



# Revision history

Product version	Operating Instructions	Changes	Comments
1.00.XX	BA02044S/04/EN/01.20	Initial version	Replaces BA01929S

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# 1 About this document

## 1.1 Document function













These instructions provide all the information required to use the system: from the product description, installation and use to system integration, operation, diagnostics and troubleshooting to software updates and disposal.

## 1.2 Symbols used






### 1.2.1 Safety symbols

Symbol	Meaning
 <b>DANGER</b>	<b>DANGER!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 <b>WARNING</b>	<b>WARNING!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 <b>CAUTION</b>	<b>CAUTION!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 <b>NOTICE</b>	<b>NOTE!</b> This symbol contains information on procedures and other facts which do not result in personal injury.








### 1.2.2 Symbols for certain types of information

Symbol	Meaning
	<b>Permitted</b> Procedures, processes or actions that are permitted.
	<b>Preferred</b> Procedures, processes or actions that are preferred.
	<b>Forbidden</b> Procedures, processes or actions that are forbidden.
	<b>Tip</b> Indicates additional information.
	Reference to documentation.
	Reference to page.
	Reference to graphic.
	Notice or individual step to be observed.
	Series of steps.
	Result of a step.
	Help in the event of a problem.
	Visual inspection.

### 1.2.3 Electrical symbols

Symbol	Meaning
	Direct current
	Alternating current
	Direct current and alternating current
	<b>Ground connection</b> A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
	<b>Protective Earth (PE)</b> A terminal which must be connected to ground prior to establishing any other connections.  The ground terminals are situated inside and outside the device: <ul style="list-style-type: none"> <li>▪ Inner ground terminal: Connects the protective earth to the mains supply.</li> <li>▪ Outer ground terminal: Connects the device to the plant grounding system.</li> </ul>

### 1.2.4 Symbols to indicate device statuses (NAMUR NE107)

Symbol	Meaning
	Symbol as per NAMUR NE107 Failed High severity level: The output signal is invalid. A device error has occurred.
	Symbol as per NAMUR NE107 Out of Specification Medium severity level: Either the permitted ambient conditions or the permitted process conditions have been exceeded, or the measured errors are too large.
	Symbol as per NAMUR NE107 Maintenance Required Low severity level: The output signal is still valid. The expected operating life is nearly exhausted, or functionality will soon be restricted. With a pH measuring device, for example, "Maintenance Required" is displayed when the pH electrode needs to be replaced.
	Symbol as per NAMUR NE107 Check Function The signal is temporarily invalid or held at the last valid value. Work is currently being carried out on the device.
	Unknown: A connection could not be established to the device.
	OK: The device is OK.
	Not monitored: The device is not monitored.

## 1.3 Text emphasis

Emphasis	Meaning	Example
Bold	Keys, buttons, program icons, tabs, menus, commands	<b>Start</b> → <b>Programs</b> → <b>Endress+Hauser</b> In the <b>File</b> menu, select the <b>Print</b> option.
Angle brackets	Variables	<DVD drive>

## 1.4 Acronyms used

Acronyms	Meaning
AC	Alternating Current
CLS50D	Endress+Hauser conductivity sensor
CM444	Endress+Hauser transmitter
COS51D	Endress+Hauser oxygen sensor
CPF81D	Endress+Hauser pH sensor
CYA112	Endress+Hauser immersion assembly
CYK10	Endress+Hauser measuring cable
CPU	Central Processing Unit
DC	Direct Current
SSP	Smart System Package
Rest JSON API	Specification for REST-compliant API (Application Programmable Interface) (REST = Representational State Transfer)

## 1.5 Documentation

The Operating Instructions for the Smart System are included in the delivery.

*Supplementary documentation for SSP Smart Systems and system components*

System or system components	Designation	Documentation
Smart System for Surface Water	SSP100B	<ul style="list-style-type: none"> <li>Technical Information TI01550S/04/EN</li> <li>Operating Instructions BA02044S/04/EN</li> </ul>
Smart System for Aquacultures	SSP200B	<ul style="list-style-type: none"> <li>Technical Information TI01551S/04/EN</li> <li>Operating Instructions BA02045S/04/EN</li> </ul>
Modbus Edge Device	SGC400	Technical Information TI01422S/04/EN
Transmitter	Liquiline CM444	<ul style="list-style-type: none"> <li>Technical Information TI00444C/07/EN</li> <li>Brief Operating Instructions KA01159C/07/EN</li> <li>Operating Instructions BA00444C/07/EN</li> <li>Installation Instructions EA00009C/07/A2</li> </ul>
Conductivity sensor	Indumax CLS50D	<ul style="list-style-type: none"> <li>Technical Information TI00182C/07/EN</li> <li>Operating Instructions BA00182C/07/EN</li> </ul>
Oxygen sensor	Oxymax COS51D	<ul style="list-style-type: none"> <li>Technical Information TI00413C/07/EN</li> <li>Brief Operating Instructions KA00413C/07/EN</li> <li>Operating Instructions BA00413C/07/EN</li> </ul>
pH sensor	Orbipac CPF81D	<ul style="list-style-type: none"> <li>Technical Information TI00191C/07/EN</li> <li>Operating Instructions BA01572C/07/A2</li> </ul>
Immersion assembly	Flexdip CYA112	<ul style="list-style-type: none"> <li>Technical Information TI00118C/07/EN</li> <li>Operating Instructions BA00118C/07/A2</li> </ul>
Measuring cables	CYK10	<ul style="list-style-type: none"> <li>Technical Information TI00432C/07/EN</li> <li>Operating Instructions BA00432C/07/EN</li> </ul>



For additional documentation, please refer to the Endress+Hauser Operations App or go to [www.endress.com/device-viewer](http://www.endress.com/device-viewer).

## 1.6 Registered trademarks

Modbus is the registered trademark of Modicon, Incorporated.

RUT240 is a product of Teltonika Ltd., 08105 Vilnius/Lithuania.

RevPi Core 3 is a product of Kunbus GmbH, 73770 Denkendorf/Germany.

UNO PS is a product of Phoenix CONTACT GmbH & Co. KG, 32825 Blomberg/Germany.

All other brand and product names are trademarks or registered trademarks of the companies and organizations in question.

## 2 Basic safety instructions

### 2.1 Requirements for personnel

The personnel for installation, commissioning, diagnostics and maintenance must meet the following requirements:

- ▶ Trained, qualified specialists: must have a relevant qualification for this specific role and task and have been trained by Endress+Hauser. Experts at the Endress+Hauser service organization.
- ▶ Personnel must be authorized by the plant owner/operator.
- ▶ Personnel must be familiar with regional and national regulations.
- ▶ Before starting work: personnel must read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- ▶ Personnel must follow instructions and comply with general policies.

Operating personnel must meet the following requirements:

- ▶ Personnel are instructed and authorized according to the requirements of the task by the facility's owner-operator.
- ▶ Personnel follow the instructions in this manual.

### 2.2 Designated use

The Smart System SSP100B is designed to monitor surface water.

The Liquiline CM444 transmitter is a multichannel controller and is used to connect the digital sensors supplied.

Any other use is considered to be non-designated use. Designated use entails compliance with the operating and maintenance requirements specified by the manufacturer. The Smart System must be mounted in an environment intended for this purpose.

The Smart System is not suitable for use in explosive atmospheres.



#### **Dangers**

It is the responsibility of the owner/operator to assess any dangers for the systems. These dangers must be assessed by the owner/operator and the measures resulting from the assessment must be implemented. While the Smart System can form part of such a measure, responsibility for the process always rests with the owner/operator, particularly the taking of suitable measures if the Smart System signals an alarm.



#### **Incorrect use**

Non-designated use can compromise safety. The manufacturer is not liable for damage caused by improper or non-designated use.

### 2.3 Occupational safety

Personnel must meet the following conditions when working on and with the system:

- ▶ Wear the required personal protective equipment according to regional/national regulations.
- ▶ When welding, do not ground the welding unit via the system.
- ▶ If hands are wet, wear gloves on account of the higher risk of electric shock.

### 2.4 Operational safety

Operate the system only if it is in proper technical condition, free from errors and faults.

The operator is responsible for the trouble-free operation of the system.



### 2.4.1 Modifications to the system

Unauthorized modifications to the system are not permitted and can lead to unforeseeable dangers:

- ▶ If, despite this, modifications are required, consult with Endress+Hauser.

### 2.4.2 Repair

To ensure continued operational safety and reliability:

- ▶ Repairs must be performed only by certified Endress+Hauser specialists.
- ▶ Observe federal/national regulations pertaining to the repair of an electrical device.
- ▶ Use original spare parts and accessories from Endress+Hauser only.

## 2.5 Product safety

The components used for the Smart System meet the general safety standards and legal requirements. Furthermore, the components comply with the EC/EU Directives that are listed in the EU Declarations of Conformity for the components.

## 2.6 IT security

We only provide a warranty if the system is installed and used as described in the Operating Instructions. The system is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the system and system data transfer must be implemented by the operators themselves.



The operator is responsible for data backup.

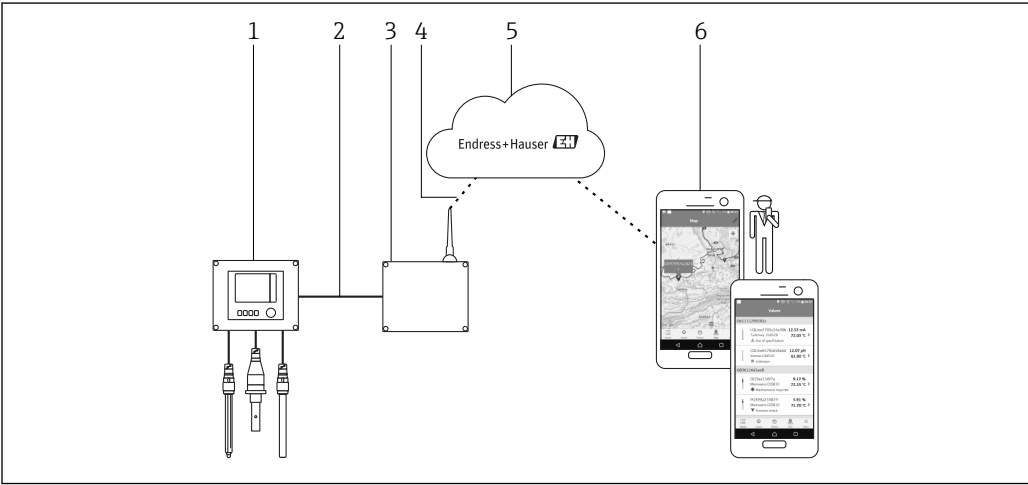
### 3 Product description

#### 3.1 Function

The Smart System for Surface Water SSP100B monitors surface water.

The package includes all the necessary sensors and a transmitter for measured data processing and the Modbus Edge Device SGC400. The package also contains immersion assemblies, mounting plates and the connecting cable for Modbus TCP connection. The Modbus Edge Device SGC400 transmits the device ID data, measured values and status information to the Netilion Cloud. The data sent to the Netilion Cloud can be either queried directly via a REST JSON API or used in a smartphone application.

#### 3.2 System design



1 Network architecture

- 1 Field device e.g. Liquiline CM444
- 2 Modbus TCP connection
- 3 Modbus Edge Device SGC400
- 4 LTE connection
- 5 Netilion Cloud
- 6 User application on smartphone

#### 3.3 Communication and data processing

Modbus TCP (Ethernet)	2x LAN port, 10/100 Mbps, comply with IEEE 802.3, IEEE 802.3u standards
Wireless LAN	IEEE 802.11b/g/n, Access Point (AP), Station (STA)
Mobile	4G (LTE) CAT4 up to 150 Mbps 3G up to 42 Mbps


## 4 Incoming acceptance and product identification

### 4.1 Incoming acceptance

- Check the packaging for visible damage arising from transportation.
- To avoid damage, remove the packaging with care.
- Keep all the accompanying documents.







The system may not be put into operation if the contents are found to be damaged beforehand. Contact your Endress+Hauser Sales Center if this happens. Return the system to Endress+Hauser in the original packaging where possible.

### 4.2 Product identification


 The nameplate of your Smart System can be found in the "Nameplate" section of these Operating Instructions. The nameplate is also located on the inside of the cover of the Edge Device.

The nameplate contains the following information:

- Serial number of the Smart System
- Serial number of the Liquiline CM444 transmitter
- Serial numbers of the sensors
- Discount code for registering the installation in Netilion Cloud

Endress+Hauser Process Solutions AG CH-4153 Reinach		Endress+Hauser 	
<b>Smart System Package SSP100B</b>			
Order code:	SSP100-1020/0		
Serial number:	R3000124810		
Extended order code:	SSP100B-AAFA11A		
Discount Code:	12345678		
Serial No. Liquiline CM444:	11111105G00		
Serial No. Oxymax COS51D:	22222205O00		
Serial No. Indumax CLS50D:	33333305L10		
Serial No. Orbipac CPF81D:	44444417W00		
 → 			
			
Assembled in Switzerland		Year of manufacturing: 2020	

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 2 Example of nameplate for SSP100B

You can identify the system in the following ways:

- Enter the serial number indicated on the nameplate in W@M Device Viewer (www.endress.com → About us → W@M Life Cycle Management → Operations → The right device information always at hand (find spare part) → Access device-specific information → Enter serial number): all the information relating to the system/device is then displayed.
- Enter the serial number indicated on the nameplate in the Endress+Hauser Operations App: all the information relating to the system is then displayed.

### **4.3 Storage and transport**

- The components are packed in such a way that they are fully protected against shock when in storage and during transportation.
- The permitted storage temperature is 0 to 40 °C (32 to 104 °F).
- Store the components in the original packaging in a dry place.
- Where possible, only transport the components in the original packaging.

## 5 Installation

### 5.1 Installation conditions

#### 5.1.1 IP degree of protection

**NOTICE****IP degree of protection not observed**

Possible damage to the device.

- ▶ Take the IP protection of Liquiline CM444 and the Modbus Edge Device SGC400 into consideration for the mounting location.

IP degree of protection:

- Liquiline CM444: IP66/67
- Modbus Edge Device SGC400: IP54

### 5.2 Liquiline CM444 and Modbus Edge Device


#### 5.2.1 Mounting the Liquiline CM444 and the Modbus Edge Device

Mount both the Liquiline CM444 transmitter and the Modbus Edge Device on the wall using a mounting plate.

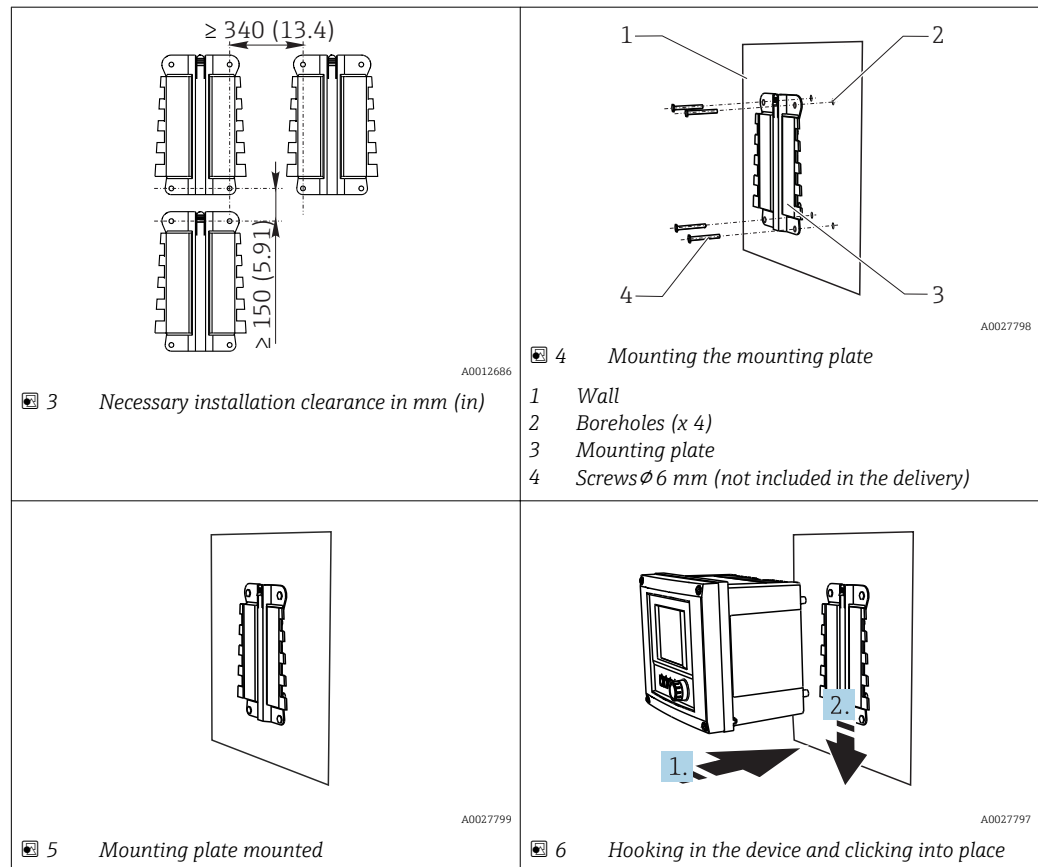


For detailed information on the dimensions, see the Technical Information for "Liquiline CM444" and the Technical Information for "Modbus Edge Device".



Take the length of the antenna connection cables and the information in the "Mounting the LTE antenna" section into consideration for the mounting location of the Modbus Edge Device →  21

.



1. Mount the mounting plates. Observe the installation clearances indicated. The diameter of the boreholes depends on the wall plugs used. Wall plugs and screws are not included in the delivery.
2. Hook the device into the holder.
3. Push the device down into the holder until the device clicks into place.

### 5.2.2 Disassembling the Liquiline CM444 and Modbus Edge Device

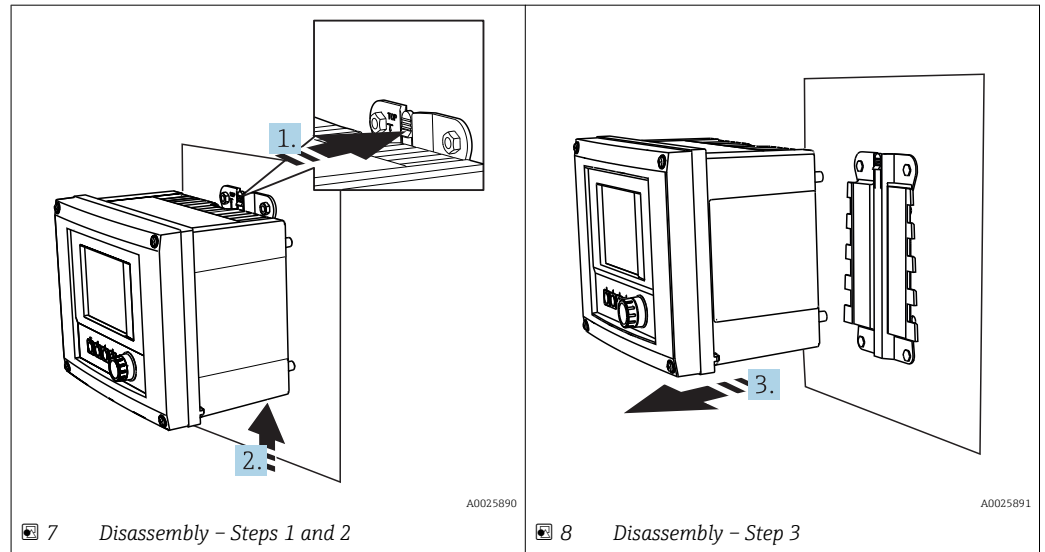
Disassemble the Liquiline CM444 transmitter and the Modbus Edge Device in the same way.

#### NOTICE

##### Device is dropped

Damage to the device

- When pushing the device out of the holder, secure the device to ensure that you do not drop it.
- Ideally, have two people disassemble the device.



1. Push back the catch.
2. Push up the device to remove it from the holder.
3. Remove the device towards the front.

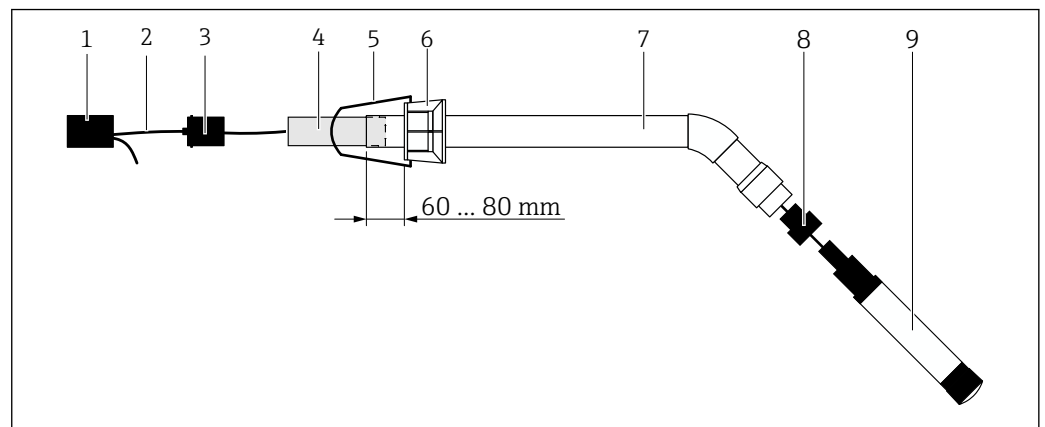
### 5.3 Assembling immersion assemblies CYA112

**i** Note that the immersion assemblies are fitted with different sensor adapters.

The following sensors are mounted with the immersion assembly CYA112:

- Oxygen sensor COS51D with NPT3/4 sensor adapter
- Conductivity sensor CLS50D with G3/4 sensor adapter
- pH sensor CPF81D with NPT3/4 sensor adapter

#### Assembling the immersion assembly




**9** Immersion assembly CYA112 with mounted sensor

- 1 Splash protection cap
- 2 Sensor cable or measuring cable, depending on sensor
- 3 Rubber plug
- 4 Weight
- 5 Retaining bracket
- 6 Multifunctional clamp ring
- 7 Immersion assembly consisting of immersion tube and connecting bracket
- 8 Sensor adapter for pH sensor CPF81D and conductivity sensor CLS50D
- 9 Sensor

**Assembling the immersion assembly**

1. CPF81D and CLS50D: screw the sensor adapter onto the connecting bracket of the immersion tube.
2. Push the weight into the immersion tube.
3. Mount the retaining bracket on the multifunctional clamp ring.
4. Mount the multifunctional clamp ring on the immersion tube. Make sure to keep a distance of 60 to 80 mm from the upper edge of the immersion tube as illustrated in the graphic above.
5. If the sensor is not fitted with a permanently attached sensor cable, connect the measuring cable supplied to the sensor.
6. Guide the cable through the immersion assembly.
7. Guide the cable through the rubber plug. Observe the required length in relation to the Liquiline CM444 transmitter.
8. Seal the immersion tube with the rubber plug.
9. Screw the splash protection cap onto the immersion tube.

 The optional Flexdip CYH112 holder system offers different ways to mount the immersion assembly.

**5.4 Post-installation check**

Are the mounted components undamaged (visual inspection)?	<input type="checkbox"/>
Do all the components meet the required specifications? For example: <ul style="list-style-type: none"> <li>■ IP degree of protection</li> <li>■ Ambient temperature</li> <li>■ Humidity</li> </ul>	<input type="checkbox"/>
Are all the securing screws tightened securely?	<input type="checkbox"/>



## 6 Electrical connection

### 6.1 Safety

#### **⚠ WARNING**

##### **Transmitter and Modbus Edge Device are live**

Incorrect connection may result in injury or death!

- ▶ Only certified electricians may perform the electrical connection.
- ▶ The certified electrician must read and understand these Operating Instructions and must follow all the instructions.
- ▶ Prior to commencing connection work, ensure that no voltage is present on any cable.

### 6.2 Opening and closing the housing

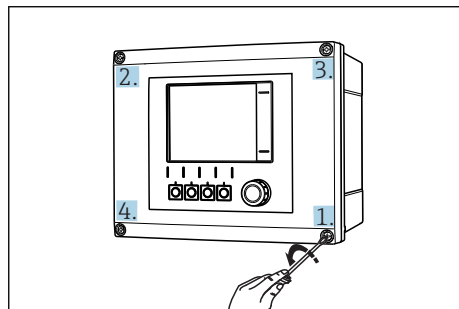
The housing of the transmitter and the housing of the Modbus Edge Device are opened and closed in the same way.

#### **NOTICE**

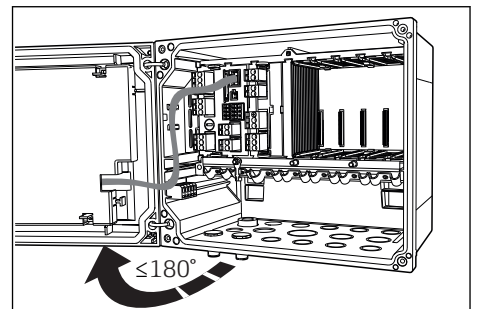
##### **Pointed and sharp tools**

If unsuitable tools are used, they can scratch the housing or damage the seal, and thus negatively affect the leak-tightness of the housing!

- ▶ Do not use any sharp or pointed objects, such as a knife, to open the housing.
- ▶ Only use a suitable Phillips-head screwdriver to open and close the housing.



10 Releasing housing screws in a diagonally opposite sequence with Phillips screwdriver



11 Opening housing cover, max. opening angle 180° (depends on installation position)

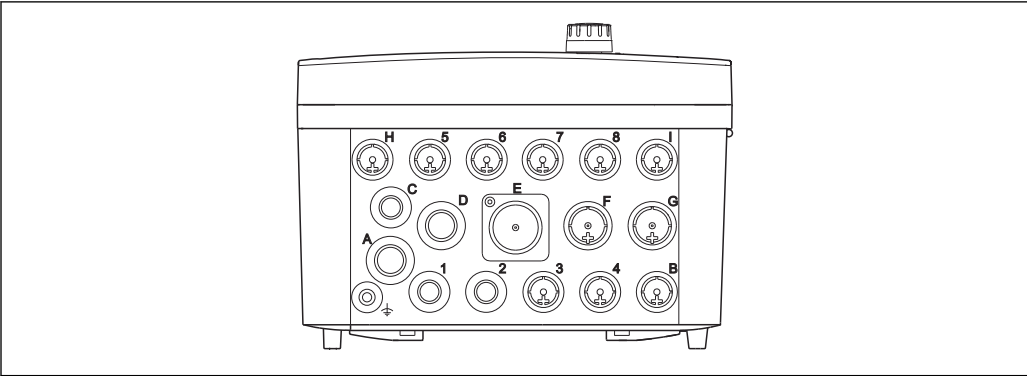
#### **Opening the housing**

1. Release the housing screws on a step-by-step basis. Start with any housing screw of your choice.
2. Release the housing screw that is diagonally opposite to this screw.
3. Release the third and fourth housing screw.

#### **Closing the housing**

- ▶ Tighten the housing screws on a step-by-step basis in a diagonally opposite sequence.

6.3 Cable entries and terminals



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12 Underside of housing with labeled cable entries and terminals

Labeling on underside of housing	Description for Liquiline CM444	Description for Modbus Device Edge
1 to 8	Sensors 1 to 8	Do not use
A	Supply voltage	Do not use
B	RS485 In or M12 DP/RS485 (not used in factory configuration)	Do not use
C	Freely usable	LTE antenna
D	Current outputs and inputs, relays (not used in factory configuration)	LTE antenna
E	Do not use	Do not use
F	Current outputs and inputs, relays (not used in factory configuration)	Ethernet
G	Current outputs and inputs, relays (not used in factory configuration)	Supply voltage
H	Freely usable	Do not use
I	RS485 Out and M12 Ethernet (M12 Ethernet used in factory configuration)	Do not use

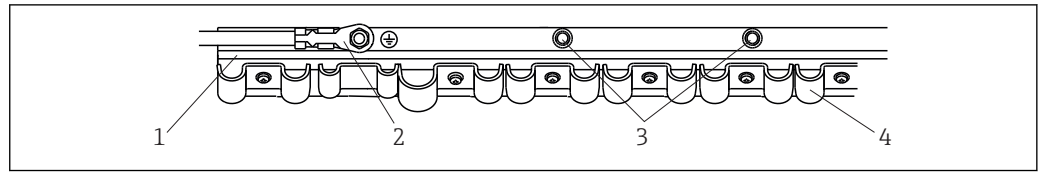
6.4 Electrical connection Liquiline CM444

NOTICE

The transmitter does not have a power switch!

- Provide a protected circuit breaker in the vicinity of the transmitter at the place of installation.
- The circuit breaker must be a switch or power switch, and must be labeled as the circuit breaker for the device.

### 6.4.1 Cable mounting rail

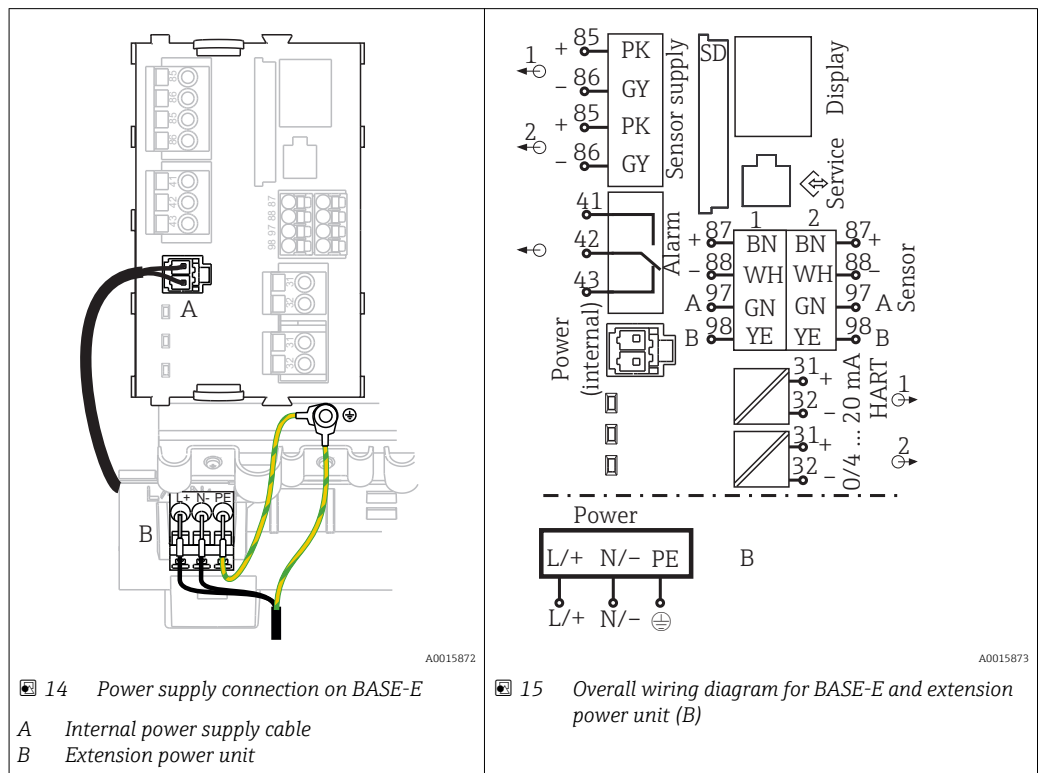


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13 Cable mounting rail and associated function

- 1 Cable mounting rail
- 2 Threaded bolt as protective ground connection, central grounding point
- 3 Additional threaded bolts for ground connections
- 4 Cable clamps for fixing and grounding the sensor cables

### 6.4.2 Connecting the Liquiline CM444 supply voltage



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14 Power supply connection on BASE-E

- A Internal power supply cable
- B Extension power unit

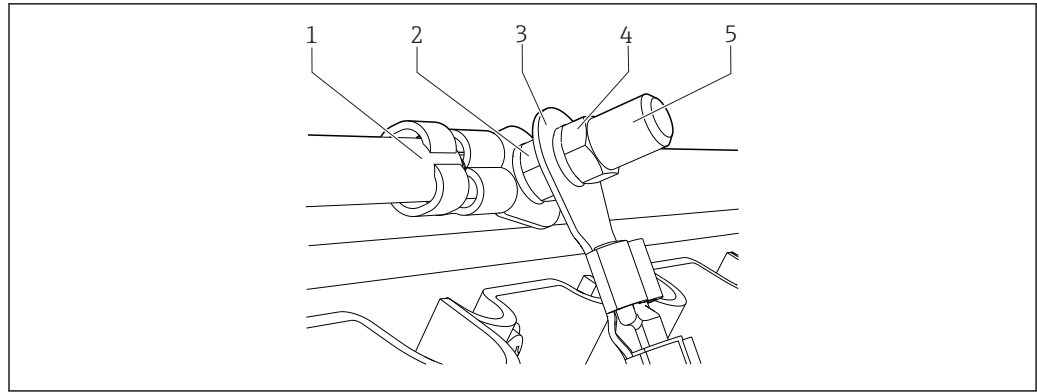
15 Overall wiring diagram for BASE-E and extension power unit (B)

#### Connecting the supply voltage – power unit 100 to 230 V AC

1. Route the power supply cable through the appropriate cable entry and into the housing.
2. Connect the protective ground of the power unit to the threaded bolt specially provided on the cable mounting rail.
3. We recommend you connect the protective ground or ground cable provided onsite to the mounting bolt. For this purpose, pull the protective ground or the ground cable through the cable entry and connect it to the threaded bolt on the cable mounting rail.
4. Connect cable cores L and N to the plug-in terminals of the power unit as shown in the wiring diagram.

#### Requirements for protective ground / ground cable

- Onsite fuse 10 A: wire cross-section min. 0.75 mm<sup>2</sup> (18 AWG)
- Onsite fuse 16 A: wire cross-section min. 1.5 mm<sup>2</sup> (14 AWG)



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16 Protective ground or grounding connection

### NOTICE

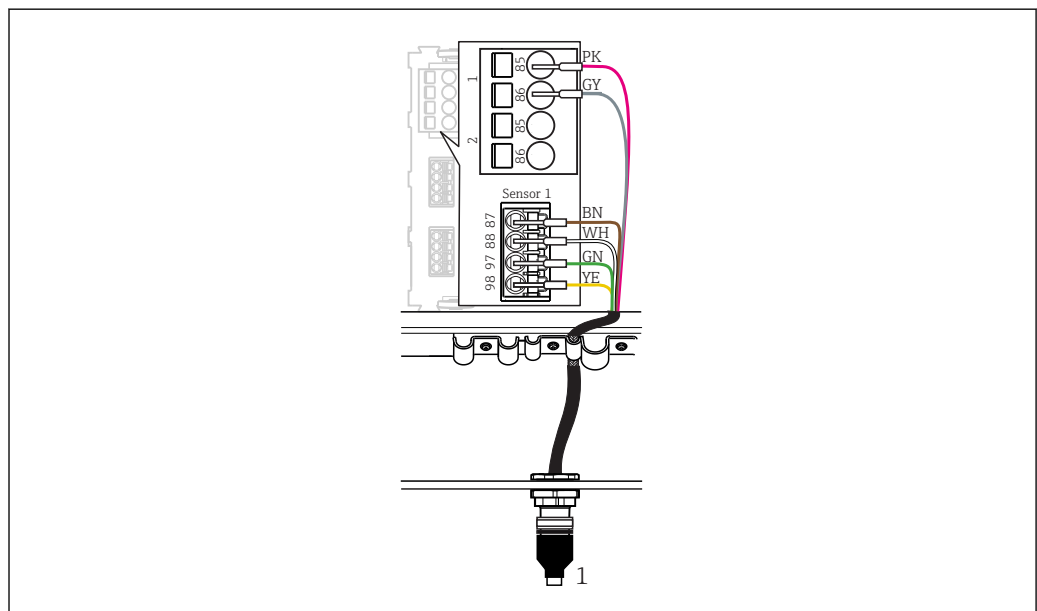
#### Protective ground or ground cable with wire ferrule or open cable lug

The cable can become loose. Loss of the protective function!

- To connect the protective ground or ground cable to the threaded bolt, only use a cable with a closed cable lug as per DIN 46211, 46225, form A.
- Never connect the protective ground or ground cable to the threaded bolt with a wire ferrule or an open cable lug.

### 6.4.3 Connecting the sensors

All sensors are supplied either with a sensor cable with an M12 connector or with a measuring cable CYA10 with an M12 connector. Connect the cable with the M12 connector to the M12 sensor socket provided on the underside of the device. The transmitter is already wired at the factory.



A0018019

17 M12 connection

1 Sensor cable with M12 connector or measuring cable CYA10 with M12 connector, depending on the sensor



Name of connection ports: → 18

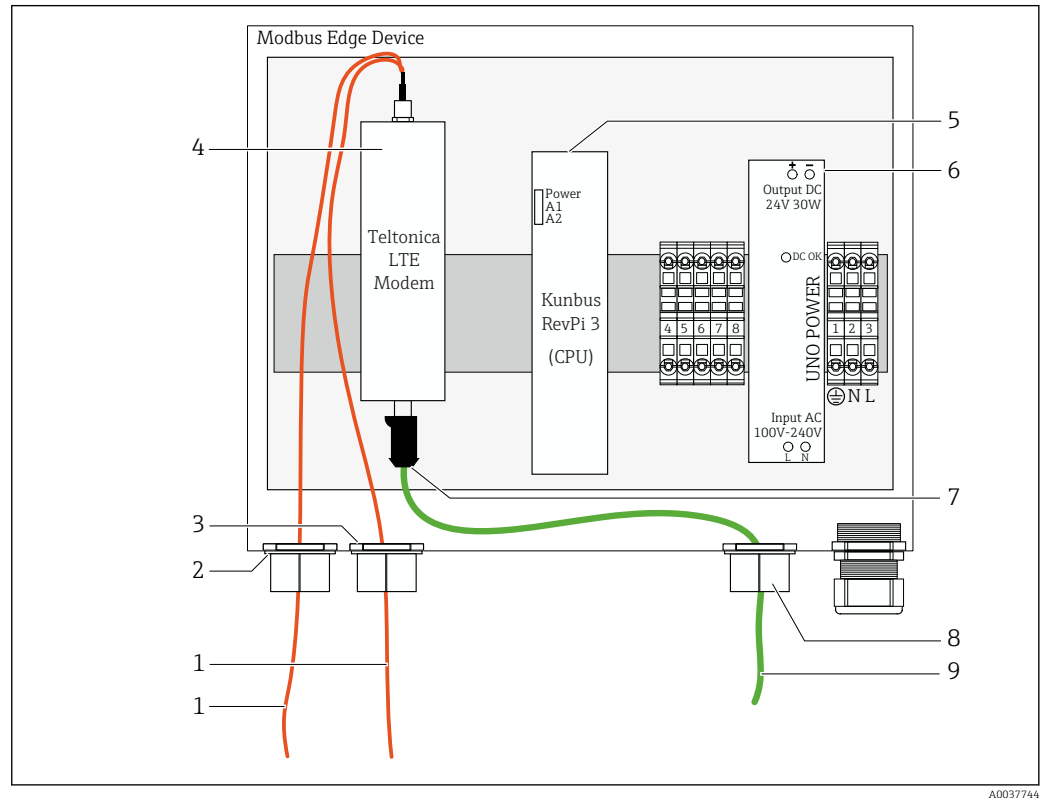
### Connecting the sensors

1. Connect the measuring cable of oxygen sensor COS51D to **connection port 1**.

2. Connect the measuring cable of conductivity sensor CLS50D to **connection port 2**.
3. Connect the measuring cable of pH sensor CPF81D to **connection port 3**.

## 6.5 Electrical connection of Modbus Edge Device

### 6.5.1 Preparing the Modbus Edge Device



18 Modbus Device Edge preparation

- 1 Antenna connection cables for LTE antenna and LTE modem
- 2 Cable gland at connection port C
- 3 Cable gland at connection port D
- 4 Teltonica LTE modem
- 5 CPU (Kunbus RevPi 3)
- 6 Power unit, only for Modbus Edge Device 100 to 240 VAC
- 7 Free connection of Teltonica LTE modem
- 8 Split cable gland
- 9 Ethernet cable (Modbus TCP connection)

1. Open the housing of the Modbus Edge Device → 17.
2. Mount the antenna head.
3. Secure the split cable gland on the Ethernet cable.
4. Mount the split cable gland with the Ethernet cable on **connection port F**.
5. Connect the Ethernet cable to the free connection of the Teltonica LTE modem.

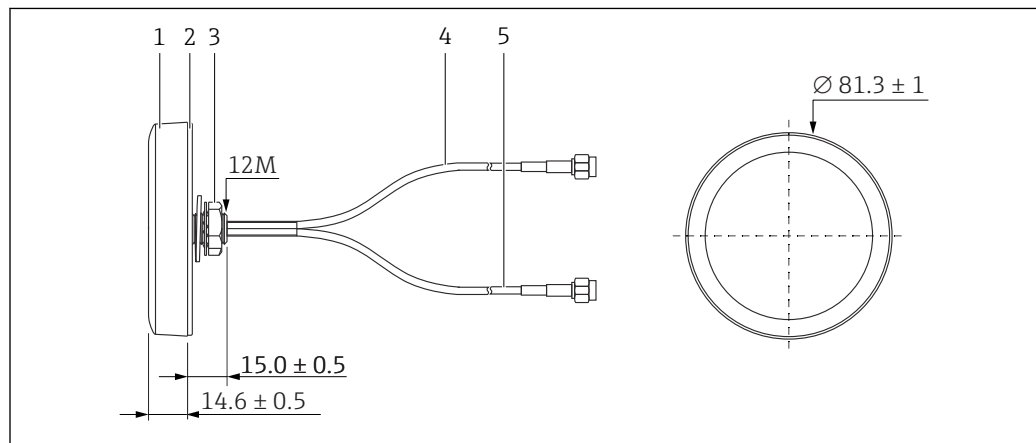
### 6.5.2 Mounting the LTE antenna

The LTE antenna is connected to the Modbus Edge Device upon delivery.

- i** Before mounting the antenna head, we recommend testing the antenna reception at the mounting location. The antenna head is difficult to disassemble once mounted.

**Mounting the LTE antenna**

1. Select a suitable mounting location for the antenna head.
2. Disconnect the antenna connection cables on the LTE modem in the Modbus Edge Device.
3. Pull the antenna connection cables through the cable glands on the Modbus Edge Device.
4. To secure the antenna head, drill an 11 mm bore in the mounting surface.
5. Guide the antenna connection cables through the bore.
6. Remove the protective film from the antenna head.
7. Stick the antenna head to the mounting surface.
8. Tighten the nut.
9. Guide the antenna connection cables through cable glands C and D.
10. Connect the antenna connection cables to the LTE modem in the Modbus Edge Device.

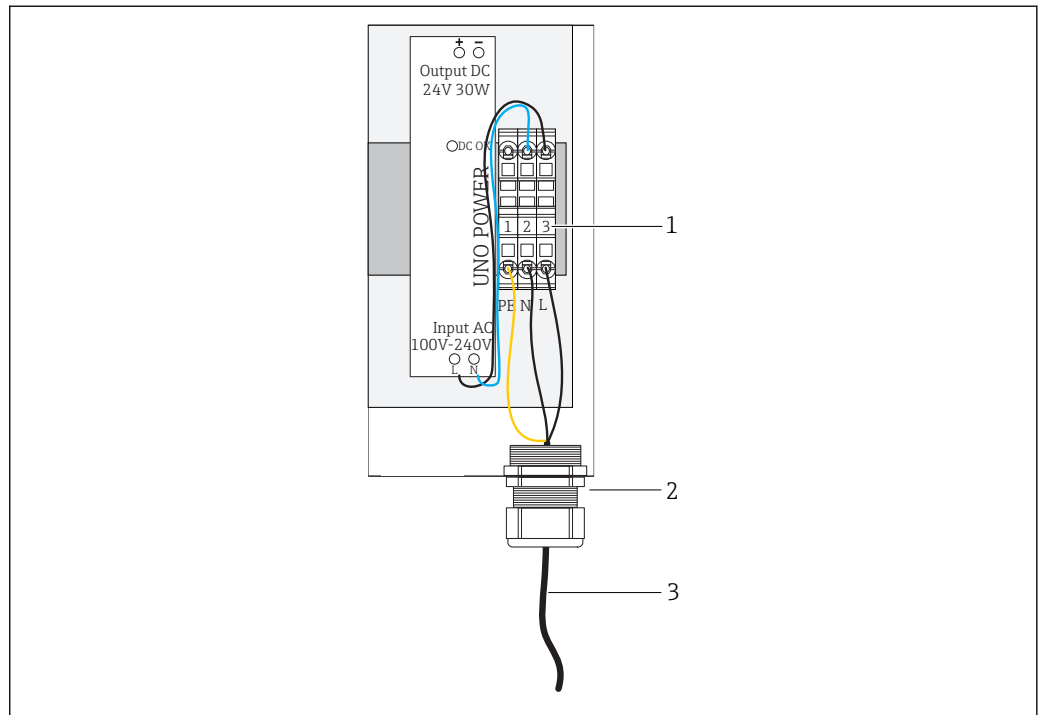


A0042905


**19 LTE antenna**

- 1 Antenna head
- 2 Protective film
- 3 Nut
- 4 Antenna connection cable: LTE-MAIN-SMA male
- 5 Antenna connection cable: LTE-AUX-SMA male


### 6.5.3 Connecting the supply voltage for the Modbus Edge Device, 100 to 240 V AC



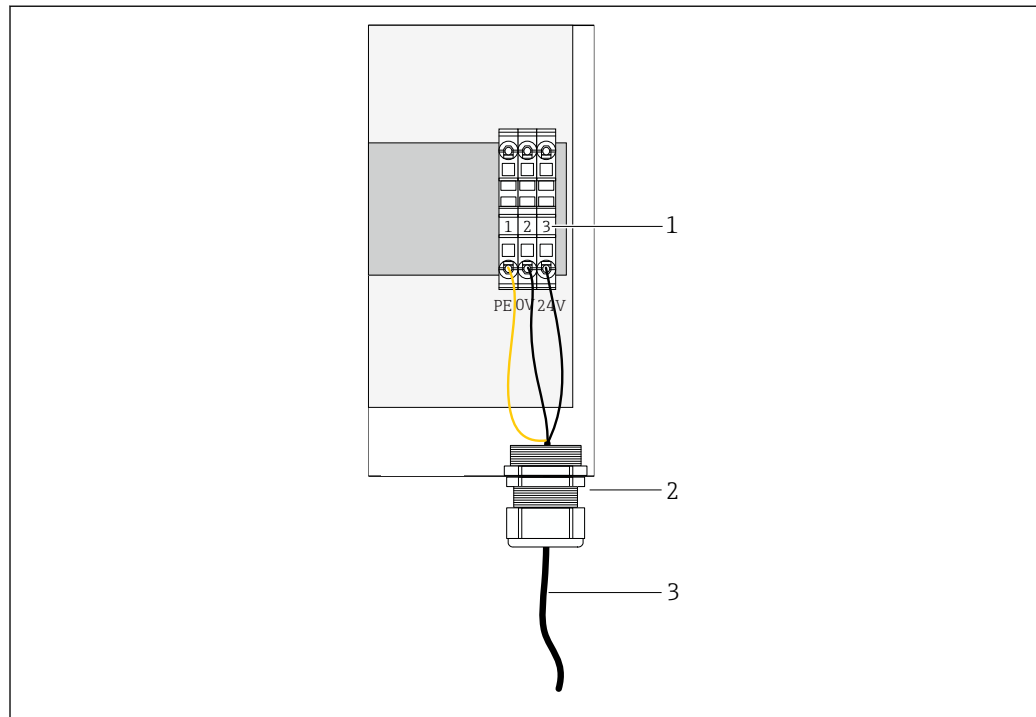
A0037821

 20 Connecting supply voltage 100 to 240 V AC


- 1 Terminal blocks
- 2 Cable entry
- 3 Power supply cable

1. Route the power supply cable into the housing through the cable gland at **connection port G**.
2. Connect the protective ground to the green/yellow terminal strip "1".
3. Connect the neutral conductor N to the blue terminal strip "2".
4. Connect phase L to the gray terminal strip "3".
5. Close the housing →  17.


### 6.5.4 Connecting the supply voltage for the Modbus Edge Device, 24 V DC



A0042707

 21 Connecting supply voltage 24 V DC

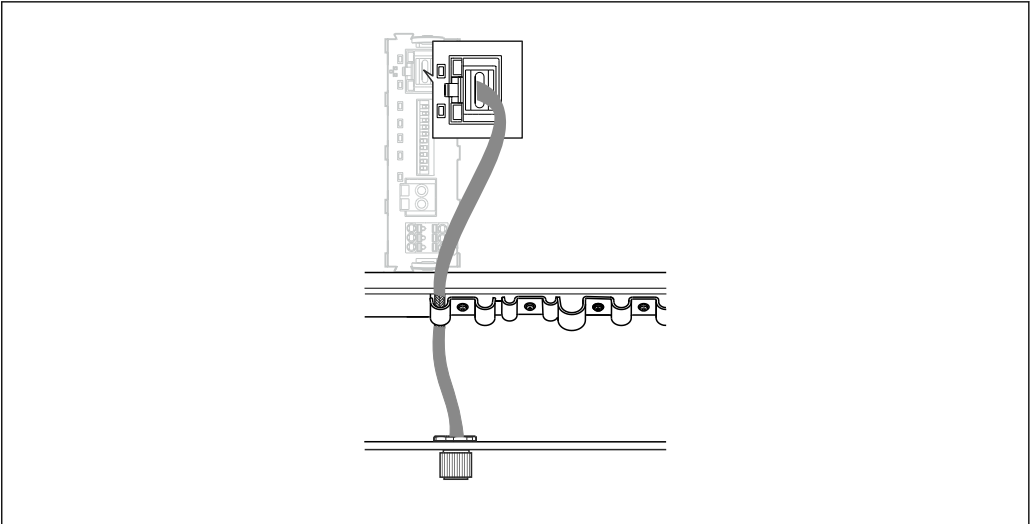
- 1 Terminal blocks
- 2 Cable entry
- 3 Power supply cable

1. Route the power supply cable into the housing through the cable gland at **connection port G**.
2. Connect the protective ground to the green/yellow terminal strip "1".
3. Connect 0 V DC to the blue terminal strip "2".
4. Connect +24 V DC to the gray terminal strip "3".
5. Close the housing →  17.

## 6.6 Connecting Liquiline CM444 and Modbus Device Edge

Signal transmission between the Liquiline CM444 transmitter and the Modbus Device Edge is via the Ethernet cable supplied. The Ethernet connection in the transmitter is already established on delivery from the factory.





A0025985

22 Connecting the Ethernet cable to the transmitter

- Connect the Ethernet cable to the M12 socket of **connection port I** on the transmitter.

### 6.7 Post-connection check

Are the system, devices and cables undamaged (visual check)?	<input type="checkbox"/>
Do the cables comply with the requirements?	<input type="checkbox"/>
Do the installed cables have adequate strain relief?	<input type="checkbox"/>
Does the supply voltage of the components match the specifications on the nameplate?	<input type="checkbox"/>
Is the terminal assignment correct?	<input type="checkbox"/>
Are all the housing covers closed?	<input type="checkbox"/>
Are all the housing screws securely fastened?	<input type="checkbox"/>
Are dummy plugs inserted in every unused cable entry?	<input type="checkbox"/>
Are all the cable glands tightened securely?	<input type="checkbox"/>

## 7 Commissioning

### 7.1 Commissioning the Liquiline CM444

#### 7.1.1 Function check



##### **WARNING**

##### **Incorrect connection and/or incorrect supply voltage**

Safety risks for staff and device malfunctions!

- ▶ Check that all connections have been established correctly in accordance with the wiring diagram.
- ▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.


Via the local display, you can take screenshots at any time and save them to an SD card.

1. Open the housing →  17.
2. Insert an SD card into the SD card slot in the base module.
3. Press the navigator button for at least 3 seconds.
4. In the context menu select the **Screenshot** item.
  - ↳ The current screen is saved as a bitmap file to the SD card in the "Screenshots" folder.
5. Close the housing →  17.

#### 7.1.2 Setting the operating language

1. Switch on the supply voltage.
2. Wait for the initialization to finish.
3. Press the **MENU** soft key. Set your language in the top menu item.
  - ↳ The device can now be operated in your chosen language.

#### 7.1.3 Configuring the Liquiline CM444

 The Liquiline CM444 transmitter is preconfigured on delivery from Endress+Hauser. Take the following steps if you want other settings or want to connect an additional sensor.

##### **Customizing specific parameters for the Liquiline CM444 transmitter**

1. Select the **Basic setup** menu. Menu path: Menu > Setup > Basic setup
2. Set the **Device tag**, **Set date** and **Set time** parameters.
  - ↳ The specific parameters for the transmitter are customized.

##### **Customizing the tag name for the sensors**

You have to customize the tag name for each connected sensor individually.

1. Select the **Tag** menu. Menu path: Menu > Setup > Inputs > Channel: Sensor type > Advanced setup > Tag check > Tag
2. Customize the **Tag name** parameter.
  - ↳ The tag name is customized for the selected sensor.

### Modifying the Modbus assignment

Each sensor is assigned one analog output for the primary value and one analog output for the secondary value. The sensors are assigned to the analog outputs according to the connection on the transmitter.

1. Select the **Modbus** menu. Menu path: Menu > Setup > Outputs > Modbus
2. Select the first analog output pertaining to the sensor. Menu path: Modbus > AI 1 to AI 16, e.g. AI 7.
3. Assign the channel or measured value to the analog output.
4. Select the second analog output pertaining to the sensor. Menu path: Modbus > AI 1 to AI 16, e.g. AI 8.
5. Assign the channel or measured value to the analog output.  
 ↳ The Modbus register has been modified.

Connection at transmitter	Analog input	Measured value	Factory configuration
A	AI 1	Sensor 1 primary value	Oxygen content (oxygen sensor COS51D)
	AI 2	Sensor 1 secondary value	Temperature (oxygen sensor COS51D)
B	AI 3	Sensor 2 primary value	Conductivity (conductivity sensor CLS50D)
	AI 4	Sensor 2 secondary value	Temperature (conductivity sensor CLS50D)
C	AI 5	Sensor 3 primary value	pH value (pH sensor CPF81D)
	AI 6	Sensor 3 secondary value	Temperature (pH sensor CPF81D)
D	AI 7	Sensor 4 primary value	–
	AI 8	Sensor 4 secondary value	–
E	AI 9	Sensor 5 primary value	–
	AI 10	Sensor 5 secondary value	–
F	AI 11	Sensor 6 primary value	–
	AI 12	Sensor 6 secondary value	–
G	AI 13	Sensor 7 primary value	–
	AI 14	Sensor 7 secondary value	–
H	AI 15	Sensor 8 primary value	–
	AI 16	Sensor 8 secondary value	–

### Modifying the settings for Ethernet





1. Select the **Ethernet** menu. Menu path: Menu > Setup > General settings > Advanced setup > Ethernet
2. Select the **Off** option for the **DHCP** parameter.
3. Save the setting. Press the **SAVE** soft key to do so.
4. For the **IP address** parameter, configure the value **192.168.1.99**.
5. For the **Subnet mask** parameter, configure the value **255.255.255.0**.
6. For the **Gateway** parameter, configure the value **192.168.1.1**.
7. Save the settings. Press the **SAVE** soft key to do so.
8. Exit the **Ethernet** menu.

9. Check the settings in the **System information** menu. Menu path: DIAG > System information
  - ↳ The Liquiline CM444 transmitter can be found by the Modbus Edge Device and read out data.

## 7.2 Commissioning the Modbus Edge Device


No settings need to be made on the Modbus Edge Device. Once the Liquiline CM444 transmitter has been configured successfully, the Modbus Edge Device connects to the transmitter.

### Checking the connection if necessary

1. Open the housing of the Modbus Edge Device →  17.
2. Check whether the LED A2 on the CPU (Kunbus RevPi3) is flashing irregularly (→  18,  21).
3. Close the housing of the Modbus Edge Device →  17.

## 7.3 Adding devices to the Web application

All devices connected to the Modbus Edge Device are automatically created in the Cloud. This can take up to 5 minutes. All the user needs to do is to add the Smart System to his assets.

1. Call up the log-in page in the Web browser  
<https://iiot.endress.com/app/smartsystems>.
  - ↳ The "ID login" page is displayed.
2. Log in or register.
  - ↳ Once the user has logged in successfully, the **Assets** page is displayed.
3. Select the **Add** function.
4. Enter the serial number of the Liquiline CM444 transmitter.
5. Enter the serial number of a connected sensor.
6. Click the **Add** button.
7. Select a subscription. The subscriptions vary due to the different data transmission intervals.
  - ↳ The **Order details** page is displayed.
8. Enter the discount code. Nameplate: →  29
9. Enter the payment and invoicing data.
10. Click the **Buy** button.
  - ↳ Once the payment has been made successfully, the newly added devices are displayed in the overview.

## 7.4 Installing a smartphone application

### Prerequisite

The user owns the Smart System (→  28).

1. Download the Smart Systems App from the Apple AppStore or Google Play Store.
2. Install the Smart System App.
3. Log in.
  - ↳ The devices are displayed in the overview.

## **8      Nameplate**

## 9      **Diagnostics and troubleshooting**

### 9.1      **Smart System SSP**

For an overview of the alarms currently pending, see the "History" view in the Smart System App.

### 9.2      **Liquiline CM444**



For detailed information on transmitter diagnostics and troubleshooting, see the Operating Instructions for Liquiline CM444 .

## 10 Maintenance

We recommend you perform regular visual inspections of the components. Endress+Hauser also offers its customers Maintenance Agreements or Service Level Agreements for this. For more information, see the next section.

### 10.1 Endress+Hauser services

Endress+Hauser offers a wide variety of services for maintenance such as recalibration, maintenance service, system tests or device tests. Your Endress+Hauser Sales Center can provide detailed information on the services.

### 10.2 Smart System SSP

#### 10.2.1 Updates

Updates for the Smart System App are available from either the Apple AppStore or the Google Play Store. Updates for the Modbus Edge Device are automatically installed by Endress+Hauser. Where necessary, updates for the transmitter will be provided by your Endress+Hauser Sales Center.

### 10.3 Liquiline CM444

 For detailed information on the maintenance of the transmitter, see the Operating Instructions for Liquiline CM444

## 11 Repair

### 11.1 General information

Please note the following:

- Repairs may only be performed by Endress+Hauser staff or by individuals authorized and trained by Endress+Hauser.
- Observe local and national laws and regulations.
- Standard components can be replaced with identical components.
- Document all repairs and enter them in the W@M Lifecycle Management database.
- Check the function after repair.



We recommend you conclude a Service Level Agreement. For more information, please contact your Endress+Hauser Sales Center.

### 11.2 Spare parts

Please contact your Endress+Hauser Sales Center at: [www.addresses.endress.com](http://www.addresses.endress.com)

### 11.3 Endress+Hauser services

Endress+Hauser offers a wide variety of services for maintenance such as recalibration, maintenance service, system tests or device tests. Your Endress+Hauser Sales Center can provide detailed information on the services.

### 11.4 Liquiline CM444



For detailed information on repairing the transmitter, see the Operating Instructions for Liquiline CM444

### 11.5 Disposal




If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to Endress+Hauser for disposal under the applicable conditions.



## 12 Technical data



For detailed information on the technical data, see the Technical Information for the particular product →  6.





[www.addresses.endress.com](http://www.addresses.endress.com)

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