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Operating Instructions
Liquiline Edge Module CYY7

Connection to Netilion via cellular radio or Ethernet
Cellular radio/Ethernet version (EMR) and Ethernet version (EME)

Endress+Hauser
People for Process Automation

1 About this document

1.1 Warnings

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

- Additional information, tips
- Permitted
- Recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- Result of an individual step

1.3 Symbols on the device

- Reference to device documentation
- Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.4 Documentation

The following manuals which complement these Operating Instructions can be found on the product pages on the Internet:
- Security Manual: SD03342C
- Special Documentation for Radio Approvals: SD03343C
- Operating Instructions Memosens for Liquiline platform: BA01245C

- Transmitter Operating Instructions
  - CM442/CM444/CM448: BA00444C
  - CM442R/CM444R/CM448R: BA01225C
- Operating Instructions for Analyzers
  - CA80AL: BA01585C
  - CA80AM: BA01240C
  - CA80COD: BA01354C
  - CA80CR: BA01575C
  - CA80FE: BA01586C
  - CA80HA: BA01772C
  - CA80NO: BA01574C
  - CA80PH: BA01416C, BA01435C
  - CA80SI: BA01650C
  - CA80TN: BA01981C
  - CA80TP: BA01593C
  - CA82HA: BA02427C
- Operating Instructions for Samplers
  - CSF34: BA00478C
  - CSF39: BA01407C
  - CSF48: BA00443C

2 Basic safety instructions

2.1 Requirements concerning personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Intended use

The edge module is operated as a plug-in module in a field device and connects this field device to the Netilion cloud platform from Endress+Hauser. This connection requires an Internet connection that is established via Ethernet or a cellular network.

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.3 Workplace safety

The operator is responsible for ensuring compliance with the following safety regulations:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.

Procedure for damaged products:

1. Do not operate damaged products, and protect them against unintentional operation.
2. Label damaged products as defective.

During operation:

▶ If errors cannot be rectified,
take products out of service and protect them against unintentional operation.

2.5 Product safety

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

2.6 IT security

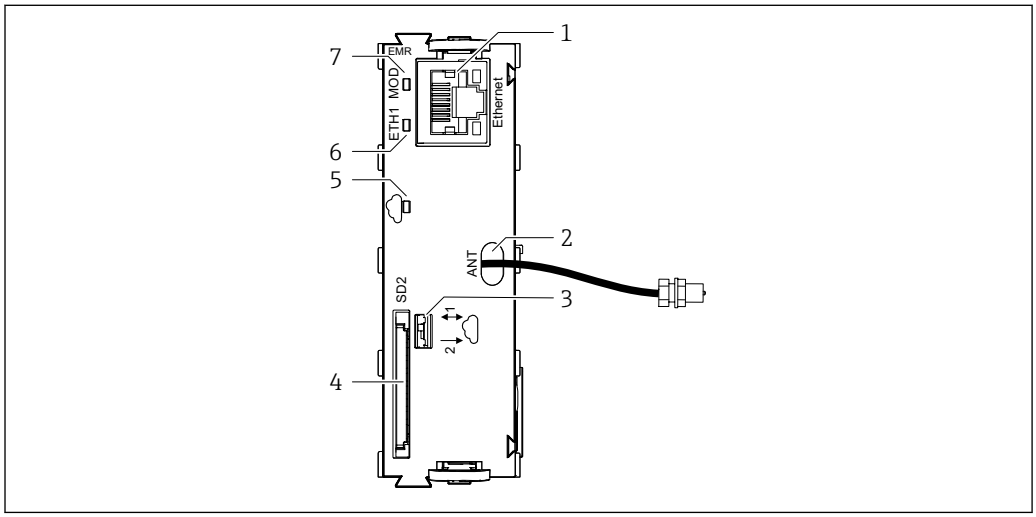
We only provide a warranty if the device is installed and used as described in the Operating Instructions and the Security Manual. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves. For more information, see the Security Manual.

3 Product description

3.1 Product design

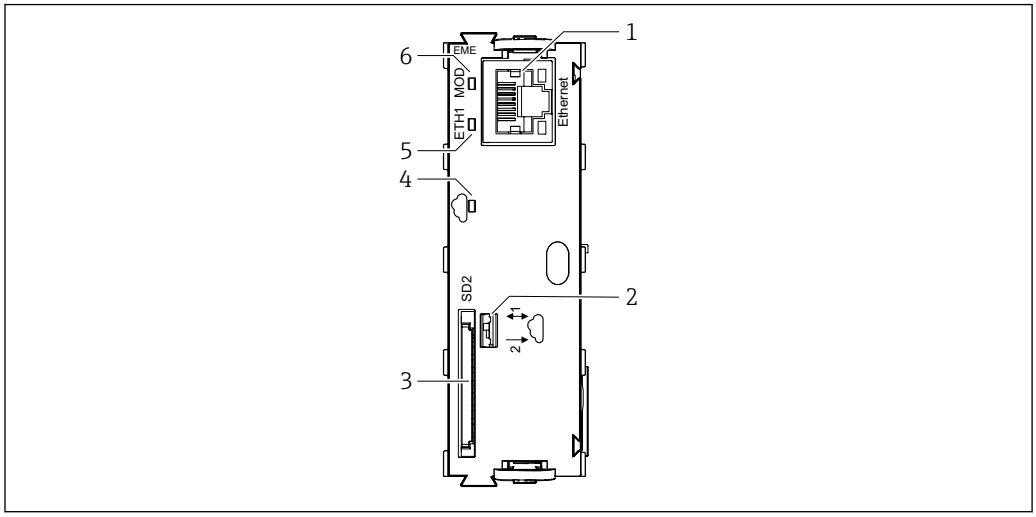
3.1.1 Cellular radio/Ethernet version (EMR)



1 Edge module, version for cellular radio or Ethernet (EMR)

1 *Ethernet port*
2 *Antenna cable output*
3 *Data transmission switch (bidirectional/unidirectional)*
4 *Slot for SD card*
5 *LED Netilion connection active*
6 *LED ETH1*
7 *LED MOD*

3.1.2 Ethernet version (EME)



2 Edge module, version for Ethernet (EME)

1 *Ethernet port*
2 *Data transmission switch (bidirectional/unidirectional)*
3 *Slot for SD card*
4 *LED Netilion connection active*
5 *LED ETH1*
6 *LED MOD*

4 Incoming acceptance and product identification

4.1 Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
   ↳ Report all damage immediately to the manufacturer.
   Do not install damaged components.
2. Check the scope of delivery using the delivery note.
3. Compare the data on the nameplate with the order specifications on the delivery note.
4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

If one of the conditions is not satisfied, contact the manufacturer.

4.2 Product identification

4.2.1 Nameplate

The following information on the device can be found on the nameplate:
- Manufacturer identification
- Extended order code
- Serial number
- Ambient conditions
- Input and output values
- Safety information and warnings
- Certificate information

▶ Compare the information on the nameplate with the order.

4.2.2 Identifying the product

Manufacturer address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
70839 Gerlingen
Germany

Product page

www.endress.com/CYY7

Interpreting the order code

The order code and serial number of your product can be found in the following locations:
- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.

2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.
4. Click the product overview.
   ↳ A new window opens. Here you will find information pertaining to your device, including the product documentation.

4.3 Scope of delivery

Liquiline Edge Module CYY7 cellular radio/Ethernet version (EMR), kit for transmitter (order code CYY7 – AA2EC8A1):
- Edge module
- Antenna with cable
- Cable gland for antenna cable
- Antenna holder for wall mounting
- Installation instructions

Liquiline Edge Module CYY7 cellular radio/Ethernet version (EMR), kit for analyzers (order code CYY7 – AA2EC4A1):
- Edge module
- Antenna with cable. The antenna cable is fitted with a heat shrink tube.
- Cable gland for antenna cable
- Antenna holder for wall mounting
- Antenna holder for mounting on samplers
- Clip-on ferrite core
- Adhesive clamps
- Installation instructions

Liquiline Edge Module CYY7 cellular radio/Ethernet version (EMR), kit for sampler (order code CYY7 – AA2EC6A1):
- Edge module
- Antenna with cable. The antenna cable is fitted with a heat shrink tube.
- Cable gland for antenna cable
- Antenna holder for wall mounting
- Antenna holder for mounting on samplers
- Ethernet cable
- Ferrite ring
- Adhesive clamps
- Installation instructions

Liquiline Edge Module CYY7 Ethernet version (EME) (order code CYY7-AA1EC4A1 / CYY7-AA1EC6A1 / CYY7-AA1EC8A1):
- Edge module
- Cable gland for Ethernet cable
- Installation instructions

Liquiline Edge Module CYY7 replacement kit Ethernet version (EME) order code CYY7-AA1ECNA1 and cellular radio/Ethernet version (EMR) order code CYY7-AA2ECNA1
- Edge module
- Installation instructions

▶ If you have any queries:
  Please contact your supplier or local sales center.

5 Installation

5.1 Installing the edge module

5.1.1 Update the field device firmware

- Before installing the edge module, make sure that the field device firmware is up to date. If necessary, install the current firmware version on the field device.

5.1.2 Inserting the edge module

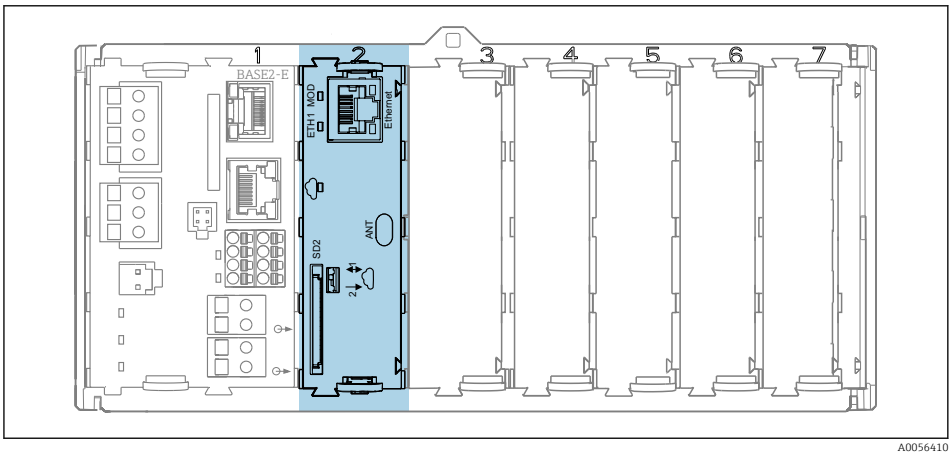
Assigning the slots

Edge module version	Transmitter CM44xx	Analyzer CA8xxx	Sampler CFSxx
Cellular radio/Ethernet (EMR)	Slot 2 or 7	Slot 2	Slot 2 or 7
Ethernet (EME)	Slot 2 or 7	Slot 2 or 7	Slot 2 or 7

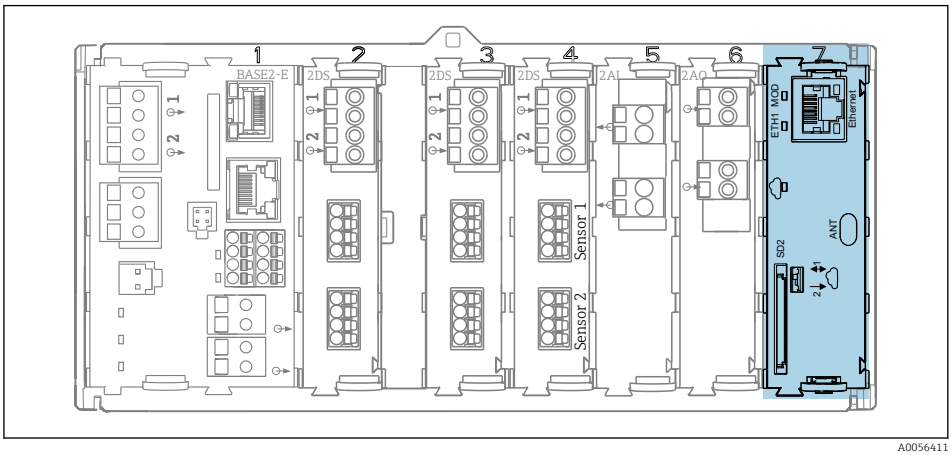
- The field device is switched off and disconnected from the power supply.

  Insert the edge module into slot 2 or 7 of the field device or the electronic unit. For analyzers, only insert the edge module version EMR (cellular radio/Ethernet) into slot 2.

  ↳



3 *Edge module in slot 2*



4 *Edge module in slot 7*

6 Electrical connection

6.1 Connecting the edge module

⚠ WARNING

Device is live!

Incorrect connection may result in injury or death!

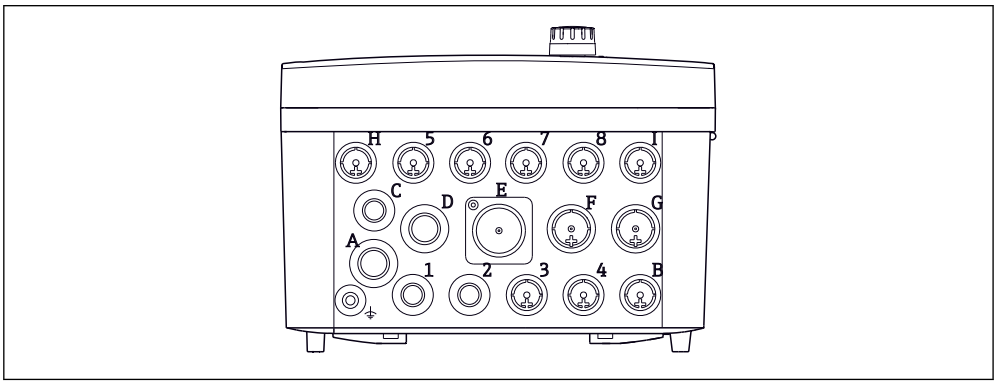
- The electrical connection may be performed only by an electrical technician.
- The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- **Prior** to commencing connection work, ensure that no voltage is present on any cable.

6.1.1 Mounting the cable gland

Route the antenna cable or Ethernet cable through the supplied cable gland. Depending on the order (cellular radio version or Ethernet version), suitable cable glands are supplied.

Mounting the cable gland for CM442/CM444/CM448 transmitters

Does not apply for CM442R/CM444R/CM448R

- 

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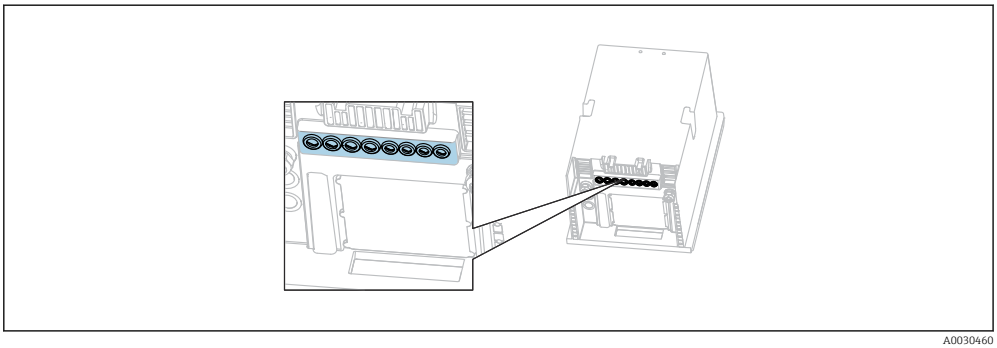
5 *Position of the cable glands for CM442/CM444/CM448 transmitters*

Mount the cable gland at position D, F, or G. Observe the operating instructions for the transmitter for this.

Mounting the cable gland for CA8xxx analyzer

- 
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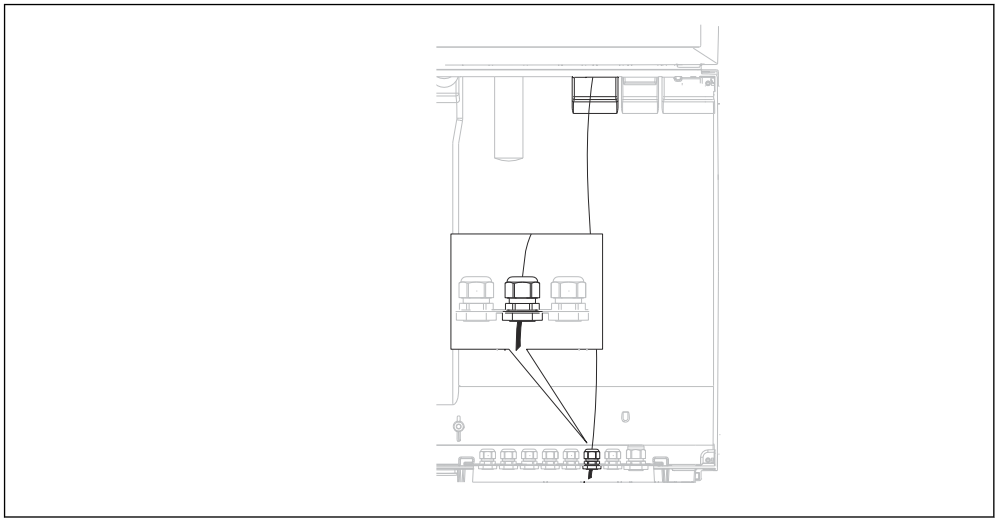
6 *Position of the cable gland for CA8xxx analyzer*

Mount the cable gland on the housing of the analyzer in an M20 thread. Observe the operating instructions for the analyzer for this.

Mounting the cable gland for CFSxx sampler

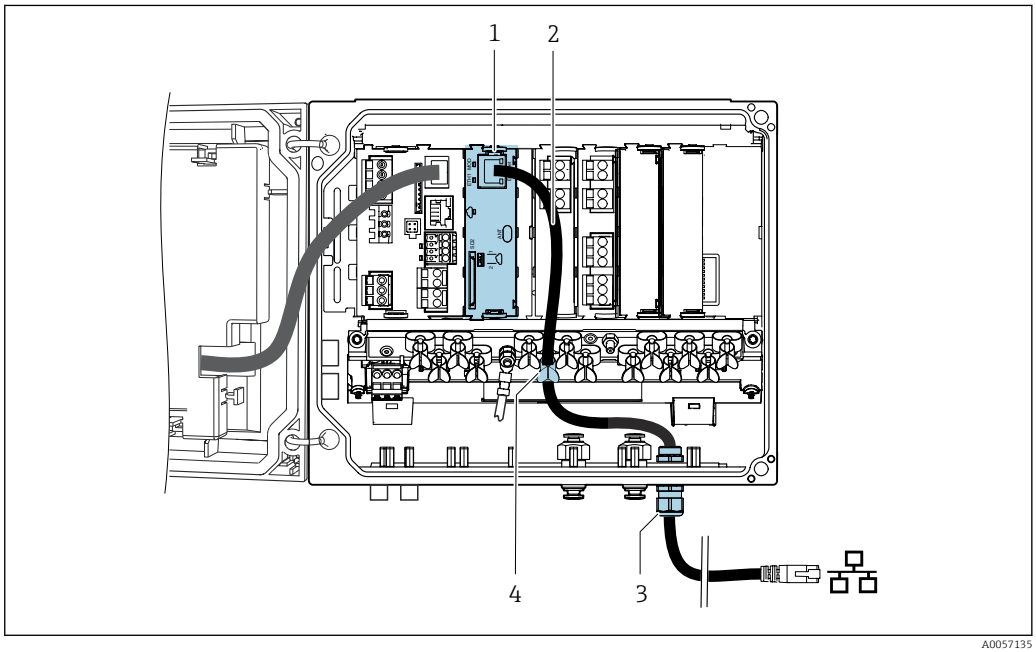
▶



7 *Position of cable glands for CFSxx sampler*

Mount the cable gland on the housing of the sampler. Observe the operating instructions for the sampler for this.

6.1.2 Connecting the Ethernet cable



8 *Routing the Ethernet cable using the example of a transmitter*

1 *Edge module*
2 *Ethernet cable*
3 *Cable gland*
4 *Cable terminal*

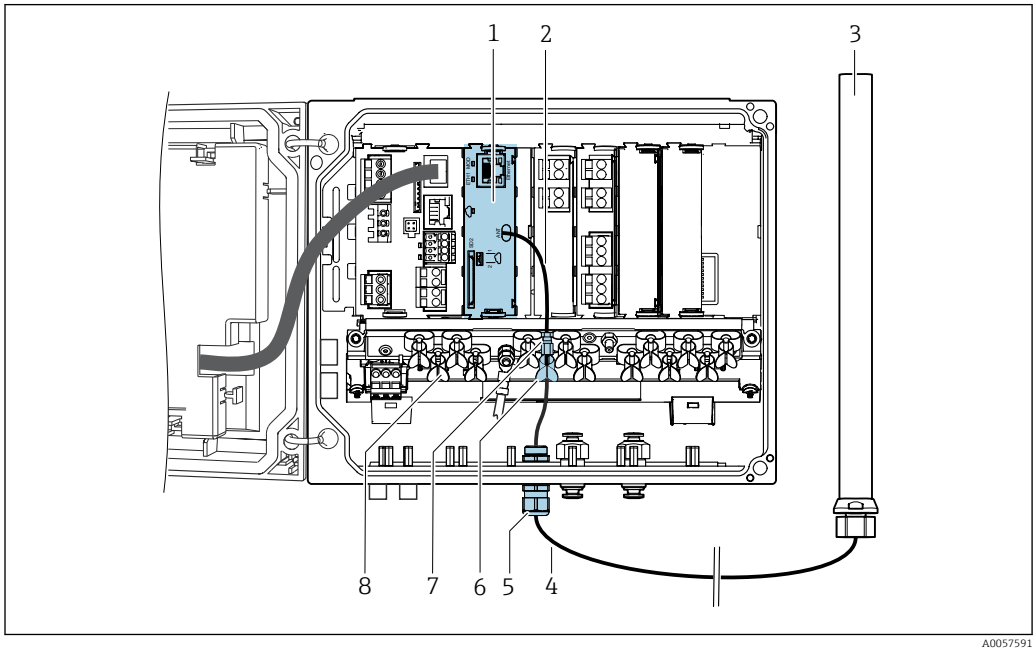
Ethernet cable (customer-supplied):
- Cable diameter: 3 to 6 mm (0.12 to 0.23 in)
- Max. diameter of the connector (diagonal): 14 mm (0.55 in)

1. Use the Ethernet cable to connect the Ethernet interface for the edge module to the receiving point.

2. Route the Ethernet cable through the supplied cable gland.

- The sealing insert for the cable entry can be separated. This means that it can be attached to the cable without having to guide the plug through.
- Tool required: Open-ended wrench 27 mm

6.1.3 Connecting the antenna cable



9 *Routing the antenna cable using the example of a transmitter*

1 *Edge module*
2 *Adapter cable*
3 *Antenna*
4 *Antenna cable*
5 *Cable gland*
6 *Cable terminal*
7 *Cable connection*
8 *Terminal strip*

NOTICE

If the bending radius of the antenna cable is too small, the radio signal may be faulty or fail.

► Do not kink the antenna cable, and route it with a sufficiently large bending radius.

NOTICE

Loss of radio approval due to the use of an unauthorized antenna or an unauthorized antenna cable.

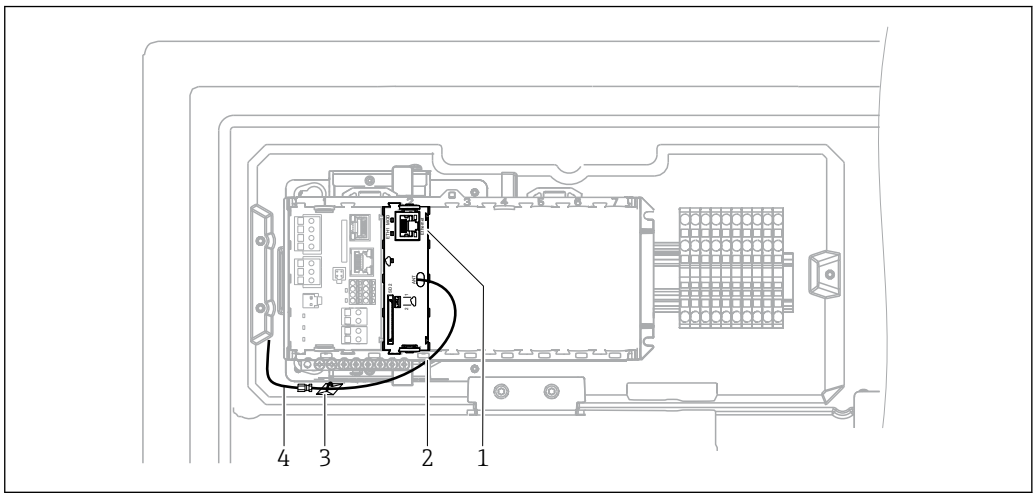
► Only use the edge module with the supplied antenna and the supplied antenna cable (length 3 m, permanently installed).
► Do not extend the antenna cable.

1. To relieve the tension, secure the adapter cable with the terminal strip (if it is fitted).
2. Route the antenna cable through the cable gland supplied.
3. Connect the antenna cable to the adapter cable.

⚠ WARNING

The antenna cable may be live if it comes into contact with single-insulated cables carrying mains voltage.

- ▶ Secondary circuits must be separated from mains supply circuits by reinforced insulation or double insulation.
- ▶ Route the antenna cable in such a way that it does not come into contact with single-insulated live cables.
- ▶ For analyzers, attach the adhesive clamp to the left of the edge module and route the cable to the left. Observe the following figure.
- ▶ For analyzers and samplers, only use antenna cables that are insulated with additional heat-shrink tubing.



10 Cable routing for analyzers

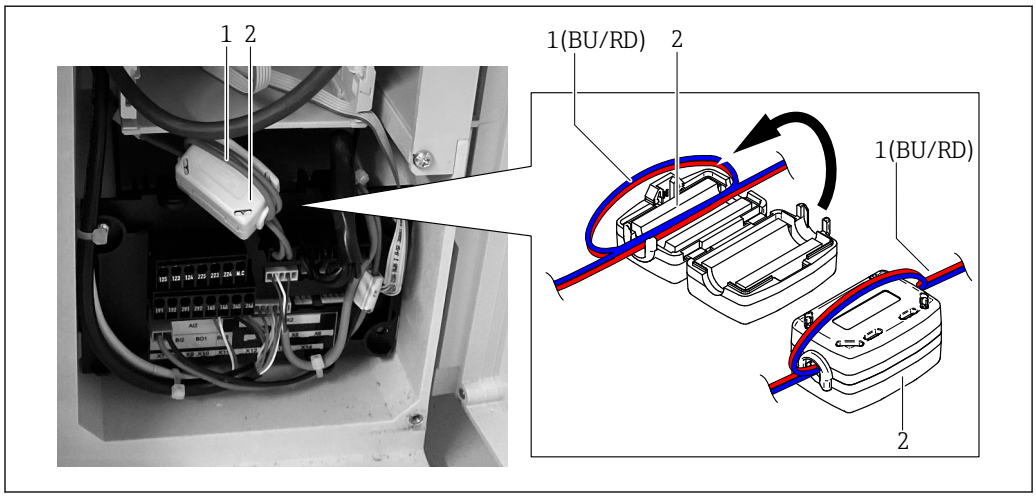
1 Edge module
2 Adapter cable
3 Adhesive clamp
4 Antenna cable, routed to the left

- Use additional adhesive clamps to guide the antenna cable upwards on the outside of the field device.
- Tool required for mounting the cable gland: Open-ended wrench 24 mm

6.1.4 Installing the ferrite core

For reasons of electromagnetic compatibility (EMC), ferrite cores must be installed for CA8x analyzers and CSFxx samplers.

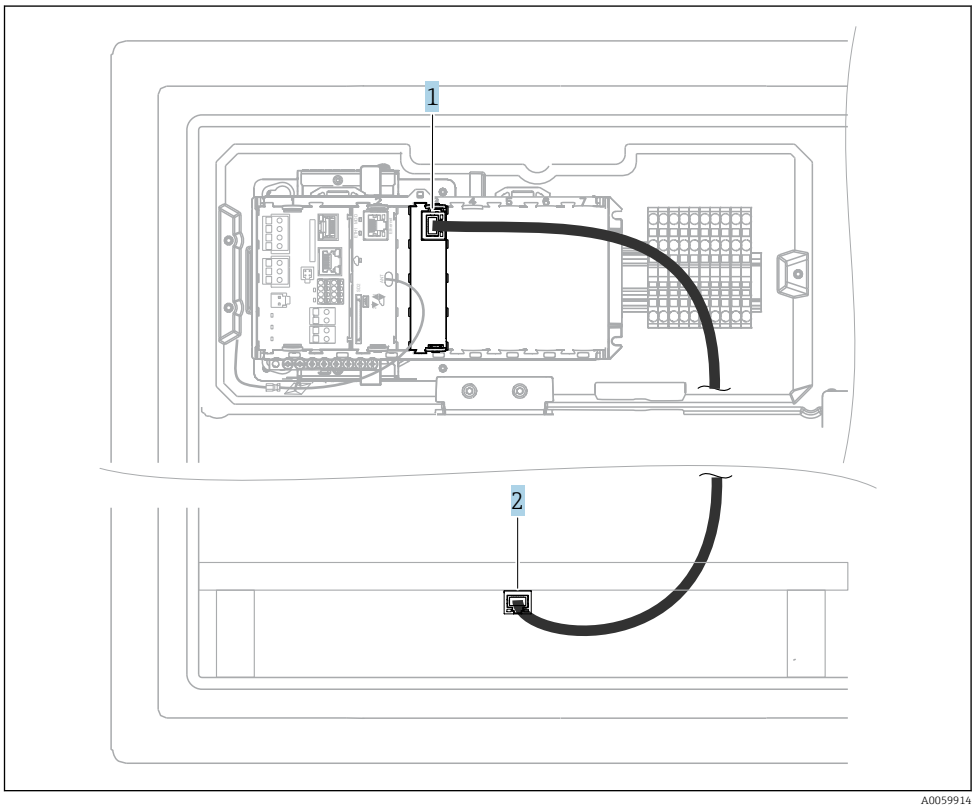
Installing the ferrite core for the sampler



1. Disconnnect cable X1 (red/blue) (1).
2. Mount the supplied clip-on ferrite core (2) on cable X1. Wrap the cable once around the ferrite core.
3. Reconnect cable X1.

Installing the ferrite core for the analyzer

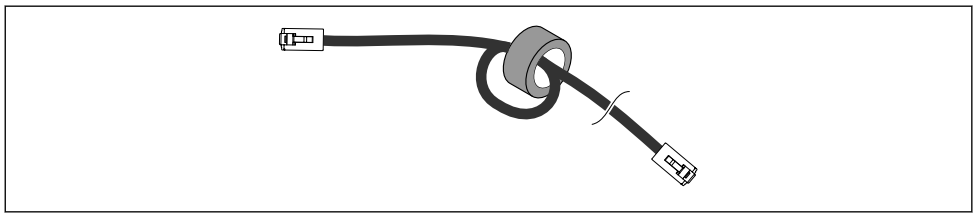
1.



Disconnect the factory-installed data cable from the communication module (1) and from the receiving point (2). The communication module is not labeled and has only one RJ45 port.

↳ The data cable is no longer used.

2.



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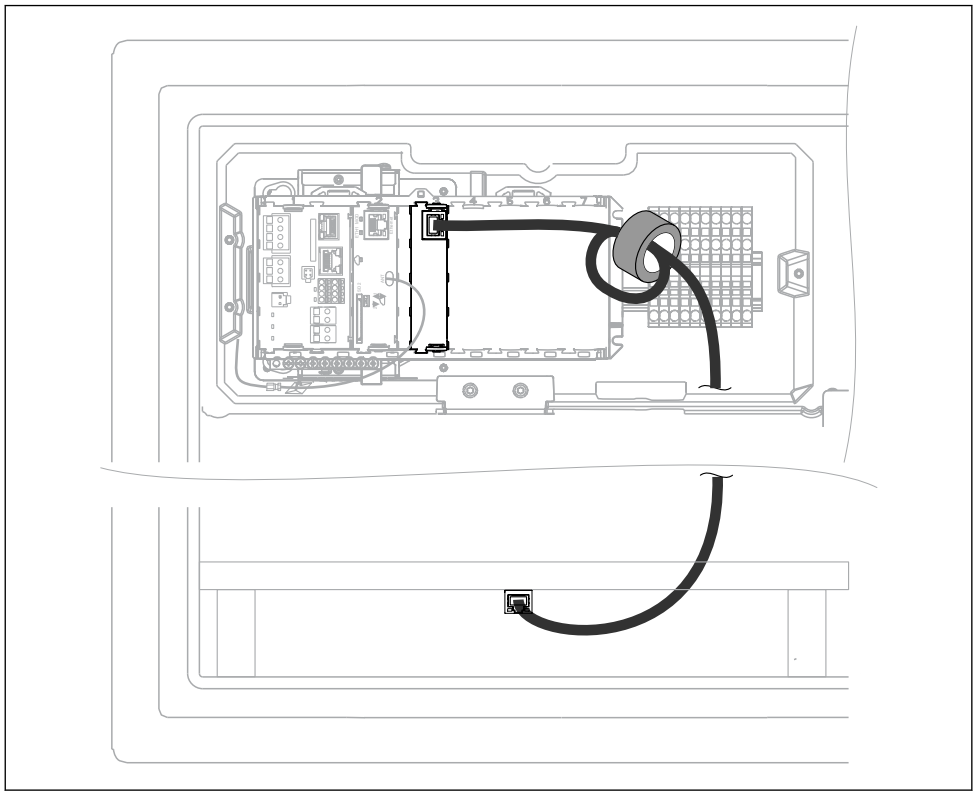
Attach the ferrite ring supplied to the data cable supplied.

3.



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Connect the data cable with ferrite ring to the communications module.

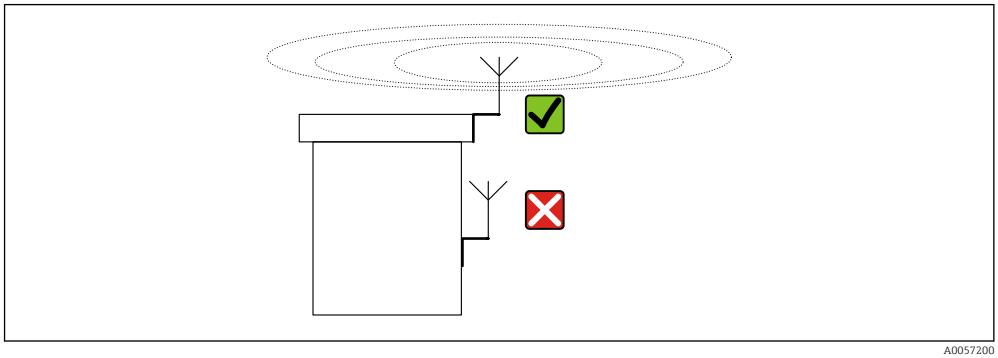
4. Route the data cable downward and connect it to the receiving point.

6.1.5 Installing the antenna

Recommendation: Installation distance between the antenna and the transmitter: min. 50 cm

Installation position

▶



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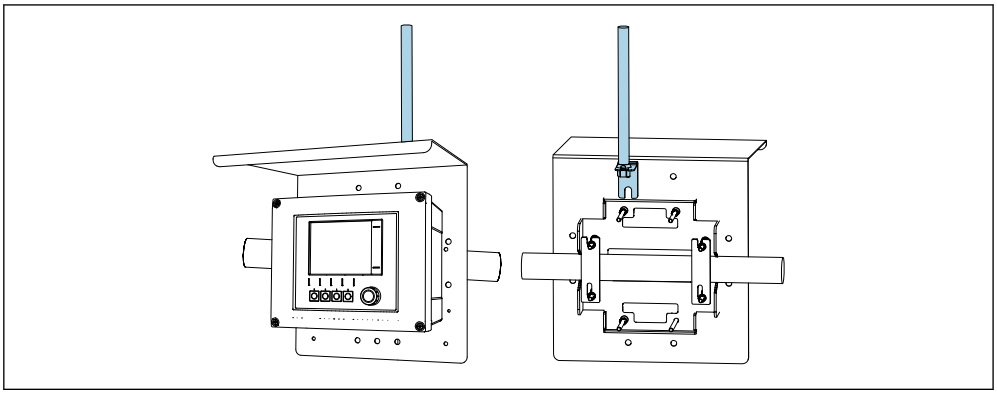
Select the highest possible installation position. Install the antenna so that it is free-standing on all sides and does not face a roof, wall, or similar obstruction.

Installation on the transmitter

Installation material (to be provided by customer):
- M5 screw, minimum length 8 mm
- Washer
- Nut M5

▶

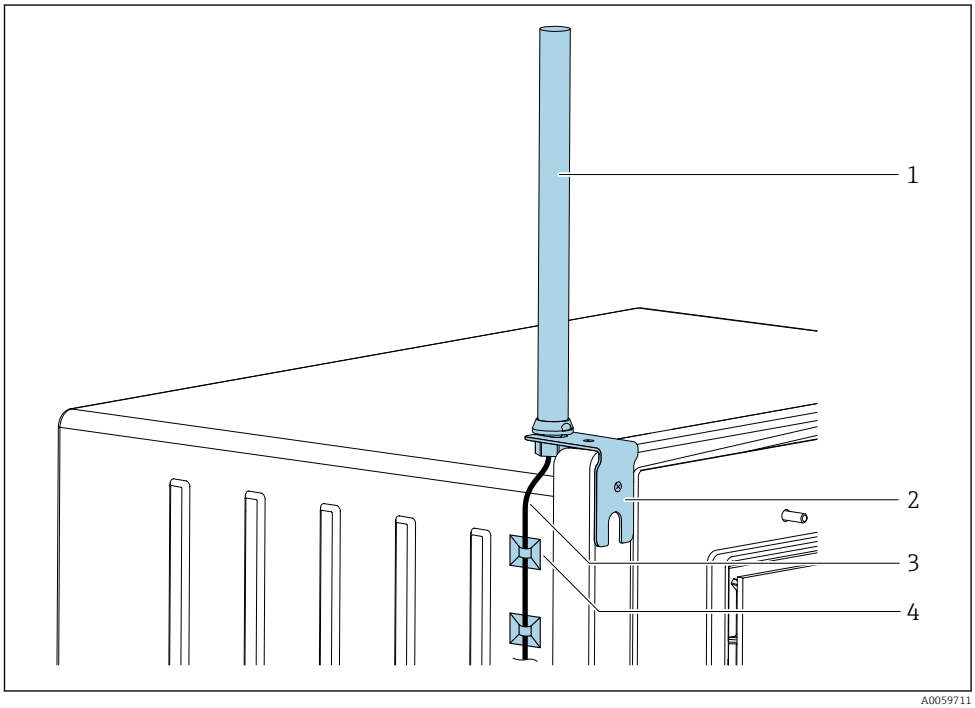


11 *Example: Installation on weather protection cover*

Install the antenna in a free-standing position, e.g. on a post mounting kit or on the rear side of the weather protection cover.

Installation on analyzer

1.



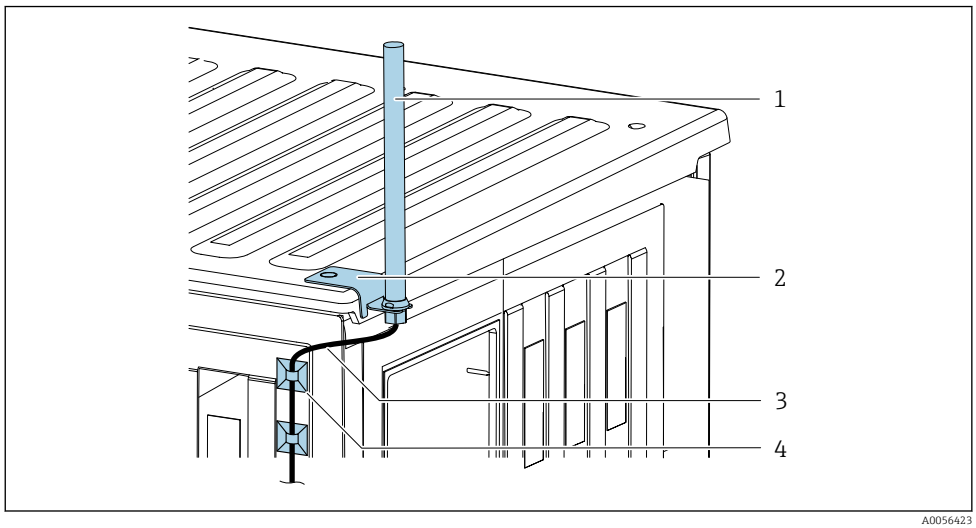
12 *Installation on analyzer*

1 Antenna
2 Antenna holder
3 Antenna cable
4 Adhesive clamp

Install the antenna (1) together with the antenna holder (2) on the analyzer.

2. Attach the antenna cable (3) to the housing using adhesive clamps (4).

Installation on sampler

1. 

13 *Installation on sampler*

1 Antenna
2 Antenna holder
3 Antenna cable
4 Adhesive clamp

Install the antenna (1) together with the antenna holder (2) on the sampler.

2. Attach the antenna cable (3) to the housing using adhesive clamps (4).

6.2 Post-connection check

⚠ WARNING

Connection errors

The safety of people and of the measuring point is under threat. The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

▶ Put the edge module into operation only if you can answer **yes** to **all** the following questions.

- Are the field device, edge module and cable undamaged (visual inspection)?
- Do the cables have adequate strain relief?
- Correct terminal assignment?

7 Operation options

7.1 Overview of operation options

Operation and settings via:
- Operating elements on the field device
- Netilion access

7.2 Access to Netilion applications

The following applications are available via Netilion:

Standard applications:
- Value
- Library
- Analytics
- Health

Application exclusively for Liquiline Edge Module CYY7:
Liquiline Assist application

Additional information on the applications can be found in the Netilion help section.

8 Commissioning

8.1 Configuring the edge module

8.1.1 Connecting to Netilion

To establish a connection to Netilion, a Netilion account and a corresponding Netilion plan are required.

Create a Netilion account:

▶ netilion.endress.com

Connect the edge module to Netilion:

1. The edge module is mounted and the Internet connection via Ethernet or cellular radio is established. The data transmission switch (unidirectional/bidirectional) is set to position 1 (bidirectional data transmission).
   Navigate to the path: **Menu/General settings/Extended setup/Edge module/Commissioning wizard**
2. Follow the wizard's instructions.
   ↳ The connection to Netilion is established.

NOTICE

Establishing the mobile connection can take several minutes.

- ▶ If no connection is established within 10 minutes during the **Cellular network reception** step of the commissioning wizard, carry out the next steps.
- ▶ Restart the device when the commissioning wizard is completed.
- ▶ Check that connection to Netilion has been successful: In the device menu via the path: **Menu//Diagnosis/System information/Edge module/Cellular network** or via the LED signal of the edge module: The LED with the cloud symbol shows a continuous green light when the connection to Netilion has been established.

8.1.2 Settings for Netilion access

Select the network interface:

It is possible here to switch between Ethernet and cellular radio (only with the EMR variant) or to deactivate the network connection completely.

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/Netilion access/Network interface**

Select the Netilion server:

Different Netilion servers are available depending on the country/region.

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/Netilion access/Netilion server**

8.1.3 Establishing the cellular radio connection

The product contains an integrated eSIM from the provider Swisscom. A cellular radio connection requires that the provider supports roaming with Swisscom.

▶ Before purchasing, check whether a cellular radio connection is available at the installation location.

If no mobile coverage is available from Swisscomor a roaming partner, an external SIM card can be used.

▶ To install an external SIM card, contact Endress+Hauser Service.

NOTICE

The use of unauthorized SIM cards may result in the loss of the warranty or the blocking of Netilion access.

▶ An external SIM card must only be installed by Endress+Hauser Service.

8.1.4 Settings for the cellular radio communication

The cellular network with which an attempt is made to establish a connection can be restricted to one of the network types **LTE CAT-M1**or **NB-IoT**. We recommend that you leave this setting at **Automatic**.

For **LTE CAT-M1** networks, all frequency bands are scanned.

For **NB-IoT**, the time required for the scanning process can be reduced by restricting the radio area to one region. Then only the bands that are available in the respective region are scanned. We recommend that you leave this setting at **World - all bands** and therefore scan all bands.

Select Network type:

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/ Cellular network/Network type**

Select Radio region:

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/ Cellular network/Radio region**

Radio areas and available bands

Band	World - all bands	Europe	North America	Korea	Australia	The Middle East	Japan	China
B1	X						X	X
B2	X		X					
B3	X	X		X	X	X		X
B4	X		X					
B5	X			X				X
B8	X	X				X	X	X
B12	X		X					
B13	X		X					
B18	X						X	
B19	X						X	
B20	X	X						
B28	X				X	X		

8.1.5 Settings for the Ethernet communication

Obtain the IPv4 address of the edge module automatically from the DHCP server (factory setting):

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/ Ethernet ETH1/IP settings/Automatic (DHCP)**

Manually enter the IPv4 address for the edge module:

1. Navigate to the path: **Menu/General settings/Extended setup/Edge module/ Ethernet ETH1/IP settings/Manual (static)**
2. Enter the **IP address**, **Netmask**, **Gateway** and **DNS** via the menu.
3. Accept using the softkey **SAVE**.

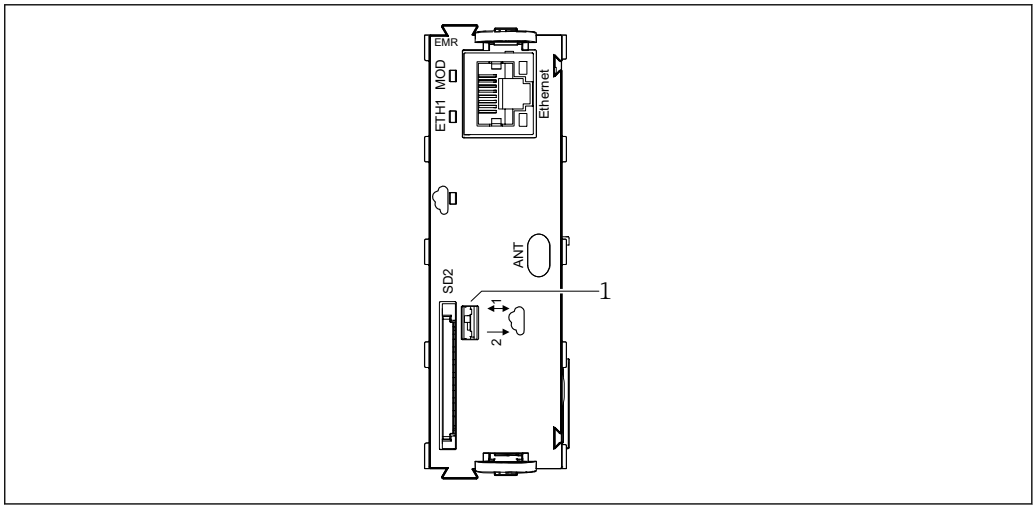
Firewall configuration:

1. All incoming connections to the edge module must be blocked via a customer firewall.
2. Enable TCP port 443 for outgoing HTTPS connections **dis.lem.netilion.endress.com**.
3. Enable UDP port 123 for **time.netilion.endress.com**.

Check the firewall configuration:

▶ Call up the URL https://api.netilion.endress.com via a web browser. It must be possible to access this page if the firewall is activated.

8.1.6 Security settings for bidirectional data transmission



14 *Edge module*

1 Data transmission switch (bidirectional/unidirectional)

- Switch position 1: Bidirectional data transmission. The security settings can be configured via the user interface.
- Switch position 2: Unidirectional data transmission. Access of the edge module to the field device is mechanically separated. Data communication only takes place from the field device to the edge module.

Configuration of the security settings

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/ Security/Bidir. data transfer**

The following options are available (only applies as long as the data transmission switch (unidirectional/bidirectional) on the edge module is set to position 1 (bidirectional data transmission)):
- **Never**: Data communication only takes place from the field device to the edge module. Data communication from the edge module to the field device is not possible.
- **Minimal**: The field device can read the signal from the edge module and output diagnosis messages without specific information.
- **Always ask**: Before the field device transmits data from the edge module, a query is made on the user interface. The field device can read the signal from the edge module and output diagnosis messages without specific information.
- **Always active**: Data communication from the edge module to the field device is possible. The field device can read the signal from the edge module and output diagnosis messages with specific information.

8.1.7 Data models

The data model defines which data is sent to Netilion and the update cycles. A standard data model is installed ex works. The following data is sent to Netilion:

- Information about the field device (default: Selected)
- Main values (default: Selected)
- Secondary process values (default: Deselected)
- Heartbeat Technology information (activation code required)

Specify which data of the data model is sent to Netilion:

▶ Navigate to the path: **Menu/General settings/Extended setup/Edge module/Data model/Data selection**

The data model can be customized using a custom data model.

▶ In order to do this, please contact Endress+Hauser Service.

8.1.8 Options for restart and reset

The following options are available:
- **Restart**: Edge module restarts
- **Reset configuration**: Reset to factory settings

▶ Path: **Menu/General settings/Extended setup/Edge module/Restart/Reset options/**

8.1.9 Download the OpenSource license information

This product contains software components that are licensed by the copyright holders as Free Software or Open Source software under the GNU General Public License, version 2 and/or 3, and/or GNU Lesser General Public License, version 2.1 and/or 3.0. Anyone can obtain the source code for these software components on a data carrier (CD-ROM, DVD or USB memory stick) or via download. This offer is valid within three years after the most recent conveyance of the object code by Endress+Hauser, and valid for as long as Endress +Hauser offers spare parts or customer support for the respective product. Send your request via email or via regular mail to the Endress+Hauser service address of your country:

see addresses.endress.com

Specify the address to send the source code to. Additional product information (e.g. explicit product name, serial number etc.) will help to identify the corresponding source code. The source code will be sent to the given address after reimbursement of the expenses actually incurred for providing the data carrier and shipping, if requested.

To display the OpenSource license information, it is downloaded to an SD card. The download is started by a trigger file on the SD card.

1. Create an empty file with the name **export_open_source_licences** on the SD card in the root directory. The file must not have a file extension.
   ↳ This trigger file starts the download of the OpenSource license information.
2. Insert the SD card with trigger file into the SD card slot of the edge module.
   ↳ The download starts automatically. During the download, the LED MOD flashes green quickly.
   As soon as the LED MOD shows a steady green light again, the download is complete.

9 Diagnostics and troubleshooting

9.1 General troubleshooting

The edge module constantly monitors its own functions.

If a diagnosis message occurs, it is displayed as follows:
- On the user interface of the field device
- In Netilion

General procedure for troubleshooting

1. Check all wires.
2. Check the LED signals.
3. Check that the firmware is up-to-date and, if required, update the firmware.

9.1.1 Provide information for the Service Team

The Endress+Hauser service requires the following information:

- Serial number of the field device and the edge module
- Firmware version of the field device and the edge module
- Contact person for the customer
- Internal log data for the edge module.

Download internal log data:

The internal log data can be downloaded to an SD card. The download is started by a trigger file on the SD card.

1. Create an empty file with the name **export_logs** on the SD card in the root directory. The file must not have a file extension.
   ↳ This trigger file is used to start the log data download.
2. Insert the SD card with trigger file into the SD card slot of the edge module.
3. Wait at least 10 min.
4. Remove the SD card.
   ↳ The log data is downloaded to the SD card and can be made available to Endress +Hauser Service.

Internal log data is encrypted during export and can only be decrypted by Endress +Hauser. The log data does not contain any sensitive information such as personal or process-related data, but log outputs from the internal software components that support Endress+Hauser in analyzing errors.

9.2 Diagnostic information via LEDs

LED MOD

LED signal	Meaning
Off	Edge module is out of service
Green steady light	Edge module is in normal operating status
Flashing green, slow	Diagnosis message present
Green flashing, fast	▪ Data transfer from/to SD card ▪ Firmware is being updated. ▪ Certificates are being updated
Flashing red, fast	Firmware update required

LED "cloud symbol"

LED signal	Meaning
Off	Netilion service is not available.
Green steady light	Netilion service is available, data transmission works without errors.
Flashing green, slow	Connection to Netilion is activated, but the transmitter asset is not yet assigned to a Netilion account.
Steady red light	Data loss because the internal buffer memory is full and the data cannot be transferred to Netilion quickly enough.
Flashing red, slow	Cellular radio only: No data connection to the mobile provider, e.g. for the following reasons: ▪ SIM card blocked ▪ APN configuration ▪ Data volume used up
Flashing red, fast	Certificate invalid or expired

LED ETH1 (only active when using Ethernet)

LED signal	Meaning
Off	Ethernet interface is deactivated.
Green steady light	Ethernet interface is initialized and is in normal operating status.
Flashing green, slow	IP configuration is valid, but waiting for other required services (e.g. NTP or DNS).
Green flashing, fast	Ethernet is initialized, but no IP configuration.
Flashing red, fast	Ethernet interface error

9.3 Diagnostic information on the local display

Up-to-date diagnostic events are displayed along with their status category, diagnostic code and short text. Clicking on the navigator lets you retrieve more information and tips on remedial measures.

9.4 Overview of diagnostic messages

Diagnostic events during initialization of the edge module

Error message	LED signals	Cause of error	Test or remedial measures
Edge module failure	LED MOD : Flashing green, slow	This error may have various causes.	Contact the Service Team.
Edge module boot failure	LED MOD : Flashing green, slow	Start process was not successful.	▪ Restart the edge module. ▪ Restart the field device. ▪ Replace the edge module. ▪ Contact the Service Team.

Edge module update failure	LED MOD : Steady green light	Error when installing a firmware update	▪ Check the firmware version. A downgrade is not possible.
			▪ Repeat the update process.
			  ▪ Via SD card
			  ▪ Via Netilion
			▪ Contact the Service Team.

Edge module failure	LED MOD : Flashing green, slow LED Cloud : Flashing red, slow	Cellular radio module error	▪ Replace the edge module. ▪ Contact the Service Team.

Diagnostic events when establishing the network connection via Ethernet

Error message	LED signals	Cause of error	Test or remedial measures
Network connection not available	LED MOD : Flashing green, slow LED ETH : Steady red	Network error: No network connection	▪ Check the network cabling. ▪ Check the accessibility of the edge module via Ethernet using ping ▪ Contact the IT department. ▪ Contact the Service Team.
NTP connection failed	LED MOD : Flashing green, slow LED ETH : Flashing green, slow	Network error: No NTP connection. The edge module cannot synchronize its time with the NTP server **time.netilion.endress.com**.	▪ Enable NTP port 123 in the firewall. ▪ Contact the IT department. ▪ Contact the Service Team.
IP configuration faulty	LED MOD : Steady green light LED ETH : Flashing green, fast	Network error: No valid IP configuration	▪ Check the IP configuration. ▪ If the edge module is configured via DHCP, check the status of the DHCP server. ▪ Contact the IT department. ▪ Contact the Service Team.

Diagnostic events when establishing the Netilion connection

Error message	LED signals	Cause of error	Test or remedial measures
Netilion certificate invalid	LED MOD : Flashing green, slow LED Cloud : Flashing red, fast	The certificate using which the edge module identifies itself to Netilion is invalid or has been revoked.	Contact the Service Team.
No cloud connection	LED MOD : Flashing green, slow LED Cloud : Flashing red, fast	No Netilion connection.	▪ Check the availability of Netilion via status.netilion.endress.com. ▪ Check the configuration of the connection settings for the edge module. ▪ Check the network connection. ▪ Contact the Service Team.
Netilion certificate expired	LED MOD : Flashing green, slow LED Cloud : Flashing red, fast	Netilion certificate has expired.	▪ Connect the edge module to Netilion. If the certificate has not been revoked, the expired certificate is accepted for the issue of a new certificate and automatically replaced. ▪ If the error still occurs, contact the Service Team to obtain a new certificate that can be installed via an SD card.
Edge module memory insufficient	LED Cloud : Steady red light	Internal buffer memory is full.	The internal buffer memory of the edge module is designed for buffering for at least 72 hours. It is operated as a circular buffer. If the circular buffer is full, the oldest buffer entry is deleted in order to free up memory for the current data. ▪ After restoring the Netilion connection, this error message should disappear by itself after a while. ▪ If this is not the case, contact the Service Team.

9.5 Firmware update

NOTICE

Outdated edge module firmware may pose a security risk. Access to Netilion may be blocked for edge modules with outdated firmware.

- Always keep the firmware of the edge module up to date. The availability of new versions can be checked via the Netilion Firmware Update Scheduler.

Firmware updates can be installed via Netilion or via SD card.

It is not possible to downgrade to legacy firmware versions.

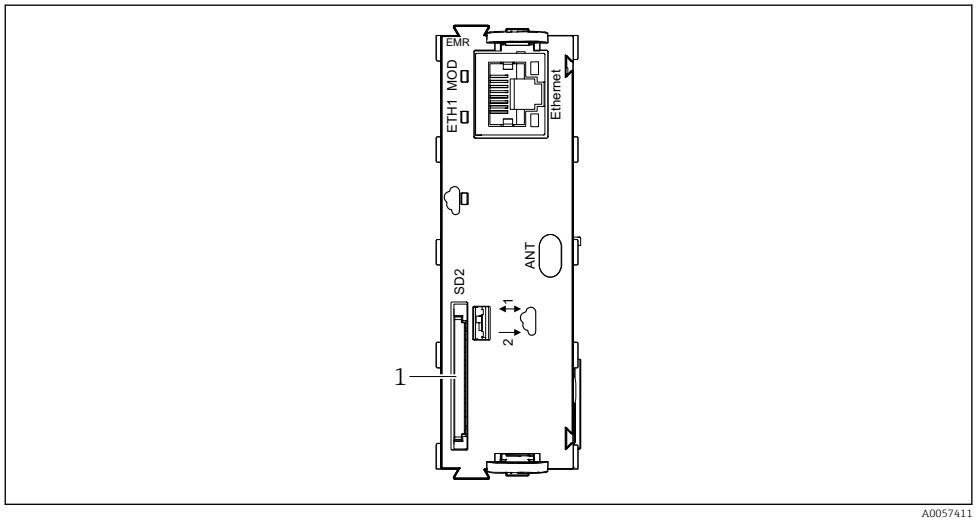
The firmware update can be scheduled in Netilion. Schedule the remote firmware update so that the field device is not disconnected from the network or restarted for at least 30 minutes at the scheduled time. The time from planning to update installation must be at least 24 hours. During this time, the firmware is transferred to the edge module. The firmware update starts at the planned time.

During the firmware update, the edge module restarts and performs self-tests with the new firmware. In the event of an error, the previously installed firmware version is restored. The firmware update can be tried again

Install the firmware update via Netilion:

- Update via the following link: netilion.endress.com/app/fus

Install the firmware update via SD card:

1. 

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15 Edge module

1 SD card slot SD2

   Insert the SD card with the latest firmware into the SD card slot of the edge module. The SD card slot is labeled with SD2.

2. Navigate to the path: **Menu/General settings/Extended setup/Data management/ Edge module update wizard**
3. Follow the instructions in the wizard.

10 Repair

10.1 General notes

- Only use spare parts from Endress+Hauser to guarantee the safe and stable functioning of the device.

Detailed information on the spare parts is available at:
www.endress.com/device-viewer

10.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

www.endress.com/support/return-material

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered.

To ensure safe, professional and swift product returns, please contact your local Sales Center for information on the procedure to be followed and general conditions.

10.3 Disposal

The device contains electronic components. The product must be disposed of as electronic waste.

- Observe the local regulations.

The edge module stores internal data that is transferred to the cloud to bridge a connection failure.

This data is deleted when the device is installed in another field device.

11 Technical data

11.1 Function and system design

Network connection

Ethernet

Connection	1 RJ45
Speed	10/100 MBit/s

Cellular radio

LTE Cat M1	3GPP release 14 Max. 375 kbps (download) Max. 1.12 Mbps (upload) Frequency bands: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85
LTE Cat NB1 (NB-IoT)	3GPP release 14 Max. 32 kbps (download) Max. 70 kbps (upload) Frequency bands: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85
LTE Cat NB2 (NB-IoT)	3GPP release 14 Max. 136 kbps (download) Max. 150 kbps (upload) Frequency bands: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85
GPRS	No
Antenna	Manufacturer: 2J antennas Model: 2J2024B
SIM interface	Internal eSIM

Communication and data processing

Netilion Connect	Connects the field device to the Netilion Industrial Internet of Things ecosystem from Endress+Hauser via Ethernet or cellular radio
Sampling interval	Measured values: 5 min. Other data: Asynchronous
Transmission interval	Max. 15 min.
Persistent data buffering	min. 72 hours
Data, cross-device	Identification data Current software version Main values Secondary values Diagnoses Logbook events Field device health (Heartbeat Technology must be enabled in the field device) Sensor health (Heartbeat Technology must be enabled in the field device)
Cellular radio	Signal strength Mobile operator Cellular network

Data, specific for analyzers	Measured values Measuring parameters Measuring range Measuring interval Operational status Current activity Calibration interval Calibration concentration Zero point Calibration factor Reagent levels
Data, specific for samplers	Program name Program status Last sampling Bottle configuration Bottle position Bottle fill level Cooling temperature
Software update	SD card Netilion Firmware Update Scheduler
Custom data model	On request
Import of custom data model	SD card

11.2 Installation

Installation instructions

Hardware requirements

Backplane from version 2

Firmware requirements

- Firmware of the field device from version: 1.15.00
- To establish a connection to Netilion, the firmware of the edge module must be up-to-date.

Restrictions

- With Liquiline CM448 and Liquiline CM448R, a maximum of six channels are available for connecting Memosens sensors.
- If installed in a non-compatible field device, the edge module does not start when the field device is booted and error message F262 appears.
  This applies to the following devices:
  - Liquiline CM448 and Liquiline CM448R with > 6 connected sensors
  - Liquiline CM44P
  - Liquistation CSF28
  - Liquiport CSP44
- Liquistation CSF34, Liquistation CSF39 and Liquistation CSF48 with base module BASE-SYS are not compatible. To use the edge module, an upgrade to base module BASE-E is required.
- For Liquiline CM442 (field device): Max. ambient temperature 60 °C
- Ex-systems must not be upgraded.

11.3 Environment

Ambient temperature	For CM442 (field device): Max. 60 °C All others: See field device
Storage temperature	–40 to 80 °C (–40 to 176 °F)

Relative humidity	See field device
Degree of protection	See field device
Vibration resistance	See field device
Electromagnetic compatibility	See field device
Electrical safety	See field device
Pollution degree	See field device

11.4 Mechanical construction

Weight	0.06 kg (0.13 lb)
Antenna cable length	3 000 mm (118 in)

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