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VARIOMOD XC and interface module XC Communication and interface modules for LZQJ-XC, LZQJ-SGM and DMTZ-XC

EN Instructions for use

Important information

Target audience

These instructions are intended for technicians who are responsible for the installation, connection and servicing of the devices. The devices must be installed and put into operation only by qualified electricians in accordance with generally accepted rules of technology and the regulations that are relevant for the installation of telecommunications equipment and end devices.

Intended use

The devices in the VARIOMOD XC series are designed exclusively for the transfer of measurement data in combination with approved measuring devices as per the technical description, and only after correct installation.

The interface modules XC may only be used as interface extensions, only in combination with approved devices in series LZQJ-XC, LZQJ-SGM and DMTZ-XC as per the technical description, and only after correct installation.

Maintenance and warranty instructions

The devices are maintenance-free. It is not permitted to make any repairs in the event of any damage (e.g. due to transport, storage). If the device is opened, the warranty will be rendered null and void. The same applies where a defect is caused by external factors (e.g. lightning, water, fire, extreme temperatures and weather conditions), or by improper or careless use or handling.

Basic safety instructions

The following safety instructions must be strictly observed:

- Before assembly, check the devices for any transport damage or other externally visible damage.
- Store, use and transport the communication module in such a way that it is protected against moisture, dirt and damage and so that the contact pins are not damaged.
- Observe the customary local occupational health and safety regulations for electrical installations.

Mobile communication modem

In the following, the term GPRS/LTE is used for all versions of mobile communication modems. These are GPRS (2G), LTE (4G).

> ⚠️ **ATTENTION**
>
> The antenna of the device must be installed and operated at a minimum distance of 30 cm from people.

> 🚫 **ATTENTION**
>
> **The radio transmitter can impair the function of electronic devices (e.g. pacemakers)! Comply with the ban on mobile phones!**
> The VARIOMOD XClte contains a radio transmitter that can affect the function of electronic devices.
> - Contact the responsible doctor or the device manufacturer if necessary.
> - Comply with the information signs and do not operate the device in areas where mobile phones are prohibited.

> ℹ️ Only the original EMH antennas listed here are approved for operation (conformity) in line with EU Radio Equipment Directive 2014/53/EU (RED).

General description

The VARIOMOD XC is a communication module with modem functionality for remote retrieval from meters in the LZQJ-XC, LZQJ-SGM and DMTZ-XC series. Furthermore, it is equipped with an RS485 interface that can be looped through for remote retrieval from additional connected electricity, gas or water meters.

The module fulfils the requirements regarding unmodified data transfer as specified in the meter approval (national approval for Germany: certificate of compliance).

The following communication modules are available:

VARIOMOD XCgprs/lte, VARIOMOD XCethernet and VARIOMOD XCanalog.

The interface module XC is equipped with an RS232 interface and an RS485 interface.

Technical data

Voltage supply	via meter or external wall power supply
Temperature range	Operation: –20 °C...+55 °C
	Storage: –40 °C...+80 °C
Humidity	Maximum 95%, non-condensing
Dimensions (housing)	45 x 105/115 x 27 (W x H x D) mm
Degree of protection	Housing: IP 20
Weight	Approx. 90 g

Scope of delivery

Please check that the contents of the packing box are complete before starting the installation and start-up procedure.

Contents of packing box:
- 1 Communication module or 1 interface module
- 1 Instructions for use

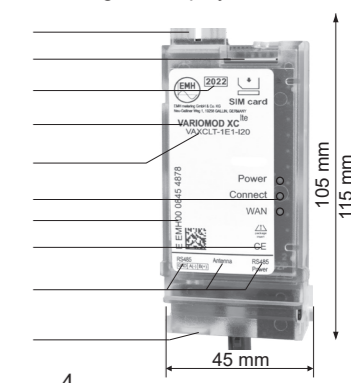Accessories (depending on the version):
- GPRS/LTE: Antenna with (FAKRA plug) as an option
- Analog: TAE line (3 m) with TAE plug (N-coded) and modular plug

If the contents are incomplete or damaged, please contact your supplier. Please keep the packaging material for future shipping or storage.

Housing and display elements

The following figure shows the housing and display elements:

Connection to the meter (contact pins)
Slot for SIM card
Year of construction
Type designation
Type code
LEDs
Serial number
CE marking
Description of the connections
Connections

Installation and start-up
Antenna assembly for the VARIOMOD XCgprs/lte

The 2G magnetic base antennas [1], the 2G/4G multiband antennas [2] and the connecting adapters [3] are connected to the FAKRA socket of the module. To ensure optimum antenna reception, it should be assembled outside the switch cabinets. The magnetic base antenna should be placed on a horizontal magnetic surface.

> ⚠️ **DANGER FROM VOLTAGE**
>
> **Risk of fatal injury due to voltage flashover (lightning strike)! Distance between modem supply cabling and connecting lines**
> Route the supply line (antenna, Ethernet,...) in such a way that a minimum distance of 10 mm from all connecting lines and terminals of the meter is ensured.
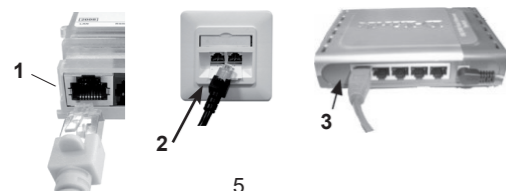

> ⚠️ **ATTENTION**
>
> **Damage to the antenna connection on the modem!**
> The connecting adapter [3] must not be combined with the terminal cover for modem installation.

Network connection for the VARIOMOD XCethernet

To connect the module to a network, plug the Ethernet cable into the left socket [1]. The plug must engage in the process. Plug the other end of the network cable into a network socket [2], a switch [3] or a network jack of a computer.

Inserting/removing the SIM card for the VARIOMOD XCgprs/lte

> ⚠️ **ATTENTION**
>
> **Damage to the SIM card!**
> - Always insert the SIM card in the VARIOMOD XCgprs/lte when the module is de-energised.

Before the module is installed in the meter, it is necessary to insert a SIM card that is activated for data traffic. It is possible to use SIM cards with the PIN deactivated, or with the PIN "0000". If you want to use a SIM card with a different PIN, you have to reconfigure the module with the VARIOMOD Manager. The SIM card is not included in the scope of delivery!

Inserting the SIM card

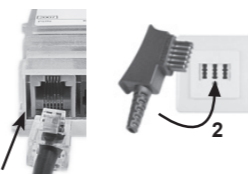Push the SIM card [1] into the card slot until it engages.

Removing the SIM card

Press the SIM card down slightly [2]. The card is pushed up automatically [3]. Now remove the card [4].

Connecting Variomod XCanalog to the phone network

1. Connect the phone line to the left socket [1].
   The plug must engage in the process.
2. Connect the other end of the phone line to the phone socket [2].

> ℹ️ The phone line must be routed at a distance from the supply line as per DIN EN 50174-2.

Installing the module:

> ⚠️ **DANGER FROM VOLTAGE**
>
> **Risk of fatal injury in case of contact with live parts!**
> The module can be installed while voltage is present.
> - Make sure that unintentional contact with the connection terminals of the meter is impossible.

1. Remove the terminal cover [5].
2. Open the module compartment flap [1].
3. With a GPRS/LTE modem: Insert the SIM card.
4. Insert the module [3] in the module compartment [2].
5. Push the module into the module slot until it engages noticeably.
6. Connect the connecting/antenna cables to the module.
7. Close the module compartment flap [1].

Install the terminal cover [5] on the terminal block [4].

Removing the module:

> ⚠️ **DANGER FROM VOLTAGE**
>
> **Risk of fatal injury in case of contact with live parts!**
> The module can be removed while voltage is present.
> - Make sure that unintentional contact with the connection terminals of the meter is impossible.
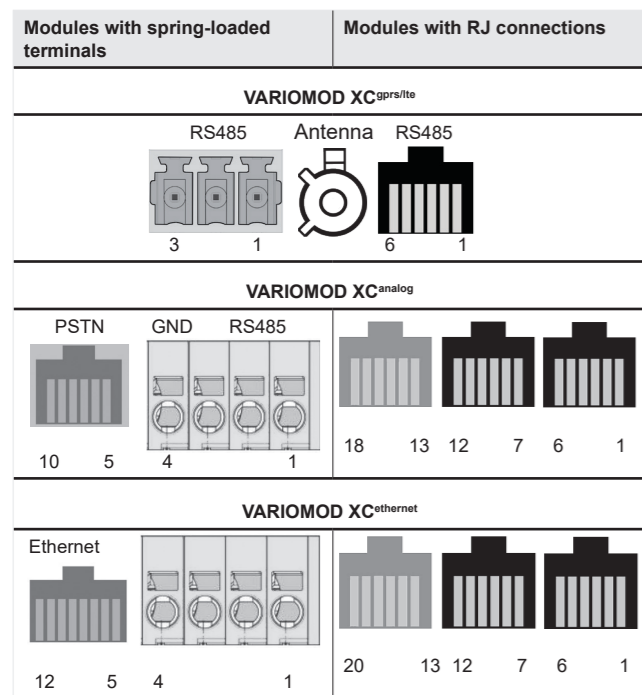
1. Remove the terminal cover [5].
2. Open the module compartment flap [1].
3. Unplug the connecting/antenna cables.

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4. Push the module out of the module compartment [2].
5. Close the module compartment flap [1].
6. Install the terminal cover [5] on the terminal block [4].
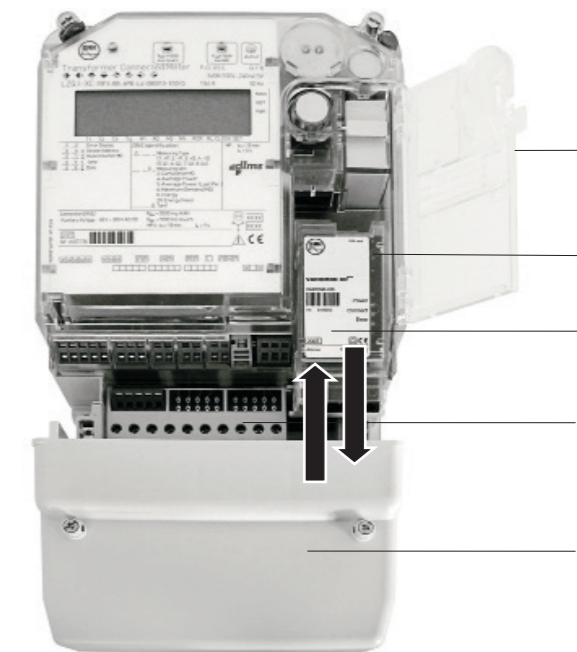
1 Module compartment flap
2 Module compartment
3 Module
4 Terminal block
5 Terminal cover

Connections on the VARIMOD XC

Modules with spring-loaded terminals	Modules with RJ connections

VARIOMOD XC^{gprs/lte}

VARIOMOD XC^{analog}

VARIOMOD XC^{ethernet}

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VARIOMOD XC^{gprs/lte}, VARIOMOD XC^{analog}, VARIOMOD XC^{ethernet}

Pin no. RJ connections	Pin no. Spring-loaded terminals	Designation	Function
1	3, 4	GND	Device earth
2	2	RS485 A (–)	"Negative" connection of the RS485 interface
3	1	RS485 B (+)	"Positive" connection of the RS485 interface
4	—	N.C.	Not assigned
5	—	GND	Device earth
6	—	+UB	External supply 12 to 18 V DC (optional)
7	—	GND	Device earth
8	—	RS485 A (–)	"Negative" connection of the RS485 interface
9	—	RS485 B (+)	"Positive" connection of the RS485 interface
10	—	N.C.	Not assigned
11	—	N.C.	Not assigned
12	—	N.C.	Not assigned

VARIOMOD XC^{analog}

Pin no. RJ connections	Pin no. Spring-loaded terminals	Designation	Function
13	5	N.C.	Not assigned
14	6	N.C.	Not assigned
15	7	PSTN	Analogue telephone network
16	8	PSTN	Analogue telephone network
17	9	N.C.	Not assigned
18	10	N.C.	Not assigned

VARIOMOD XC^{ethernet}

Pin no. RJ connections	Pin no. Spring-loaded terminals	Designation	Function
13	5	TX+	
14	6	TX-	
15	7	RX+	
16	8		Ethernet 10BaseT 100BaseTX assignment
17	9		
18	10	RX-	
19	11		
20	12		

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Connections on the interface module XC

Modules with RJ connections			Modules with spring-loaded terminals
RS232	RS485	RS485	
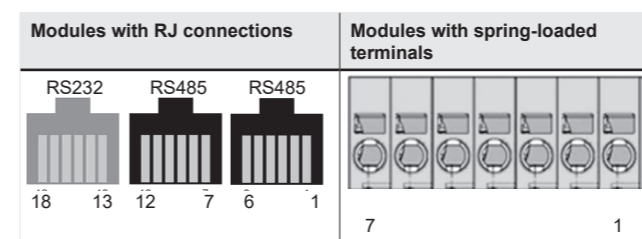
a) Modules with RJ connections

Pin no. RJ connections	Designation	Function
1 - 12	See table for VARIOMOD XC on page 10.	
13	GND	Device earth
14	RS232 TxD	Transmission line
15	RS232 RxD	Receiving line
16	N.C.	Not assigned
17	N.C.	Not assigned
18	N.C.	Not assigned

b) Modules with spring-loaded terminals

Pin no. Spring-loaded terminals	Designation	Function
1	RS485 B (+)	"Positive" connection of the RS485 interface
2	RS485 A (–)	"Negative" connection of the RS485 interface
3	RS485 B (+)	"Positive" connection of the RS485 interface
4	RS485 A (–)	"Negative" connection of the RS485 interface
5	GND	Device earth
6	RS232 RxD	Receiving line
7	RS232 TxD	Transmission line

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c) Conductor cross-section for modules with spring-loaded terminals

VARIOMOD XC^{analog}/VARIOMOD XC^{ethernet}

Type	min.	max.	
rigid	0.2 mm²	4 mm²	
flexible	0.2 mm²	2.5 mm²	
flexible with ferrules with plastic collar	0.25 mm²	1.5 mm²	Stripping length 8 mm

VARIOMOD^{gprs/lte}

Type	min.	max.	
rigid	0.2 mm²	1.5 mm²	
flexible with ferrules with plastic collar	0.25 mm²	0.75 mm²	Stripping length 9-10 mm

Voltage supply of the module

The communication module or interface module is supplied with operating voltage via the meter if the meter is equipped with the necessary mains adapter.

Please see the configuration of the meter to determine whether this mains adapter is available. If no corresponding mains adapter is available, please contact your supplier or power the module by means of an external DC source if the module has an RJ socket. The operating voltage is 12-18 V DC, and the max. current consumption is 0.5 A, depending on the module type. The mains adapter is connected as shown in the figure.
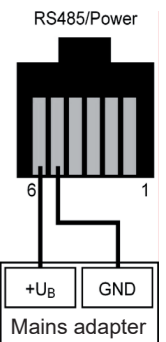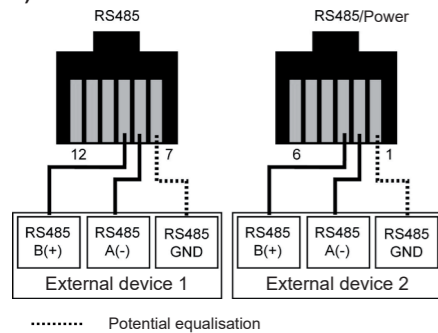

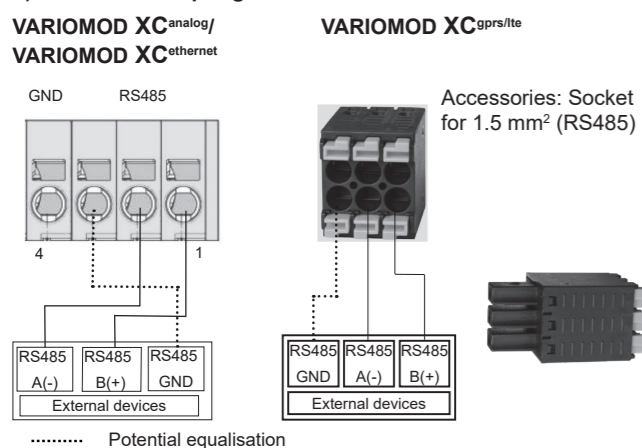### Connecting devices to the RS485 interface of the VARIOMOD XC

Connect the module to external devices as shown in the circuit diagrams below.

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a) Modules with RJ connections

External device 1   External device 2

·········· Potential equalisation

b) Modules with spring-loaded terminals

VARIOMOD XC^{analog}/ VARIOMOD XC^{ethernet}   **VARIOMOD XC^{gprs/lte}**

Accessories: Socket for 1.5 mm² (RS485)


·········· Potential equalisation

Connecting devices to interface module XC

The interface module is equipped with an RS232 loop and a RS485 that can be looped through. However, only one interface variant can be used. Parallel operation is not possible!
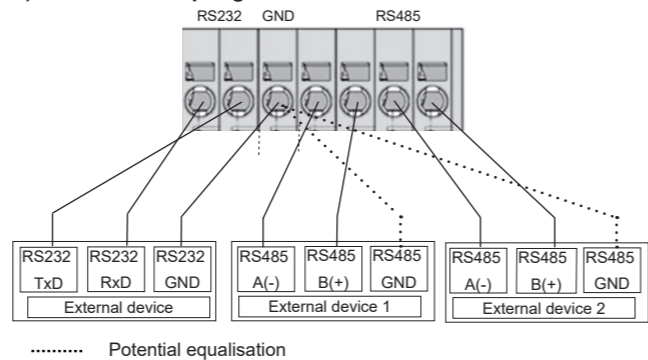
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Connect the interface module XC to external devices as shown in the circuit diagrams below.

a) Modules with RJ connections

·········· Potential equalisation

b) Modules with spring-loaded terminals

·········· Potential equalisation
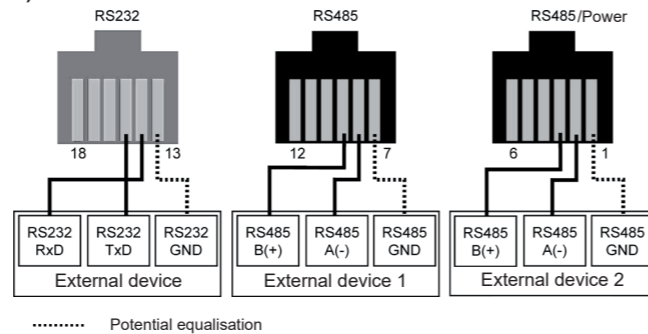
VARIOMOD-XC LED functions

Once power has been applied (power LED lit/flashing) or a reset has been performed, the VARIOMOD XC performs an initialisation.

If the error LED is lit or flashing, a fault has occurred. In this case, please contact your supplier.

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LED	VARIOMOD XC^{gprs/lte}	VARIOMOD XC^{analog}	VARIOMOD XC^{ethernet}
Power (green)	**Flashing:** Connection with meter established, SIM card initialised, display of field strength (field strength is determined from switch-on time or number of flashes) **Lit:** Voltage supply connected, but no connection to meter, or SIM card not initialised, or login to LTE network not possible **Off:** No voltage supply	**Flashing:** Connection with meter and phone network established **Lit:** Voltage supply connected, but no connection to meter or analogue phone network **Off:** No voltage supply	**Flashing:** Connection with meter and network established **Lit:** Voltage supply connected, but no connection to meter or network **Off:** No voltage supply
Connect (yellow/ green)	**Off:** No IP address **Flashing:** Connecting (IP address of the APN, in IP-T server login if applicable) **Lit:** Connection established (IP address assigned, IP-T login if applicable)	**Lit:** Readout active	**Flashing:** Connecting **Flashes quickly:** IPT login in progress **Lit:** Connection established, IPT login completed (in IPT mode)
Error (red)	Not applicable, all LEDs flash simultaneously in the event of a fault	**Flashing:** Fault **Lit:** Fault	**Flashing:** Fault **Lit:** Fault
WAN (green)	**Flashes** 2x to **indicate the 2G** network.		
LTE version only	**Flashes** 4x to **indicate the 4G** network.		

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Care and disposal instructions

Use a dry cloth to clean the device housing. Do not use any chemical cleaning agents! The following table names the components and how they are to be treated at the end of their life cycle.

Components	Waste collection and disposal
Printed circuit boards	Electronic waste: dispose of such waste in accordance with the local regulations.
LEDs, LC displays	Hazardous waste: dispose of such waste in accordance with the local regulations.
Metal parts	Recyclable material: collect this material and sort it into separate metal containers.
Plastic parts	Send sorted plastic parts to a recycling plant (regranulation) or, where applicable, to a waste incineration plant (thermal energy generation).

EU Declarations of Conformity

EMH metering hereby declares that the VARIOMOD XC model VARIOMOD XC^{gprs/lte} complies with the following Directive:

- Radio Equipment Directive (RED) 2014/53/EU

EMH metering hereby declares that the VARIOMOD XC models VARIOMOD XC^{ethernet}, VARIOMOD XC^{analog} and the interface module XC comply with the following Directive:

- Electromagnetic Compatibility (EMC) 2014/30/EU

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