



Operating instruction

Combi-Gateway

Version V1.57





Eckelmann Gruppe

Eckelmann AG
Business Unit Refrigeration and Building Management Systems
Berliner Straße 161
65205 Wiesbaden, Germany

Telephone +49 611 7103-0
Fax +49 611 7103-133

E.LDS@eckelmann.de
www.eckelmann.de

Board of Directors:

Dipl.-Ing. Peter Frankenbach (Management Spokesman), Dipl.-Wirtsch.-Ing. Philipp Eckelmann
Dr.-Ing. Frank-Thomas Mellert, Dr.-Ing. Marco Münchhof, Dr.-Ing. Frank Uhlemann

Chairman of the supervisory board:
Hubertus G. Krossa

Registration court / registration number
District court Wiesbaden, Germany
HRB 12636



Before commissioning and use, please check that this is the latest version of the document.
With the publication of a new version of the documentation, all previous versions lose their validity.
Errors and technical modifications are expressly reserved.

The current operating manual and information such as data sheets, more detailed documentation and FAQs are available for you on-line in E°EDP (Eckelmann ° Electronic Documentation Platform) at www.eckelmann.de/elds

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



Information on safety and connection instructions are described in detail in chapter 1 "Industrial safety notes".

All rights to any use whatever, utilisation, further development, forwarding and creation of copies remain with the Eckelmann AG company.

In particular, neither the contract partners of Eckelmann AG nor other users have the right to distribute or market the IT programs/program parts or modified or edited versions without express written permission. To some extent, names of products/goods or designations are protected for the respective manufacturer (registered trademarks etc.); in any case, no guarantee is assumed for their free availability/permission to use them. The information provided in the description is given independently of any existing patent protection or other third-party rights.



Conventions	1
Explanation of 'General Instructions'	1
Explanation of 'Safety Instructions and Hazard Warnings'	1
Warning Signs and Symbols Employed	2
1 Safety instructions	3
1.1 Disclaimer in the event of non-compliance	4
1.2 Personnel requirements, requirements on staff	4
1.3 Intended use	5
1.4 BGV A3 - Five safety rules	5
1.5 Electrostatic sensitive devices (ESDs)	6
1.5.1 ESD - Rules for handling and working	6
1.6 Abbreviations used	6
2 System Design of Combi-Gateway	7
2.1 Introduction	7
2.2 Combi-Gateway design	8
3 Application Combi-Gateway	9
3.1 Application of the E*LDS Combi-Gateway	9
3.2 New features compared to previous versions	10
3.2.1 Version-dependent functions and access data	11
4 Function of Combi-Gateway	13
4.1 Physical Interfaces	13
4.1.1 Power supply	13
4.1.2 CAN bus interface	13
4.1.3 LAN interface	13
4.1.4 USB interface	13
4.1.5 RS232 interface	13
4.2 Software Modules	14
4.2.1 COM Port Server	14
5 Software module LAN-Gateway	15
5.1 Application	15
5.2 Use of LAN-Gateway as an alarm path	16
5.3 Establishing connection using LDSWin	16
5.3.1 Configuration of the computer connection in LDSWin	16



6	Installation and Startup of Combi Gateway	17
6.1	Commissioning	17
6.2	Connection to the CAN bus	18
6.2.1	Standard connection - CI 3000 / CI 3100	19
6.2.2	High speed (fast) connection - CI 3000 / CI 3100 only	20
6.2.3	DIP switch to terminate the CAN bus (terminating resistor)	21
6.3	Status LEDs	22
6.4	Starting Combi Gateway	23
6.4.1	Configuration of the node information and priority	24
6.4.2	Error codes	24
6.5	Network connection (LAN)	25
6.5.1	Network settings using a configuration file (recommended)	26
6.5.1.1	Structure of the configuration file	27
6.5.1.2	IP configuration	28
6.5.2	Correction of an incorrect configuration	28
6.6	Web-based configuration interface	29
6.6.1	Global settings	31
6.6.1.1	Network settings	31
6.6.1.2	Language and time	32
6.6.1.3	System	33
6.6.2	LAN-Gateway	35
6.6.3	XML-Gateway	36
6.6.4	Modbus-TCP-Master-Gateway	37
6.6.5	Modbus-TCP-Slave-Gateway	38
6.6.6	Setup of the COM Port Server	39
6.6.6.1	Connection to a GLT 3010	39
6.6.6.2	Required software on the user PC	39
6.7	Checklist for the putting into service	40



7	Pin and Terminal Assignments	43
7.1	Terminal diagramm of the Combi-Gateway	43
7.1.1	Terminal assignment of the 24 V DC power supply and functional earthing	44
7.1.2	Terminal assignment of CAN1 COMBICON - connection to CAN bus	44
7.1.3	RJ45 interface CAN2 - High speed connection to the CAN bus	45
7.1.4	RJ45 interface RS232	45
7.1.5	RJ45 interface LAN (Ethernet)	46
7.1.6	USB interface	46
8	Decommissioning and disposal	47
8.1	Decommissioning / Demounting	47
8.2	Disposal	47
9	Specifications of Combi-Gateway	49
9.1	Electrical data	49
9.2	Mechanical data	50
9.3	Information on open source software	50
10	Order No.'s and accessories	51
10.1	Combi-Gateway	51
10.2	Components	51



Notice:



Conventions

Explanation of 'General Instructions'

A general instruction is composed of two elements:

1. A pictogram of a hand at the side of the page as well as
2. The actual text:

For example:



Further information on the device's degree of protection is contained in the chapter "Technical Data".

Explanation of 'Safety Instructions and Hazard Warnings'

Safety instructions or hazard warnings are composed of four elements:

1. The pictogram (warning sign / symbol) 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 prevention measures.

For example:



Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE and AFTER connection it must be checked that the 230 V AC relay outputs are **off load!**

On the following pages the warning signs and symbols employed for the safety instructions and hazard warnings in this documentation are described in more detail.



Warning Signs and Symbols Employed

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

- **Attention symbol - general hazard warning**



1. Hazard warning

The attention symbol indicates all safety instructions in this operating instruction and service manual, which, if not observed, could result in danger to life and limb. Carefully comply with the work safety instructions and proceed with special caution in these cases.

2. Attention

The attention symbol highlights guidelines and regulations, instructions and correct working procedures that must be carefully observed in order to prevent damage to or destruction of LDS components or a malfunctioning (for example to avoid 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 - warns of hazardous electrical voltage**



This work safety symbol warns of danger from a hazardous electrical voltage, with potential consequences such as serious injury or death.

- **ESD symbol - warns of electrostatic sensitive components and assemblies**



This symbol indicates electrostatic sensitive components and assemblies, for details see chapter 1.5.

- **Note symbol**



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

- **Battery disposal symbol**



Never dispose of this product with other household waste. Please inform yourself of the local regulations for the separate disposal of electrical and electronic products. The correct disposal of your old equipment will protect people and the environment from possible negative effects. You will find further information in the chapter "Decommissioning and Disposal".



1 Safety instructions



The safety regulations, codes and notes contained in this section must definitely be observed and complied with at all times. During repairs on the entire LDS system, the accident prevention regulations and general safety instructions must be observed. Important information (safety instructions and hazard warnings) are indicated by corresponding symbols (see page 1 of the chapter "Conventions").

Follow these instructions in order to prevent accidents and danger to life and limb, as well as damage to the LDS system.



Warning - hazardous electrical voltage!

Danger of electric shock! Beware of external voltage at the digital inputs and outputs! All device connections/plugs are **only** to be plugged in, unplugged and/or wired when **off load**.

- This operating instruction is an integral part of the equipment. It **must** be kept in the proximity of the equipment and must be stored for future use, so that it can be referred to when necessary. To avoid operating errors, the operation instructions must **always** be kept available for operating and maintenance staff, see Chapter 1.2.
- For safety reasons, the equipment must not be used for any application other than described in the operating instruction i.e. only for the intended use, see Chapter 1.3.
- Before using the equipment, always check that its limits are suitable for the intended application.
- Check that the electric power supply is correct for the equipment before connecting it to power.
- 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 ambient conditions (e.g. humidity and temperature limits) must be observed and complied with in order to avoid malfunctioning (see Section "Specifications").
- Check correct wiring of the connections before switching on power to the equipment.
- Never operate the equipment without its casing. Before opening the casing the equipment must be switched to zero potential.
- Contact the supplier in any malfunction.
- Note that all leads running to and from the controller- especially those of the CAN bus - must be shielded and installed sufficiently clear of other leads carrying live power. Doing so will avoid faulty measurements and will protect the equipment from external interference via the analog inputs.
Parallel connection of RC elements is recommended for applications in a critical environment.



1. According to experience, error message transmission is not yet fully functional during commissioning (no telephone line laid etc.) In such cases it is urgently recommended to monitor the controller via the CAN bus using a store computer or an operator terminal AL 300, and enable error message transmission e.g. using a GSM modem via a mobile telephone network. In stand alone operation, or as an alternative to monitoring with the store computer/ operator terminal, an alarm contact on the controller must be used in order to realise error message transmission via a telephone network.



For further information on the CAN bus, see the operating instruction "Basic and General Safety and Connection Instructions".



Work on electrical equipment may **only be undertaken by authorized and duly trained personnel** (as defined by DIN/VDE 0105 and IEC364) with full observance of the currently valid regulations contained in the following:

- VDE Regulations
- Local safety codes
- Intended use see chapter 1.3
- BGV A3 - Five Safety Rules see chapter 1.4
- ESD precautions and rules see chapter 1.5.
- Operating instructions

1.1 Disclaimer in the event of non-compliance

These operating instructions contain information on the commissioning, function, operation and maintenance of the controls and of the associated components.



Observance of these operating instructions is a prerequisite for safe and trouble-free operation.

1.2 Personnel requirements, requirements on staff

Special skills are required for project planning, programming, assembly, commissioning and maintenance work. This work may be performed by qualified and specially trained staff.

The staff involved in installation, commissioning and maintenance must have received the special training needed for them to work on the unit and on the automation system.

The project planning and programming staff must be familiar with the safety concepts involved in automation technology.

Expertise is a requirement for any work on electrical systems. Work on electrical installations may only be performed by trained electrical specialists (or may only be performed when directed or supervised by them). The applicable regulations (e.g. DIN EN 60204, EN 50178, BGV A3, and DIN VDE 0100/0113) must be followed.

The operating staff who deal with the unit/machine and the controls must be correspondingly trained and familiar with the operating instructions.



1.3 Intended use

This control system may only be used for the purpose for which it is intended:

The Combi-Gateway is intended for use as XML and web based interface for components in the E*LDS system with the scope of functions and under the ambient conditions described in this operating instructions.

Follow the safety instructions, as well as the instructions on installation, commissioning, operation and maintenance. Only THEN should you start commissioning or operating the machine/system.

The safety and function of the machine/unit is only assured in the use for which it has been intended.

Never use the machine/unit, its components, assemblies or parts of it for a different purpose.

The installation may be only operated for the first time when the entire unit has been shown to conform to the EC Directives.

1.4 BGV A3 - Five safety rules

The following rules must be strictly observed:

1. **Disconnect electric power:** Disconnect power at all connections of the entire installation on which work is to be carried out.



Warning - hazardous electrical voltage!

Beware of possible external power supplies! **BEFORE and AFTER** connection it must be checked that the controller is **off load!** All device connections/plugs are only to be plugged in, unplugged and/or wired when off load.

2. **Secure against reconnection of power:** Tag the disconnected equipment with the following information:

- What has been disconnected from power
- Why it has been disconnected
- Name of person who disconnected power
- Use a suitable lock-out (e.g. padlock) to prevent reconnection of power.

3. **Make sure that power is off (authorized and duly trained personnel only):**

- Check with voltmeter immediately before use.
- Check that power is off on all connections at the disconnection point.
- Check that power is off on all connections at the place of work.

4. **Ground and short circuit:** Ground and then short circuit all electrical parts at the place of work.

5. **Cover or bar off adjacent power-carrying parts:** Any equipment carrying power adjacent to the work area must be covered by suitable means (e.g. insulating cloths or panels).



1.5 Electrostatic sensitive devices (ESDs)



Electronic components and assemblies (e.g. printed circuit boards) are vulnerable to electrostatic discharge. Regulations for handling and working with electrostatic sensitive devices must definitely be observed and complied with, see also section 1.5.1!

All electrostatic sensitive devices (ESDs) are identified by the warning sign illustrated. Electrostatic discharge is caused by friction of insulating materials (e.g. floor coverings, synthetic fiber clothing, etc.).

Even slight charges can cause components to be damaged or destroyed. Damage cannot always be ascertained directly and it may take time for the component to actually fail in operation.

1.5.1 ESD - Rules for handling and working

Transport and store ESDs only in the protective packaging provided.

Avoid materials that may produce electrostatic discharge, for example

- Plastic containers and table tops
- Synthetic fiber clothing
- Plastic-soled shoes
- Plastic file covers
- Styrofoam packaging
- Computer monitors, etc.

Preferably wear the following:

- Cotton work clothes
- ESD shoes with conductive soles or leather soles

Use the following:

- Conductive flooring
- ESD workstations equipped with suitable tools (grounded soldering guns, antistatic wrist straps, etc.)
- Conductive ESD bags, conductive plastic containers, IC tubes or cartons lined with conductive foam
- Containers and worktops made of wood, metal or conductive plastics or paper bags

1.6 Abbreviations used

DIN	Deutsches Institut für Normung e. V.
EGB	Elektrostatisch Gefährdete Bauelemente oder Baugruppen
ESD	Electro-static discharge (Electro Sensitive Devices)
VDE	Verband der Elektrotechnik Elektronik Informationstechnik e.V.
IEC	International Electric Committee
BGV	Employer's Liability Association regulations for health and safety in the workplace



2 System Design of Combi-Gateway

2.1 Introduction

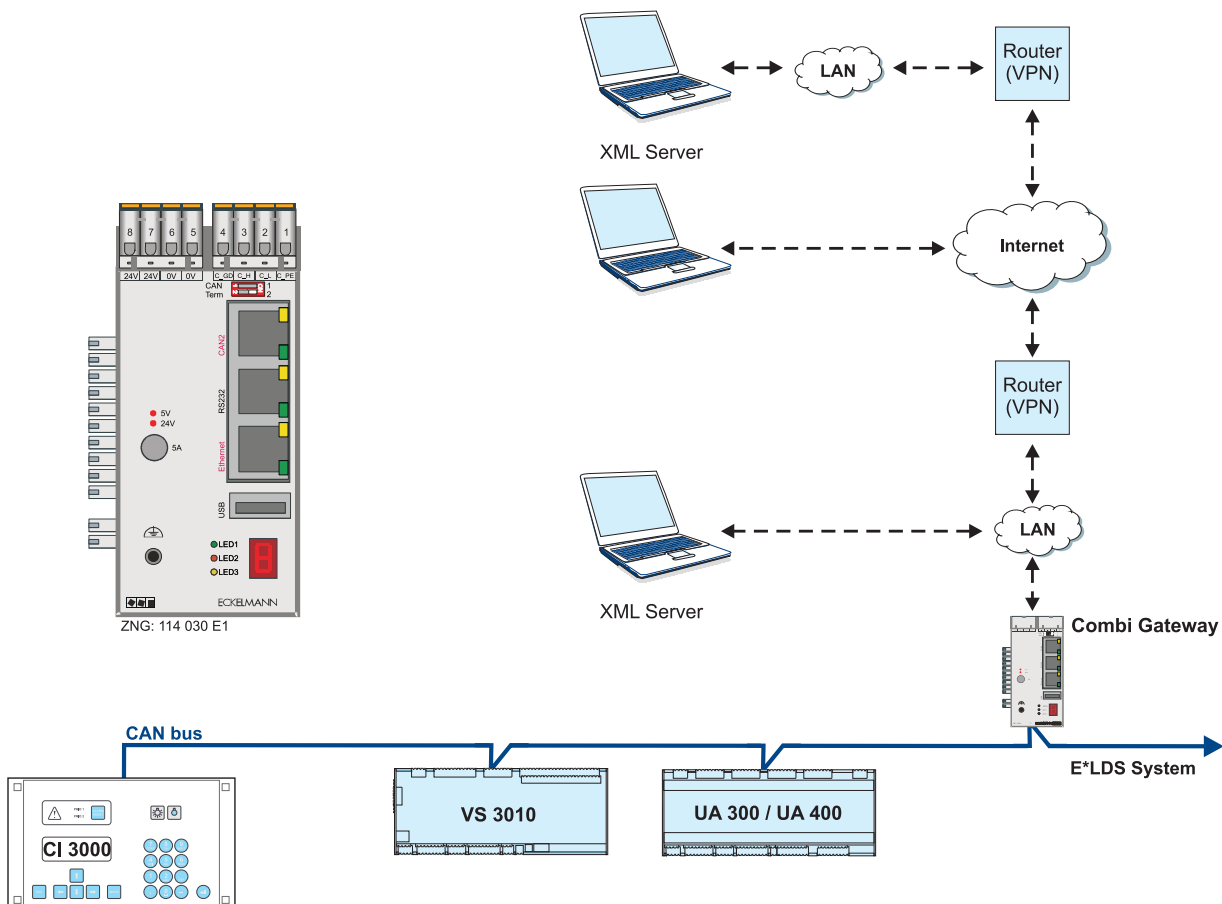
The Combi-Gateway is used to connect an E*LDS system to a network (LAN) for the purpose of local operation on site (e.g. for the market manager) as well as for remote monitoring and configuration.



The Combi Gateway has been specially developed for E*LDS systems where a CI 3000 or CI 3100 System Centre is available. Any use is not intended for E*LDS systems with a CI 4xx0 System Centre!

Furthermore, selection of common parameters and functions of components of the E*LDS system is provided via the XML and web based interface.

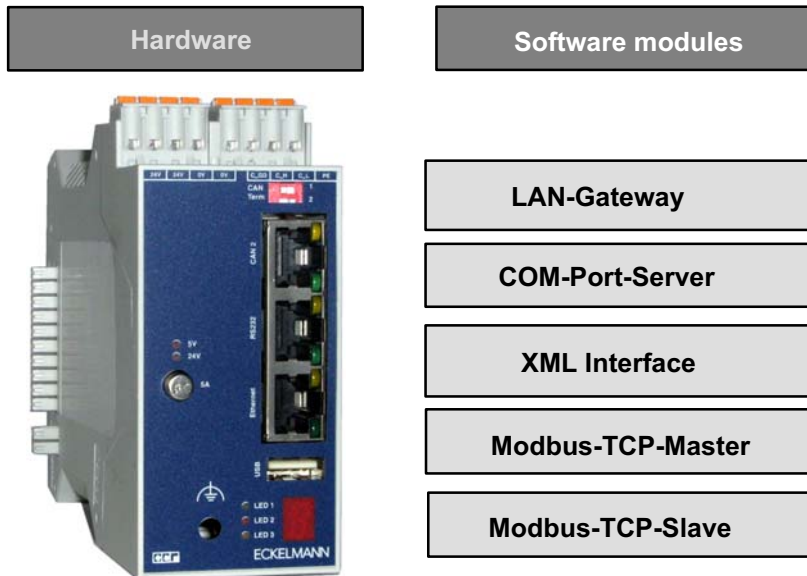
The connection to the E*LDS system is made via the CAN bus.





2.2 Combi-Gateway design

As well as the hardware, the Combi Gateway also consists of software modules:



Interfaces:

2 x CAN bus	CAN1	(COMBICON)	Communication in E*LDS system with 50 kbit (default) (CI 3000 / CI 3100)
	CAN2	(RJ45)	Interface for fast CAN bus connection of the store computer ,CI 3000 / CI 3100 with 250 kbit see chapter 6.2
1 x Seriell	RS232	(RJ45)	COM Port Server for connection to a GLT 3010 via network and CoDeSys
1 x LAN	ETHERNET	(LAN)	LAN connection
1 x USB			A firmware update can be carried out via the USB interface (type A), see chapter 7.1.6.

Power supply:

COMBICON Typ. 24 V DC (19 .. 30 V DC), max. 500 mA



3 Application Combi-Gateway

3.1 Application of the E*LDS Combi-Gateway

- Software module LAN-Gateway
- Enables the network (LAN) connection of an LDSWin PC to the E*LDS system
- Software module XML-Gateway
- Software module Modbus-TCP
- Software-Module Master / -Slave



Explanatory notes for the setup and configuration of the software modules

- XML-Gateway and
- Modbus-TCP-Master
- Modbus-TCP-Slave

are given in detail in the chapters 6.6.3, 6.6.4 and 6.6.5.

More detailed descriptions of the tasks and functions of these software modules are available in separate documents.

- COM Port Server for connection to a GLT 3010 via network and CoDeSys



3.2 New features compared to previous versions

Combi-Gateway	Version	New functions
Basic functions	V1.57	- Increase of the system stability.
Basic functions	V1.56	- Increase of the system stability.
Basic functions	V1.55	- COM Port Server for connection to a GLT 3010 via network and CoDeSys - Increase of the system stability.
Basic functions	V1.51	- Optimization of the software.
Basic functions	V1.3	- Fast CAN bus connection to the store computers CI 3000 / CI 3100 - Network settings using a configuration file.
LAN Gateway	V1.3	Initial Version The LAN-Gateway software module is used to connect an E*LDS system to a network (LAN) for the purpose of local operation on-site (e.g. for the market manager) as well as for remote monitoring and configuration. This TCP/IP-based form of communication represents an alternative to communication via serial interface, modem or CAN bus PC adapter and thus contributes to the development of network-based communication solutions.

For details see chapter 3.2.1.



A firmware update is only to be carried out by trained staff or factory-side by the manufacturer, see chapter 6.6.1.3 for detailed information.



3.2.1 Version-dependent functions and access data



Danger data loss! During an update, all data in the Combi Gateway are reset to the factory settings.

NOTE: Strictly backup the device settings before any firmware update, otherwise connection establishment with the Combi Gateway is no longer possible!

TIP: Use the checklist for putting into service, see chapter 6.7, for backing up the necessary settings. .

The following version-dependent functions must be taken into account when updating:

Version	Version-dependent functions	Access data User name Password
V1.57	A firmware update to V1.57 is recommended to increase the system stability.	webadmin FanTubo3
V1.56	A firmware update to V1.56 is recommended to increase the system stability.	webadmin FanTubo3
V1.55	A firmware update to V1.55 is recommended to increase the system stability.	webadmin FanTubo3
V1.51	NOTE: A firmware update to version V1.51 is urgently recommended as previous versions had problems with the Watchdog in connection with the XML Gateway!	webadmin FanTubo3
V1.50	During an update to V1.50 all data in the Combi-Gateway is returned to the factory settings.	webadmin FanTubo3
V1.3	Initial Version, no comments.	webadmin ufegatila628



Application Combi-Gateway

ECKELMANN

Notice:



4 Function of Combi-Gateway



Eckelmann AG reserves the right to make technical further developments of the interfaces of the gateway. Any resulting costs and adaptations to customer data systems shall not be borne by Eckelmann AG.

4.1 Physical Interfaces

4.1.1 Power supply

The Combi-Gateway includes an integral 24 V DC power supply and need an additional external power supply of 230 V AC to 24 V DC (order number KGLNT23024). See also chapter 7.1.1 for detailed information.

4.1.2 CAN bus interface

The Combi-Gateway has two CAN bus interfaces for connection to the E*LDS system.

- **CAN bus interface 1, COMBICON connectors** on top of the device - Standard connection to the E*LDS system with CI 3000 / CI 3100, see chapter 6.2.1.
- **CAN bus interface 2, RJ45** Fast CAN bus connection to the store computer with CI 3000 / CI 3100, see chapter 6.2.2.

4.1.3 LAN interface

Using this interface, the Combi-Gateway makes functions and data of the E*LDS system available to other network devices (server, PC, notebook), see chapter 5.

4.1.4 USB interface

A firmware update can be carried out via the USB interface (type B), see also chapter 7.1.6.

4.1.5 RS232 interface

COM Port Server for CoDeSys access, see chapter 4.2.1.



4.2 Software Modules

The Combi-Gateway comprises various software modules. Each of these modules extends the possibilities of the Combi-Gateway by further functionalities. The following software modules are currently implemented in the full version:

- LAN Gateway See chapter 5
- XML Gateway Further information can be found in separate documentation.
- Modbus TCP-Gateway Further information can be found in separate documentation.
- Modbus Master / Slave Nähere Informationen gibt es in einer separaten Dokumentation.
- COM-Port-Server See chapter 4.2.1

4.2.1 COM Port Server

The COM Port Server software module is used for the connection of a GLT 3010 via network and CoDeSys and is integrated in the Combi Gateway as standard.

A remote connection to a GLT 3010 was previously only possible using the "GLT modem switching" function. With the increasing disappearance of modem connections and the establishment of network connections, the problem arises that a GLT 3010 can no longer be accessed remotely. The COM Port Server has been developed to resolve this requirement.

The Combi Gateway makes its COM port (RS232) available via the network service so that the GLT 30105 can be accessed via the network connection using CoDeSys; see chapter 6.6.6 for details.



5 Software module LAN-Gateway

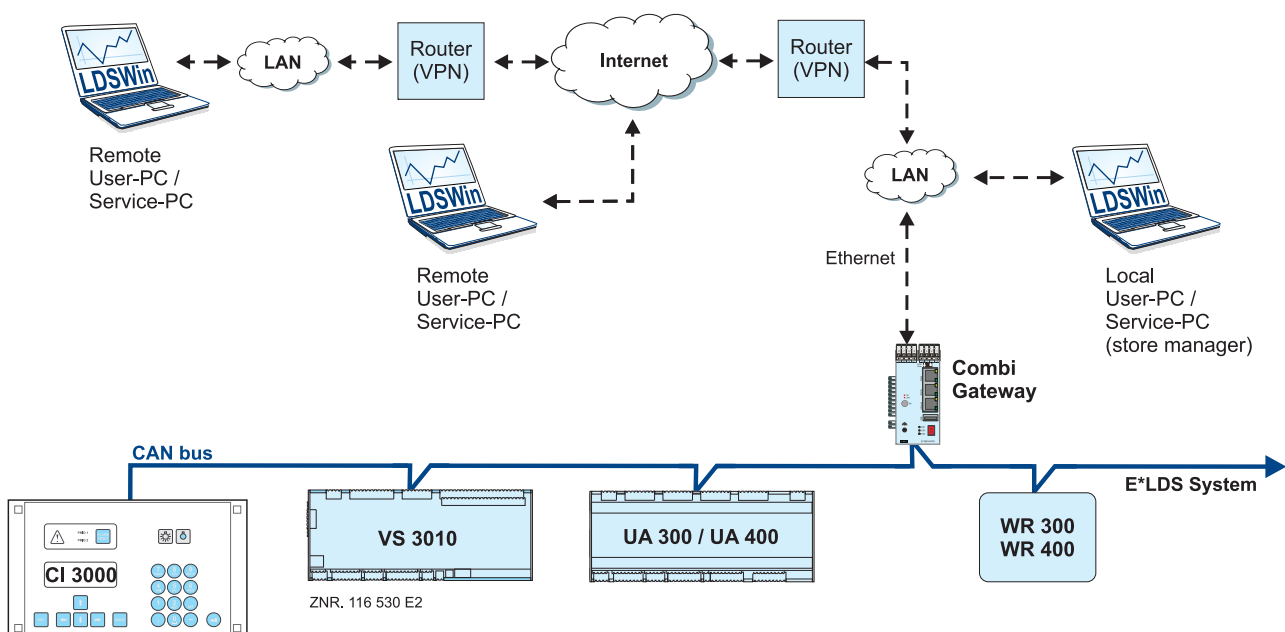


Violation of data protection! The Combi-Gateway is not equipped with any security mechanisms for the encryption of communication via the LAN interface. For this reason, connections should only be established in secure networks. For communication via public or insecure networks, additional security components (e.g. VPN router etc.) should be used.

The Combi-Gateway should never **be directly connected to the Internet!**

5.1 Application

The LAN-Gateway software module is used to connect an E*LDS system to a network (LAN) for the purpose of local operation on-site (e.g. for the market manager) as well as for remote monitoring and configuration. This TCP/IP-based form of communication represents an alternative to transmission via serial interface, modem or CAN bus PC adapter, and it so helps the development towards a network-based communication solution:



It is possible to access the E*LDS system via a PC in the same network (local LAN) using the LDSWin PC software. In addition, a connection can also be made via the LAN Gateway using appropriate, additional VPN solutions to an E*LDS system outside the network boundaries.

Existing Internet connections can be used for this to access an E*LDS system from a remote PC at another location. Up to three simultaneous connections are possible with the LDSWIN PC software.



See chapter 6.5 for further details about establishing a network connection.



5.2 Use of LAN-Gateway as an alarm path

In principle, the LAN Gateway can be used as an alarm path. Alarm signalling can only be carried out if polling is active. The precondition for this is a PC with the PC software LDSWin as remote station which can connect to the LAN gateway via the network. This then retrieves the alarms of the E*LDS system on a cyclical basis.



The LAN Gateway has no active send function for alarms.



The LAN Ggateway should not be used as the only alarm path. A second alarm path, employing a different technology e.g. an uplink to the alarm system, telephone dialling device or similar, must be implemented.

When assessing the reliability of a network based alarm path the availability class of all participating (sub)networks must be considered. Internet connections do not usually achieve the availability level of very good telephone networks.

5.3 Establishing connection using LDSWin

A configurable TCP/IP port in LAN Gateway 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 and as done in LDSWin as follows:

192.168.161.66:5000 (for details see chapter 5.3.1).



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 LAN Gateway is possible!

The use of a "Well Known Port" (0-1023) can result in communication problems and should be avoided!

5.3.1 Configuration of the computer connection in LDSWin

In LDSWIN, the IP address of the LAN Gateway for the store must be entered in the "IP address" field under the "Change name / telephone" section in the selection dialogue of the stores.

Then open the store dialogue and select the **Settings** option from the **File** menu. In the dialog which now opens the following parameters are available for the option **Computer connection** via under the tab **General**:

- A: **Network** - Setting for remote access.
After 5 minutes of inactivity the connection is automatically severed and reactivated.
- B: **Network (local PC)** - Setting for local, on-site access (e.g. PC in store manager's office)
Actual values are collected every 4 seconds by LDSWin, the connection is not severed, the connection is not reactivated.



6 Installation and Startup of Combi Gateway



Important safety instructions!

BEFORE the installation and commissioning of the Combi Gateway, chapter 1 should be carefully read in its entirety and all safety instructions and hazard warnings observed.



CAN bus connection using "high speed connection" (chapter 6.2.2):

In order to prevent "false alarms", it is recommended to activate "Service Mode" in the store computer before repair / maintenance work so that the remote alarm function is suppressed for a limited period. Refer to the operating manual of the store controller for the details for this. The control centre should also be informed.

Background: If the Combi Gateway is disconnected from the power supply or connection lines are disconnected, the store computer would generate an alarm for each component connected to the CAN bus and signal this, e.g. via modem, to the control centre. This flood of messages could result in unnecessary service visits and consequential costs.

6.1 Commissioning



The device may only be mounted on a Cap (DIN) rail and operated as an integrated regulation and control device (EN60730).



6.2 Connection to the CAN bus



Warning - hazardous electrical voltage!
Danger of electric shock! BEFORE connecting it must be ensured that the power supply is off load.

The Combi Gateway uses the CAN bus addresses **126 and 126 or 127**, which are used in the following software modules:

CAN bus address	110:	XML Gateway (fixed address)
	126 oder 127:	LAN Gateway (wahlweise konfigurierbar, siehe Kapitel 6.6.2)

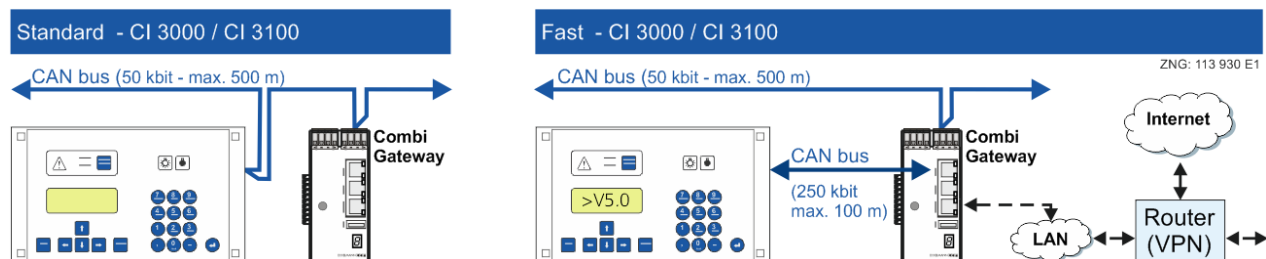


CAN bus address conflict! The parallel operation of a Combi-Gateway with a **CAN Bus to PC adapter** is only possible when the LAN Gateway's CAN bus address is set to **127**. For data archiving and system monitoring the connection should be made via the Combi-Gateway. The simultaneous, parallel retrieval of archive data can lead to recording gaps in the instances retrieved!

The Combi Gateway can be integrated in the LDS system via the CAN bus as follows:

- **Standard connection:**
The data exchange with the store computer CI 3000 / CI 3100 is performed at approx. See chapter 6.2.1 for detail
- **High speed (fast) connection**
The data exchange with the store computer CI 3000 / CI 3100 is performed at approx. 250 kbit See chapter 6.2.2 for details

The following diagram illustrates the mode of operation:



Unprofessional shielding of the CAN bus leads to electromagnetic noise fields. During wiring work, it is essential that the conductors be connected by a professional and correctly shielded. The following cable type must be used for the CAN bus cable: LIYCY 2x2x0.75 mm2 (twisted pair and shielded).

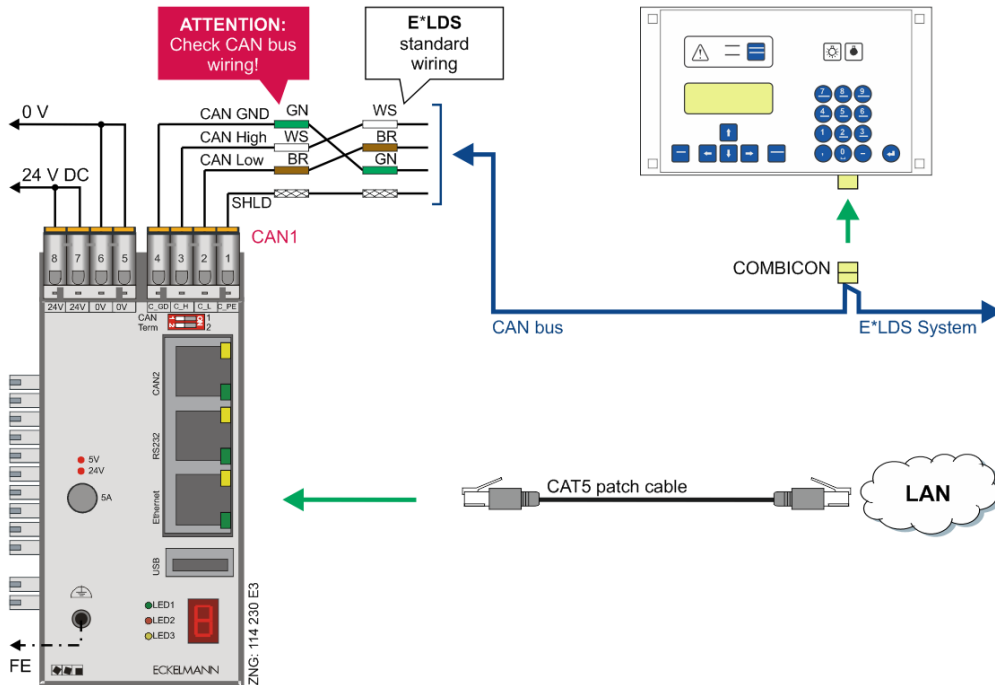


Further details for connection to the CAN bus (cable type, cable length, necessary terminating resistors and correct installation, etc.) are described in detail in the operating manual "Basics and general safety and connection instructions".



6.2.1 Standard connection - CI 3000 / CI 3100

The connection of the Combi Gateway to the CAN bus of the LDS system is performed in the same way as for all other components; the data exchange with the store computer is performed at approx. 50 kbit:



Procedure

Step 1: Before the first start-up, the Combi Gateway must be connected to the CAN bus via the COMBICON connector (CAN1 interface) on the top right on the device.



If the Combi Gateway is installed at the end of the CAN bus segment, the terminating resistor of the CAN1 interface must be set to ON using the DIP switch CAN Term1; see chapter 6.2.3.

Step 2: Settings on the store computer:

- store computer with firmware < V5.0: Not required.
- store computer with firmware >= V5.0: The parameter *CAN-Bus fast* (menu 6-1-1) must be set to *No*.

Step 3: The connection to the LAN is made using a CAT5 patch cable.

Step 4: The Combi Gateway must be connected to the functional earth and supplied with 24 V DC. If necessary, use a 230 V AC/24 V DC power supply (order number KGLNT23024).

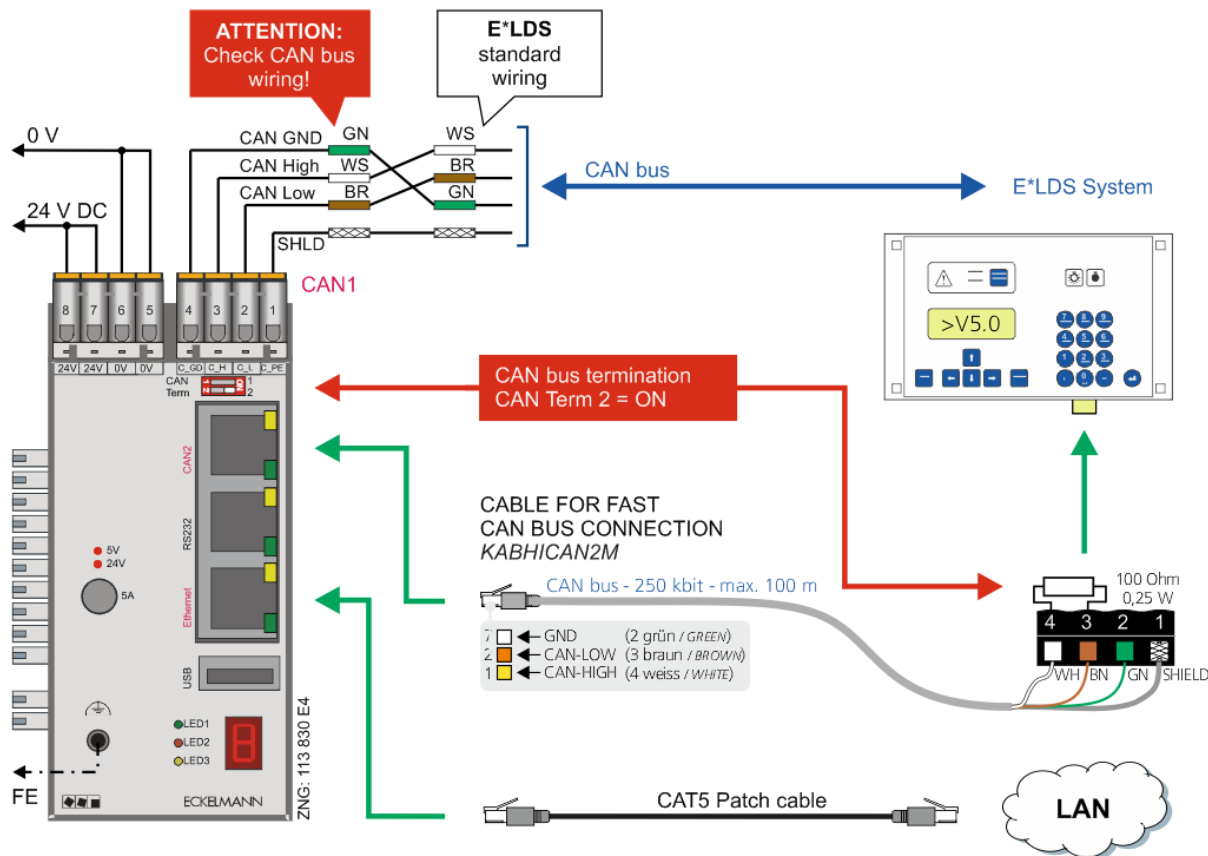


6.2.2 High speed (fast) connection - CI 3000 / CI 3100 only

The high speed CAN bus coupling increases the data transmission rate between store computer and Combi Gateway.

The connection to the CAN bus of the LDS system is made via the CAN1 interface. For the high speed connection, the Combi Gateway is directly connected to the store computer via the CAN2 interface.

In this case, the data exchange with the store computer is performed at approx. 250 kbit:



Procedure

Step 1: Before the first start-up, the Combi Gateway must be connected to the CAN bus of the LDS system via the COMBICON connector (CAN1 interface) on the top right on the device.



Only if the Combi Gateway is installed at the end of the CAN bus segment, the terminating resistor of the CAN1 interface must be set to ON using the DIP switch CAN Term1; see chapter 6.2.3 for details.

Step 2: Settings on the store computer:

- the store computer must be equipped with the firmware V5.0 or higher
- the parameter *CAN-Bus fast* (menu 6-1-1) must be set to Yes.

Step 3: The Combi Gateway is connected to the CAN bus terminals of the store computer using the connection cable (order number KABHICAN2M) at the RJ45 connector (CAN2 interface) on the front panel of the device. Connect the open end of the cable to the store computer's COMBICON plug, whose terminals (3 and 4) must be fitted with the resistor (100 Ohm). Recommendation: For assembly use the terminal set with integrated 100 Ohm terminating resistor, order number KGLCANTERM, see chapter 7.1.3 for details.



The terminating resistor of the CAN2 interface of the Combi Gateway **must** be set to ON using the DIP switch CAN Term2; see chapter 6.2.3 for details.



Installation and Startup of Combi Gateway

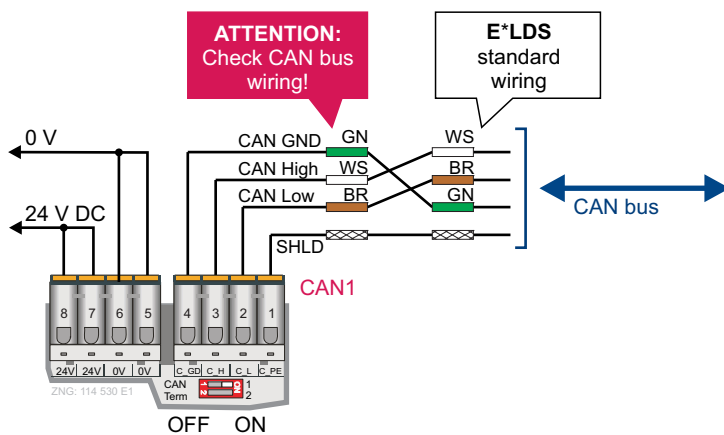
Step 4: The connection to the LAN is made using a CAT5 patch cable.

Step 5: The Combi Gateway must be connected to the functional earth and supplied with 24 V DC. Falls benötigt, muss ein 230 V AC/24 V DC Netzteil verwendet werden (Artikel-Nummer KGLNT23024).

6.2.3 DIP switch to terminate the CAN bus (terminating resistor)

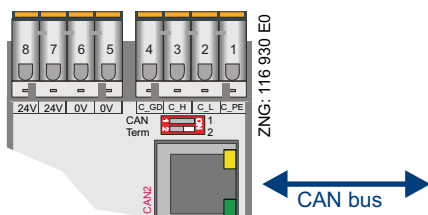
After wiring, the following must be observed for the connection of the Combi Gateway to the CAN bus:

- CAN bus connection to the LDS system:



Only if the Combi Gateway is installed at the end of the CAN bus segment, the terminating resistor of the CAN1 interface **must** be set to **ON** using the DIP switch CAN Term1.

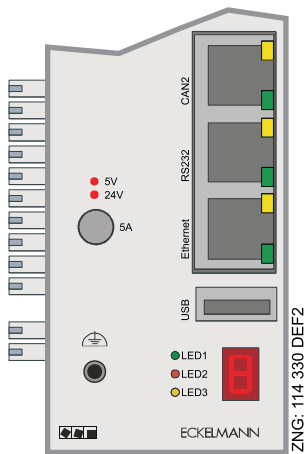
- CAN bus connection directly at the store computer CI 3000 / CI 3100 via connection cable (order number KABHICAN2M):



This setting must only be taken into account for high speed connection (CI 3000 / CI 3100 only). The terminating resistor of the CAN2 interface of the Combi Gateway **must** be set to **ON** using the DIP switch CAN Term2.



6.3 Status LEDs



LED		Colour	Function	
5 V		red	Status 5 V DC:	ON = OK
24 V		red	Status 24 V DC:	ON = OK
RJ45	CAN2	Yellow	Flashing	Data transfer to the CAN2 interface (RJ45)
		green	OFF:	NO data transfer to the CAN2 interface (RJ45)
			ON:	Communication to the store computer possible
			OFF:	Communication to the store computer NOT possible
	RS232	yellow green	For future functions	
	Ethernet	yellow green	ON:	Data transfer
			ON:	Connected to LAN
Blaue Front	Weiß Front			
LED1	WDOG	green	For future functions	
LED2	LED1	red	Flashing	Data transfer on CAN1 interface (COMBICON)
			OFF:	NO data transfer on CAN1 interface (COMBICON)
LED3	LED2	yellow	ON:	CAN1: Communication to store computer possible
			OFF:	CAN1: Communication to store computer NOT possible
7-Segment display (bottom right)		red	Circling:	OK
			Error codes:	See chapter 6.4.2 for detailed information



6.4 Starting Combi Gateway

During the start-up of the Combi Gateway messages are shown in the 7-segment display.

Sequence during start-up	7-segment display	Description
1. Start-up	0... 1... 2... 3	Display of 0, 1, 2, 3, the controller is booting
	cycling	
2. Information on USB stick (s. chapter 6.5.1) and configuration file (s. chapter 6.5.1.1)	c o n f - s n f c o n f - f n f c o n f - e r r c o n f - s u c	The following information is displayed following "conf" (configuration): snf Stick not found – USB stick is not recognized. Cause: The USB stick has not been plugged in, or the plugged USB stick is not recognised, i.e. supported. fnf File not found – A USB stick has been recognised, but no configuration file. Cause: The file cannot be found on the USB stick, see chapter NO TAG. err Error – Faulty data, no changes have been made. Cause: At least one data point within the configuration file is outside the valid value range, see chapter 6.5.1.1. suc Success – The configuration file has been successfully read and used.
	cycling	
3. Information on the IP configuration	IP- xxx.xxx.xxx.xxx	Display of the IP address: The IP address is displayed with the four xxx numbers separated by a point.
4. Standard operating mode	cycling	The Combi-Gateway is in standard operating mode.
Display of error messages	E -- 0 - 2 E -- 0 - 6 E -- 4 - 5 E -- 6 - 0	Two-digit error code, see chapter 6.4.2

The 7-segment display begins to cycle when operational readiness is reached. This process can last up to 5 minutes. The standard operating mode of the Combi Gateway displays the following messages:

7-segment display: circling
LED 2:: ON



In case of an error a two digit error code will be displayed, see chapter 6.4.2 for detailed information.

The LED labelled **LED 2** indicates that the Combi Gateway is able to communicate with the store computer of the E*LDS System. The LAN gateway is now included in the monitoring of the system's CAN bus components and is subject to failure monitoring by the store computer (alternatively: operator terminal), see chapter 6.4.1.



6.4.1 Configuration of the node information and priority

The participant information and the priority can also be configured using a browser via the configuration interface in the Administration area of the controller; see chapter 6.2.2.

These settings can also be made on the store computer.

Procedure: Under the store computer's menu item 7 - "Monitoring", select submenu 3 - "Configuration" and enter the CAN bus address **126 or 127** of the Combi Gateway. At the same time, it is also checked whether the Combi Gateway has been correctly integrated as participant in the E*LDS system.

Now - with the corresponding rights - both the name as well as the alarm priority of the Combi Gateway can be changed. The monitoring and failure alarm is carried out analogous to the other E*LDS components.

6.4.2 Error codes

In case of an error a two digit error code will be displayed:

E -- 0 - 2: Indicates that the store computer is running an incompatible firmware. The supplier must be contacted to obtain compatible firmware for the Combi Gateway or the description how a firmware update is performed for a store computer.

E -- 0 - 6: FLASH defect

Cause: A file required internally cannot be read.

Remedy: Restore the controller to the factory settings, see chapter 6.6.1.3.

If this does not produce the desired result please contact customer services and replace the device.

E -- 4 - 5: Indicates a CAN bus address conflict. Another controller in the E*LDS system is configured to the same address as the Combi Gateway. Probably it conflicts with an LDS LAN-Gateway or the LDS CAN bus adapter. Check register of the CAN bus addresses.

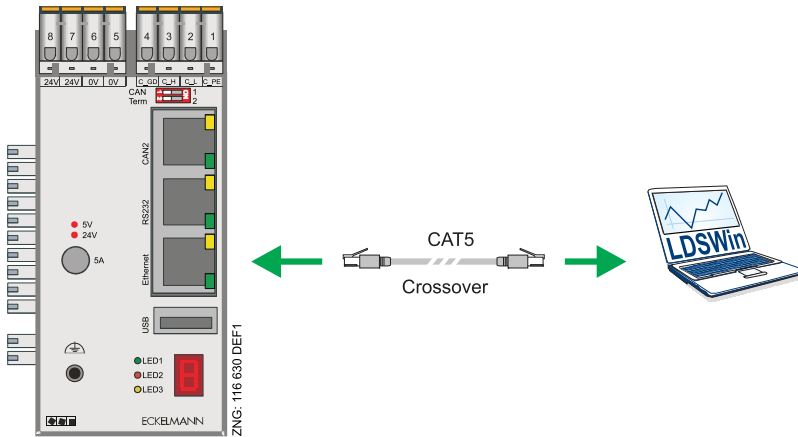
E -- 6 - 0: The Modbus-TCP-Master configuration file is missing (error in the submodule "Modbus-TCP-Master")

Remedy: Load the configuration file via the web-based configuration interface in the controller, see chapter 6.6.4.

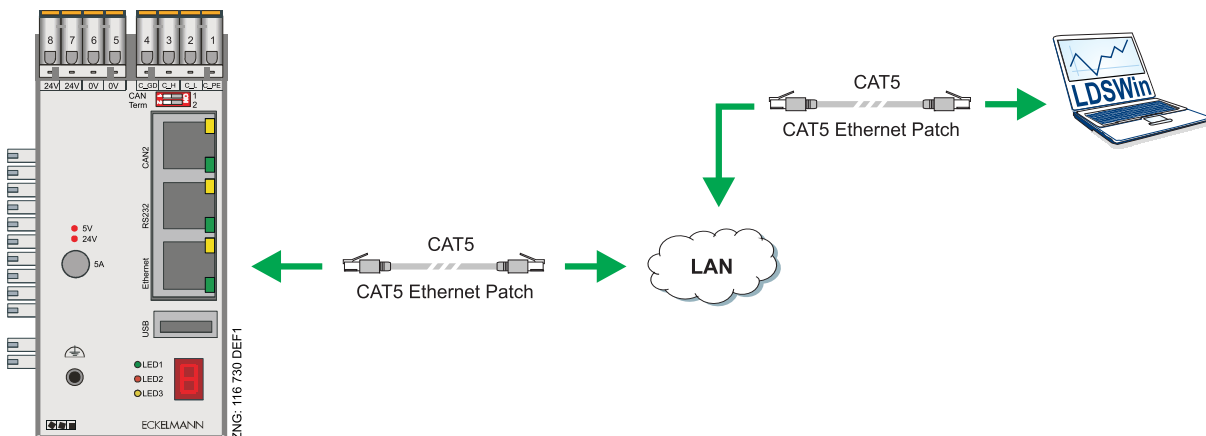


6.5 Network connection (LAN)

A: An Ethernet crossover patch cable CAT5 is needed for a **local** connection between LAN-Gateway and PC (LDSWin as remote station):



B: An Ethernet patch cable CAT5 is needed for a **remote** connection via a network between LAN-Gateway and PC (LDSWin as remote station).



For communication within a network, the Combi Gateway needs an individual IP address, including the corresponding subnet mask. These details must be obtained from the administrator of the network **before** commissioning and configuring the Combi Gateway as described in section 6.5.1. The Combi Gateway may only be integrated in the network after this has been done.



The LAN-Gateway uses the TCP port 5000 for communication. This port must be opened if a connection is made via a firewall. The XML and HTML interfaces communicate via the TCP port 80 (HTTP). This port must be opened for TCP/IP and HTTP services if a connection is made via a firewall.



Failure of components!

A double or incorrect assignment of IP address and/or subnet mask can lead to the failure of components within a network. Consequently, in every case, the Combi Gateway must be provided with an appropriate IP address **before** connection to the network.

Violation of data protection!

Under no circumstances should the Combi Gateway be connected directly with the Internet. 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 employed.



The following methods are available for the configuration of the network settings:

- network settings using a configuration file (recommended); see chapter 6.5.1
- web-based configuration interface; see chapter 6.6.

6.5.1 Network settings using a configuration file (recommended)

The Combi Gateway provides the possibility of conveniently loading a configuration file using a USB stick. In this way, all the settings required for the network are configured automatically.



With this technique, it is possible to modify the network settings of the gateway if the network can no longer be reached due to incorrect configuration of the gateway.

Requirements

- USB stick
- The *ELDS_Combi_Gateway_Configuration.ini* file is in the root directory of the USB stick.
- The structure of the configuration file is explained in chapter 6.5.1.1.



6.5.1.1 Structure of the configuration file

File name: "ELDS_Combi_Gateway_Configuration.ini"

Erstellung: The configuration file can be created and edited using any standard text editor (e.g. Notepad). It must be strictly ensured that the following file structure is maintained.

Configuration file example: The parameters marked as "bold" must be adapted and the changes saved under the file name *ELDS_Combi_Gateway_Configuration.ini*:

```
; Dateianfang #####
; E*LDS - Combi-Gateway Konfigurationsdatei
;                               CONFIGURATION FILE
;
; #####
; HINWEIS
; - Der Dateiname muss ELDS_Combi_Gateway_Configuration.ini heißen
; - Keine führende Nullen in der IP-Konfiguration          (Bsp: 192.168.161.66)
; - Auf Tippfehler achten
; - Datei-Kodierung: ASCII text
; - Copyright 2015 - Eckelmann AG - Alle Rechte vorbehalten.
;
; NOTE
; - THE FILE MUST BE NAMED AS ELDS_Combi_Gateway_Configuration.ini
; - WITHOUT LEADING ZEROES IN THE IP Configuration        (EXAMPLE: 192.168.161.66)
; - PAY ATTENTION TO TYPING ERRORS
; - FILE CODING: ASCII text
; - Copyright 2015 - Eckelmann AG - ALL RIGHTS RESERVED.
; #####
; Netzwerk-Konfiguration Ethernet Schnittstelle (RJ45)
; NETWORK CONFIGURATION ETHERNET INTERFACE      (RJ45)
;
[network_eth0]
; IP-Adresse          (anzupassen / TO BE EDITED)
ipAddress=192.168.161.66
; Subnetzmaske        (anzupassen / TO BE EDITED)
subnetMask=255.255.255.0
; Standard-Gateway    (anzupassen / TO BE EDITED)
standardGateway=192.168.161.1
; Hostname             (anzupassen / TO BE EDITED)
hostname=elds-gateway
; Dateiende #####
```



The required parameters for the configuration file can be found in chapter 6.6.1.1 Network Settings
PRACTICAL TIP: The configuration file can be downloaded and adapted afterwards using the following link: https://edp.eckelmann.de/edp/lds/_M3uZco3pG2

The file is present as template) in the ZIP archive of the firmware and has the name there of *template_ELDS_Combi_Gateway_Configuration.ini*

It is recommended to arrange creation of the configuration file by the responsible network administrator. The adapted configuration file for the network settings must be renamed to *ELDS_Combi_Gateway_Configuration.ini* and then copied to the root directory of the USB stick!

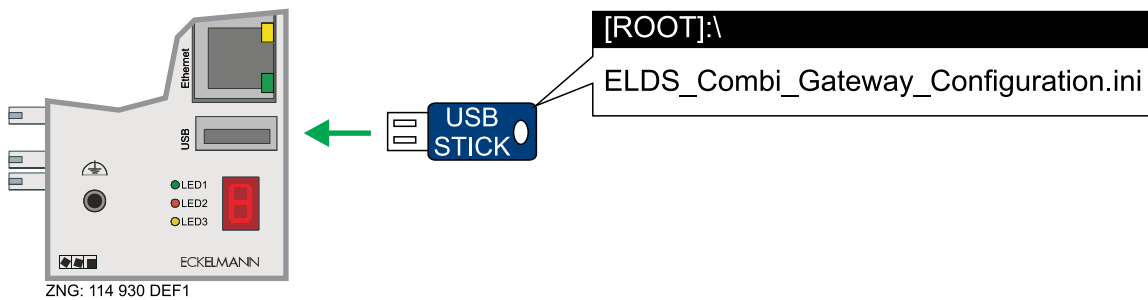


6.5.1.2 IP configuration

Step 1: Disconnect the gateway from the power supply

Step 2: If the USB stick has mechanical write protection, this must be set to "without write protection".

Step 3: Plug the USB on which the configuration file "ELDS_Combi_Gateway_Configuration.ini" has been copied into the USB socket of the controller:



Step 4: Switch on the gateway again (the controller detects the configuration file during system start and adopts the settings contained there).

Step 5: USB stick can be unplugged again as soon as the 7-segment display of the gateway is cycling.



PRACTICAL TIP: After successful application of the network settings, the gateway has renamed the configuration file to **[USED]ELDS_Combi_Gateway_Configuration.ini**. Further details for the manual configuration of the settings on the notebook of the commissioning engineer are explained in chapter 6.6.

Checking the IP configuration: Remove the patch cable from the Combi-Gateway during operation – wait 5 seconds and plug back in – the IP address will now be shown in the 7 segment display, for information on the display see chapter 6.4. If this does not produce the desired result, continue with the steps described in chapter 6.5.1.

6.5.2 Correction of an incorrect configuration

In the case of incorrect configuration of the IP address, the web-based configuration interface of the Combi Gateway cannot be reached and any input is thus no longer possible!

Checking the IP configuration could be of assistance, see the PRACTICAL TIP in chapter 6.5.1.2:



However, the required network settings can be loaded again using a configuration file so that input is possible again; see chapter 6.5.1 for this.



6.6 Web-based configuration interface

Using the web-based configuration interface, parameters of the Combi Gateway can be set using a web browser. The requirements for the web browser are:

- Minimum screen resolution:
800 x 400 pixels (width x height)
- Minimum versions of supported browsers:
Mozilla Firefox 10.0, Internet Explorer 8, Google Chrome 24.0, Safari 6.0, Opera 12.0

The device on which the web browser is integrated must be configured with compatible network settings (same network) for the Combi Gateway so that the configuration interface can be reached using the web browser, for detailed infos see https://edp.eckelmann.de/edp/lds/_2YqrLxxxXw.

The Combi Gateway is preconfigured with the following network settings at the factory:

Hostname

(„computer name“
in the mask): Combi-Gateway

IP Address: 192.168.161.66

Subnet Mask: 255.255.255.0

Gateway: 192.168.161.1

If the network settings of the Combi Gateway have already been configured manually (see chapter 6.5.1), the currently set values must be selected.

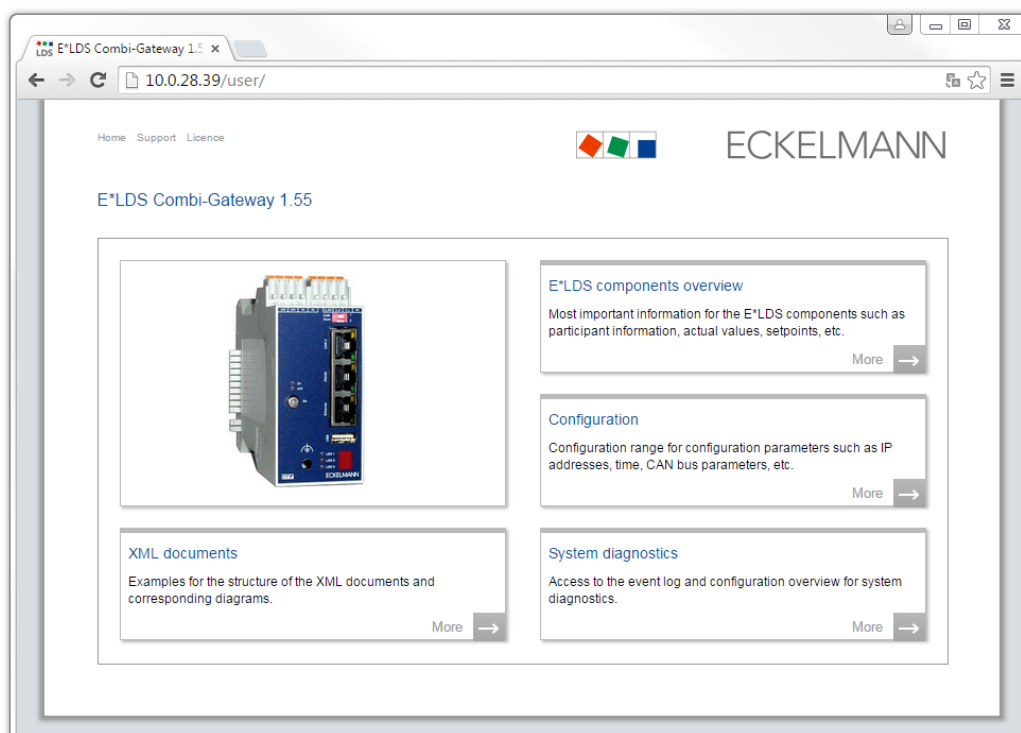
Example: The IP configuration of the web-capable device can look like the following:

IP Address: 192.168.161.1

Subnet Mask: 255.255.255.0

The main screen of the configuration interface of the Combi Gateway can be reached by entering the following address in the browser:

http://192.168.161.66:





The "More" button in the "Configuration" field must be pressed to configure the Combi Gateway and its software modules. The following screen is displayed for the configuration of the network settings:

The individual configuration parameters for the individual software modules are grouped thematically in tabs. The corresponding configuration screen explained in further detail below of the respective software module is reached by clicking on the tab in the tab bar.

The input options are available:

- Default input fields (if these are greyed out, these values cannot be changed)
- Drop-down menus for selection of possible parameters
- Checkboxes for activating the required option
- "Upload" button for uploading a file
- The changed parameters are saved by pressing the "OK" button.



Refer to the corresponding help texts in the configuration interface for explanations of the individual input values. If parameters are input incorrectly, these are marked red and the user receives an appropriate notification.



6.6.1 Global settings

The **Global settings** tab contains parameters and functions for configuration and operation of the Combi-Gateway.

6.6.1.1 Network settings

The network settings are configured under the tab

Global settings / Network.

The screenshot shows the configuration interface for the Combi Gateway. The 'Global settings' tab is selected, and the 'Network' sub-tab is active. The 'Network' section contains the following fields:

Computer name:	Combi-Gateway
IP address:	192.168.161.66
Subnet mask:	255.255.255.0
Default gateway:	192.168.161.66
MAC address:	00:05:7E:00:66:10

An 'OK' button is located below the fields. To the right, a 'Network' section contains the following instructions:

- The gateway must always have an appropriate address before the connection to the network!
- A duplicate or incorrect allocation of IP addresses and/or subnet masks can result in failure of components in a network.
- If an invalid IP configuration has been entered, the configuration interface can no longer be reached. Further information for this case can be found in the operating manual.
- The MAC address cannot be changed.

The settings received from the network administrator can be entered in the corresponding fields. These are confirmed afterwards by pressing the "OK" button.

If the network parameters have been input correctly, they are saved in the Combi Gateway.

The default network settings are shown in chapter 6.6. The network settings can be reset to default values by resetting the Combi Gateway to the factory settings (see chapter 6.6.1.3).

As a result, it is possible that the network settings of the configuration PC and those of the Combi Gateway are no longer compatible with each other. This results in the web-based configuration interface no longer being accessible!



NOTE: It is important that the **new** IP configuration entered is documented on the device or in its immediate vicinity. If it is no longer possible to access the configuration interface due to a missing IP address, this can be displayed as follows: Remove the patch cable from the Combi-Gateway during operation – wait 5 seconds and plug back in – the IP address will now be shown in the 7 segment display, for information on the display see chapter 6.4.

If this does not produce the desired result, continue with the steps described in chapter 6.5.1.



6.6.1.2 Language and time

The settings relating to the language of the web-based interface and the time of the Combi-Gateway are configured under the tab

Global settings / Language and time

Language

The option "LDS" as well as the supported languages can also be selected in the drop-down box. In this case, the language of the configuration interface is automatically changed to the language selected as "system language" in the store computer provided this is supported by the Combi-Gateway.

Global settings | LAN Gateway | XML Gateway | Modbus TCP Master Gateway | Modbus TCP Slave Gateway

Network | COM Port Server | Language and time | System | Security

Language

English (EN) ▼
Deutsch (DE)
English (EN)
LDS

Time zone

(UTC+01:00) Europe/Berlin ▼

OK

Language

- The language of the gateway interface can be changed to the optionally available language in the list.
- The system language of the E*LDS system is set by selecting the 'LDS' option.

Time zone

Attention: Incorrect setting of the time zone results in incorrect output of date and time.

- The gateway operates internally based on coordinated universal time (UTC).
- The appropriate time zone must be selected to display the time information in the local time at the location of the E*LDS system.

Time

Different time zones of the Earth with the UTC information are available for the options for setting the time zone. UTC is coordinated world time which is a standard. Starting from the Greenwich Meridian, the other times in the different time zones of the world are derived.

A time specification in the form 12:15 UTC+1:00 means 12:15 local time (local zone time) for a time zone which is one hour in advance of UTC (e.g. CET). The UTC at this time is then 11:15.



6.6.1.3 System

The following functions can be performed under the tab **Global settings / System**:

- System restart
- Load factory settings
- Perform firmware update
- Activation of the following software modules:
Modbus-TCP-Master-Gateway and Modbus-TCP-Slave-Gateway

The screenshot shows the 'System' tab in the configuration interface. It is divided into three main sections:

- System restart:** Shows 'System running since: 06 Day(s) 19:24:25' and a 'Restart' button.
- Factory settings and firmware:** Contains 'Factory settings:' with a 'Load' button and 'Firmware update:' with a 'Check' button.
- Activation code:** A text input field with an 'OK' button.

The right-hand pane is titled 'Firmware update' and contains the following text:

Attention: The firmware update process must not be interrupted at any time!

Performing firmware update:

1. Plug the USB stick with the firmware update into the USB socket on the front of the gateway case.
2. Press the 'Check' button to check the new firmware.
 - This process takes about 10 seconds.
3. If the firmware has been checked successfully, the label of the "Check" button changes to "Update".
4. The "Update" button must now be pressed to perform the firmware update.
 - This process takes about 10 minutes and must not be interrupted!
 - During this time, the configuration interface cannot be used and the gateway cannot be reached.
5. The configuration interface is reloaded after successful firmware update.

If any error occurs during the update, further information can be found in the operating manual.

Activation code

System restart

The system can be restarted using the "System restart" button. A system restart is required in some cases, e.g. for saving changes in the configuration. There is an appropriate note in the help texts for this.

A restart is initiated by pressing the "OK" button.

Factory settings



When the "Load" button is pressed, the current configuration files are deleted and the Combi-Gateway is reset to the factory settings!
All configured parameters are irretrievably lost!



In this context, the current network settings are also deleted!
Further information for this case can be found in chapter 6.5.1.



Firmware update

The Combi-Gateway is supplied with the current firmware, ready for operation. Future software versions can be loaded into the Combi-Gateway as required using a firmware update, and thus updated.



Caution: data loss! All settings of the Combi Gateway are reset to the factory settings for any firmware update. Only the activation code is not reset; this is retained and does not have to be entered again.

NOTE: Strictly backup the device settings before any firmware update, otherwise connection establishment with the Combi Gateway is no longer possible!

TIP: Use the *checklist for putting into service*, see chapter 6.7, for backing up the necessary settings.

The loading of the software via firmware update must not be interrupted. The power cable and USB stick must not be disconnected during the firmware update. It must be ensured that power is supplied throughout the entire procedure. As a precaution, **prior** to the update, the set-tings **should** be documented. For further information on version-dependent functions see chapter 3.2.1.

Procedure

1. For the firmware update the files "firmware" and "firmware.md5" must be copied into the root directory of a USB stick for this.
2. If the previous network settings should be automatically adopted in the Combi Gateway after the firmware update, the adapted configuration file for the network settings *ELDS_Combi_Gateway_Configuration.ini* (see chapter 6.5.1) must also be copied to the root directory of the USB stick.

Both files are available from the manufacturer, see https://edp.eckelmann.de/edp/lds/_M3uZco3pG2



The USB stick (<= 16 GB) **must** be formatted with **FAT32** as file system for the firmware update.

The firmware files named above **must** be in the root directory on the USB stick.

3. Put in the USB stick into the device. After successful verification of the new firmware by the Combi-Gateway, the label of the button changes from "Verify" to "Update" which can then be performed. See help text in the configuration interface for more detailed explanations of this.



A firmware update must only be performed by trained personnel or at the factory by the manufacturer.

Activation code

The Combi-Gateway and LAN-Gateway software modules are enabled in the delivery condition of the hardware of the Combi-Gateway.

Other software modules such as XML-Gateway, Modbus-TCP-Master-Gateway and Modbus-TCP-Slave-Gateway can be enabled by entering an activation code.



The activation of the enabled software modules requires a manual system restart after enabling; see chapter 6.6.1.3.



Security

Access to the configuration interface is password-protected for security reasons. Among other things, this should ensure that unauthorised persons cannot make any changes to parameters of the Combi-Gateway.

When leaving the factory, the access details for the Combi-Gateway are as follows:

User name: webadmin
Password: FanTubo3

All list of the access data for older versions is contained in chapter 3.2.1.



The password should be changed and stored safely after the commissioning!
The new password should be kept securely against access by unauthorised persons!
Contact the supplier if the password is no longer available for you.

6.6.2 LAN-Gateway

The LAN-Gateway software module is integrated in the Combi-Gateway as standard. Under the tab LAN-Gateway, the TCP port, the CAN bus address, participant information, priority and parameters can be configured using the configuration interface:

Global settings | LAN Gateway | XML Gateway | Modbus TCP Master Gateway | Modbus TCP Slave Gateway

TCP port

5000 OK

CAN bus address

127 OK

CAN bus participant information

Name: Combi-Gateway
Position: ----
Priority: 0
Type: ExC66
Version Number:
Serial number: *****
OK

TCP port

- Number of the TCP port configured in LDSWin for the access.
- Default value 5000.

Note: The configuration is saved using the 'OK' button; however the changes are not activated until after a system restart!

CAN bus address

- CAN bus address which the LAN-Gateway software module uses to communicate on the CAN bus.
- Default value 127.
- Address 126 cannot be used in combination with CAN bus PC adapter.

Note: The configuration is saved using the 'OK' button; however the changes are not activated until after a system restart!

CAN bus participant information

- Participant information in the participants list which the LAN-Gateway software module on the E*LDS system announces.
- The priority value determines the alarm signalling behaviour of the components in the event of failure.

Parameters such as TCP port (standard port is 5000), CAN bus address and CAN bus participant information must be configured for correct functioning.

Refer to chapter 5 of this operating manual for the individual functions of the LAN-Gateway and the appropriate configuration of the parameters.



The changed parameters are saved by pressing the "OK" button.
A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.

If any changes are made to the screen then the **settings in LDSWin must** also be changed, for more information see chapter 5.3!



6.6.3 XML-Gateway

For correct functioning, the parameters of the CAN bus participant information can be configured using the configuration interface under the **XML-Gateway** tab.



More detailed descriptions of the tasks and functions of this software module are available in the separate "XML-Gateway" API documentation.

Global settings | LAN Gateway | **XML Gateway** | Modbus TCP Master Gateway | Modbus TCP Slave Gateway

CAN bus address
110

CAN bus participant information

Name: XML-Gateway
Position: ----
Priority: 0
Type: ExC66
Version Number: 1.3
Serial number: *****

OK

CAN bus address

- CAN bus address which the XML-Gateway software module uses to communicate on the CAN bus.
- Default value 110 - this cannot be changed.

CAN bus participant information

- Participant information in the participants list which the XML-Gateway on the E*LDS system announces.
- The priority value determines the alarm signalling behaviour of the components in the event of failure.

Note: The configuration is saved using the 'OK' button; however the changes are not activated until after a system restart!



A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.



6.6.4 Modbus-TCP-Master-Gateway

The Modbus-TCP-Master-Gateway software module is not enabled until activation with a valid activation code; see chapter 6.6.1.3. Up to four Modbus-TCP-Master gateways can be integrated in the E*LDS system.

The individual gateways 1..4 are configured under the corresponding tabs

Modbus-Gateway 1 to Master-Gateway 4:

Global settings | LAN Gateway | XML Gateway | Modbus TCP Master Gateway | Modbus TCP Slave Gateway

Master Gateway 1 | Master Gateway 2 | Master Gateway 3 | Master Gateway 4

Modbus TCP Master

Active

Polling interval [s]:

Reconnection interval [s]:

OK

Configuration file

Already exists

Select a file for the upload

Modbus Slave

IP address:

TCP port:

Unit identifier:

OK

Modbus TCP Master

- Activation of the gateway function by setting the 'Active' parameter.
- Polling interval in seconds, in which the data between the Master Gateway and the E*LDS system are updated (default value 15).
- Reconnection interval in seconds, using which another connection establishment to the E*LDS system is made in the event of a dropped connection (default value 30).

Note: The configuration is saved using the 'OK' button; however the changes are not activated until after a system restart!

Configuration file

- Configuration file for showing the external data points on the process image in the E*LDS system.
- See the operating manual for a detailed description.

Note: The configuration is saved via the upload of the configuration file; however the changes are not activated until after a system restart!

Modbus Slave

- IP address of the Modbus Slave to be integrated.
- TCP port of the Modbus Slave (default value 502).

Basic configuration | CAN bus | Alarm

The settings of the respective Modbus-TCP-Master-Gateways 1..4 are made using the **Basic configuration**, **CAN bus** and **Alarm** tabs on the bottom left.

Basic configuration

The specific parameters of the Modbus-TCP-Master gateway are set in the basic configuration. The activation of the Modbus-TCP-Master process is controlled by the "Active" checkbox. If the process is deactivated, this has the consequence that the external data points are no longer mapped in the E*LDS system and the functions of the Modbus-TCP-Master cannot be used.



More detailed descriptions of the tasks and functions of this software module are available in the separate "Modbus-TCP-Master-Gateway" API documentation.

If the external data points of an external system are mapped to the process image in the E*LDS system, the E*LDS system can be used, for example, for monitoring purposes of external systems. A configuration file which specifies the mapping is saved for this. Further information about the structure of the configuration file is available from the manufacturer.



A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.



CAN bus

Each Master gateway uses a CAN bus address from the range of the BMS controllers and is defined as follows:

- Master gateway 1 uses the CAN bus address 122
- Master gateway 2 uses the CAN bus address 123
- Master gateway 3 uses the CAN bus address 124
- Master gateway 4 uses the CAN bus address 125

The CAN bus participant information must be configured so that the Modbus-TCP-Master-Gateway software module is shown correctly in the participant list of the E*LDS system.



A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.

Alarm

The communication between the Modbus-TCP-Master and the Modbus-TCP-Slave is performed using a network connection. An alarm is triggered if any failure at this level occurs.



A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.

6.6.5 Modbus-TCP-Slave-Gateway

The Modbus-TCP-Slave-Gateway software module is not enabled until activation with a valid activation code; see chapter 6.6.1.3. Parameters such as TCP port, maximum number of clients, client inactive timeout and maximum request time must be configured for correct functioning.



More detailed descriptions of the tasks and functions of this software module are available in the separate "Modbus-TCP-Slave-Gateway" API documentation.

The parameters to be set can be configured under the tab **Modbus-TCP-Slave-Gateway**.

Global settings	LAN Gateway	XML Gateway	Modbus TCP Master Gateway	Modbus TCP Slave Gateway
Modbus TCP Slave				
TCP port	<input type="text" value="502"/>			
Max. number of clients	<input type="text" value="10"/>			
Client inactive timeout [s]	<input type="text" value="300"/>			
Max. request time [s]	<input type="text" value="30"/>			
<input type="button" value="OK"/>				
Modbus-TCP-Slave				
<ul style="list-style-type: none">• TCP-Port unter dem der Modbus-Slave zur Verfügung steht.• Max. Client-Anzahl begrenzt die Anzahl aktiver Anmeldungen an den Modbus-Slave (Standardwert 10).• Client-Inaktiv-Timeout in Sekunden (Standardwert 300).• Max. Anfragedauer legt fest, wie lange eine Anfrage auf Daten aus dem E*LDS System wartet (Standardwert 30).				
Hinweis: Die Konfiguration wird über den Button 'OK' gespeichert, die Änderungen werden jedoch erst nach einem Systemneustart aktiviert!				



A manual system restart is required to apply the changes of the configuration; see chapter 6.6.1.3.



6.6.6 Setup of the COM Port Server

The COM Port Server software module is integrated in the Combi Gateway as standard. The TCP port and baud rate parameters can be configured on the **COM Port Server** tab for the correct functioning.

Global settings | LAN Gateway | XML Gateway | Modbus TCP Master Gateway | Modbus TCP Slave Gateway

Network | **COM Port Server** | Language and time | System | Security

COM Port Server

TCP port:

Baud rate:

OK

TCP port

- Configuration of the TCP port for CODESYS access.
- Default value 1041.

Baud rate

- Baud rate for the serial data transfer.
- Default value 38400.



It is recommended to use the value 38400 (default) as baud rate.

6.6.6.1 Connection to a GLT 3010

The COM port (RJ45 interface "RS232") of the Combi Gateway must be connected to the COM port of the respective controller. The cable set with the part number KABCOMSRV1 is needed for this, see chapter 7.1.4.

6.6.6.2 Required software on the user PC

An additional program (not included in the scope of delivery) is needed on the PC to connect to a GLT 3010 using CoDeSys via the "COM Port Server" function. This program emulates a local COM port on the PC and connects this to the Combi Gateway via the network.

Basically any program that transfers serial data in the "RAW" mode can be used for this.

Serial Port Redirector from Fabulatech has been tested and is recommended:
<http://www.fabulatech.com/serial-port-redirector.html>



See its own documentation for operation of the "Serial Port Redirector".

The required parameters for a successful connection are:

- IP address of the Combi Gateway, see chapter 6.5
- Port of the COM Port Server (default: 1041)
- Protocol "RAW"



6.7 Checklist for the putting into service

Page 1/3

Store: _____

Location _____

Street _____

Postcode _____

Telephone _____

1. E*LDS System - CAN bus connections			
Module	Measure / test	Note / settings	Status
CAN-Bus at store computer	CAN bus termination (terminating resistor 100 Ohm) checked?	For information about the CAN bus, see the operating manual "Basics and general safety and connection instructions", see https://edp.eckelmann.de/edp/lds/_0sErd44C8T	
CAN-Bus at Combi Gateway	Correct CAN bus-termination, see chapter 6.2?	Check DIP switch CAN Term 1 resp. CAN Term 2	



The following three pages must be completely filled in to backup all settings of the Combi Gateway. All required parameters (here the factory settings) must be checked on the web-based configuration interface (see chapter 6.6) and documented here.

2. Combi Gateway			
Module	Measure / test	Note / settings	Status
Status LEDs	Status LEDs checked?	7-segment display cycles -> connection to the store computer is present	
Global Settings			
Net work			
Hostname ¹⁾	Hostname configured? (called „Compter name“ in the field mask)	Combi-Gateway	
IP address ¹⁾	Configured?	192.168.161.66	
Subnet mask ¹⁾	Configured?	255.255.255.0	
Default gateway ¹⁾	Configured?	192.168.161.1	
COM Port Server			
TCP port	Configured?	1041	
Baud rate	Configured?	38400	
Language and time			
Language	Configured?	Deutsch (German)	
Time zone	Configured?	UTC+01:00 - Europe/Berlin	
Security			
Access details	Modification of the access details	User name:: webadmin Password: FanTubo3 New: _____	

¹⁾ For the configuration file required settings, see chapter 6.5.1.1.



Unauthorized access protection! The new password should be kept securely against access by unauthorised persons!



2. Combi Gateway			
Module	Measure / test	Note / settings	Status
LAN Gateway			
TCP port	Configured?	5000	
CAN bus address	Configured?	127	
Name	Participant information (Name) configured?	Combi-Gateway	
Position	Configured?	----	
Priorität	Configured?	0	
XML Gateway			
Name	Participant information (Name) configured?	XML-Gateway	
Position	Configured?	----	
Priority	Configured?	0	

Optional

2a. Combi Gateway - Only visible, if functions are activated using the activation key						
Module	Measure / test	Note / settings				Status
Modbus TCP Master						
Basic configuration		Master-Gateway 1	Master-Gateway 2	Master-Gateway 3	Master-Gateway 4	
Aktive	Modbus-TCP-Master aktiviert?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Polling intervall [s]	Configured?	15	15	15	15	
Reconnection intervall [s]	Configured?	30	30	30	30	
Configuration file ²⁾ already exists?	Configured? File name:	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	
IP address	Configured?	192.168.161.51	192.168.161.51	192.168.161.51	192.168.161.51	
TCP Port	Configured?	502	502	502	502	
Unit identifier	Configured?	1	1	1	1	
CAN bus		122	123	124	125	
Name	Participant information (Name) configured?	ModbusTcp-Master1	ModbusTcp-Master2	ModbusTcp-Master3	ModbusTcp-Master4	
Position	Configured?	----	----	----	----	
Priority	Configured?	2	2	2	2	
Alarm						
Priority	Configured?	1	1	1	1	
Alarm delay [min]	Configured?	5	5	5	5	

²⁾ The Modbus-Master-Configurations-File must be reloaded into the device after the firmware update, see chapter 6.6.4.



Page 3/3

Optional

2b. Combi Gateway - Only visible, if functions are activated using the activation key			
Module	Measure / test	Note / settings	Status
Modbus TCP Slave			
TCP port	Configured?	502	
Max. Number of clients	Configured?	10	
Client inactive timeout [s]	Configured?	300	
Max. request time [s]	Configured?	30	

3. Store computer CI 3000 / CI 3100			
Module	Measure / test	Note / settings	Status
CAN-Bus at store computer	Setting for high speed / low speed connection,	Standard (low speed), see menu 6-1-1	
Name	Participant information (Name) in store computer configured?	Combi-Gateway, see menu 7-3	
Priority	Configured?	0 see menu 7-3	



PRAXIS TIP: All three pages of the *checklist for putting into service* must be

1. filled in (check and document settings),
2. printed out (then available in paper form),
3. filed (for the inventory documents) and
4. saved (e.g. backup on the server).

Location, Date: _____

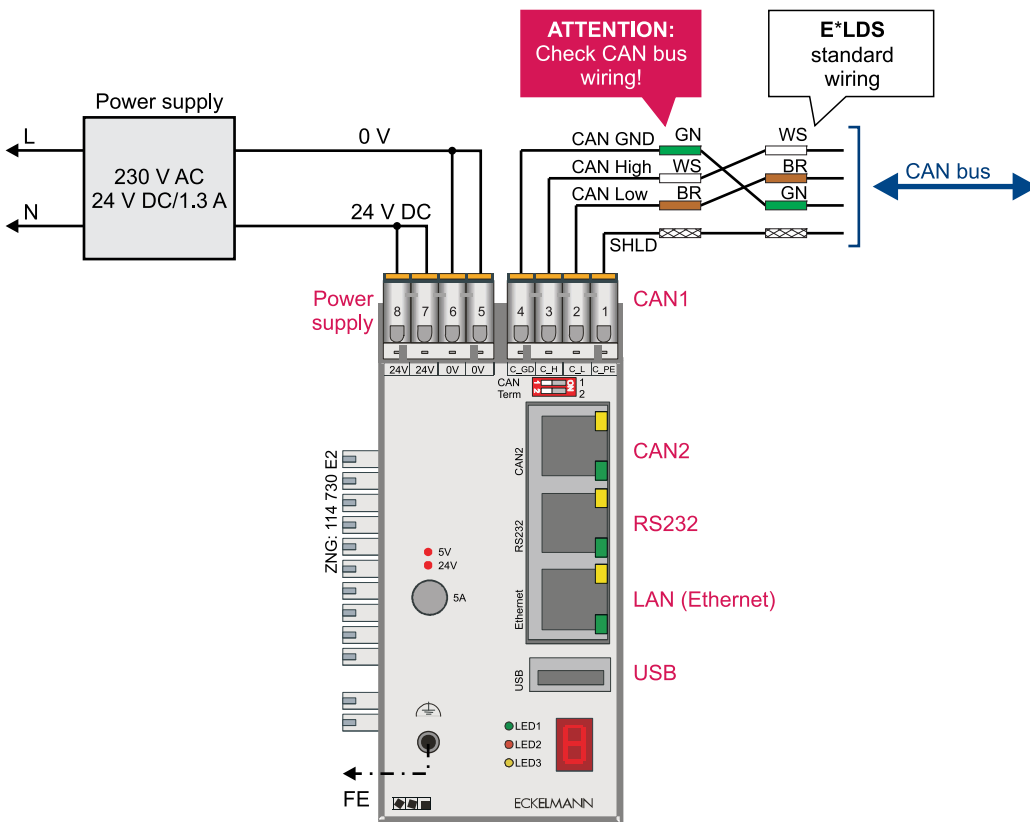
Company: _____

Name, Signature: _____



7 Pin and Terminal Assignments

7.1 Terminal diagramm of the Combi-Gateway



Combi Gateway connection diagram with terminal configuration. Following connection of the power supply the LEDs flashes, see chapter 6.3 - Status LEDs.

A detailed description of the connection and terminal configuration of the Combi-gateway is contained on the following pages.



7.1.1 Terminal assignment of the 24 V DC power supply and functional earthing



Warning - hazardous electrical voltage!

Danger of electric shock! BEFORE and after connecting and disconnecting it must be checked that the 230 V AC power supply cable is **off load!**

Terminal no.	Function
1 2	Power supply 0 V DC at the COMBICON, both interconnected
3 4	Power supply 24 V DC at the COMBICON, both interconnected
FE	Functional earthing - provides improvement of the electromagnetic compatibility

If required, a 230 V AC/24 V DC mains adapter must be used (article number KGLNT23024).

7.1.2 Terminal assignment of CAN1 COMBICON - connection to CAN bus



Warning - hazardous 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!

Incorrect shielding of the CAN bus results in electromagnetic interference fields. It must be strictly ensured during installation that the cables with shielding are correctly connected. The following cable type must be used for the CAN bus cable:

Terminal no.	Function
1	SHLD (Shielding) (Shield)
2	CAN-low (brown)
3	CAN high (white)
4	CAN Ground (green)



1. The CAN bus wiring at the CAN1 COMBICON connector does **not correspond** to the standard CAN bus wiring in the E*LDS system!

The correct wire assignment and the shielding must **always** be checked before the connection!

2. If the device is at the start/end of the CAN bus, the DIP switch CAN Term1 must be set to 1 (see also chapter 6.2.3).

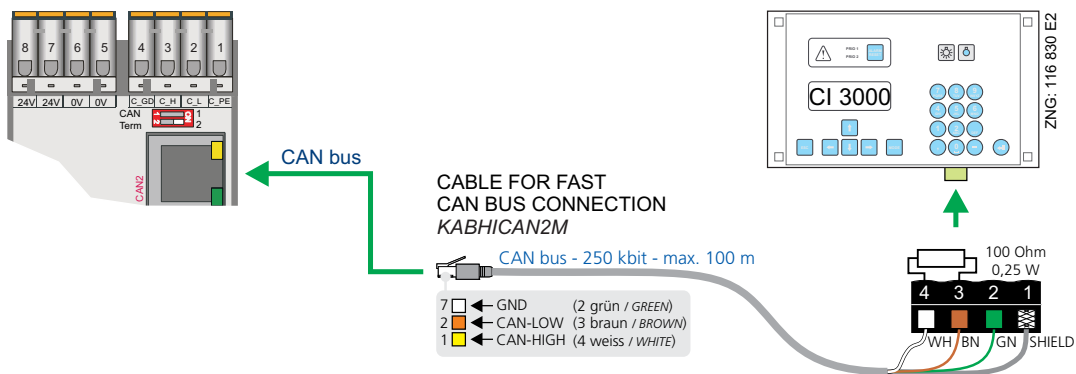


7.1.3 RJ45 interface CAN2 - High speed connection to the CAN bus



Warning - hazardous 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! Incorrect shielding of the CAN bus results in electromagnetic interference fields. It must be strictly ensured during installation that the cables with shielding are correctly connected. The following cable type must be used for the CAN bus cable: LIYCY 2x2x0.75 mm² (twisted pair and shielded). **Recommendation:** Use cable for fast CAN bus connection (order number KABHICAN2M):

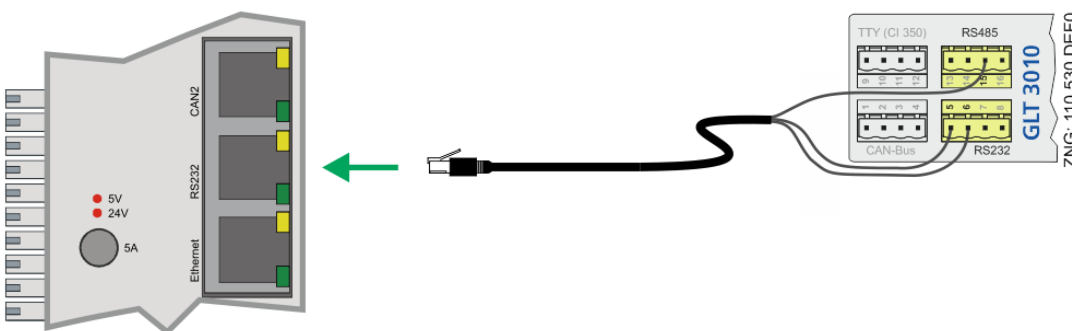


The Combi-Gateway is connected to the CAN bus terminals of the store computer using the connection cable (order number KABHICAN2M) at the RJ45 connector (CAN2 interface) on the front panel of the device. The COMBICON connector must be attached at the open end of the Y cable; the resistor (100 Ohm) must then be connected to terminals 3/4 of the connector.



The terminating resistor of the CAN2 interface **must** be set to **ON** using the DIP switch *CAN Term 2* (see also Chapter 6.2.2). This type of connection only has to be taken into account for a high speed CAN bus connection; the steps shown in Chapter 6.2.2 must be performed.

7.1.4 RJ45 interface RS232



Connection via the RS232 interface (RJ45 socket) to the GLT 3010 (COMBICON) using cable set (Order number KABCOMSRV1).



7.1.5 RJ45 interface LAN (Ethernet)

Use high-quality shielded copper cables for the Ethernet connection, at least of category 5 (CAT5e, CAT6 or CAT7).

The MAC address of the ethernet controller is factory-assigned, see label on the assembly.

Use a cross-over cable if a point-to-point connection is made between Combi-Gateway and other devices.

7.1.6 USB interface

Use high-quality shielded cables for the USB connection. The maximum length of these cables is 5 m.



8 Decommissioning and disposal

8.1 Decommissioning / Demounting

The disassembly of the equipment is only to be carried out by trained and authorised personnel.



Warning - hazardous electrical voltage!

Danger of electric shock! During disassembly the same safety instructions and hazard warnings are to be observed as in the case of installation, commissioning and maintenance, see chapter 1, "Industrial safety notes".

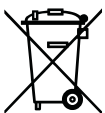


During disassembly the reverse procedure is to be observed as that during assembly, see chapter "Installation and Startup".

8.2 Disposal

The scope of our delivery is designated as a component exclusively for further processing.

As a consequence of this fact, ECKELMANN AG does not undertake any measures for the taking back or municipal recycling of this product as it is not supplied directly to the free market.



Never dispose of this product with other household waste. Please inform yourself of the local regulations for the separate disposal of electrical and electronic products. The correct disposal of your old equipment will protect people and the environment from possible negative effects.



The provisions and regulations for the disposal of the equipment are to be observed. In accordance with the contractual agreement, the customer is beholden to dispose of electrical and electronic waste in compliance with the statutory regulations based on the Directive 2002/96/EC on waste electrical and electronic equipment.



Decommissioning and disposal


ECKELMANN

Notice:



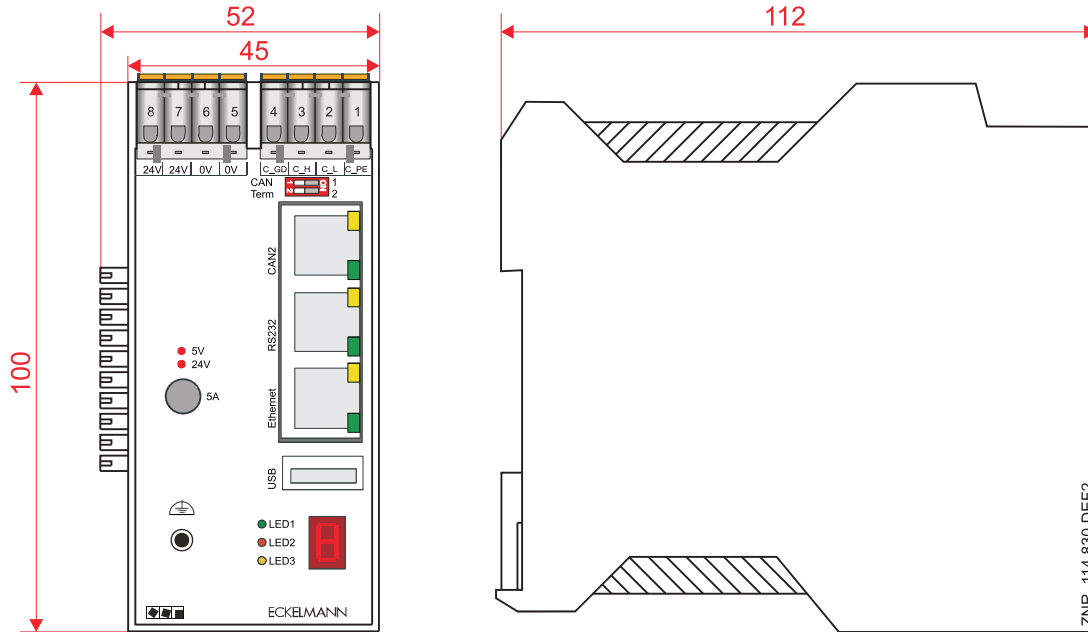
9 Specifications of Combi-Gateway

9.1 Electrical data

Combi-Gateway	
Electrical Data	
Power supply	Typ. 24 VDC (19 .. 30 VDC), max. 210 mA
Rated power	max. 5 W
Fieldbus port	CAN bus, floating 1 x via COMBICON connector (CAN1) 1 x via RJ45 (CAN2)
Interfaces	RS232 via RJ45 LAN/Ethernet via RJ45, MAC address: see label
Display	LED, 7segment
USB interface	USB 2.0 (type A)
Monitoring function	Watchdog
Environmental conditions	
Temperature range	Transport: -20 °C ... +60 °C Operation: 0 °C ... +50 °C Storage at low temperatures enhances the battery lifetime!
Temperature change	Transport: max. 20 K/h Operation: max. 10 K/h
Relative humidity (non-condensing)	Transport: 8 % ... 80 % Operation: 20 % ... 80 %
Atmospheric pressure	Transport: 660 hPa ... 1060 hPa Operation: 860 hPa ... 1060 hPa
Weight	ca. 240 g
Enclosure	IP20  The device may only be operated in heated or air conditioned rooms.
CE conformity	2002/95/EG (RoHS) 2004/108/EG (EMC Directive) 2006/95/EG (Low Voltage Directive)



9.2 Mechanical data



9.3 Information on open source software

This product uses the following open source software under the mentioned licences:

- Under GPL licence: Linux Kernel 3.5.4, busybox, canutils, coreutils, dbus, e2fsprogs, gettext, iproute2, libblockfile, libnl, readline, udev, util-linux, freetype, u-boot
- Under LGPL licence: eglibc, glib, Qt 4.8.4, libsocketcan, libmodbus, libquazip
- Under BSD licence: lighttpd, pcre, pppd, libpcap
- Other: zlib Copyright (C) 1995–2010 Jean-loup Gailly and Mark Adler, eventlog, figlet, libxml2, strace, dropbear

The Eckelmann AG make you an offer for a fee (for distribution, media, shipping and administration) to provide you source code on CD-ROM. If disired please write an E-Mail at Eckelmann AG: E.LDS@Eckelmann.de. This offer is available for a period of three (3) years and starts from the date of this present software distribution through the Eckelmann AG.

An example of the licences for GPL, LGPL and BSD can be called up via the product's user front end:

http://DNS_NAME_ODER_IP-ADRESSE/licences/index.html

You will find a translation of the GPL, LGPL licences under:

<http://www.gnu.org/licenses/old-licenses/gpl-2.0-translations.html> and <http://www.gnu.org/licenses/old-licenses/lgpl-2.1-translations.html>

All Rights reserved.

Every person who purchases a copy of this software and the accompanying documentation files (the "Software") is hereby permitted to use the software free of charge and without restriction. This authorisation also applies, without restrictions, to the making of copies, combination, modification, publishing, dissemination, issuing of a sub-licence and / or the sale of copies as well as the granting of this authorisation for the exercise of these activities to people who have been provided with the software, as long as the following conditions are met:

THIS SOFTWARE IS PROVIDED BY THE AUTHOR 'AS IS' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



10 Order No.'s and accessories

10.1 Combi-Gateway

Type	Description	Order number
Combi-Gateway	Combi-Gateway	KGLXMLGW03

10.2 Components

Component	Description	Order number
CAT5 data cable	CAT5 data cable, length: 0,4 m 0,7 m 2,0 m 5,0 m	KABLIND001 KABLIND002 KABLIND003 KABLIND007
RJ45 cable adapter on CAN bus	The CAN bus Y-cable is also required for fast CAN bus coupling between Combi Gateway and store computer CI 3000 / CI 3100	KABHICAN2M
Cable set for connection to a GLT 3010	Cable set for connection to a GLT 3010	KABCOMSRV1
Connector set for CAN bus	Connector set with terminating resistor 100 Ohm for CAN bus	KGLCANTERM
Power supply	Power supply 100-240 V AC / 24 V DC / 1,3 A	KGLNT23024



Order No.'s and accessories

Notice: