock
PriorityXX	Priority of the signal / alarm input	--, 0..99	0
Delay [sec.] XX	Delay time of the signal / alarm in seconds	0..255	1
Quiescent current (low-active) X	Alarm is signalled if - quiescent current = Yes: (signal voltage not present, low-active) - quiescent current = No: (signal voltage is present, high-active)	Y/N	N
Signal input			
Module	Module [1)] to which the message / alarm signal is connected	SIOX1 ..SIOX4	-
Submodule XX	Submodule [1)] to which the message / alarm signal is applied; this is ONLY visible if module=DDC1..DDC4 has been selected	1..4	-
Input XX	Input[1)] to which the message / alarm signal is applied	1..12	-
Status XX	Current status of the input: OK = light grey, no signalling Waiting = yellow: signalling, delay time running, Message = green: no alarm Alarm = red: signalling, alarm / message has been tripped	-	-

[1)] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1. extension module, inputs 1 .. 12
SIOX2 2. extension module, inputs 1 .. 12

SIOX3 3. extension module, inputs 1 .. 12
SIOX4 4. extension module, inputs 1 .. 12

DDC1 1. GLT DDC module 1
DDC2 2. GLT DDC module 2
DDC3 3. GLT DDC module 3
DDC4 4. GLT DDC module 4

Note: GLT = building control and. DDC = Digital Direct Control

> Only those SIOX modules and GLT PLC modules are provided for selection that have been configured accordingly in screen 4-1-1! A description of the functions can be found in chapter Digital inputs.

Menu 4-1-4 - Week Timers

The entry screen for configuration of the week timers of the system centre is called using this button. All important parameters and the status of the week timers are displayed there. Week timers can be added using the "New entry" button. Already added inputs can be selected and configured using the corresponding screen or deleted again.

Every week timer functions as independent week timer with up to 7 control times to which a switching output and/or a passing contact can be assigned. The output is then active if the current time is within any of the 7 configured control times.

The screen contains the following parameters:

Week timers		**Input**	**Default**
Name	Freely editable name / designation of the week timer	max. 32 characters	-
Control times			
Start	Week timer start	00:00..23:59	08:00
End	Week timer end	00:00..23:59	4:00 PM
XXXXXXXXX	Weekdays and groups of days	Mon-Fri Mon-Sat Mon-Sun Sat-Sun Mon, Tue, Wed, Thu, Fri, Sat, Sun	Mo-Fr
Switching contact and/or passing contact [1)]			
Module	Module[1)] to which the output is connected	SIOX1 ..SIOX4	-
Submodule XX	Submodule[1)] to which the output is connected; this is ONLY visible if module=DDC1..DDC4 has been selected	1..4	-
Output XX	Output[1)]to which the output is connected	1..12	-
Status XX	Current status of the output: Not active: = light grey Active= green	-	-

[1)] Designations of the supported modules / outputs:

SIOX1 1st extension module, outputs 1 .. 8
SIOX2 2nd extension module, outputs 1 .. 8
SIOX3 3rd extension module, outputs 1 .. 8
SIOX4 4th extension module, outputs 1 .. 8

DDC1 1st GLT DDC module 1
DDC2 2nd GLT DDC module 2
DDC3 3rd GLT DDC module 3
DDC4 4th GLT DDC module 4

> ⓘ Only those SIOX modules and GLT PLC modules are provided for selection that have been configured accordingly in screen 4-1-1! A description of the functions can be found in chapter Relay outputs for week timers.

Note: GLT = Building Control and DDC = Digital Direct Control
Menu 4-1-5 - Interfaces

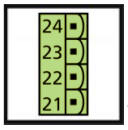
> ⓘ Further details for the connection and position of the interfaces are shown in chapter System centre and SIOX connection / terminal assignment.

The list element for configuration of the interfaces of the system centre is called using this button. Configured values are displayed if available.

The list element is structured as follows:

- CAN2
- COM1/Modem
- COM2
- COM3/Modbus
- COM4
- Ethernet
- USB
- IP ports

Interface CAN2 - only CI 4500

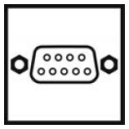


The operating mode of the second CAN bus interface (CAN2) is configured in this screen.

The screen contains the following parameters:

Interface - CAN2		Input	Default
Setting of the operating mode for the 2nd CAN bus interface **CI 4500:** no function or as CAN bus repeater for details, see chapter CAN bus - Connection of E*LDS Components		--, Repeater	---

Interface COM1/Modem - all CI 4x00



The COM1 interface is configured in this screen. The COM1 interface can be used as modem or as COM port server. When the interface is used as COM port server, the serial interface of the GLT 3010 can be accessed via the Ethernet connection of the CI 4x00.

Use of the interface as modem

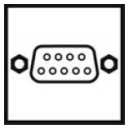
Interface - COM1/Modem		Input	Default
Telephone number	Telephone number of the modem at the system centre (connected to COM1)	max. 19 characters	-
Dialling prefix	Number for the outside line	max. 8 digits	-
MSN	19-digit terminal device identification number - for direct outside line, this is the telephone number (without the dialling prefix)) - in the normal case (i.e. for extensions), this is the direct dial number	max. 19 characters	0
PIN	PIN		-
Alarm if modem not available	Should an alarm be signalled if the modem is not detected? If the check mark is set and no modem is detected at the interface, the alarm "Modem Fault" is output after 2 minutes.	Y/N	Y

Use of the interface as COM port server

Interface - COM1 / COM port server		Input	Default
TCP port	Input of the TCP/IP port of the COM port server	Numbers (1 ...65535)	1041
Baud rate	Baud rate of the serial connection to the GLT3010	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400

ⓘ For detailed information, see chapter Modem.

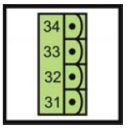
Interface COM2 - all CI 4x00



This screen is used for the M-bus.

No configuration is currently envisaged.

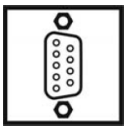
Interface COM3/Modbus - Only CI 4100 or higher



The COM3/Modbus interface is configured in this screen. This interface is used for data exchange with compact controllers (e.g. UA 30 / Dixell) or case controllers of the LDS1 system that are connected to the system centre with LDS1 gateways via the Modbus.

No configuration is currently envisaged.

Interface COM4 - all CI 4x00



The COM4 interface is configured in this screen. This interface is used for data exchange of AHT cases with Danfoss / Wurm controllers that are connected to the system centre via a gateway (accessory). The function for "Modbus RTU Slave" can also be parametrised.

The screen contains the following parameters:

Interface - COM4		Input	Default
Use of COM4	Use of the COM4 interface	-- Modbus Danfoss Wurm Modbus RTU*	---
In the case of "Modbus RTU" configuration, other parameters are shown for information			
Baud rate	Baud rate	-	9600
Data bits	Number of data bits	-	8
Parity	Parity	-	none
Stop bits	Number of stop bits	-	1
Handshake	Handshake available	-	none

ⓘ * More about the Modbus RTU interface see https://edp.eckelmann.de/edp/lds/_dH7IGZeEJK.

Interface Ethernet - only CI 4400 or higher

The Ethernet interface for the connection in a LAN is configured in this screen. This interface is used for the data exchange and communication with LDSWin.

ⓘ An Ethernet crossover patch cable CAT5 is needed for a local connection between system centre and PC (LDSWin as remote station)!

The screen contains the following parameters:

Interface - Ethernet		Input	Default
MAC address	Display of the MAC address	-	Device-dependent
Host name	Input of the host name	Text	ci4000
IP address	Input of the IP address	Numbers	10.0.28.66
Subnet mask	Input of the subnet mask	Numbers	255.255.255.0
Default gateway	Input of the default gateway	Numbers	10.0.28.1
Preferred DNS server	Input of the preferred DNS server	Numbers	-

Interface - Ethernet		Input	Default
Alternative DNS server	Input of the alternative DNS server	Numbers	-

An error message is output if the changed values are not applied when saving!
Then the values actually used by the system centre are displayed again on the entry screen.

Interface USB - all CI 4x00

An update (e.g. for update of the firmware and/or boot loader) can be performed using a USB stick via the USB host port (left USB female connector, type A); for further details, see chapter Firmware Update .

Using the USB slave port (right USB female connector, type B), this interface can be configured to be able to access the system with LDSWin.

USB		Input	Default
IP address	Input of the IP address	Numbers	169.254.2.1
Subnet mask	Input of the subnet mask	Numbers	255.255.0.0

IP ports - only CI 4400 or higher

The TCP/IP ports of the services can be configured in this screen.

Service		Input	Default
LAN gateway	Input of the TCP/IP port for the LAN gateway	Numbers (1 ...65535)	5000
VNC server	Input of the TCP/IP port for the VNC server; for details see chapter Remote control of the system centre via VNC (Virtual Network Computing)	Numbers (1 ...65535)	5900

Menu 4-1-6 - Measuring points

The submenu for configuration of the measuring points of the system centre is called using this button. All important parameters of the S0 and M-bus meters are displayed there. Available M-bus meters are searched for using the "Refresh" button; see chapter M-bus Interface for Consumption Data Capture. The S0 measuring points can be added using the "New entry" button. Already added measuring points can be selected and configured using the corresponding screen or deleted again.

The screen contains the following parameters:

4-1-6 - Measuring points		Input	Default
Name	Name of the measuring point	max. 19 characters	-
Meter type XX	Selection of the meter type. After selection of the meter type, this is displayed graphically, see legend.	Power Water Gas Heat Oil Event	-
Position	Position identifier	max. 5 characters	-
Meter number	Input of the meter number	max. 10 characters	-
Meter constant	Only for pulse meters: Input of the meter constant (pulses per kWh or m^3) 1 .. 9999 M-bus meter: Must be set on the meter!	1...9999	-
Transformer constant	Only for pulse meters: Input of conversion ratio of the current transformer 1..255 M-bus meter: Must be set on the meter!	1..255	-
Meter reading index	Only for M-bus meters: If the "Determine index automatically" option is activated (factory setting), the meter value (electricity (kW), water (m^3), etc.) to be archived is determined automatically. If an alternative meter value should be archived, the meter reading index must be configured for this. The meter reading index can be determined using the "Retrieve meter data" button. The meter indexes in the meter data can be found via the designation "DataRecord id=xxx)" whereby "xxx" stands for the index. **Example**: <DataRecord id="0"> <Function>Instantaneous value</Function> <StorageNumber>0</StorageNumber> <Unit>Parameter set identification</Unit> <Value>171798613849 71</Value> <Timestamp>2016-03-27T01:33:57</Timestamp> </DataRecord> <DataRecord id="1"> <Function>Instantaneous value</Function> <StorageNumber>0</StorageNumber> <Unit>Energy (100 Wh)</Unit> <Value>28700</Value> <Timestamp>2016-03-27T01:33:57</Timestamp> </DataRecord>		
Retrieval of the meter data	Retrieval of the meter data can be initiated to test the communication with the M-bus meter. This data retrieval is initiated by tapping the button **Practical tip**: in the event of communication faults on the M-bus, this can also be used to check whether the communication is still functioning.		
Unit	Only for pulse meters: Selection of the unit of measure to be displayed. Only for M-bus meters: cannot be edited	kWh, l	-

Primary address	Only for M-bus meters: the M-bus has an address range of 1..255. The M-bus meters are identified via the primary address. The primary address **must** be configured in the meter. Therefore, a unique address must be allocated during first start-up that may only be used once on the M-bus. **Practical tip**: Most M-bus meters have the primary address "0" as factory setting and are not found and listed by the system centre. It is recommended to label the M-bus meter with the primary address after the configuration.		
Power calculation	Only for M-bus meters: This activates the power calculation for the meter that is required for the display of the load profile of the meter (see Menu 6-2 - Load Profile). The power calculation is deactivated at the factory. **Practical tip**: No battery-buffered M-bus meter may be used for continuous recording and for the Energy management.		
Meter input or tariff input			
Module	Module [1] to which the measuring point is connected	SIOX1 ..SIOX4	-
Submodule XX	Submodule [1] to which the measuring point is connected; this is ONLY visible if module=DDC1..DDC4 has been selected	1..4	-
Input XX	Input [1]to which the measuring point is connected	1..12	-
Status XX	Current status of the measuring point:	-	-

Legend for the meter symbols used:

power, water, gas, heating, cooling, oil and event

Warning about dangerous electrical voltage! Danger of destruction of components! If the meter signal is connected to the SIOX input via an S0 interface of the meter, its jumper must be set to 24 V AC; see chapter SIOX - Connection of power, gas, water and event meters.

When using electronic meters, the settings with regard to their meter and transformer constants must be taken into account, otherwise the system centre produces incorrect energy evaluation due to incorrect meter and transformer relationships! For further details, see chapter Calculation of consumption/capacity from meter values.

[1] Designations of the supported modules / inputs:
CI 4x00 system centre, internal inputs IN1 / IN2 (terminals A1, A2 / B1, B2)

SIOX1 1st extension module, inputs 1 .. 12
SIOX2 2nd extension module, inputs 1 .. 12
SIOX3 3rd extension module, inputs 1 .. 12
SIOX4 4th extension module, inputs 1 .. 12

DDC1 1st GLT DDC module 1
DDC2 2nd GLT DDC module 2

DDC3 3rd GLT DDC module 3
DDC4 4th GLT DDC module 4

Note: GLT = Building Control and DDC = Digital Direct Control

> Only those SIOX modules and GLT PLC modules are provided for selection that have been configured accordingly in screen 4-1-1! A description of the functions can be found in chapter Digital Inputs.

Menu 4-1-7 - Alarm Signalling

The list element for configuration of the alarm signalling of the system centre is called using this button. The required parameter is called and can be configured by tapping on a line or the associated symbol for editing. Paging is performed using the up/down buttons or swiping to display more entries than those that are currently visible.

The list element is structured as follows:

- Pushover service*
- Pushover alarms*
- E-Mail (SMTP) service*
- E-Mail (SMTP) Alarms*
- Easy alarm destinations: 3 permanent configurable alarm destinations (LDSWin, LDSWin and SMS Anny Way).
  For these alarm destinations, the configured time ranges and special days are also displayed (read-only!).
- Time ranges of the system centre
- Specification of the special days
- Provider for SMS destinations
- Other: definition of the mode of operation of the multi-function relay AUX / tripping a test alarm
- Extended alarm destinations 4..15

> *: These alarm signalling paths can only be configured on the screens of the system centre. Changes can only be made by authorised personnel and are only possible when logged in as "Admin".

Pushover service

Pushover service		Input	Default
Application token	Input of the application token from the "Pushover Account"	max. 40 characters	--
User code	Input of the user code from the "Pushover Account"	max. 40 characters	--

Pushover alarms

Pushover alarms		Input	Default
Pushover activated	The check mark must be set for activation of the transmission of alarms via Pushover		-
Selection of the priorities	The alarm priorities for which transmission of alarms via Pushover should be performed can be selected in the priority matrix. The alarm priorities for the entire decade can be selected by tapping on a priority in the column or row header		-

E-Mail (SMTP) service

Configuration of the E-Mail (SMTP) service

E-Mail (SMTP) service		Input	Default
Security type	Security standard used for the E-Mail communication	SSL / TLS	SSL
SMTP server	Input of the SMTP server (e.g. smtp.strato.de) for the E-Mail communication	max. 40 characters	-
Port of the server	Input of the TCP/IP port for the communication with the SMTP server	Numbers (1 ...65535)	0
User name	Input of the user name for the authentication at the SMTP server	max. 40 characters	-
Password	Input of the password for the authentication at the SMTP server	max. 40 characters	-
Sender address	Input of the E-Mail address from which the error messages are sent	max. 40 characters	-
Sender name	Input of the sender name from which the error messages are sent	max. 40 characters	-
Recipient address	Input of the E-Mail recipient address for the error message	max. 40 characters	-

E-Mail (SMTP) Alarms

E-Mail (SMTP) Alarms		Input	Default
E-Mail activated	The check mark must be set for activation of the transmission of alarms via E-Mail		-
Selection of the priorities	The alarm priorities for which transmission of alarms via E-Mail should be performed can be selected in the priority matrix. The alarm priorities for the entire decade can be selected by tapping on a priority in the column or row header		-

LDSWin

It is defined using this entry screen where the alarm is signalled in the event of a fault or which remote station is contacted with the LDSWin PC software.

The screen contains the following parameters:

LDSWin alarm signalling		Entry	Default
LDSWin Description	Description of the remote station of LDSWin, e.g. Service Centre	max. 19 characters	Service Centre
Telephone number	Telephone number of the remote station		-
Priority	Priority	None,1, 2, 1 + 2	None

LDSWin alarm signalling		Entry	Default
Time range	Messages are never, within, outside or always transmitted in the time range.	Never, Within, Outside, Always	Never

LDSWin

It is defined using this entry screen where the alarm is signalled in the event of a fault or which remote station with the LDSWin PC software is contacted.

The screen contains the following parameters:

LDSWin alarm signalling		Entry	Default
LDSWin Description	Description of the remote station of LDSWin, e.g. fault reporting service	max. 19 characters	Fault reporting service
Telephone number	Telephone number of the remote station		-
Priority	Priority	Alternative destination of destination 0, 1, 2, 1 + 2	Alternative destination of destination 0
Time range	Messages are never, within, outside or always transmitted in the time range.	Never, Within, Outside, Always	Never

SMS - Anny Way

This entry screen is used to define where an alarm is signalled by SMS in the event of a fault.

The screen contains the following parameters:

SMS alarm signalling - Anny Way		Input	Default
SMS - Anny Way Description	Description of the remote station for the SMS, e.g. SMS	max. 19 characters	SMS
Telephone number	Enter telephone number of the remote station (e.g. that of the on-call technician)		-
Priority	Messages with this priority will be transmitted.	None1, 2, 1 + 2	None
Time range	Messages are never, within, outside or always transmitted in the time range.	Never, Within, Outside, Always	Never

For SMS Text Message Transmission, the telephone numbers of the SMS providers must be activated in the telephone system otherwise no SMS text message transmission is possible: The following numbers are stored in the system centre and must be checked at the provider for their validity: D1:0171-25 21 002Anny Way:0900-32 66 90 02 Source: MATERNAs Anny Way SMS-Dienst, http://www.sms-im-festnetz.de/sms/

An alternative destination with a different telephone number and a different provider should always be used for every destination! It is not ensured after successful transmission of any message to the provider that this reaches the recipient promptly or at all. For this reason, alarm signalling only by SMS should not be used and another separate alarm path should be implemented.

Time ranges

The time ranges (duty hours) at the Service Centre are defined using this entry screen. New time ranges are defined using the "New" button; a total of 3 time ranges can be entered.

The screen contains the following parameters:

Alarm signalling time ranges		Entry	Default
Start	Week timer start	00:00..23:59	08:00
End	Week timer end	00:00..23:59	16:00
XXXXXXXXX	Weekdays and groups of days	Mon-Fri Mon-Sat Mon-Sun Sat-Sun Mon, Tue, Wed, Thu, Fri, Sat, Sun	Mon - Fri

If no time ranges are specified, the Service Centre is considered as not manned!

Special days

Up to 30 special days on which the Service Centre is not manned can be defined using this entry screen. New special days are defined using the button for editing.

The screen contains the following parameters:

Special days alarm signalling		Entry	Default
Entry screen for date	The input is made as follows: D/M or DD/MM (day/month) A special day can be deleted / removed again with the entry of "--" or "0:0" or "00:00".	1/1 ..31/12 --,0:0, 00:00	-

If no days are specified, the Service Centre is considered as always manned!

Provider

The telephone providers (e.g. D2, EPlus,…) for the SMS destinations are defined using this entry screen.

The screen contains the following parameters:

Alarm signalling provider 1/2		Entry	Default
Description	Description of the provider 1/2 e.g. "D2"	Max. 19 characters	-
Telephone number	Telephone number of the provider 1/2		-
Protocol	SMS protocol of the provider 1/2 NOTE: This must be requested from the provider!	TAP, UCP	TAP

An alternative destination with a different telephone number and a different provider should always be used for every destination! It is not ensured after successful transmission of any message to the provider that this reaches the recipient promptly or at all. For this reason, alarm signalling only by SMS should not be used and another separate alarm path should be implemented.

Other

The mode of operation of the multi-function relay AUX is configured using this entry screen. For further information, see chapter Modem hardware reset, page 46.

The screen contains the following parameters:

Alarm signalling other		Entry	Default
AUX relay Function XXX	The multi-function relay AUX must be set to PRIOX3, .. or PRIOX9 so that it can be used as alarm relay! For details about the configuration, chapter Multi-function relay AUX, page 30.	Horn, alarm relay PrioX3, PrioX4, PrioX5, PrioX6, PrioX7, PrioX8, PrioX9 Modem reset GLT modem changeover	Horn
Alarm relay stop	Stop alarm relay PRIO1/PRIO2: Y: Relays are only deactivated when the cause for the alarm has been rectified and the alarm has been acknowledged N: Relays are deactivated when the horn is switched off	Y/N	Y
Test alarm Message text XXX	Message text of the test alarm	-	Test alarm
Priority XXX	Message priority of the test alarm	1..99	1
Test alarm trip	Button for tripping the test alarm	-	-

ⓘ It must be checked before the configuration of the multi-function relay AUX that no conflict with the existing configuration / wiring is produced by the change of the settings.
For example, a possible conflict could be that a horn is already connected to the multi-function relay AUX and is used for audible alarm signalling!

Alarm destination 4..15 - read-only!

ⓘ The extended alarm destinations can only be configured using the LDSWin PC software; the menu only shows the settings configured there!

The screen contains the following parameters:

Alarm destination 4..15		Entry	Default
Description	Description of the alarm destination, e.g. Service 2	-	-
Telephone number	Telephone number of the alarm destination	-	-
Priority A	Priority A	-	-
Priority B	Priority B	-	-
Time range	Messages are never, within, outside or always transmitted in the time range. Possible values are: Never, Within, Outside, Always	-	Never

Menu 4-1-8 - Date / Time

The entry screen for configuration of the date and time of the system centre is called using this button. This makes the date and time available system-wide for all E*LDS components; it is the so-called "time server".

Any change of the time zone or the date results in inconsistencies in the data archiving as the assignment of the recorded data (EU archives, temperatures, alarms etc.) to their actual time stamps is lost as a result!

Changes can only be made by authorised personnel and are only possible with login as "Master".

The screen contains the following parameters:

Date / time		Entry	Default
Time zone - place	Time zone - place	European cities	Berlin
Year	Entry of the year		
Month	Entry of the month		
Day	Entry of the day		
Hour	Entry of the hour		
Minutes	Entry of the minutes		
Seconds	Entry of the seconds		

Menu 4-1-9 - Firmware Update

The entry screen for loading a firmware update is called using this button, see chapter Firmware Update.

Caution: data loss! The loading of any firmware update must not be interrupted! The mains plug and the USB stick must not be disconnected during the firmware update. It must be ensured that power is supplied throughout the entire procedure. The settings should be documented as a precaution before any update.

Changes can only be made by authorised personnel and are only possible when logged in as "*Master*" or "*Admin*", see chapter Login to the system centre (unlocking).

The screen contains the following parameters:

Firmware Update		Input	Default
1. Check USB stick	The USB stick must be checked by the user before performing any boot loader / firmware update by tapping the "Check USB stick" button. This preliminary check tests the following functions and characteristics: • Has the USB stick been recognised? • Is the USB stick formatted with FAT32? • Is the USB stick smaller than 16 GB? • Can the USB stick be read? • Are the required files for the boot loader / firmware update on the USB stick in the correct directory?	-	-
2.Update of the firmware	The "Update of the firmware" check box is enabled for the update after the tests mentioned above have been successfully passed.	Y/N	N

Firmware Update		Input	Default
3.Now perform update and restart	If the above check box has been checked and the "Now perform update and restart" button has been tapped, the update is "prepared" in the background. This process can take a few seconds (approx. 5 seconds).Then the system centre performs a restart and the new firmware is loaded.	-	-

Menu 4-1-10 - System Information

The screen for system information is called up using this button.

Menu 4-1-11 - Reset System

The screen for restarting the device, deletion of operating and energy data and the alarm and message lists and the reset to factory settings is called using this button.

> **Risk of loss of data and the configuration!** All saved data and configurations of the system centre are irrevocably lost during deletion of the archives (operating and energy data), the alarm and message list as well as during reset to factory settings!

The screen contains the following parameters:

Reset system		Input	Login required as ...
Perform restart of the device	Perform restart of the device	Y/N	**Service**
Deletion of the operating data archives of the controller	Deletion of all archived operating data of the following node groups: • Case controllers on the CAN bus • Case controllers on the Modbus • Pack controllers • BCT (building control technology)	Y/N	**Master**
Deletion of the energy archives	Deletion of all archived energy data of the following node groups: • SO meters • M-bus meters	Y/N	
Deletion of the alarm and message lists	Deletion of all entries in the alarm and message lists	Y/N	
Deletion of the 24h list	Deletion of all entries in the 24h list	Y/N	
Reset to delivery condition	Reset to delivery condition (factory settings): • All data will be completely removed from the system! • The system centre will be restarted twice - Duration: approx. 3 minutes	Y/N	**Admin**

> By setting the check mark for the required action, the following actions can be selected and executed using the "*Execute selected actions*" button.

Menu 4-1-12 - System Upgrade

The screen for upgrade of the system is called using this button. The Expansion stages of the CI 4000 series and new functions are enabled using a licence key that can be requested from Eckelmann AG. The part numbers of the individual expansion stages are listed in chapter Order numbers and accessories of System Centre.

The screen contains the following parameters:

System Upgrade		Input	Login required as "Master"
MAC address	Display of the MAC address	-	Device-dependent
Licence key	Input of the licence key	Numbers and hyphen	Example: 1234-1234-1234-1234

ⓘ The system centre is restarted after input of a valid licence key.

2 Menu 4-2 - Case controllers

The submenu for configuration of the case controllers is called using this button. All important parameters and the status of the case controllers are displayed there. Case controllers can be added using the "New entry" button. Already added case controllers can be selected and configured using the corresponding screen.

The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

The screen contains the following parameters:

Configuration Case Controllers		Entry	Default
Name	Name of the node, e.g. Deep freeze island site case	max. 19 characters	-
Position	Position designation of the node, e.g. TK_01	5 characters	-
Priority	Alarm and message priority 0..99	0..99	-
Address	CAN bus address 1..99	These fields cannot be edited!	-
Serial number	Serial number of the controller		-
Firmware version	Firmware version of the controller		-
Integrated using	The controller is connected to the system centre via this interface		-
Pack number	Pack membership for the pack		-

ⓘ Any case controller can be removed from the system again using the "Delete" button. A case controller can only be deleted if it has previously been switched off and accordingly signalled as failed!

Remote control using terminal mode

The terminal mode screen is opened using the *Remote Control* button. All parameters of the case controller can be configured in the terminal mode. For more information, see chapter Remote control of E*LDS components (terminal mode).

ⓘ If the EU archiving of a case controller is activated, the archive is created in the storage 15 minutes at the latest after receiving the first measured value. A created archive cannot be deleted manually. If the EU archiving of a case controller is deactivated in this screen, the archive is retained and is not deleted automatically until after one year has elapsed.

3 Menu 4-3 - Pack controllers

The submenu for configuration of the pack controllers is called using this button. All important parameters and the status of the pack controllers are displayed there. Pack controllers can be added using the "New entry" button. Already added pack controllers can be selected and configured using the corresponding screen.

The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

The screen contains the following parameters:

Configuration Pack Controller		Entry	Default
Name	Name of the node, e.g. Deep freeze pack	max. 19 characters	-
Position	Position designation of the node, e.g. VSTK_01	5 characters	-
Priority	Alarm and message priority 0..99	0..99	-
Address	CAN bus address 101..109	These fields cannot be edited!	-
Serial number	Serial number of the controller		-
Firmware version	Firmware version of the controller		-
Integrated using	The controller is connected to the system centre via this interface		-
Pack number	Pack number 1 = CAN bus address 101 … 9 = CAN bus address 109		-

ⓘ Any pack controller can be removed from the system again using the "Delete" button. A pack controller can only be deleted if it has previously been switched off and accordingly signalled as failed!

Remote control using terminal mode
The terminal mode screen is opened using the *Remote Control* button. All parameters of the pack controller can be configured in the terminal mode. For more information, see chapter Remote control of E*LDS components (terminal mode).

4 Menu 4-4 - Receiver Module Wireless Sensors

The submenu for configuration of the receiver modules and the wireless sensors is called using this button. All important parameters and the statuses of the receiver modules and wireless sensors are displayed there. Receiver modules can be added using the "New entry" button. Already added receiver modules can be selected and configured using the corresponding screen. The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

The screen contains the following parameters:

Configuration Pack Controller		Entry	Default
Name	Name of the node, e.g. Receiver_module_01	max. 19 characters	-
Position	Position designation of the node, e.g. WR_01	5 characters	-
Priority	Alarm and message priority 0..99	0..99	-
Address	CAN bus address 117..120	These fields cannot be edited!	-
Serial number	Serial number of the receiver module		-
Firmware version	Firmware version of the receiver module		-
Integrated using	The receiver module is connected to the system centre via this interface		-

ⓘ Any receiver module including the associated wireless sensors can be removed from the system using the "Delete" button. A receiver module can only be deleted if it has previously been switched off and accordingly signalled as failed, see menu!

Remote control using terminal mode
The terminal mode screen is opened using the *Remote Control* button. In the terminal mode, all parameters of the receiver module including the associated wireless sensors can be configured. For more information, see chapter Remote control of E*LDS components (terminal mode). The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

5 Menu 4-5 - General Information

The screen for general information of the store is called using this button.

The screen contains the following parameters:

General information	Read only!
Operating time of the system centre	Years / days /hours
Operating time of the display	Years / days /hours
System up time	Years / days / hours / minutes / seconds
"Information for open source software" button	QR code with specification of the hyperlink where further information about the use of Open Source software components (Licence Reports) is described in detail for the present product: https://edp.eckelmann.de/edp/lds/_V0brLLadsi Link to E°EDP of Eckelmann AG: https://edp.eckelmann.de/edp/lds/_V0brLLadsi

6 Menu 4-6 - Users

The screen for user management of the system centre is called up using this button. All users created in the system are displayed there. The following users are available: Admin, Master and Service; for further details see chapter Login to the system centre (unlocking).

Attention! Security Note! For security reasons, **all** passwords set at the factory should be changed **immediately after** installation and commissioning!

The screen contains the following parameters:

Change password	Description
Tips and requirements	• Minimum length 8 characters • The password must not contain the user name (e.g. “Admin” or “admin”) • The password must contain at least three of the following four elements - Numbers (0-9) - Lowercase letters (a-z) - Uppercase letters (A-Z) - Special characters limited to (.@-)

User	
Admin	New password Repeat new password The requirements above must be observed!
Master	New password Repeat new password The requirements above must be observed!
Service	New password Repeat new password The requirements above must be observed!

It is recommended to choose a password that meets certain minimum requirements for a good password. For this, Recommendations and tips for good passwords can be found on the website of the Bundesamt für Sicherheit in der Informationstechnik (German Federal Office for Information Technology Security).

7 Menu 4-7 - Log

The log screen of the installation is called up using this button. The log is created and edited using the LDSWin PC software and is only displayed in the screen.

8 Menu 4-8 - Language

The screen for selection of the language is called using this button. The setting made here ensures that the required language is used system-wide in the menus of all E*LDS components. The required language is marked with a tick and can be changed at any time during running operation. Each language in the selection list is displayed in its own language as well as in English. The following languages can be selected:

- German
- English
- French
- Italian
- Czech

If any E*LDS component does not support the selected language, this component changes over to the "English" language.

9 Menu 4-9 - Other Components

The submenu for configuration of other E*LDS components is called using this button. If a component has been selected, its **"Name"** parameter can be changed system-wide using the corresponding screen: The assigned CAN bus address, diverse statuses and operating statuses are also displayed.

Symbol	Meaning
	The status of the connection (communication) with the node is OK
	The status of the connection (communication) with the node is unknown
	The node has failed
	The node has been unloaded
	The status of the node is OK
	The node has alarm status

The screen contains the following parameters:

Configuration Case Controllers		Entry	Default
Name	Name of the node, e.g. Deep freeze island site case	max. 19 characters	-
Position	Position designation of the node, e.g. TK_01	5 characters	-
Priority	Alarm and message priority 0..99	0..99	-
Address	CAN bus address 1..99	These fields cannot be edited!	-
Serial number	Serial number of the controller		-
Firmware version	Firmware version of the controller		-
Integrated using	The controller is connected to the system centre via this interface		-
Pack number	Pack membership for the pack		-

The following components are displayed:

- CI 4000
- Operator terminals (e.g. AL 300)
- CI 400 LAN gateway (software module)

Remote control using terminal mode

The terminal mode screen is opened using the *Remote Control* button. All parameters of the nodes can be configured in the terminal mode. For detail information about remote control using the terminal mode, see chapter Remote control of E*LDS components (terminal mode).

5 Menu 5 - Horn

If the horn button is coloured white, the audible signalling units (internal buzzer or optional external horn on the AUX relay, see Menu 4-1-7) are deactivated.

However, for each new alarm, the audible signalling units of the alarm centre are activated and the horn button colour changes to red. Pressing the button switches off the audible signalling units again and the button changes colour to white again.

> Switching off the audible alarm signalling units does not acknowledge alarms! The acknowledgement of alarms can only be performed using the acknowledge button in the alarm list (Menu 1), see chapter Menü 1 - Alarme und Meldungen!

6 Menu 6 - Energy Management

List of all meters connected to the system centre. The associated graphic is opened by pressing the "Edit" button.

The submenu contains the following buttons:

Brief description of the buttons

6-1 - Energy Management	
1 Consumption	Overview of the measuring locations with graphical display
2 Load Profile	Overview of the load profile

1 Menu 6-1 - Consumption

The submenu for display of the measuring locations is called up using this button. All the measuring locations (meters) configured in Menu 4-1-6 are shown here and can be displayed graphically.

Legend of the meter symbols:

Energy, water, gas, heat, oil and event

Every line entry in the screen contains the following parameters:
Type and name of the meter, its position designation, the meter and transformer constants and the unit of measure. Note: Meters must be created and configured in Menu 4-1-6 otherwise they are not displayed in this screen.

Select a meter in the list to display the consumption of a meter. The day consumption of the current week is shown first in the "week" period. For better orientation, 2 previous days and one following day on the right are displayed. Individual time periods can be changed between by pressing the left/right buttons. The presentation of the consumption can be displayed over a week in days (left button "23") or monthly (middle button "May") or annually (right button "2014").

Individual time periods (days, months, years) can be changed between by pressing the left/right buttons. Note: The "year" time period cumulates the daily consumptions to the month consumption.

2 Menu 6-2 - Load Profile

The submenu for display of the load profile of the individual meter types is called up using this button.

Legend for the meter symbols used:

Energy, water, gas, heat, oil and event

Every line entry in the screen contains the following parameters:
Type and name of the meter, its position designation, the meter and transformer constants and the unit of measure. Note: Meters must be created and configured in Menu 4-1-6 otherwise they are not displayed in this screen.
The required meter in the list must be selected to display the load profile of a meter. The load profile of the current day is shown initially. Individual time periods can be changed between by pressing the left/right buttons.

7 Menü 7 - BCS

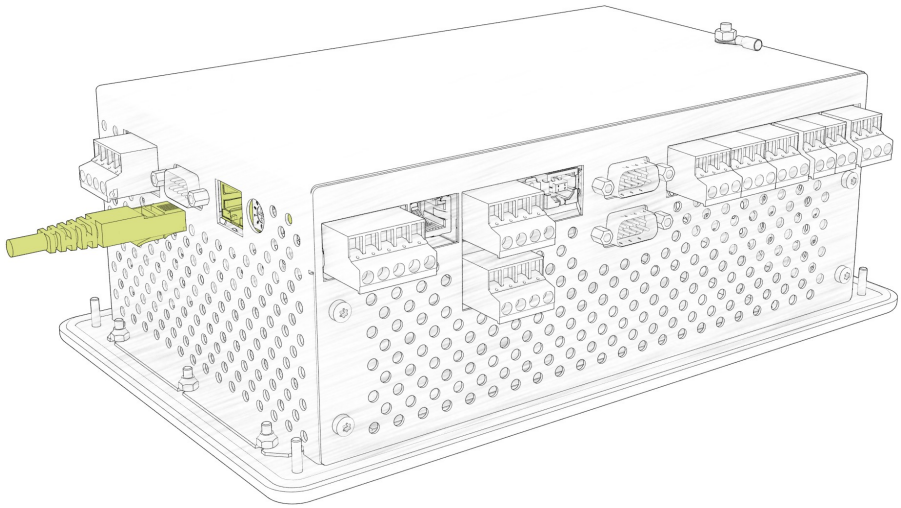
The screen for overview of BCS data is opened using this button.

9.2 Remote

The system centre can be operated remotely via a network e.g. Internet/Intranet) via

- Remote operation of the system centre using VNC (Virtual Network Computing)

The required ETHERNET / LAN connection for this is located on the left on the device:

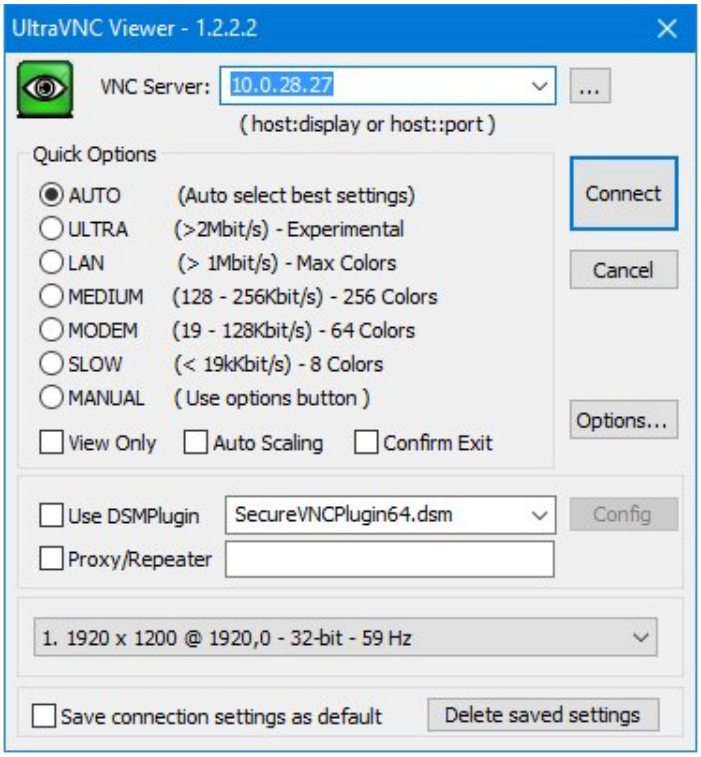


The interface is configured using Menu 4-1-5. For more details, see chapter Terminal assignment of communication interfaces.

9.2.1 Remote operation of the system centre using VNC (Virtual Network Computing)

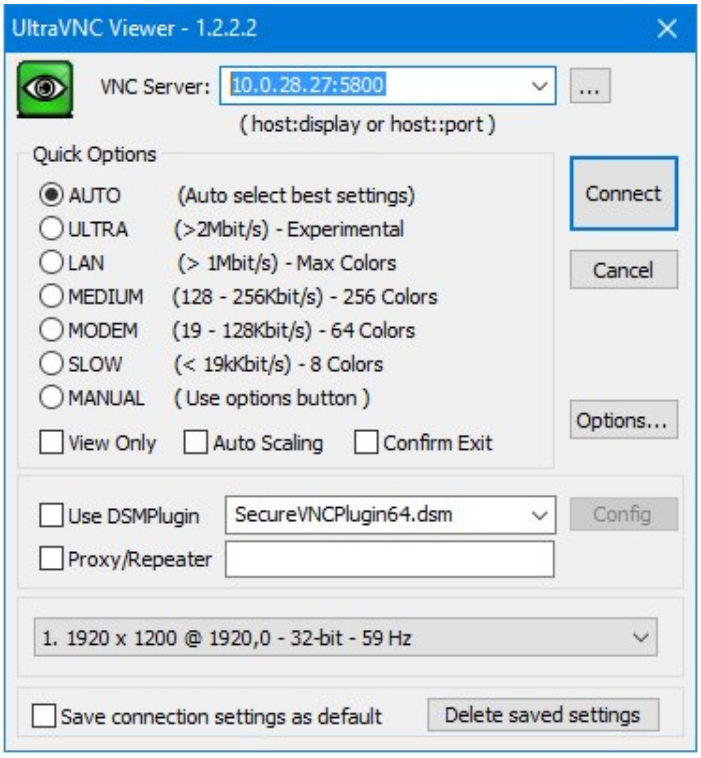
The system centre can be remotely operated using VNC with, for example, the *UltraVNC Viewer* (htttp://www.uvnc.com/). After starting the VNC viewer, the IP address of the system centre must be entered in the "VNC Server" configuration field. The connection is then established by clicking with the mouse on the "Connect" button.

Example 1: Establishment of a VNC connection to the system centre with the IP address **10.0.28.27**



If the VNC port has been changed (see Menu 4-1-5, page 105), the new port must be explicitly appended with a colon after the IP address.

Example 2: Establishment of a VNC connection to the system centre with the IP address **10.0.28.27** at the port **5800**



After establishment of the VNC connection, it is possible to operate the system centre using the PC keyboard and mouse.

If the system centre is not operated for a longer time, the screen saver for protection of the display is activated. If a VNC connection exists, the screen saver is deactivated with the first mouse click.

10 Decommissioning and disposal

10.1 Decommissioning / Demounting

The dismantling of the equipment may only be performed by authorised and trained personnel.

DANGER
Warning of dangerous electrical voltage! Danger of electric shock!
During dismantling, the same safety instructions and hazard warnings must be observed as for installation, putting into service and maintenance, see chapter Safety instructions.

ATTENTION
For dismantlement, follow the steps for assembly in reverse order, see chapter Installation and Putting into Service.

10.2 Disposal

Our scope of delivery is a component that is intended exclusively for further processing. As a consequence of this fact, Eckelmann AG does not take any measures for the taking back or municipal recycling of this product as it is not supplied directly to the free market.

Potential negative impact on people and the environment due to non-environmentally friendly disposal!

- In accordance with the contractual agreement, the customer has a duty to dispose of electrical and electronic waste in compliance with the statutory regulations based on the Directive 2012/19/EU – WEEE2 on waste electrical and electronic equipment.
- Ensure the environmentally friendly disposal of the packaging, the product and its components at the end of their service life. Observe the applicable national regulations and laws.

ATTENTION

The device may contain a lithium battery (for details, see chapter Electrical Data) that must be disposed of separately! Please inform yourself about the local regulations for the separate disposal of electrical and electronic products and batteries.

11 System centre alarms and messages

The following list contains all alarm and message texts with error number that are signalled by the system centre in Menu 1 (Alarms and messages). There is a brief explanation of the possible cause and suggestions for remedy / elimination of the error for each of these alarms and for each message.

No.	Message text	Cause	Remedy
Hardware error			
8	RTC fault	The real-time clock is defective	1. Set date **and** time (see Menu 4-1-8) 2. Restart the device (see Menu 4-1-11) 3. Acknowledge alarm (see Menu 5) Contact Customer Service if the alarm cannot be acknowledged
9	Defective SIOX *n*	A SIOX extension module (n=1 .. 4) has failed or a cable (terminals 91,,95 or patch cable) is defective.	Check: • wiring, terminals 91..95, • check patch cables if necessary (firmly plugged in, not kinked?) • replace extension module
10	Battery voltage	The battery for the real-time clock is discharged	Please contact Customer Service
46	Time difference	The stored time in the real-time clock is lost during system start	
CAN bus fault			
41	CAN bus overflow	Communication fault on the CAN bus or short circuit between CAN-H and CAN-L.	Check: • Wiring of the CAN bus • CAN bus length (max. 500 m) • No branch lines • CAN-GND must be available everywhere • CAN bus termination 100 ohms • Colour scheme complied with • Correct cable type (LiYCY 2 x 2 x 0.75 mm² with 120 ohms characteristic impedance)
42	CAN-Bus MSGLOST (= Message lost)		
43	CAN bus fault		
44	CAN bus failure		
45	CAN address conflict or Bus collision Mxx	Two components use an identical CAN bus address or Two components use an identical Modbus address Mxx*	• Change address of one of the components • Check component Mxx*
Internal error			
0	internal error 41 0025	COM port server: Configuration read error	Please contact Customer Service
	internal error 41 0026	COM port server: Configuration write error	Please contact Customer Service
	internal error 41 0027	COM port server: could not be started	Please contact Customer Service
0	internal error 41 0028	SIOX: internal communication error in the device driver	Please contact Customer Service

0	internal error 42 4E20 internal error 42 4E21 internal error 42 4E22 internal error 42 4E23 internal error 42 4E24 internal error 42 4E25 internal error 42 4E26 internal error 42 4E27 internal error 42 4E28 internal error 42 4E29 internal error 42 4E2A	Error in alarm signalling module	Please contact Customer Service
0	internal error 43 0000	Archiving: Serious error in the archiving of the operating data	Please contact Customer Service
	internal error 43 0001 internal error 43 0002	Archiving: Settings invalid	Please contact Customer Service
	internal error 43 0003	Archiving: Invalid timestamp	Please contact Customer Service
	internal error 43 0005 internal error 43 0006	Archiving: Incomplete data check	Please contact Customer Service
	internal error 43 0004 internal error 43 000A internal error 43 0100 internal error 43 0200 internal error 43 0201 internal error 43 0202 internal error 43 0203 internal error 43 0204 internal error 43 0205	Archiving: memory error	Please contact Customer Service
0	internal error 44 2710	Node management: saved node list could not be	Please contact Customer Service
	internal error 44 2711	Node management: at least one stored CAN bus node could not be loaded	Please contact Customer Service
	internal error 44 2712	Node management: at least one stored compact controller could not be loaded	Please contact Customer Service
	internal error 44 2713	Node management: at least one stored Danfoss controller could not be loaded	Please contact Customer Service
	internal error 44 2714	Node management: stored node list has been restored	Please contact Customer Service
	internal error 44 2715	Node management: at least one temperature sensor (TS 30 W) stored in the system centre could not be loaded	Please contact Customer Service
	internal error 44 2716	Node management: at least one stored Wurm controller could not be loaded	Please contact Customer Service
0	internal error 45 2710	GLT configuration could not be loaded	Please contact Customer Service
	internal error 45 2711	GLT configuration has been restored	Please contact Customer Service
0	internal error 47 0001	Data integrity check: error during the initialisation	Please contact Customer Service
	internal error 47 0100 internal error 47 0101 internal error 47 0201 internal error 47 0202 internal error 47 0300 internal error 47 0301 internal error 47 0302	Error in the data integrity check	Please contact Customer Service
Messages			

0	*xxxxxxxxxxxxxxxx*	The limit value of a totaliser has been exceeded The name of the totaliser (freely editable) whose parametrised limit value has been exceeded is in the system message	---
0	Backup Alarm Config	Alarm configuration has been restored from the backup	Please contact Customer Service
0	Data carrier reinit	Data carrier reinitialisation	Please contact Customer Service
	Data carrier reorg	Data carrier reorganisation	Please contact Customer Service
	Data carrier defective	Data carrier defective	Please contact Customer Service
0	E-Mail file error	Configuration for E-Mail could not be loaded	Please contact Customer Service
	E-Mail data error	The configuration data for E-Mail have errors	Please contact Customer Service
	E-Mail DNS error	The host name of the mail server cannot be resolved	Check: • network configuration (see Menu 4-1-5)
	E-Mail error: x	An error with the error number x has occurred during the transmission of messages and alarms via E-Mail.	Please contact Customer Service
	E-Mail no network	E-Mail connection establishment to the mail server not possible	Check: • network configuration (see Menu 4-1-5)
	E-Mail send error	Error in the E-Mail alarm transmission	Check: • network configuration (see Menu 4-1-5) • E-Mail configuration (see Menu 4-1-7)
	E-Mail language definition	E-Mail message could not be created	Please contact Customer Service
	E-Mail SSL error	E-Mail SSL error during connection establishment to the mail server	Check: • network configuration (see Menu 4-1-5) • E-Mail configuration (see Menu 4-1-7)
	E-Mail timeout	E-Mail timeout during send	Check: • network configuration (see Menu 4-1-5) • E-Mail configuration (see Menu 4-1-7)
0	EUArchDBWrtFailTN	Archiving: error during write of EU data	Check EU Logger configuration
	EUArchInvalZoneTN	Archiving: an incorrect temperature zone is configured in a logger	Check EU Logger configuration
	EUArchMultiLogTN	Archiving: multiple loggers have the same temperature sensor configured	Check EU Logger configuration
	EUArchMultSensTN	Archiving: a logger has the same temperature sensor configured multiple times	Check EU Logger configuration
0	Events deleted	All alarms and messages with a send timestamp have been deleted	---
0	Firmware update failed	Firmware update has not completed successfully	Please contact Customer Service
	Firmware update OK	Firmware update performed successfully	---
0	LSM: Invalid power meter	An invalid power meter has been configured in the Load Shedding Manager (LSM).	Check configuration in the Load Shedding Manager (LSM)

0	Pushover data error	The configuration data for Pushover have errors.	Please contact Customer Service
	Pushover file error	Configuration for Pushover could not be loaded	Please contact Customer Service
	Pushover error: x	An error with the error number x has occurred during the transmission of messages and alarms via Pushover.	Please contact Customer Service
	Pushover No network	Pushover could not establish a network connection	Check: • Network configuration (see Menu 4-1-5) • Pushover configuration (see Menu 4-1-7)
	Pushover Keys error	Incorrect user key or incorrect application token in the Pushover configuration	Check user key and application token in the Pushover account
	Pushover message low.	The quota for Pushover messages is low	Adjust message quota in the Pushover account
	Pushover message limit	The limit for the transmission of messages in the Pushover account has been reached	Adjust message quota in the Pushover account
	Pushover transmission error	Error in the Pushover alarm transmission	Check: • network configuration (see Menu 4-1-5) • Pushover configuration (see Menu 4-1-7)
	Pushover language definition	Pushover message could not be created	Please contact Customer Service
	Pushover timeout	A timeout has occurred during the transmission of messages and alarms via Pushover	Check: • network configuration (see Menu 4-1-5) • Pushover configuration (see Menu 4-1-7)
0	Reboot ANF_SERVICE	Reboot of the system centre requested via LDSWin	---
0	Sum.-Z:Ung.Zaehler	No power data could be determined for at least one meter in the totaliser module.	Check: • Configuration of the totaliser (only using LDSWin)
0	Alarm config loss	Alarm configuration could not be loaded	Please contact Customer Service
0	Verst. DP M-Bus	Configuration change: M-bus meter data point	---
0	VNCPort x:y	VNC port x has been changed over to y x: old VNC port y: new VNC port	---
0	W-Stop: Power	Water stop: The limit value for the power has been exceeded	---
	W-Stop: Ung.Sum-Z	Water stop: The configured totaliser is not valid	Check: • Configuration of the water stop (only using LDSWin)
	W-Stop: Consumption	Water stop: The limit value for the consumption has been exceeded	---
0	GLT Type Mix 3000	There are both GLT components of the 5000 family as well as GLT components of the 3000 family on the CAN bus. This constellation is not supported by the system centre in the 4000 family.	Removal of the GLT components of the 5000 family
0	Invalid GLT type	There is a GLT component of the 5000 family on the CAN bus. This is not supported by the system centre in the 4000 family.	Removal of the GLT components of the 5000 family

47	Time adjustment	The time in the system centre has been adjusted.	---
48	Date adjustment	The date in the system centre has been adjusted.	---
	Verst. System time	The date and time in the system centre have been adjusted.	---
	Verst. Time zone	The time zone of the system centre has been adjusted.	---
51	Restart: POR Restart: WDG Restart: RST	The controller has been restarted for the following reasons: • POR = power failure • WDG = hardware watchdog • RST = manual reset or reset by watchdog	---
88	M-bus response missing	At least one M-bus meter is not providing any data	Check: • Cabling of the M-bus • Configuration of the M-bus gateway For details, see chapter M-bus - Connection of gateways
89	M-bus failure	Failure of the M-bus	
98	Load shedding	Load shedding active	---
	VerstKonfig Tageb.	Change of the log	---
153	Delete 24h list	Archiving: Temperature data deleted	
	Delete operating data	Archiving: Operating data archives deleted	---
	Delete energy data	Archiving: Energy data deleted	---
241	VerstKonfig Al.Ein.	Configuration change: Signal inputs	---
	VerstKonfig Alm-Cfg	Configuration change: Alarm settings	---
	VerstKonfig Lastab.	Configuration change: Load shedding	---
	VerstKonfig M-Zlr	Configuration change: M-bus meter	---
	VerstKonfig Modem	Configuration change: Modem settings	---
	VerstKonfig MrCfg	Configuration change: System centre	---
	VerstKonfig Netzw.	Configuration change: Network	---
	VerstKonfig SchUhr	Configuration change: Week timers	---
	VerstKonfig So.Ein.	Configuration change: Special inputs	---
	VerstKonfig Sprache	Configuration change: System language	---
	VerstKonfig Sum.Z.	Configuration change: Totaliser	---
	VerstKonfig W.Stop	Configuration change: Water stop	---
	VerstKonfig Zähler	Configuration change: SO meters	---
255	Test alarm	A test alarm has been triggered	---
0	RTC time adjusted	Internal error of System-Clock occurred	Please check date and time and correct if necessary
Monitoring			
28	Manual shutdown or Manual shutdown Mxx Manual shutdown Wxx	A manual shutdown has been initiated in the system centre for the following components: • E*LDS component on the CAN bus • Modbus component Mxx • Wurm component Wxx	---

52	Computer fault or Computer fault Mxx or Computer fault Wxx	The system centre cannot communicate with the stated components: • E*LDS component on the CAN bus • Modbus component Mxx • Wurm component Wxx	Check: • power supply and connection of the E*LDS component on the CAN bus or Modbus and Wurm component
66	Ver. Teilnehm. or Ver. Teilnehm. Mxx Ver. Teilnehm. Wxx	The node information for the following components has been changed: • E*LDS component on the CAN bus • Modbus component Mxx • Wurm component Wxx	---
Communication			
55	Dial-in modem *nnnn-nnnn*	The system centre has been called from a PC via modem. *nnnn-nnnn* is the number of the LDSWin dongle	---
	Dial-in telephone number mmmm	The system centre has been called from a PC via modem. mmmm identifies the telephone number of the remote PC.	---
65	Dial-in direct	A connection to LDSWin has been established using direct cable connection to the system centre. The number of the LDSWin dongle is displayed as message text.	---
	Dial-in CAN	A connection to LDSWin using CAN bus to PC adapter has been established to the system centre. The number of the LDSWin dongle is displayed as message text.	---
	Dial-in LAN	A connection to LDSWin has been established using the network (LAN) to the system centre. The number of the LDSWin dongle is displayed as message text.	---
Modem error			
85	Modem fault	The modem is not detected, not switched on or not connected.	Modem and check connection to the system centre.
86	Error alarm destination *n* n = 0..7	The system centre cannot transmit any alarms to the specified remote station; for example because the remote station is occupied or the modem does not detect any dial tone. The following alarm destinations are possible: 0 Control centre 1 Fault reporting service 2 LDSWin extension 1 3 Voice mail 4 LDSWin External 1 5 LDSWin External 2 6 SMS 7 FAX	Check telephone number and remote station Note: Due to the new priority concept, there no longer any fixed assignment of the message to the alarm destinations!
87	Direct cable connection	The coupling to the modem has been temporarily replaced by coupling operating mode "direct coupling" between LDSWin-PC and the system centre (e.g. for configuration of the E*LDS system on-site by Customer Service).	---
Alarm and special inputs			
0	Toggle setpoint	Special input "toggle setpoint" has been activated	---

91	*xxxxxxxxxxxxxxxx*	Text is freely editable for message or alarm input on the system centre e.g. input: int.E/1 (digital input IN1, terminal A1/A2) or message or alarm input on the SIOX extension module e.g. input: SIOX2/5 (2nd SIOX module / digital input 5, terminal E1/E2)	Eliminate fault of the external alarm
93	Emergency power supply	Special input emergency power supply has been activated	---
94	Sprinkler alarm	Special input sprinkler alarm has been activated	---
95	Store lighting	Special input store lighting has been activated	---
96	Shunt lock	Special input shunt lock has been activated	---
97	Meter limit monitoring	Limit value of the meter has been exceeded	---
Modbus node error messages			
0	Abtaufehler Mxx*	Defrost fault on component Mxx*	Check component Mxx*
1	Hardwarefehler Mxx*	Hardware error on component Mxx*	Check component Mxx*
5	SollW-Verlust Mxx*	Setpoint loss on component Mxx*	Check component Mxx*
8	RTC fault Mxx*	Real-time clock of component Mxx* defective	Check component Mxx*
10	Batteriefehler Mxx*	Battery fault on component Mxx*	Check component Mxx*
124	Coldroom door Mxx*	Coldroom door of component Mxx* open	Close coldroom door, check door contact and cable connections
126	Defrost thermostat Mxx* or temporal defrost. Mxx*	Defrost thermostat fault at component Mxx* or Defrost end time at component Mxx*	Check component Mxx*
128	Sensor fault x* Mxx* * designates the sensor number (1 to 4)	Sensor fault on component Mxx*. Possible causes: • Sensor has been removed • Sensor short-circuit • Electrical interference has occurred	• Check connection cable • Check shield • Replace affected sensor
	Sensor fault Mxx*	Sensor fault on component Mxx*. Possible causes: • Sensor has been removed • Sensor short-circuit • Electrical interference has occurred	• Check connection cable • Check shield • Replace affected sensor
132 133	High temp. Mxx* Low temp. Mxx*	High / low temperature at component Mxx*	• Parametrisation • Temperature sensor • Check system
150	Verdichterstör. Mxx*	Compressor fault of an AHT case Mxx* with Danfoss controller	Check compressor for component Mxx**
160	Pressostat Mxx*	Pressure fault at component Mxx*	Condenser Mxx** dirty, check

164	LP too low Mxx*	Lower limit value t_0 at compressor Mxx* undercut	Check compressor Mxx*
179	External alarm Mxx*	Error message of component Mxx*	Check component Mxx*
Wurm node error messages			
128	Sensor fault Wxx*	Sensor fault on component Wxx*. Possible causes: • Sensor has been removed • Sensor short-circuit • Electrical interference has occurred	• Check connection cable • Check shield • Replace affected sensor
132	High temp. Wxx*	High / low temperature at component Wxx*	• Parametrisation • Temperature sensor • Check system
Other			
180	Service Mode	The automatic transmission of alarms has been deactivated temporarily for maintenance purposes.	Reset Service Mode, see chapter Service Mode - Suppression of remote alarm signalling.

* **xxx** stands for the CAN bus addresses 1..127

Mxx stands for the Modbus addresses M1..M50

Wxx stands for the address of a node from the Wurm company

12 Specifications of System Centre and SIOX

For safety reasons and to guarantee important functions (e.g. alarm forwarding to a service centre via modem) only accessories approved by Eckelmann AG (see chapter Zubehör für Systemzentrale) are permitted to be used with the system centre.

12.1 Electrical data

Warning about dangerous electrical voltage! Danger to life - Danger of electric shock!
Overvoltage category II / soiling degree 2: All connections of the device provided for operation with 230 V AC supply voltage **must** be wired with the same phase conductor. 400 V AC between neighbouring connection terminals is **not** permitted!
Overvoltage category II / soiling degree 2: Different phase conductors may be used. 400 V AC between neighbouring connection terminals is permitted!

	System centre	SIOX extension module
Operating voltage	230 V AC, 200 - 265 V AC, 47/63 Hz	9 V / 24 V DC supply via the system centre
Rated power	36 W	3.1 W
Leakage current over PE (protective earth)	max 1 mA	
Digital inputs [1)]	2 x 230 V AC floating output, for external alarms (inputs IN.1 and IN.2)	12 x 230 V AC / 24 V, floating output, S0 meter input internally adjustable using jumper; for details, see chapter SIOX - configuration of the jumpers.
Relay outputs [1)]	3 x changeover contact for signalling system, floating output: • 2 x 230 V AC, min. >= 10 mA, load type: max. 6 A (ohmic) / max. 3 A (inductive) / (24 V DC / max. 5 A DC) For outputs PRIO.1 and PRIO.2 with bistable relays and 5 minutes response delay after shutdown of the device. • 1 x 230 V AC min. 5 V / 10 mA max 230 V AC / 6 A max. 24 V DC / 5 A For output AUX, e.g. for audible signalling unit	• 4 x normally open contact, 250 V AC, floating output, min 10 mA Load type: ohmic: max. 6 A, inductive: max. 3 A, cos phi = 0.4 • 4 x changeover contact, 250 V AC, floating output, min 10 mA Load type: ohmic: max. 6 A, inductive: max. 3 A, cos phi = 0.4
Manual control switch	-	The SIOX extension modules have manual control switches so that the regulation can be overridden in emergency operation, see chapter SIOX manual / automatic mode selection
Field bus interface	CAN bus, floating output	-
Data ports	1x data port for SIOX	Internal interface for the system centre
	3 x seriell RS232 1x seriell RS485	-
Archive memory	Compressor run times, starts, quotas, messages	-
Real-time clock	With power reserve and lithium cell (for details, see ""Transport and storage") Accuracy: typical 12 minutes per year at 25 °C	-
Monitoring function	Watchdog	

	System centre	SIOX extension module
Other interfaces	Power supply for external SIOX	
Environmental conditions		
Transport and storage	The controller contains a 3 V lithium cell (design type CRC 2450 N, shelf life 10 years) with capacity of 540 mAh and lithium content of 0.16 g. The battery complies with the UN3090 requirements for lithium metal cells. No special markings or measures for transport and storage are required up to a lithium amount of 2.5 kg per package (total amount for pallets or containers).	-
Weight	approx. 1600 g	approx. 800 g
Temperature range	Transport: -20 °C ... +80 °C Operation: 0 °C ... +50 °C	
Temperature change	Transport: max. 20 K/h Operation: max. 10 K/h	
Relative humidity (non-condensing)	Transport: 8% ... 80% Operation: 20 % ... 80%	
Shock according to DIN EN 60068-2-27	Transport and operation: 30 g	
Vibration 10 Hz ... 150 Hz according to DIN EN 60068-2-6	Transport and operation: 2 g	
Atmospheric pressure	Transport: 660 hPa ... 1060 hPa Operation: 860 hPa ... 1060 hPa	
Standards and Directives		
Protection rating	IP20 (EN 60529)	
CE conformity according to (see https://edp.eckelmann.de/edp/lds/_aftpgg7so5)	• Low Voltage Directive 2014/35/EU; Official Journal of the EU L96, 29/03/2014, pages 357-374 • EMC Directive 2014/30/EU; Official Journal of the EU L96, 29/03/2014, pages 79-106 • RoHS Directive 2011/65/EU; Official Journal of the EU L174, 01/07/2011, pages 88-11	

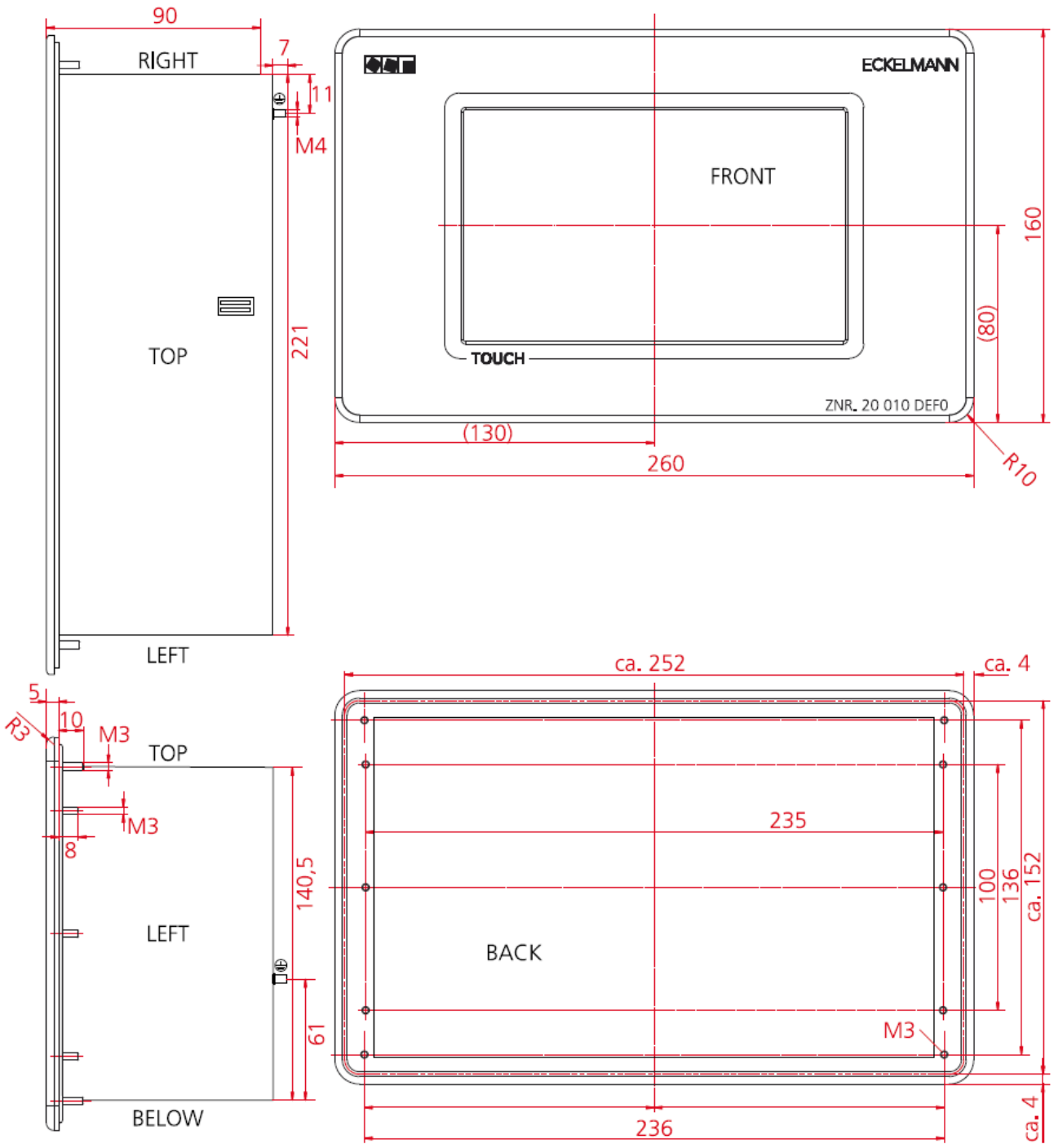
[1] **Warning about dangerous electrical voltage! Danger of electric shock! BEFORE** connection, it must be checked that **no voltage is present** at the 230 V AC digital inputs and 230 V AC relay outputs! Low voltage **and** safety extra-low voltage must **not** be applied together at the digital inputs A1/A2 and B1/B2 **and** the relay outputs 15/16/18, 25/26/28 and 35/36/38! Rating data of the insulation of the outer power circuits:

- Rated insulation voltage: 300 V AC
- Test voltage (L to PE): 1500 V AC
- Safe electrical isolation

12.2 Mechanical data

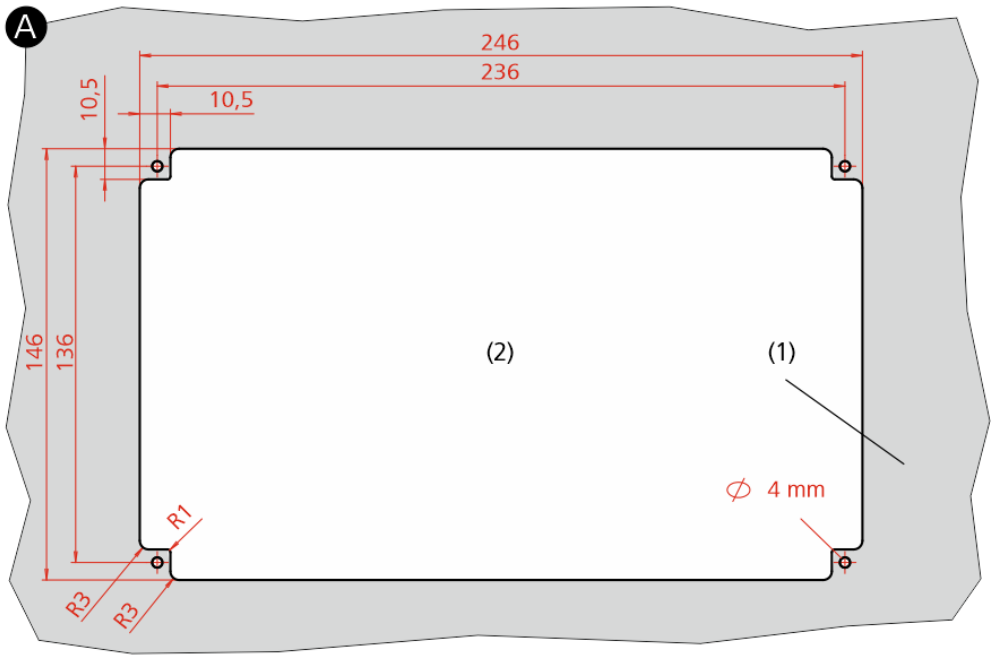
Impact loads on the touch screen are not permitted!

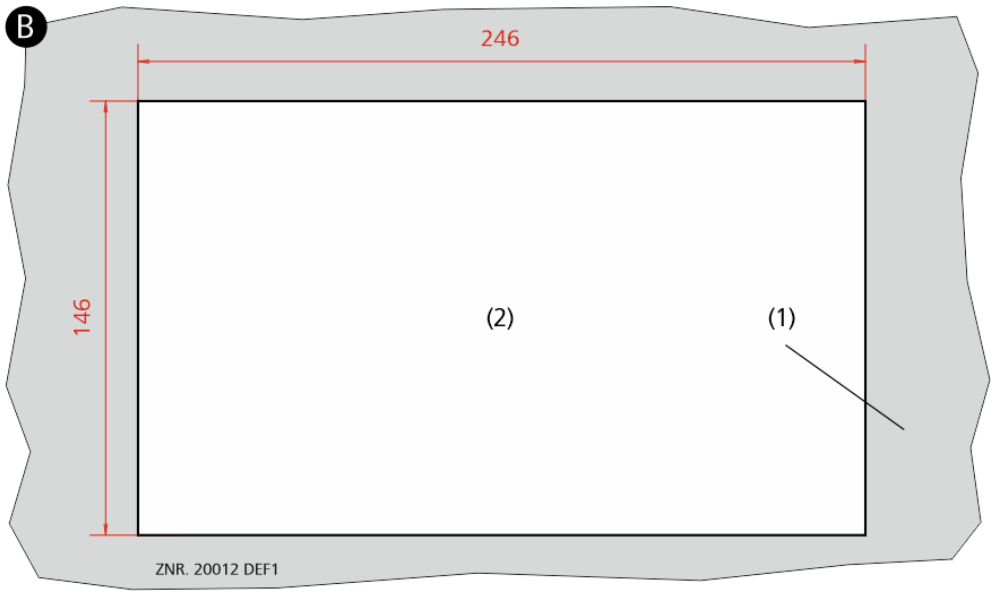
12.2.1 Dimensions



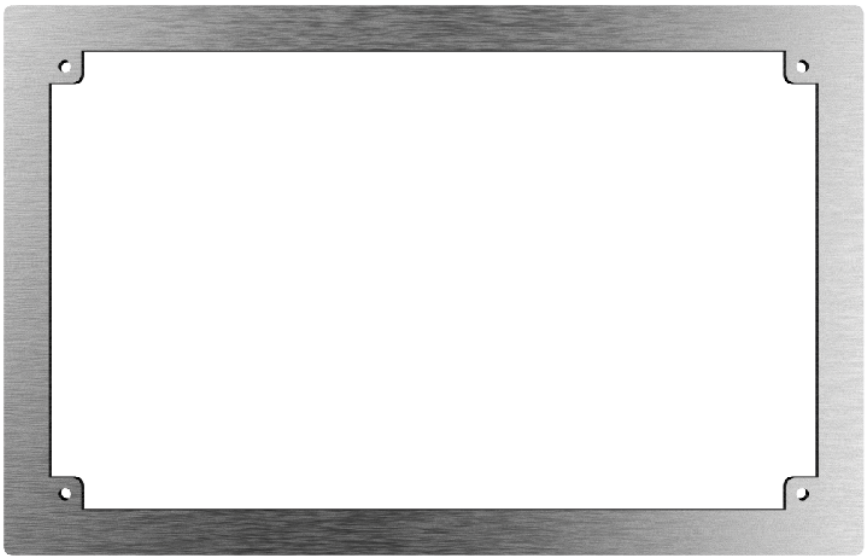
12.2.2 Control panel cut-out

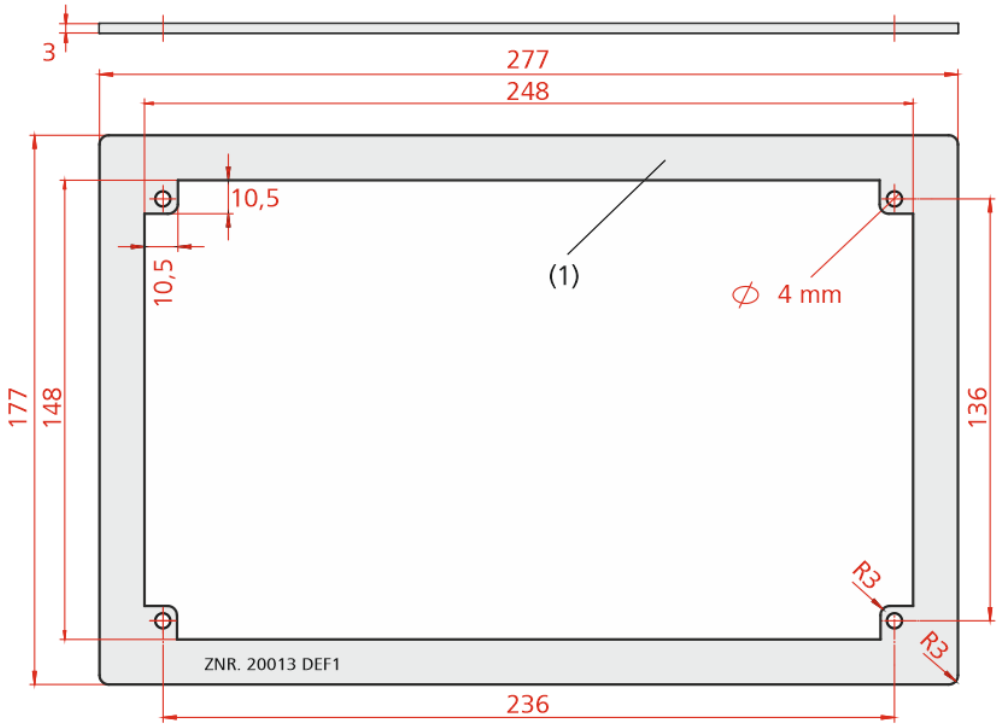
Variant A: Technically most attractive solution with somewhat complex manufacture of the panel cut-out and the 4 x 4 mm holes
Variant B: The rectangular panel cut-out can be realised quickly with a jigsaw, e.g. during commissioning / service; however a mounting frame is needed for installation; see chapter Einbaurahmen zur Schalttafelmontage.


A
246
236
10,5
10,5
146
136
(2)
(1)
∅ 4 mm
R1
R3
R3


B
246
146
(2)
(1)
ZNR. 20012 DEF1

12.2.3 Mounting frame for control panel installation

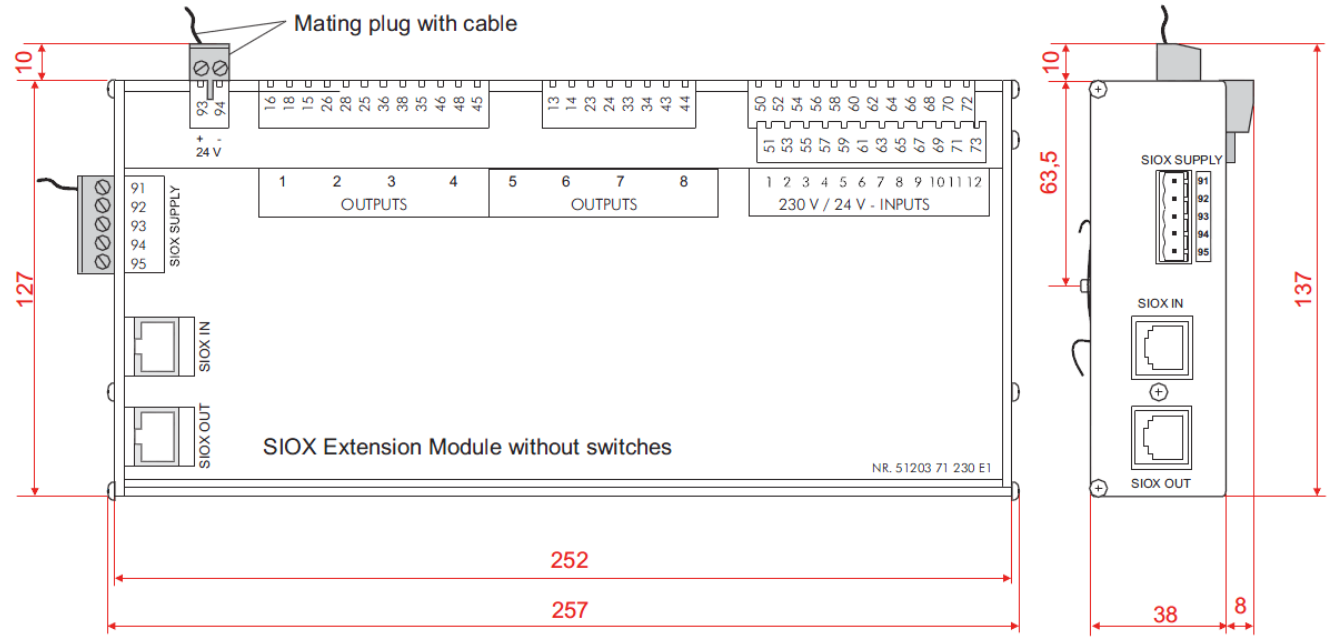




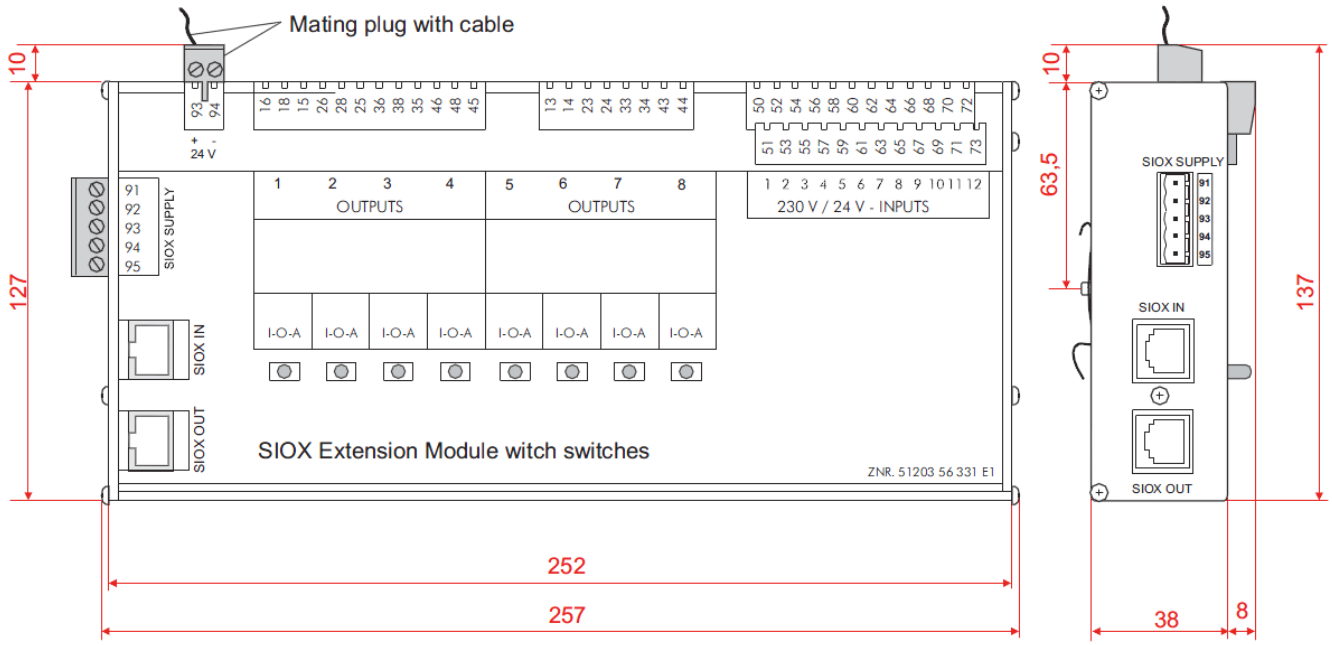
(1): mounting frame, part number: KGLRAHMEN2

12.2.4 SIOX extension module

Without manual control switches



With manual control switches

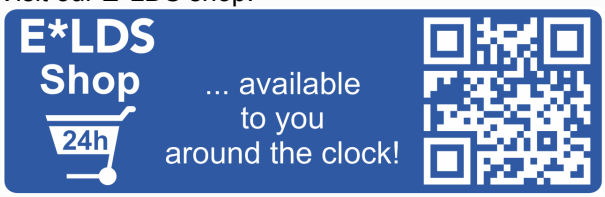


12.3 Information on open source software

Information for Open Source software is shown in Menu 4-5 - General Information v6.0 or at https://edp.eckelmann.de/edp/lds/_V0brLLadsi .

13 Order numbers and accessories of System Centre

Visit our E*LDS shop:



Further https://ldsshop.eckelmann.de

13.1 System centre and SIOX

Type	Description	Part number
CI 4000	System centre: S0 / M-bus meter, GLT, successor for CI 3000 (without Modbus compact controller)	KGLCI4000E
CI 4100	System centre: CI 4000 + Modbus, successor for CI 3000 / CI 3100 (with Modbus compact controller)	KGLCI4100E
CI 4400	System centre: CI 4100 + LAN	KGLCI4400E
CI 4500	System centre: CI 4400 + CAN bus	KGLCI4500E
SIOX extension module	SIOX without manual control switch SIOX with manual control switch (Auto/Off/Manual)	LISIOX0011 LISIOX0012

For details, see chapter Expansion stages of the CI 4000 series

13.2 Accessories for system centre

Accessory part	Description	Part number
Mounting frame	Mounting frame for attachment in switch cabinet	KGLRAHMEN2
SIOX supply cable	Supply cable for the power supply of the SIOX, length 2 m	KABLIND006
SIOX data cable	Data cable from system centre or SIOX to the SIOX in the lengths: 0.4 m 0.7 m 2.0 m 5.0 m	 KABLIND001 KABLIND002 KABLIND003 KABLIND007
Connector set for CAN bus terminatin	Connector set with terminating resistor 100 Ohm for CAN bus, 2 pcs.	KGLCANTERM
Modem GSM	GSM modem	PCZMODEM04
Null modem cable	For connecting the flash cable to the serial interface of the PC / laptop, length 3.0 m	PCZKABSER2
Extension for null modem cable	Extension for null modem cable, length 1.8 m	PCZKABSER3

Accessory part	Description	Part number
SUB-Min-D connector	9 pole SUB-Min-D connector (male) with screw terminals for Modbus connection	STSUBCON9M
Package for inclusion of AHT chest freezers	- For AHT chest freezers with Danfoss SLV controllers - For AHT chest freezers with Wurm controllers - For AHT chest freezers with Danfoss SLV and Wurm controllers	KGLAHTAD01 KGLAHTAD02 KGLAHTAD03
M-bus gateway	For consumption data capture including serial interface cable (an external power supply KGLNT23024 is required) - M-bus Gateway-20 (max. 20 M-bus meters) - M-bus Gateway-60 (max. 60 M-bus meters)	KGLZMBUS01 KGLZMBUS02
Power supply	Power supply 100 - 240 V AC / 24 V DC / 1.3 A	KGLNT23024