



Volume Conversion Device EK205-M

Operating
Instructions

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1 General

1.1 Information in these instructions

These instructions make it possible to work with the device in a safe and efficient manner.

Compliance with all of the safety and handling instructions specified in this operating manual is a prerequisite to working with the device in a safe manner and to use it properly. In addition, compliance is also necessary with the guidelines, standards, local accident prevention regulations and general safety regulations that apply for the device's area of application.

The instructions are a component of the product and must be kept in the immediate vicinity of the device, so that installation, operational, maintenance, and cleaning personnel may access them at any time. The graphical illustrations in these instructions serve to depict the facts that are being explained and are therefore not necessarily true to scale and may differ from the actual design of the device.



The data and material properties that are presented below are guidelines. They must be reviewed for each individual case and corrected if necessary.



For the commissioning of the various communication and device applications, you can use the application manual of the EK205-M (see section 1.1.1).

1.1.1 Downloading manuals from Docuthek

Elster Gas provides user documentations such as manuals, certificates, data sheets and technical information bulletins for various device types in Docuthek. The documents are updated on a regular basis:

<https://docuthek.kromschroeder.com>

Use the device type EK205-M as your search term.



Check the PDF after downloading it.

You can use SHA-1 checksum information to check the file integrity of a PDF after downloading it using a suitable tool.

The desired value of the SHA-1 checksum for a PDF can be found in Docuthek in the detailed information in the section entitled "Remarks" or, if you have downloaded the PDF from the Elster-Instromet website, in brackets next to the download link.

**Which manuals are relevant for earlier device software versions?**

Docuthek only contains the current manual versions. If you are using an older software version, you can find the manuals for every version in the software history on the Elster-Instromet website. The software history is available for product releases since 2020 in PDF format in the download area for the relevant device type.

www.elster-instromet.com/en/volume-converter

1.1.2 Device software available on the Elster-Instromet website

The Elster-Instromet website contains the latest software releases for the Elster Gas device series. The current versions for EK205-M and enSuite can be found in the download area:

www.elster-instromet.com/en/software-downloads

The change history provides information about new functions, improvements, bug fixes and security problems which have been rectified. The change history is available for product releases since 2020 in PDF format in the download area for the relevant device type.

Furthermore, the change history lists the relevant manuals for a software release.

**Elster Gas newsletter**

Our newsletter provides you with regular information about new software releases and relevant manuals for the EK, DL and enCore FC device series. If you are interested, you can register at:

<https://outcomes.gasdatalab.com/techniknewsEN.html>

1.2 enSuite parameterization software

The download area of the Elster-Instromet website also contains the enSuite parameterization for Windows 64-bit (from Windows XP) required for the commissioning process:

www.elster-instromet.com/en/software-downloads

**Updating enSuite**

We recommend that you download the latest version of enSuite from the Elster-Instromet website before you commission the EK205-M.

1.3 Warranty provisions

The current warranty provisions can be found in our General Terms of Business, e.g., on our website at:

www.elster-instromet.com/en/general-terms-of-business

1.4 Customer service and Technical Support (TAC)

Our customer service department is available for technical advice as well as repairs. Furthermore, our employees are always interested in new information and experiences that arise through use of the device and that may be valuable for improving our products.

1.4.1 Customer services and repairs

- Phone. +49 (0) 61 34/605-346
- Fax +49 (0) 61 34 605-390
- E-mail: PMT-Reparatur_Mainz-GE4N@honeywell.com

1.4.2 Technical Assistance Centre (TAC)

Our Technical Support (TAC Technical Assistance Center) is at your disposal in case of faults:

- Phone. +49 (0) 6134/605-123
- Website: www.elster-instromet.com/en/support
- Knowledge Base: www.honeywellprocess.com/support
- E-mail: ElsterSupport@honeywell.com

1.5 Explanation of symbols

1.5.1 Safety instructions

Safety instructions are indicated in these instructions by symbols. The safety instructions are introduced by keywords that express the extent of the risk.

Safety instructions must be observed and treated diligently to avoid accidents, personal injury, and material damage.



DANGER!

...indicates an immediately hazardous situation that leads to death or severe injury if it is not avoided.



WARNING!

...indicates an immediately hazardous situation that may lead to death or severe injury if it is not avoided.



CAUTION!

...indicates an immediately hazardous situation that may lead to minor or slight injury if it is not avoided.



... indicates hazards from electric current. In the event of non-observance of the safety instructions, there is a risk of severe or fatal injuries.

**CAUTION!**

...indicates an immediately hazardous situation that may lead to material damage if it is not avoided.

1.5.2 Tips and recommendations

... highlights useful tips and recommendations as well as information for ensuring efficient and smooth operations.

1.6 Limitation of liability

All specifications and instructions in these operating instructions were compiled under consideration of applicable standards and regulations, the current state of the art and the knowledge and experience we gained over the years. The manufacturer assumes no liability for loss due to:

- Non-compliance with these operating instructions
- Use of the device not in accordance with its intended use
- Use of the device by non-instructed personnel
- Unauthorized device modifications
- Technical changes
- Use of non-authorized replacement parts

The actual scope of delivery may differ from the explanations and descriptions included here in case of special device designs, the use of additional order options or because of the latest technical changes.

The obligations arranged in the delivery contract apply, as do the General Terms and Conditions, manufacturer delivery conditions and current legal regulations that apply at the time the contract was concluded.



*Read through these operating instructions carefully before beginning any work to and with the device, especially before commissioning the device!
The manufacturer assumes no liability for loss and malfunctions that result from non-compliance with these instructions.*

We reserve the right to make technical changes within the scope of improving performance characteristics and continuous development of the device.

1.7 Copyright

These instructions are copyright-protected and intended for internal purposes only. Handover to third parties, copies of any form, including extracts, as well as utilization and/or notification of the content without written approval of the manufacturer is not permitted, except for internal purposes. Violations give rise to compensation. Further claims remain reserved.

1.8 Scope of delivery

The scope of delivery of the EK205-M includes:

- Electronic Volume Conversion Device EK205-M

- Dispatch breakdown
- Interpretation data sheet
- Instructions
- Accessories bag

1.9 Replacement and accessory parts



WARNING!

Incorrect replacement parts and accessories are a safety risk!

Incorrect or defective replacement parts and accessories may detract from safety and lead to damage, malfunction, or total device failure.

Therefore:

- Use only original replacement parts and accessories from the manufacturer.
- Always contact the manufacturer if you are in doubt.

The replacement parts and accessories list can be found in the appendix. Replacement parts and accessories can be ordered from a contract dealership or directly from our customer service.

The accessories of the EK205-M also include the free enSuite program (see section 1.1.2). With them, you can program the Volume Conversion Device EK205-M via its data interfaces in order to carry out further applications.

The EK205-M is available in numerous equipment variants.

Details can be found at www.elster-instromet.com as well as in section 6 “Installation, connection and commissioning”.

1.10 Storage



CAUTION!

Reduced performance after exceeding or falling below the valid temperature range of the batteries.

Exceeding or falling below the valid temperature range can reduce the performance of the batteries when storing the device.

Therefore:

- For longer-term storage, ensure that the valid temperature range of the built-in batteries between -40 °C and +60 °C is not exceeded or fallen below.



CAUTION!

Material damage from formation of condensation!

Storing the device can lead to the formation of condensation resulting from variations in temperature. This may result in the device malfunctioning at a later time.

Therefore:

- After the device has been stored or transported in cold weather or if it has been subject to extreme variations in temperature, bring it slowly to room temperature before it is commissioned.
- The device must undergo a waiting period of at least 12 hours before it is put into operation if condensation formed during storage.



If the power supply of the device is interrupted during storage from clamping the batteries, the time and date need to be reset.

The following regulations apply for storage:

- Relative humidity may not exceed 93%.
- Do not store the packaging units outdoors.
- The storage temperature may not fall below -40°C and exceed +60°C.
- Avoid mechanical vibrations during storage.

2 Security considerations for your network

EK series volume converters are used in modern billing infrastructures and network control systems to supply process information such as meter readings, measurements and messages to a billing or control centre. A connection of this type constitutes a significant security risk which must be given careful consideration when designing the network.

2.1 How to report a vulnerability

A vulnerability is defined as an error or weakness in the software which can be exploited to adversely affect or reduce the operation or security of the parameterization or device software.

Honeywell reviews all reports about vulnerabilities relating to Honeywell products and services. You can find further information about the Honeywell Security Policy at:

www.honeywell.com/product-security

If you would like to report a possible vulnerability in a Honeywell product, follow the instructions on the Honeywell website at:

www.honeywell.com/product-security

You can find information about current malware threats at:

www.honeywellprocess.com/en-US/support/Pages/security-updates.aspx

Or

Contact your local Honeywell Process Solutions Customer Contact Centre (CCC) or our Elster Gas Technical Support team (see section 1.4.1 “Customer services and repairs”, page 11).

2.2 Implementing stringent password guidelines

Since various types of attacks on passwords take place these days, you should follow best practices for password management. Here are a few time-tested methods:

- Change standard passwords
- Use secure passwords. A secure password for LIS devices consists of eight characters.
- Change passwords on a regular basis.
- Change passwords immediately in case someone has tried to attack the system.
- LIS200 uses role-based authentication, please follow best practices for shared passwords like secured distribution and secured storage.



Passwords can be changed via so-called insecure protocols without re-authentication!

Note that when a password is changed via IEC 62056-21 and DLMS, the initial password is not queried again. This vulnerability enables a potential attacker to assign a new password without specifying the old password!

It is therefore even more important to protect data communication from third-party access.



Document any changes from time-tested methods.

If your system does not allow one of these time-tested methods to be used, you should document this. For example, if special symbols such as the equals sign “=” are not allowed in passwords.

2.3 Preventing unauthorized external access using a firewall

To reduce the risk for your network, we recommend that you use a firewall or another mechanism to restrict network traffic between the “external” central billing or control system and the “internal” network of the gas metering systems. Furthermore, EK devices should only be installed in the gas metering system, where access control is guaranteed, i.e., protective action is taken to prevent unauthorized persons gaining access to the device.

We also recommend that you only allow protocols and ports which are actually used for data exchange with the external network and that these are added, for example, to the firewall’s whitelist.

Refer to the information in section 2.4 Data security for data at rest and in transit.

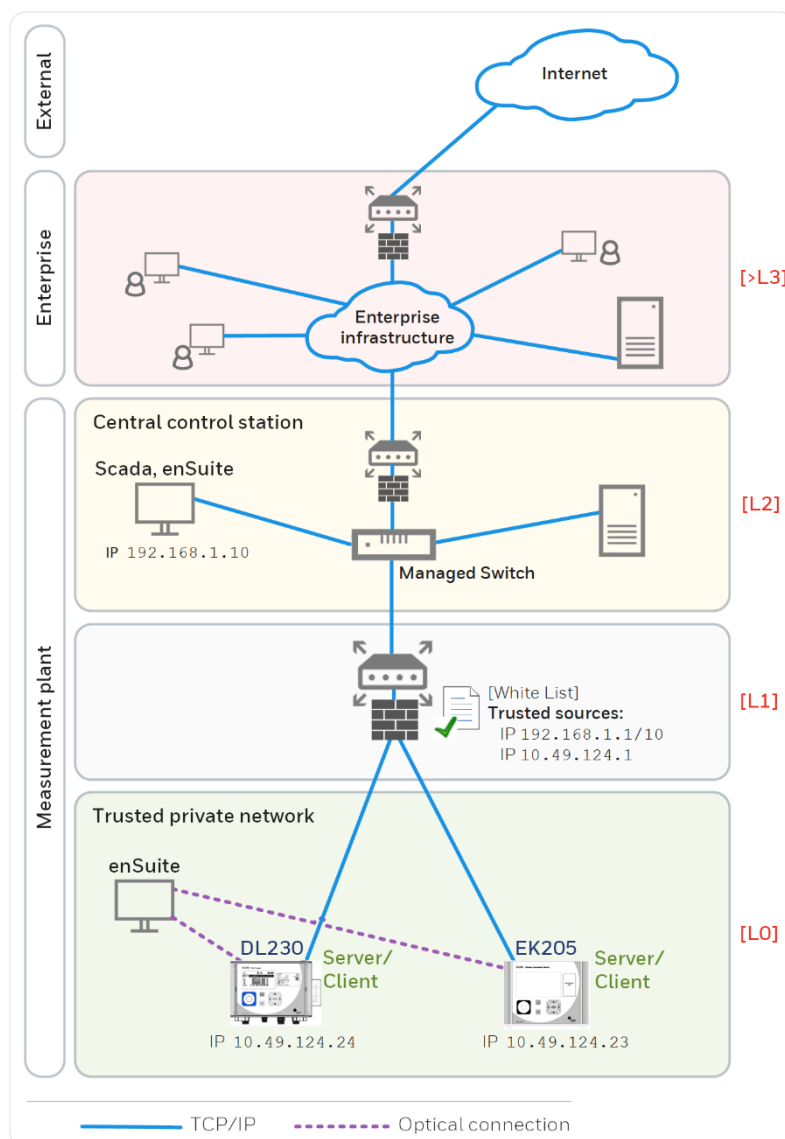


Fig. 1: Router and firewall between the metering systems and control centre – example with indication of security zones L0..L3 and higher according to IEC 62443



We recommend opening safety zone L0 only for zone L1 and not for zones L2, L3 and L4.

2.4 Data security for data at rest and in transit

2.4.1 Data security for data at rest

Data at rest are the data which are temporarily or permanently stored in the EK205-M. These data are unencrypted in the EK series. This means it is even more important to protect the device from unauthorized access.

See section 2.3 “Preventing unauthorized external access using a firewall”.

2.4.2 Data security for data in transit

Data in transit are data which are currently being transferred between the EK205-M and, for example, a control station in a public or trustworthy network.

The protocols used with the EK205-M normally transfer the data in plain text form. If possible, you should therefore use the secure version of a protocol (see section 4.9 “Supported protocols”, page 28).

See section 2.3 “Preventing unauthorized external access using a firewall”.



Using an encrypted VPN connection

We recommend that you use a VPN connection whenever you require a secure data connection, but a secure protocol is not supported for the data transfer.

In a VPN, the data are transferred between two or more subscribers in encrypted form. Therefore, a VPN connection is extremely important, for example for mobile access to a volume conversion device, for accessing a private network or for data communication using different systems.

3 Safety

This section provides an overview of all key safety aspects for optimal protection of the staff as well as for safe and fault-free operation.

Non-observance of these operating and safety instructions may result in considerable hazards.

3.1 General

The EK205-M is an intrinsically safe device and is suitable for operation within the zone at risk of gas explosion 2 for gases of temperature class T4.

Check for use in zone 2 in accordance with the currently applicable rules of the art: see section 13.3:



DANGER!

Risk of explosion by connection to non-intrinsically safe and associated equipment.

When operating the EK205-M in an area at risk of explosion (zones 2) and connecting devices without certification as an "associated piece of equipment", there is a risk of explosion.

Therefore:

- When used in an area at risk of explosion, connect the EK205-M to certified, associated pieces of equipment only in accordance with the valid rules of the art stated in the design test certificates.
- Connect the EK205-M only to intrinsically safe pieces of equipment whose electric data correspond to the requirements stated in the design test certificates of the EK205-M (see section 13.3).



DANGER!

Risk of explosion from use of wrong batteries.

Use only batteries stated in the design test certificates of the EK205-M (see section 13.3). Order number see section 13.1.4.



DANGER!

Risk of explosion from incorrect use or connection!

During connection and operation of the EK205-M in areas at risk of gas explosion, observe the associated norms:

DIN EN 60079-0

The device may only be used in an area at risk of gas explosion if the installation is carried out in accordance with the general requirements of DIN EN 60079-0 and the operating conditions (see section Technical data) and connection conditions (see section Installation, connection, and commissioning) are observed.

The device can be hazardous if it is used by staff not trained correctly in an improper or unintended manner.

- Anyone appointed to perform work to or with the device must read and understand these operating instructions before beginning work on the device. This also applies if the

individuals concerned have already worked with such a device or a similar one or were instructed by the manufacturer.

- Knowledge of the content is one of the requirements of protecting staff from hazards and avoiding faults and therefore operating the device in a safe and fault-free manner.
- In order to avoid risks and to ensure that the device performs in an optimal manner, no changes or modifications that were not expressly authorized by the manufacturer may be performed to the device.
- Always keep all operating instructions on the device in easily legible condition. Renew damaged or illegible instructions.
- Observe settings values or value ranges stated in the instructions.

3.2 Intended use

The device is designed and constructed exclusively for its intended use as described here.



The Volume Conversion Device EK205-M serves to convert a gas volume of a gas line in basic condition measured by a meter in measurement conditions as well as to assign the volumes measured to tariffs. In addition, using the device, further parameters can be measured, recorded, and monitored depending on the configuration set by the user.

Compliance with all the specifications in these operating instructions also falls under the device's intended use. Any use of the device that goes beyond or deviates from its intended use is considered a misuse of the device and may lead to hazardous situations. Claims of any kind due to loss resulting from non-intended use of the device are excluded.



WARNING!

Hazard from incorrect use!

Incorrect use of the device may result in hazardous situations.

Therefore:

- Use the device only as intended.
- Do not use the device to control the gas flow or other parameters influencing the gas volume within the framework of the overall system.

3.3 Specific Conditions of Use

- The equipment must be only connected to a certified associated intrinsically safe equipment. This combination must be compatible as regards the intrinsically safe rules.
- Only temperature or pressure sensor defined in the manufacturer's technical file can be used.

3.4 Staff

**WARNING!****Risk of injury in the event of insufficient qualification!**

Improper use may result in considerable personal injury and material damage.

Therefore:

- Have all activities carried out by qualified staff only.

The following qualifications for different areas of activity are listed below in the instructions:

■ Instructed staff

was instructed by the plant operator in an informational session on the tasks assigned to him or her, and on possible hazards in case of improper behaviour.

■ Specialist staff

has the ability, because of his or her technical training, knowledge, and experience, as well as his or her knowledge of the relevant regulations, to carry out the work to the device assigned to him or her, and to recognize and avoid possible hazards on his or her own.

■ Gas specialist

has the ability, because of his or her technical training, knowledge, and experience, as well as his or her knowledge of the relevant standards and regulations, to carry out work to gas systems, and to recognize possible hazards on his or her own. A gas specialist receives training for the specific location in which he or she works and is acquainted with the relevant standards and regulations.

■ Calibration officer

has the ability, because of his or her technical training, knowledge, and experience, as well as his or her knowledge of the relevant standards and regulations, to carry out calibration-protected work to gas systems. The calibration officer is trained to work with calibration-protected devices and systems and is acquainted with the relevant standards and regulations that apply.

■ Electrical expert

has the ability, because of his or her technical training, knowledge, and experience, as well as his or her knowledge of the relevant standards and regulations, to carry out work to electrical systems, and to recognize and avoid possible hazards on his or her own. A qualified electrician receives training for the specific location in which he/she works and is acquainted with the relevant standards and regulations.

**WARNING!****Risk for unauthorized persons!**

Unauthorized persons who do not fulfil the requirements described do not know the hazards in the work area.

Therefore:

- Keep unauthorized persons away.
- In the event of doubt, speak to people and direct them out of the working area.
- Interrupt the work as long as unauthorized persons are in the working area.

Only persons are permitted as staff from whom it can be expected that they will perform their work reliably. Persons whose reactivity is influenced, e.g., from drugs, alcohol, or medication, are not permitted.

- When selecting personnel to operate the device, make sure you comply with the specific regulations of the overall gas system that concern age and occupation.

3.5 Personal protective equipment

When working on the device within a gas system, wearing personal protective equipment is required to minimize health hazards.

- During the activity on the device, always wear the protective equipment required within the relevant system.
- Always observe the notes on the personal protective equipment provided in the working area.

3.6 Special hazards

The risks arising on the basis of the risk assessment are specified below. Observe the safety and warning instructions stated here in the further sections to reduce health hazards and avoid dangerous situations.



WARNING!

Risk of injury when handling batteries incorrectly!

Batteries need to be treated with special care.

Therefore:

- Do not throw batteries in the fire or expose them to high temperatures. There is a risk of explosion.
- Do not charge batteries. There is a risk of explosion.
- Liquid being released in the event of incorrect use may result in skin inflammations. Avoid contact with the liquid. Rinse the liquid with lots of water in the event of contact. If the liquid enters the eyes, rinse the eyes for 10 mins with water and see a doctor immediately.



WARNING!

Fire hazard from easily flammable substances!

Easily flammable substances, liquids or gases can ignite and cause severe to fatal injuries.

Therefore:

- Do not smoke inside the hazardous area and in the near proximity. Do not handle open flames or sources of ignition.
- Keep a fire extinguisher ready.
- Report suspicious substances, liquids, or gases to the person in charge immediately.
- Suspend work immediately in the event of fire. Leave the hazardous area until the all-clear has been given.

3.7 Environmental protection



CAUTION!

Substances harmful to the environment!

When handling substances harmful to the environment, in particular in the event of incorrect disposal, severe damage may arise for the environment.

Therefore:

- Observe the below notes at all times.
- Take suitable measures immediately if substances harmful to the environment enter the environment by mistake. In the event of doubt, inform the municipal authorities in charge of the damage.

The following substances harmful to the environment are used:

- Batteries

Batteries contain poisonous heavy metals. They are subject to special waste treatment and need to be disposed of at the municipal collection points or by a specialist company.

3.8 Operator liability

The device is used in industrial applications. The device operator is therefore subject to legal obligations of occupational health and safety.

In addition to the safety instructions in these operating instructions, current regulations of safety, accident prevention and environmental protection must be observed for the device area of application. The following items especially apply:

- The operator must ensure compliance with the current regulations of safety, accident prevention and environmental protection that apply for the overall system in which the device is integrated.
- The operator must keep himself/herself informed of the applicable occupational health and safety regulations, and determine, over the course of a risk assessment, the additional risks that arise from the specific working conditions when the device is being used. The operator must include these items in the form of operating instructions for the device.
- The operator must review, over the entire operational life of the device, whether the operating instructions prepared by him or her correspond to the status of the bodies of regulations and revise the instructions if necessary.
- The operator must definitively regulate and establish the responsibilities for device assembly, connection, commissioning, operation, and maintenance.
- The operator must ensure that all employees who work with the device have read and understood these operating instructions. In addition, the operator must train these personnel at regular intervals and inform them of the risks involved with the device.
- The operator of the overall system in which the device is integrated must provide personnel with the required protective equipment.

In addition, the operator is responsible for ensuring the device is always in technically perfect condition. The following items therefore apply:

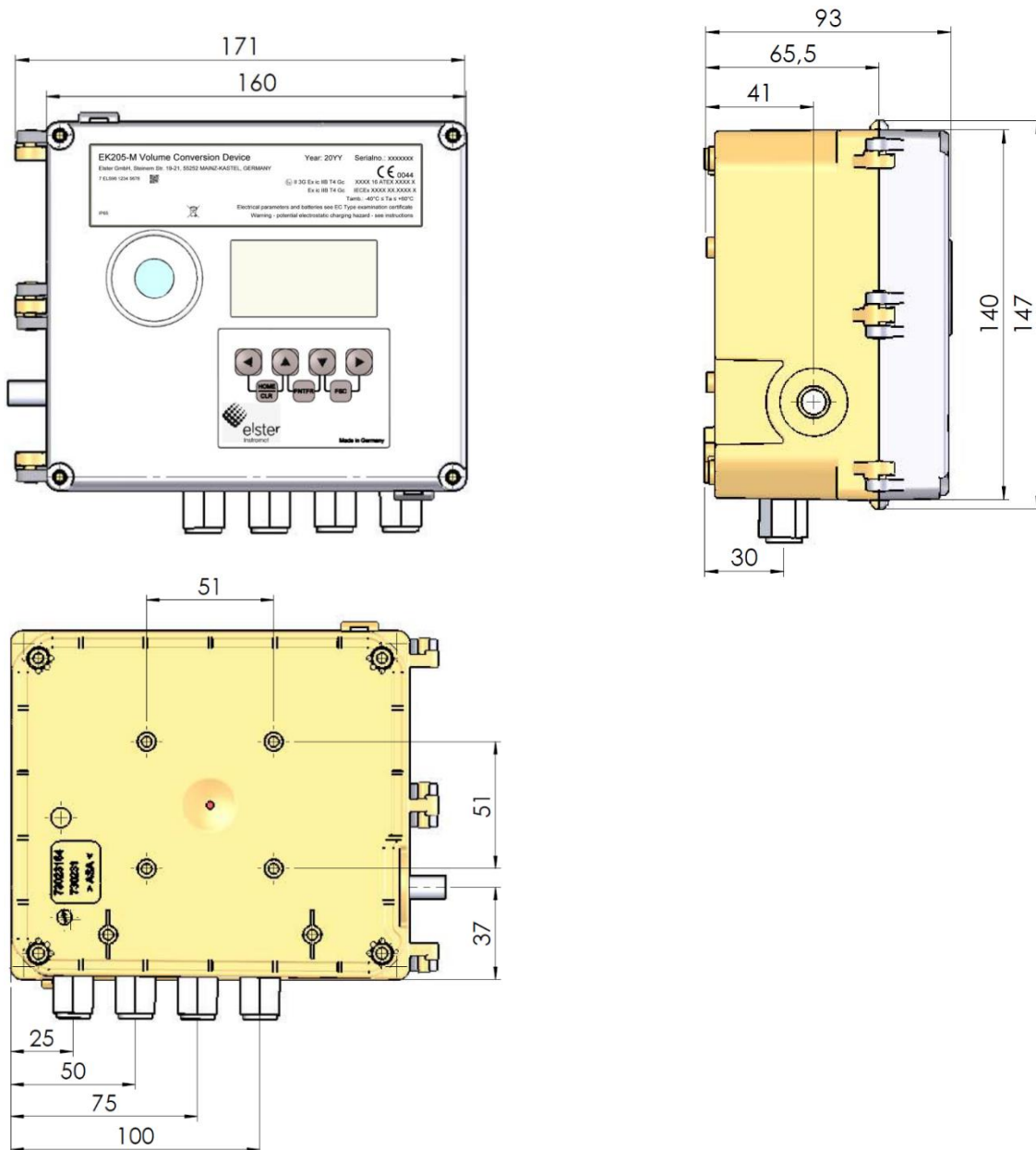
- The operator must ensure that the installation and maintenance work described in these operating instructions are performed properly.
- The operator must have all safety installations checked regularly to ensure they function correctly and are complete.

4 Technical data

4.1 General data

Information	Value	Unit
Width (incl. hinges)	170	mm
Height (incl. cable screw connections)	180	mm
Depth	90	mm
Permissible ambient temperature range	-40 – +60	°C
Permissible gas temperature range	-30 – +60	°C
IP protection class	IP65	

4.1.1 Dimensions



4.2 Power supply for EK205-M without integrated mains adapter

EK205-M is powered with dedicated batteries each for the basic device and the modem. The quantity of each of them is one.

The **standard operation mode** for the device operation is defined as follows:

Information	Value
Measurement cycle	30 seconds
Mode input 1	Pulse input
Display active	60 minutes per month
Interface active	30 minutes per month
Ambient temperature	-10 – +50°C

Modem readout duration	2 minutes per day
------------------------	-------------------

4.2.1 Basic device battery supply

Information	Value	Unit
Voltage	3.6	V
General nominal capacity	16.5	Ah
Usable capacity	13.0	Ah
Minimally required number of batteries	1	Unit
Minimal operating duration (in standard operation mode)	5	Years

4.2.2 Modem battery supply

Information	Value	Unit
Voltage	3.9	V
General nominal capacity	16	Ah
Usable capacity	13.68	Ah
Minimally required number of batteries	1	Unit
Minimal operating duration (in standard operation mode)	5	Years

4.2.3 External power supply for the basic device

Data	Value	Unit
Supply voltage	6.0 ...9.0	VDC
Supply current, maximum	60	mA

4.3 Pressure sensor

4.3.1 CT30 Type Pressure Sensor

Information	Value	Unit
External thread	M12 x 1.5	
Usable thread length	About 10	mm

4.3.1.1 Absolute pressure ranges

Measuring range	Overload capacity
0.8 – 5 bar abs.	25 bar abs.
2.0 – 10 bar abs.	40 bar abs.
1.0 – 16 bar abs.	40 bar abs.



The pressure sensor is available as an internally completed variant.
You can find details at www.elster-instromet.com or see section 5.5 Cable glands.



Not applicable when used as a Temperature Conversion Device.

4.4 Temperature sensor

Information	Value	Unit
Measuring range	-30 – +60	°C
Measurement uncertainty	max. ± 0.1	%
Installation length	50	mm

4.5 Digital inputs

4.5.1 Pulse and reporting inputs NF

The maximum meter frequency of the digital inputs can be set with the enSuite software. The thresholds stated here for frequency and duration apply only if the so-called software debouncing is deactivated.

Ex works, the software debouncing is activated to suppress fault pulses and so that safe counting is limited to 2 Hz.



If the software debouncing is set to a higher frequency than 2 Hz, miscounting from electromagnetic faults may arise under certain circumstances.

Information		Value	Unit
No-load voltage U_0		2.0	V
Internal resistance R_i	About	500	kΩ
Short-circuit current I_k	About	4	μA
Switchpoint "on":	▪ Resistance R_e	max.	300 kΩ
	▪ Voltage U_e	max.	0.8 V
Switchpoint "off":	▪ Resistance R_a	min.	5 MΩ
	▪ Voltage U_a	min.	1.8 V
Pulse duration t_e	min.	62.5	ms
Break duration t_a	min.	62.5	ms
Meter frequency f	max.	10	Hz
Cable length	max.	10	m

4.6 Digital outputs

The digital outputs DA1 and DA2 can be set exclusively as low-frequency pulse or report outputs.



CAUTION!

It is essential that you observe the polarity of the outputs. Incorrect polarity will probably result in the destruction of the output. You should therefore not use reverse polarity even for test purposes.

Information	Value		Unit
Switching voltage	max.	30	V DC
Switching current	max.	100	mA DC
Voltage drop	max.	1	V
Remaining current	max.	0.001	mA
Pulse duration	min.	125	ms
Break duration	min.	125	ms
Output frequency	max.	4	Hz
Cable length	max.	10	m

4.7 Optical serial interface

Information	Value	Unit
Baud rate	9600	Bd
Format	1 start, 1 parity, 1 stop bit	



The baud rate of the serial optical interface is adjustable to 19200 Bd. However, operation using this baud rate also depends on the connected optical reading cable and can therefore not be guaranteed.

4.8 Electrical serial interface

Information	Value
Adjustable types	RS232 or RS485
Cable length	max. 10 m

4.8.1 RS485 type

Parameter	Value
Operating types	RS485 2-wire (semi-duplex) RS485 4-wire (full-duplex)
Scheduling	No load resistor usable in the connected bus participants
Maximum data transmission rate	19,200 baud
Number of bus participants	Drive performance at the outlet: max. 16 unit loads ¹ Received power at the input ² : - 6 unit loads (RS485, not electr. insulated) - 3 unit loads (RS485, electr. separated)
Cable length	max. 10 m



The complete description for bus operation using Modbus is provided in the EK205-M application manual.

4.9 Supported protocols

Transmission method	Application protocols
Optical	IEC 62056-21
Serial (RS232, RS485)	IEC 62056-21, Modbus (ASCII, RTU, TCP)
Via modem	IEC 62056-21, Modbus (ASCII, RTU, TCP)



Use secure version of a protocol!

The protocols used with the EK280 normally transfer the data in plain text form. If possible, use the secure version of a protocol.

Please take our recommendations in the following sections into account:

2.3 “Preventing unauthorized external access using a firewall”

2.4.2 “Data security for data in transit”

¹Unit load: Standard RS485 receiver with an input resistance = 12 kOhm

²Details on the connection of the RS485 interface, see application manual

Application protocol	Description	Secure versions
DLMS/COSEM HLS	Device Language Message Specification for reading out the device and software updates (in High Level Security)	DLMS (HLS)
DLMS/COSEM LLS	Device Language Message Specification for reading out the device (in Low Level Security)	–
IEC 62056-21	Standard protocol for parameterizing and reading the device (\cong LIS200 protocol)	–
Modbus ASCII, RTU, TCP	Protocol for data exchange by user-defined registers between AMR and an EK series volume conversion device	–



Modbus TCP and IEC 62056-21: check the national regulations.

Please note that communication via Modbus and IEC 62056-21 is unencrypted. This means that the possibility of an attacker intercepting or modifying the data cannot be excluded. Check the national regulations. These may require the data to be verified manually or other measures.

4.10 Integrated Modem

Information	Value	Unit
Modem type	2G: GSM / GPRS	
Frequency bands	2G: 850 /900 /1800 /1900	MHz

4.11 Antenna

Information	Value	Unit
Frequency Range	820~960 & 1710~2690	MHz
Input Impedence	50	Ω
VSWR	700-960 \leq 4.0, 1710-2690 \leq 3	
Gain	\leq 5.23	dBi
Polarization Type	Vertical	

4.12 Operating conditions

4.12.1 Environment

Information	Value	Unit
Temperature range	-40 – +60	°C
Relative humidity, maximum	93	%
Humidity conditions acc. EN12405-1	condensation	
Point of use acc. EN12405-1	open	
Mechanical ambient conditions acc. EN12405-1	M2	
Electromagnetic ambient conditions acc. EN12405-1	E2	

4.13 Identification

The EK205-M is approved as a volume corrector as per the Measuring Instruments Directive (MID). The identification of the EK205-M is carried out on the front side (see section Structure and function).

4.13.1 Type plate³ and EX identification

The type identification of the EK205-M, which relates to its function as Volume Conversion Device, contains the following information:

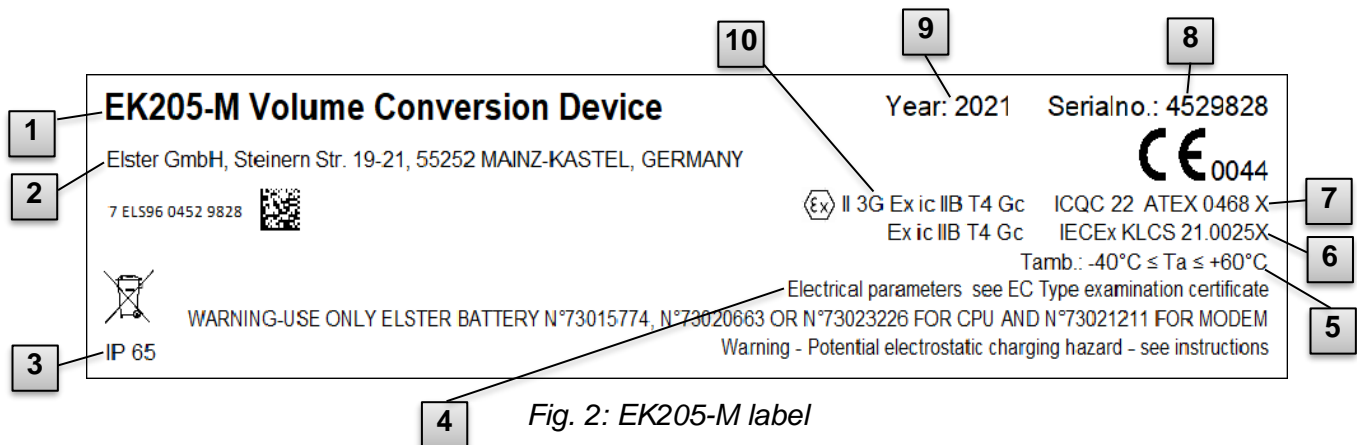


Fig. 2: EK205-M label

- | | | | |
|---|---------------------------|----|--|
| 1 | Type designation | 6 | IECEx - EC type examination certificate no. ⁴ |
| 2 | Manufacturer and address | 7 | ATEX - EC type examination certificate no. |
| 3 | IP protection class data | 8 | Serial number |
| 4 | Notices | 9 | Year of construction |
| 5 | Ambient temperature range | 10 | Ex marking |

³ Depending on the device design or country of destination, the type plate may contain other information.

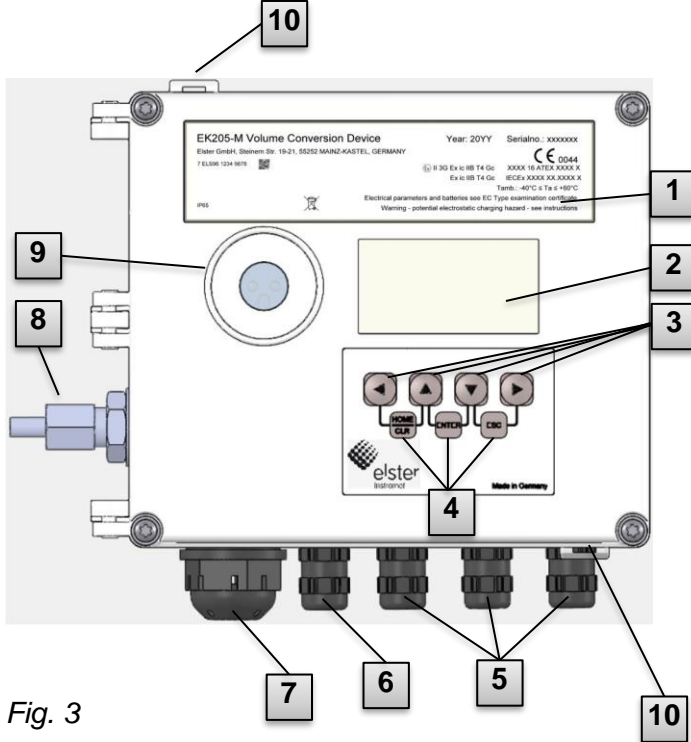
⁴ Not available for all device types.

4.13.2 Device software identification

- Move the cursor with the arrow keys to the Serv. tab and via the following path to the values Vers (device software version) or Chk (checksum):
Serv. → Identification → Volume converter → Vers or Chk
- The checksum Chk can be recalculated for verification purposes by pressing the ENTER button.

5 Construction and function

5.1 External view



- 1 Type plate
- 2 Display
- 3 Arrow keys ▲, ▼, ►, ◀
- 4 Description of the key combinations
- 5 Cable bushings for the connection of further components
- 6 Cable bushing Temperature sensor
- 7 Outdoor plug (option)
- 8 Pressure sensor⁵
- 9 Optical interface
- 10 Security rails

Fig. 3

5.2 Internal view

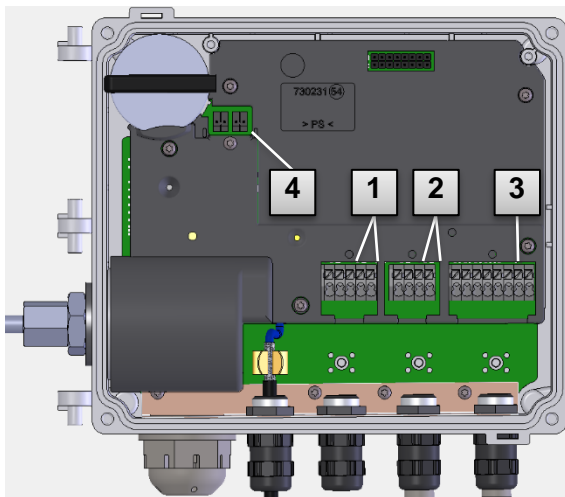


Fig. 4 (a): EK205-M with top assemblies removed

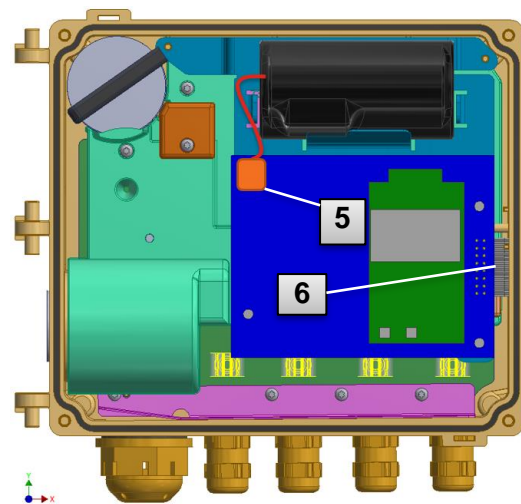


Fig. 4 (b): EK205-M with lid removed

- 1 Connections of the meter and reporting inputs DE1 and DE2
- 2 Connections of the pulse and reporting outputs DA1 and DA2
- 3 Connections of the serial interface
- 4 Connections of the basic device battery

- 5 Connection of modem battery
- 6 Connections of the base device and the modem assembly

⁵ Not applicable when used as a Temperature Conversion Device.

5.3 Brief description

The volume converter EK205-M is an explosion-protected, electronic device that calculates from a volume of a gas determined by an external meter in operating mode the volume in normal mode and therefore the energy share of the relevant gas volume.

In addition, using the registration function, the reporting inputs / outputs, the serial and optical data interfaces of the device, the gas load of a line can be monitored, registered and passed on.

The recording of the status parameters required for this is carried out via an internally connected pressure sensor and a temperature sensor. When using the EK205-M as a Temperature Conversion Device, the momentary values of temperature are measured, and the pressure is set as a constant. As an operating element of the EK205-M, an alphanumeric display and a keyboard on the front side of the device are available.

5.4 Connections

The Volume Conversion Device EK205-M has connection options for:

- Two batteries
- External supply for the basic device

To monitor and register the calculated data and to pass on the data and program its functions, the following are available:

- 2 meter and reporting inputs DE1, DE2
- 2 pulse and reporting outputs DA1, DA2
- Serial data interface
- Optical data interface



Details on the connection options of the EK205-M and the deliverable equipment variants can be found under section 4 Technical data and under section 5.5 Cable glands.

5.5 Cable glands

The following cable diameters are possible for the existing cable glands:

Cable gland	Cable diameter	Unit
M12 x 1.5 Ex e II, plastic, black	4.0 – 7.0	mm

6 Installation, connection and commissioning

6.1 Installation



The EK205-M can be installed either on the gas meter, on the pipeline or on a wall.



In the event of issues during installation, e.g. when selecting the suitable installation accessories, please contact our customer service (see section General).

6.1.1 Installation on a gas meter



Install the EK205-M on a gas meter using a mounting bracket (see Appendix) as well as suitable cylinder screws and square nuts.

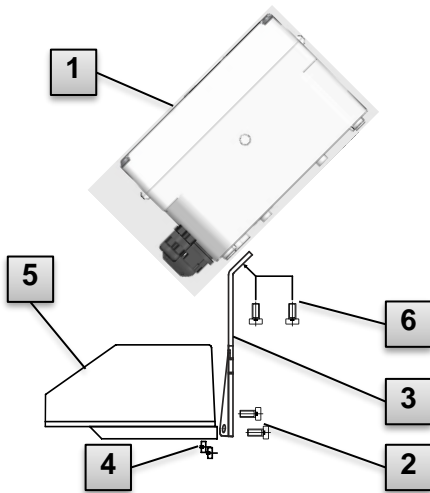


Fig. 5

1. Using two self-cutting screws (6), install the mounting bracket (3) on the EK205-M (1)
2. Tighten the self-cutting screws such that the angle is tight.
3. Using two M5 square nuts (4) and two M5 x 10 mm cylinder screws (2), install the mounting bracket on the rear of the meter head (5).
4. Tighten the cylinder screws such that the device sits tight and cannot fall down.

6.1.2 Installation on a pipeline



Using pipe installation aids (see Appendix) with suitable cable ties, install the EK205-M on a pipeline.

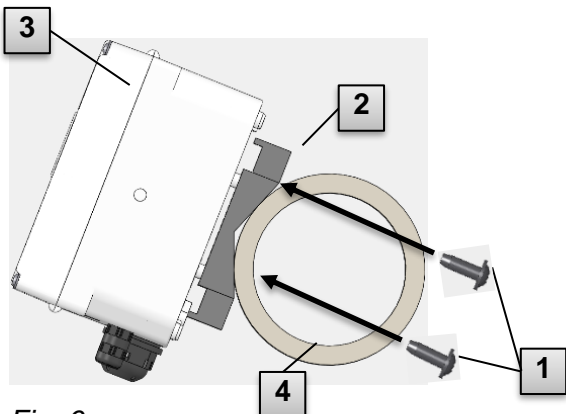


Fig. 6

1. Using the four self-cutting screws provided (1), install the pipeline installation aid (2) on the rear of the EK205-M (3).
2. Tighten the cylinder screws such that the installation aid sits tight.
3. Fasten the EK205-M with installed pipeline installation aid (2 and 3) with the help of cable ties on the pipeline (4).
4. Install the device such that it sits tight and cannot fall down.

6.1.3 Installation on a wall



Using the wall mounting feet (see Appendix), install the EK205-M on the wall.

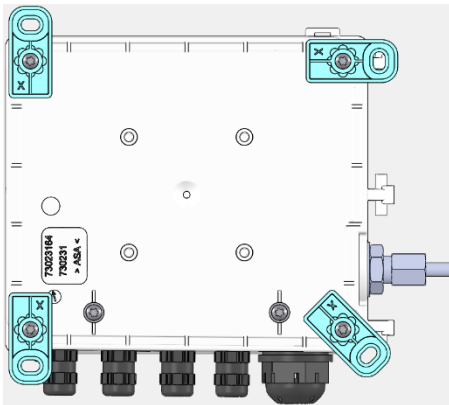


Fig. 7

1. Using the four self-cutting screws provided on the rear of the EK205-M, install the wall mounting feet. The fastening feet can be fastened in different positions.
2. Drill holes in the wall in accordance with the position of the installed installation feet. Select the wall plugs suitable for the size of the screws and insert them in the borings of the wall.
3. Use four screws for fastening the EK205-M, e.g. 5 x 35 mm.

6.1.4 Three-way cock⁶

When installing the pressure sensor, a three-way cock is usually installed in order to carry out an inspection of the pressure sensor in built-in condition or for the replacement of deficient sensors without deactivating the overall gas line. The three-way cock available from Elster has the following structure:

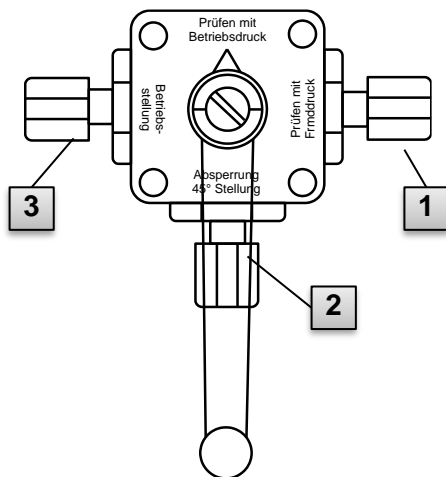


Fig. 8

- 1**: From the meter: From the pressure connection of the gas meter
For bellows-type gas flow meters, this is carried out on the input side of the meter
- 2**: For the MU: To connect the gas sensor of the Volume Conversion Device
- 3**: Test connection: Possibility to take test pressure or to give external pressure on the pressure sensor of the Volume Conversion Device.



When installing the three-way cock, it must be noted that the position of the operating lever is checked with the corresponding throughputs, as the lever can be removed and may be installed in a twisted manner.

⁶ Not applicable when using EK205 as a Temperature Conversion Device.



The pipeline from the pressure sensor to the meter must be laid in a falling manner so that, where applicable, water cannot damage the pressure sensor or influence the measurement precision.

6.2 Connection



The EK205-M is available in various equipment variants. Information about this can be found at www.elster-instromet.com.



DANGER!

Risk of explosion by connection to non-intrinsically-safe and associated equipment.

When operating the EK205-M in an area at risk of explosion (zones 2) and connecting devices without certification as an "associated piece of equipment", there is a risk of explosion.

Therefore:

- When used in an area at risk of explosion, connect the EK205-M to certified, associated pieces of equipment only in accordance with the valid rules of the art stated in the design test certificates.
- Connect the EK205-M only to intrinsically safe pieces of equipment whose electric data correspond to the requirements stated in the design test certificates of the EK205-M (see section 13.3).



WARNING!

Risk from faulty connection of the device!

The connection of the device may be carried out by a gas expert only (see section Safety). Faults in this process may result in fatal situations or considerable material damage.

Therefore:

- Have the connection of the calibrated device be carried out by a gas expert only.
- Also involve this person for subsequent relocations.
- Do not perform any connection changes or relocations of the device independently.

- During connection and commissioning of the EK205-M, observe the requirements of the associated norms DIN EN 60079-0 and DIN EN 60079-14.
- Have the wiring of the connections carried out correctly by a gas expert or a calibration officer.
- Do not connect active outputs against each other and ensure that they have the correct polarity in advance.
- Seal unused cable glands as described in DIN EN 60079-14 using a plug or a suitable screw-in cover to maintain the required IP protection class (see section 4.1).
- Insulate any unused wire (e.g., in multicore cables) at the end by appropriate termination means. (see "Technische Regel für Betriebssicherheit (TRBS)")

To program the device and carry out additional applications, you can also connect in addition to the components stated in this section the serial and optical interfaces of the EK205-M (see section Construction and function).

6.2.1 Connecting gas meters

To measure the gas volume, a gas meter with a low-frequency pulse transducer can be connected to the digital input DE1 of the EK205-M.

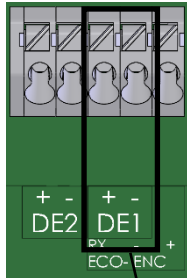


Fig. 9

The pulse transducer of the gas meter is connected to the DE1 (**1**) terminal of the EK205-M.

Details and characteristics on the use of the pulse transducer are described in the following subsections.



The line diameter for connection of the inputs of the EK205-M is 0.8 ... 1.0 mm (AWG 20 – 18).

6.2.1.1 Connection to a low-frequency pulse transducer

1. Connect the pulse output of the gas meter to the DE1 terminal (**1** in Fig. 9) of the EK205-M. The priority can be freely selected. (The labels + and - of the terminals are intended for connecting other pulse transducers.)
2. Set the operation parameters such as the cp value (pulse constant) as described in section 6.3.1.2.

6.2.2 Lead-sealing of the input terminals

After connecting to the gas meter in accordance with section 6.2.1, the input terminal DE1 needs to be sealed.

To this end, the accessory bag terminal covers are provided. Where required, screw them via the connected terminals and then glue an adhesive seal to the fastening screw (see section 6.3.2).

6.2.3 Connect temperature sensor



When connecting the temperature sensor, national requirements must be observed.



Lubricate the temperature sensor before connecting with heat transfer paste to increase its functionality.

6.2.3.1 Connection to standard temperature sensor pocket

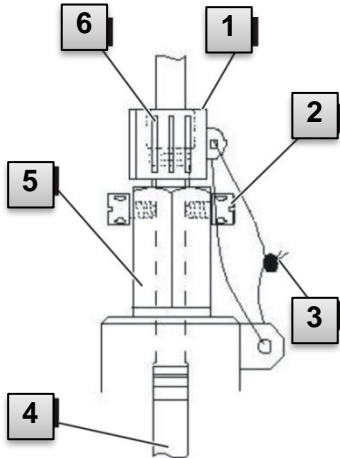


Fig. 10

1. Insert the temperature sensor Pt 500 **4** in the temperature sensor pocket **5** (see Appendix).
2. Fasten the temperature sensor through the capstan screw **2** and the planned screw connection **6**.
3. Have the temperature sensor sealed using a lead-sealing socket **1** and the wire seal **3** in accordance with Fig. 9 by a calibration officer.

6.2.3.2 Connection to an older temperature sensor pocket

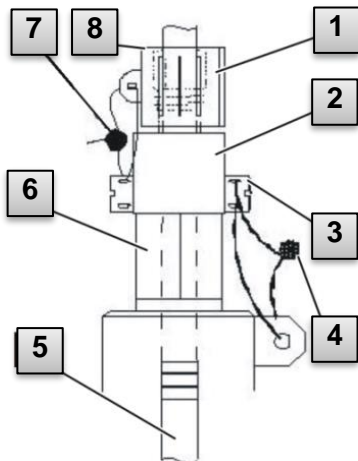


Fig. 11

1. Insert the temperature sensor Pt 500 **5** in the temperature sensor pocket **6** (see Appendix).
2. Use the adapter for lead-sealing the connection **2** (see Appendix).
3. Fasten the temperature sensor through the capstan screw **3** and the planned screw connection **8**.
4. Have the temperature sensor sealed using a lead-sealing socket **1** and the wire seal **4, 7** by a calibration officer.

6.2.4 Connect pressure line⁷



When connecting the pressure lines, national requirements must be observed. For Germany, the requirements of the PTB inspection rules, volume 20 Electronic Volume Conversion Devices for gas, section 5 apply.



When installing pipelines, ensure that there is a downward gradient from the EK205-M to the gas line.

6.2.4.1 Connection to an internal pressure sensor

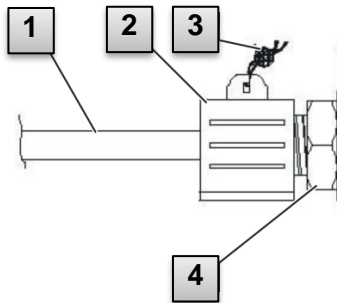


Fig. 12

1. Connect the pressure connection **1** using the union nut and the seal insert to the connection of the internal pressure sensor **4**.
2. Seal the connection with the sealing socket **2** and a wire seal **3**.

6.2.5 Connecting the power supply



DANGER!

The connection of non-associated equipment presents a risk of explosion!

Operating the EK205 in zone 2 and connecting devices which are not certified as "associated equipment" present a risk of explosion.

Therefore:

- When using the EK205 in zone 2, it should only be connected to certified associated equipment as per the ATEX Product Directive 94/9/EC.
- The EK205-M should only be connected to the intrinsically-safe circuits of associated equipment whose electrical data correspond to those requirements stipulated in the declaration of conformity for the EK205-M (see Appendix).

For the external power supply of the EK205-M (model without in-built power supply unit), the electrical data should be adhered to as per sections 13.3 and 4.2.3.

The extended function unit "FE260" from Elster can be used as a power supply unit, for example.



Connect the power supply in safe assembly area only. Modem power needs to be unplugged and removed from the enclosure to access the power connections in the field.

⁷ Not applicable when using EK205 as a Temperature Conversion Device.

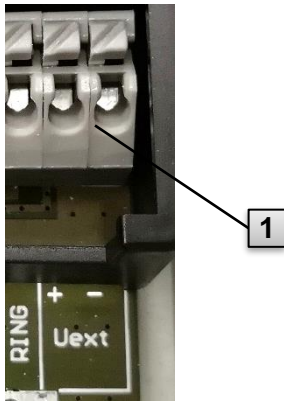


Fig. 13

Connect the power supply to the "Uext" terminal **1** of the EK205-M.

The polarity should be taken into consideration, i.e. connect the "+" of the power supply unit to the "Uext +" terminal and "-" to "Uext".

6.2.6 Connect outputs of the EK205-M



The line diameter for connection of the inputs of the EK205-M is 0.8 ... 1.0 mm (AWG 20 – 18).



Various instruments can be connected to the digital output of the EK205-M. To this end, the outputs are preset (see section 6.3.1.10)



CAUTION!

Danger from incorrect device connection!

Ensure that the outputs have the correct polarity to prevent damaging the outputs.



Connect the outputs in safe assembly area only. Modem power needs to be unplugged and removed from the enclosure to access the output connections in the field.

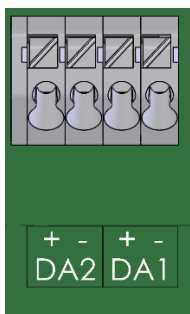


Fig. 14

1. Connect the downstream device to the required digital outputs (terminals DA1 and DA2) on the EK205-M (see Fig. 14).
2. A terminal cover is supplied in the accessories bag to seal the output terminals. If necessary, place these over the terminals and screw tight. Then affix a seal to the retaining screw (see section 6.3.2).
3. If necessary, set the cp value (pulse constant) for the pulse outputs as described in section 6.3.1.10.

6.3 Commissioning

6.3.1 Setting the operating parameters

The setting of the operating parameters required can be carried out using the free enSuite software, see chapter 1.1.2).

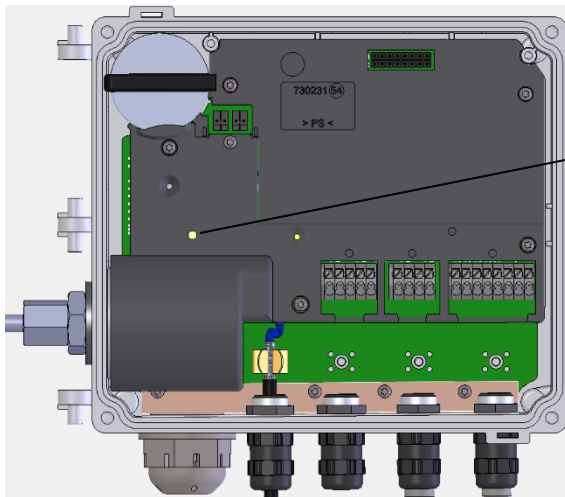
If the program is not available, the settings can be alternatively made using the device keyboard.



Before setting the operating parameters using the keyboard, read section 9 to familiarize yourself with the operation of the device.

6.3.1.1 Opening the calibration lock

On circuit board in the housing floor, the calibration lock can be found in the form of a key that can be secured with an adhesive label. This needs to be operated to change relevant values and parameters.



Position of the key for opening the calibration lock (top assemblies removed for clarity).

Fig. 15

6.3.1.2 Setting parameters for the NF pulse transducer of the gas meter

If a low-frequency pulse transducer is connected in accordance with 6.2.1.1, you can set the input mode and cp value as follows:

1. Setting the input mode:

- Move the cursor to the "Serv" tab and via the following path to the value "Md.I1" input mode:
Serv. → Inputs → Input 1 → Md.I1
- Press the key combination ENTER ▲ + ▼ ⇒ The value set flashes.
- Repeatedly press one of the ▲ or ▼ arrow buttons until the text "Pulse input" flashes.
- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

2. Setting the cp value (pulse constant):

- Move the cursor to cp value "cp.I1" in the same path
- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.

- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

6.3.1.3 Setting the volume at measurement conditions

In order to control the recording of volumes within measurement conditions, the EK205-M's counter can be set to the same value as the gas counter once when the administrator lock is open. Setting the volume is always possible when the calibration lock is open.

- Open the administrator lock or the calibration lock
- Move the cursor to the "Serv" tab and via the following path to the value "VmA" (adjustable volume at measurement conditions) input mode:
Serv. → Volume → Actual volume → Synchronization Vm → VmA
- Press the key combination ENTER ▲ + ▼ ⇒ one digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.
- After all digits have been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.
- To adopt the value set, move the cursor to the Store value.
- Press the ENTER key combination ▲ + ▼ ⇒ "0" flashes.
- Change the value using the arrow buttons ▲ or ▼ to "1".
- After the value has been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►. ⇒ For Vm, VmA is adopted.



If the administrator lock is open and the transfer of VmA for Vm is rejected with the – 13– message, this process has already been carried out.

Further changes are possible when either the calibration lock or the administration lock is open, after deleting the change information regarding setting Vm at the same value as the gas counter (see section 6.3.1.4).

6.3.1.4 Deleting change information for alignment of Vm with the gas meter

To allow for resetting of the volume within measurement conditions when the administrator lock is open, the change information regarding setting Vm at the same value as the gas counter must be deleted:

- Open the calibration lock
- Move the cursor to the "Serv." tab and via the following path to the value "Clear" (adjustable volume at measurement conditions) input mode:
Serv. → Volume → Actual volume → Synchronization Vm → Clear
- Press the key combination ENTER ▲ + ▼ ⇒ "0" flashes.
- Change the value using the arrow buttons ▲ or ▼ to "1".
- After the value has been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►. ⇒ "TimeX" (time stamp of the alignment), "Vm_o" (Vm old value), "Vm_n" (Vm new value) are set to the default values.

6.3.1.5 Setting the volume at base conditions

It is possible to set up the meter when first operating the EK205-M provided that the administrator lock is open. Setting the volume is always possible when the calibration lock is open.

- Open the administrator lock or the calibration lock.
- Move the cursor to the "Serv" tab and via the following path to the value "VbA" (adjustable standard volume meter) input mode:
Serv. → Volume → Standard volume → Synchronization Vb → VbA
- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.
- After all digits have been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.
- To adopt the value set, move the cursor to the *Store* value.
- Press the key combination ENTER ▲ + ▼ ⇒ "0" flashes.
- Change the value using the arrow buttons ▲ or ▼ to "1".
- After the value has been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►. ⇒ For *Vb*, *VbA* is adopted.



If the administrator lock is open and the transfer of VbA for Vb is rejected with the – 13– message then this process has already been carried out.

Further changes are possible when either the calibration lock or the administration lock is open, after deleting the change information regarding setting Vb (see section 6.3.1.6).

6.3.1.6 Deleting change information for alignment of Vb

To allow for resetting of the standard volume when the administrator lock is open, the change information regarding setting at the same value as "Vb" must be deleted:

- Open the calibration lock
- Move the cursor to the "Serv." tab and via the following path to the value "Clear" (adjustable volume at base conditions) input mode:
Serv. → Volume → Standard volume → Synchronization Vb → Clear
- Press the key combination ENTER ▲ + ▼ ⇒ "0" flashes.
- Change the value using the arrow buttons ▲ or ▼ to "1".
- After the value has been changed, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►. ⇒ "TimeX" (time stamp of the alignment), "Vb_o" (Vb old value), "Vb_n" (Vb new value) are set to the default values.

6.3.1.7 Setting compressibility equation and gas analysis

- Move the cursor to the "Serv" tab and via the following path to the value "Md.K" (compressibility equation):
Serv. → Volume conversion → Parameter settings → Md.K
- Press the key combination ENTER ▲ + ▼ ⇒ The value set flashes.

- Change the value using the arrow buttons ▲ or ▼. In doing so, observe the legal provisions applicable at the place of use.

Md.K	Meaning
Fixed value	No calculation of the compressibility. The adjustable K.F value is used.
S-Gerg-88	Calculation of the compressibility in accordance with S-Gerg-88
AGA-NX19	Calculation of the compressibility in accordance with AGA-NX19
AGA-8 GC1	AGA8 gross characterization method 1
AGA-8 GC2	AGA8 gross characterization method 2
AGA-NX19-HW	AGA-NX19 according to Herning and Wolowsky
AGA-8 DC92	AGA8 detailed characterization

- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.
- Move the cursor with the arrow keys ▲ or ▼ further to the gas analysis values (*Ho,b*, *CO₂*, etc.).
- Change the values in accordance with the gas used by enabling with the ENTER ▲ + ▼ key combination the entry, going with the arrow keys ► or ◀ to the figures and changing them with the keys ▲ or ▼.
- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.



The calorific value Ho,b applies to the basic conditions pbX , TbX and reference combustion temperature $+25^{\circ}C$. pbX and TbX are adjustable under calibration lock.

6.3.1.8 Setting the alarm limits for gas pressure and temperature measurement

Ex works, the alarm thresholds are set to sensible values. If a change is necessary, proceed as follows:

- Move the cursor to the "Serv" tab and via the following paths to the alarm thresholds:
Serv. → Measured values → Pressure → pMin and pMax⁸
Serv. → Measured values → Temperature → TMin and TMax
- Press the key combination ENTER ▲ + ▼ to enable the entry.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.
- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

⁸ These values are not required in the performance as Temperature Conversion device.

6.3.1.9 Setting replacement values for gas pressure and temperature

If the gas pressure or the gas temperature cannot be measured due to a fault or if pressure and temperature are outside the alarm limits defined in section 6.3.1.8, an adjustable replacement value (fixed value) is used to calculate the standard volume. The volume thereby calculated is counted in the separate fault volume meter VbD (Base Volume Disturbed).

The total base volume counter VbT is keep on counting although there is a disturbance. The total base volume calculated under these faulty conditions has no measuring relevance. It must not be used for billing purposes.

The replacement values can be found at the following paths:

Serv. → Measured values → Pressure → p.F⁹

Serv. → Measured values → Temperature → T.F

The values are changed as a rule in the same way as described in section 6.3.1.8.

6.3.1.10 Parameterization of the outputs



The setting of the cp values (pulse constants) for the outputs can be carried out via the enSuite software as an alternative.

The following functions are preset for the outputs as factory settings:

Output	Function
DA1	Pulse output for the total standard volume "VbT" ¹⁰ (CP.O1= 0.1 Imp/m ³)
DA2	Pulse output for the total standard volume "VmT" (CP.O2= 0.1 Imp/m ³)

The cp value of an output states how many pulses were emitted per cubic meter. A cp value of 0.1/m³ (0.1 pulses per m³) means that e.g. a pulse is emitted per 10m³.

To change the cp values for output 1 or output 2, move the cursor to the "Serv." tab and via the following path to "CP.O1" (output 1) or "CP.O2" (output 2):

Serv. → Outputs → Output 1 → CP.O1 or

Serv. → Outputs → Output 2 → CP.O2

- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the cp value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.
- Press the key combination ENTER ▲ + ▼ to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.



Except for the settings described here, many additional functions, such as time synchronous pulses, can be set for the outputs.

The complete description can be found in the application manual EK205 (see section 1.1.1).

⁹ These values are not required in the performance as Temperature Conversion device.

¹⁰ VbT must not be used for billing purposes.

6.3.1.11 Setting summer time switching

- Move the cursor to the "Serv." tab and via the following path to the value "MdTim" (summer time mode):

Serv. → Date and time → MdTim

- Press the key combination ENTER ▲ + ▼ ⇒ The value set flashes.
- Change the value using the arrow buttons ▲ or ▼:

Mod.Z	Meaning
off	No switching to CEST*
auto	Automatic switching to CEST*
manual	Every year, the start and end of CEST* is set by the control room.

*CEST = Central European Summer Time

- Press the ENTER ▲ + ▼ button to confirm the set value. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

6.3.1.12 Delete measurement archives



It is not mandatory to delete the archives on commissioning.

- Move the cursor to the "Serv." tab and via the following path to the value "Clr.A" (delete measurement archives):

Serv. → Edit and delete → Clr.A



All measurement archives (no logbooks) are deleted.

To avoid deleting the archives by mistake, when the calibration lock is open the serial number (on the type plate of the device) of the EK205-M must be stated.

- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and enter with the arrow buttons ▲ or ▼ the serial number of the device.
- After stating the serial number of the device, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

6.3.1.13 Clearing the certification data log



The logbook can only be cleared if the calibration lock is open.

- Move the cursor to the "Serv." tab and use the following path to access the value "CICDL" (Clear certification data log):

Serv. → Edit and delete → CICDL

- Press the ENTER key combination ▲ + ▼ ⇒ "0" will flash.
- Change the value to "1" using the ▲ or ▼ arrow key.
- After you have entered the value, press the ENTER key combination ▲ + ▼ to confirm the input. The input process can be cancelled by pressing the ESC key combination ▼ + ►.

6.3.1.14 Close and secure calibration key

After making all settings subject to calibration requirements, close the calibration lock. Press the key described in section 6.3.1.1 again.

The calibration lock is calibrated with an adhesive label as described in section 6.3.2.2.

6.3.2 Sealing

6.3.2.1 External view

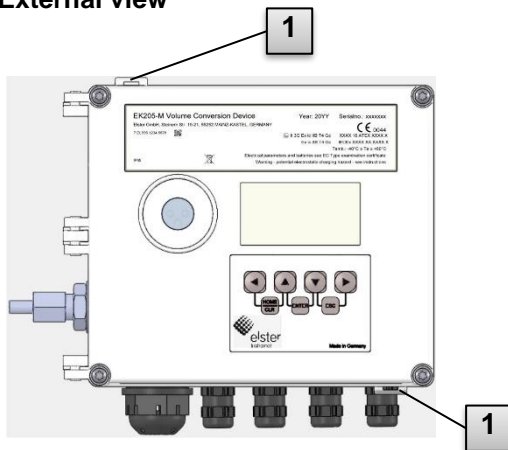


Fig. 16

- 1 Optional user protection: Lid sealing using wiring seals through sealing plugs.

6.3.2.2 Internal view

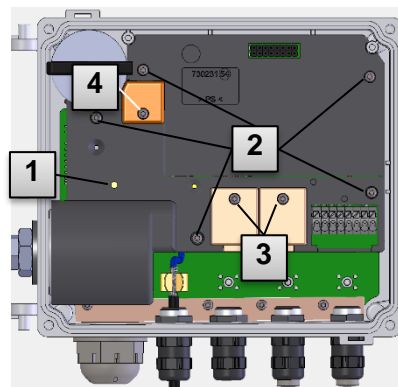


Fig. 17(a)

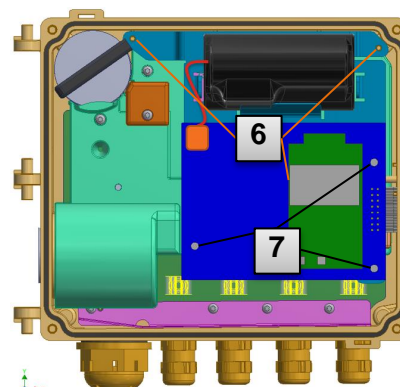


Fig. 17(b)

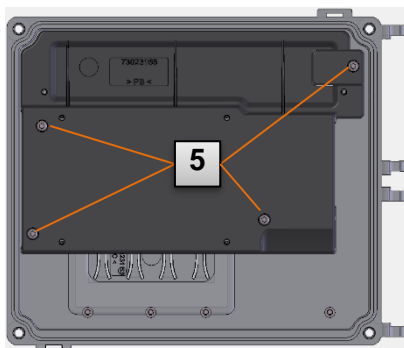


Fig. 18

- 1 Sealing point for securing the calibration switch.
- 2 Sealing points for securing the plate covers.
- 3 Sealing points for securing the terminal covers of the inputs and outputs.
- 4 Sealing points for securing the basic device battery cover (if available).
- 5 Sealing points for securing the LCD plate cover.
- 6 Sealing points for securing the modem plate (bracket).
- 7 Sealing points for securing the modem assembly.



The sealing of the sealing points Fig. 17/3 for securing the pulse inputs and pulse outputs is subject to national law (see WELMEC 11.1, section 2.7.1).

Depending on the legal situation in the country of use, seals from a group of people set out in law or from meter operators must be used.

If devices are delivered with connected input and/or output cables then seals with the manufacturer's symbol are applied at the plant. If necessary, these can be substituted on site as described above.

6.3.2.3 Sensors



The sealing of the connected temperature and pressure sensors is illustrated in sections 6.2.3 and 6.2.4 as an example.

6.3.3 Close housing



CAUTION!

Damage to property caused by improper device closure!

If the device is not properly closed cables can get pinched and cause damage.

Therefore:

- Ensure correct positioning of the cable guide when closing.

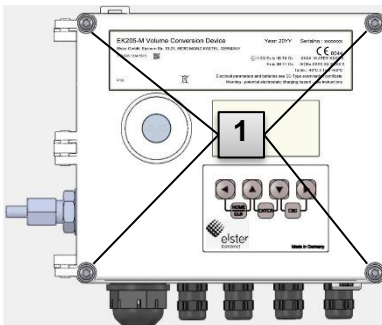


Fig. 19

1. Close the housing using the four pre-installed screws (Fig. 19: 1).
2. Do not close the cable screw connections used with matching sealing plugs.

6.3.4 Check installation and connection



WARNING!

Risk from improper installation and connection!

Improper installation and connection of the EK205-M may result in fatal situations.

Therefore:

- Carry out the installation and connection of the EK205-M correctly.
- Observe the requirements of the standards and guidelines stated in the design test certificates.

6.3.5 Data transfer

For the various options of remote data transmission to a control room via a device connected to the terminal interface, please observe the corresponding instructions in the application manual EK205-M, see section 1.1.1).

The settings of the data transfer are possible without opening the calibration lock.

7 Working with enSuite

enSuite is the parameter configuration and analysis program for current Honeywell products in the field of flow computers, data storage, gas property measuring instruments and ultrasound gas meters, and it supports all activities that are necessary for the commissioning and maintenance of these terminal devices. enSuite replaces the WinPADS series. The main functions only are briefly explained here. For a more detailed description please refer to the enSuite documentation.

7.1 Setting up the communication link to the EK205-M via optical interface



To set the EK205-M parameters via the optical interface, you need an optical read head cable, available from Honeywell. The parameterization program enSuite can be downloaded for free at www.elster.com.

- Insert the optical read head into the ring on the front panel of the EK205-M and connect the other end to a COM or USB port on your PC or laptop.
- Connect a PC or laptop to the EK205's optical interface using the cable.
- Start the enSuite program (i.e. *Start > Programs > Elster > enSuite*).
- Press symbol "*Search device...*" (magnifying glass symbol).
- In the "*Search device and connect*" window select the "*LIS200*" tab.
- Select "*Access*" → "*LIS200*", "*User*" → "*Administrator*", "*Connection*" → "*Optical*" and "*use default settings*".
- In the field "*Key*" enter the administrator key.
- Press "*OK*".
- After a few seconds "*connected*" is displayed at the bottom of the "*Output*" window.

7.2 Setting up the communication link to EK205-M via a modem

Prerequisite: A communication link between enSuite and the EK205-M (⇒ section 8).

- Ensure your PC or laptop is configured for remote data transmission, i.e. is connected to a modem.
- Start the enSuite program (i.e. *Start > Programs > Elster > enSuite*).
- Press symbol "*Search device...*" (magnifying glass symbol).
- In the "*Search device and connect*" window select the "*LIS200*" tab.
- Select "*Access*" → "*LIS200*", "*User*" → "*Administrator*", "*Connection*" → "*Modem*" and "*use default settings*".
- In the field "*Key*" enter the administrator key.
- Enter the EK205's SIM card telephone number under "*Modem*".
- Press "*OK*".
- After a few seconds "*connected*" is displayed at the bottom of the "*Output*" window. Via a GSM modem communication link to an EK205-M this may take up to a minute.

7.3 Setting up the communication link to EK205-M via a network (TCP/IP)

Prerequisite: A communication link between enSuite and the EK205-M (⇒ section 8).

- Ensure your PC or laptop is connected to the LAN. The EK205-M must be connected to the same network.
- Start the enSuite program (i.e. *Start > Programs > Elster > enSuite*).

- Press symbol "*Search device...*" (magnifying glass symbol).
- In the "*Search device and connect*" window select the "*LIS200*" tab.
- Select "*Access*" → "*LIS200*", "*User*" → "*Administrator*", "*Connection*" → "*TCP/IP*" and "*use default settings*".
- In the field "*Key*" enter the administrator key.
- Enter the EK205-M's IP address under "*Address*" and port number under "*Port*".
- Press "*OK*".
- After a few seconds "*connected*" is displayed at the bottom of the "*Output*" window.

7.4 Setting up a direct communication link to EK205-M

Prerequisite: A communication link between enSuite and the EK205-M (⇒ section 8).

- Ensure your PC or laptop has a COM port.
- Start the enSuite program (i.e. *Start > Programs > Elster > enSuite*).
- Select the "*Search device...*" icon (magnifying glass icon).
- In the "*Search device and connect*" window select the "*LIS200*" tab
- Select "*Access*" → "*LIS200*", "*User*" → "*Administrator*", "*Connection*" → "*Serial RS232*" and "*use default settings*".
- Enter the serial communication link speed under "*Baud rate*".
- Press "*OK*".
- After a few seconds "*connected*" is displayed at the bottom of the "*Output*" window.

7.5 Updating customized parameters

Prerequisite: A communication link between enSuite and the EK205-M via optical interface, modem or network (TCP/IP) has been set up (⇒ sections 7.1 to 7.3).

- Select "*Navigation*" on the left-hand side.
- Click on the plus sign beside "*My Devices*" in the newly-opened navigation window, to see a list of your devices.
- Click on the entry beginning with the serial number of the connected device.
- The device identifier is now displayed at the bottom of the navigation window. If no command list is displayed underneath, click on the arrow next to the device identifier.
- In the lower part of the navigation window, press "*Parameterize online*"
- Click on the plus sign next to "*Parameter*" at the top of the navigation window, to expand the parameter tree.
- In this parameter tree you can open parameter pages, to update parameters or drill down to open more parameter pages.

7.6 Send parameter file

Prerequisite: A communication link between enSuite and the EK205-M via optical interface, modem or network (TCP/IP) has been set up (⇒ sections 7.1 to 7.3).

- Select "*Navigation*" on the left-hand side.
- Click on the plus sign next to "*Connections*" in the newly-opened navigation window.
- Click on the entry beginning with the serial number of the connected device.
- The device identifier is now displayed at the bottom of the navigation window. If no command list is displayed underneath, click on the arrow next to the device identifier.
- Select "*Send parameter file*".
- Click "*Open...*" in the top right.

- In the dialog box "*Select WPP file*" select the corresponding directory and the parameter file and then press "OK".



In enSuite from version 2.7 onwards, the name and issue (in brackets) of the parameter file are both displayed. The file extension ".wpp" is not displayed.



*If needed, any arbitrary wpp file can be selected with the "*File system...*" button. Make sure that this manually selected wpp file is suitable for the EK205-M software version.*

- Click on "*Start*" in the bottom right and wait until the file has been successfully sent.



*In the center of the window, you will see the number of rows that have been sent along with the number of rows containing errors (if applicable)
You must check in such cases whether the necessary locks are open and/or whether the file used is suitable for the device version. Contact the Honeywell hotline (⇒ EK205-M manual) is necessary.*

- To begin another task, click again on "*Navigation*" on the left-hand side.

8 Data transfer

8.1 Internal 2G Modem - (GSM/GPRS)

8.1.1 Distinguishing the internal modem

The EK205-M with software version 1.07 supports 2G modem for remote data monitoring. The modem to be used is "ECM-2G-UG350" (GSM/GPRS). Fig. 20 and Fig. 21 respectively shows the built-in modem type used and its rating plate.

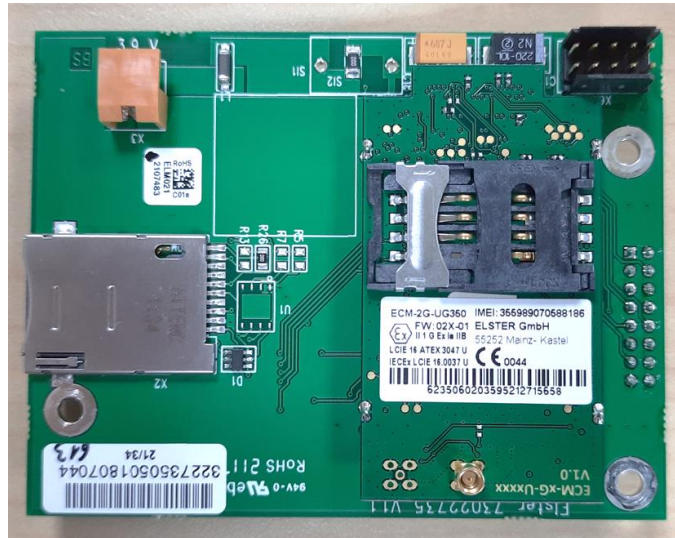


Fig. 20: ECM-2G-UG350 modem



Fig. 21: ECM-2G-UG350 modem rating plate

8.1.1.1 Hardware Setting for Modem

If the module has already been installed in the EK205-M at Elster (no retrofitting on site), the modem types can also be configured in the EK205-M using the "**MdxS3**" setting in the following menu "**Serv. - Interfaces – internal modem – Hardware Configur.**":

Device driver serial interface "MdxS2"	7: Ublox_GPRS
Interface signal configuration "Cfgl2"	0: RS232-direct
Type serial interface "Typ S2"	3: int. Modem



Before using the EK205-M for the first time, connect the battery to the modem. It has not been connected at the factory in order to avoid an unnecessary load on the battery!

8.1.2 Inserting the SIM card

The EK205-M has mini-SIM slot for the SIM installation. The SIM installation steps are as follows:

- For EK205-M powered with external power supply for the basic device, the external supply must be switched off before opening the housing.



Danger of death!

For EK205-M powered with external power supply for the basic device, the external power supply voltage must be switched off before opening the housing, ensure it is not turned back on and verify that there is no voltage.

- Remove the four screws from the top of the EK205-M and open it. (see Fig. 22)



Fig. 22: EK205-M with screws at each corner

- Disconnect the modem and basic device battery if already connected. (see Fig. 23 and Fig. 24)

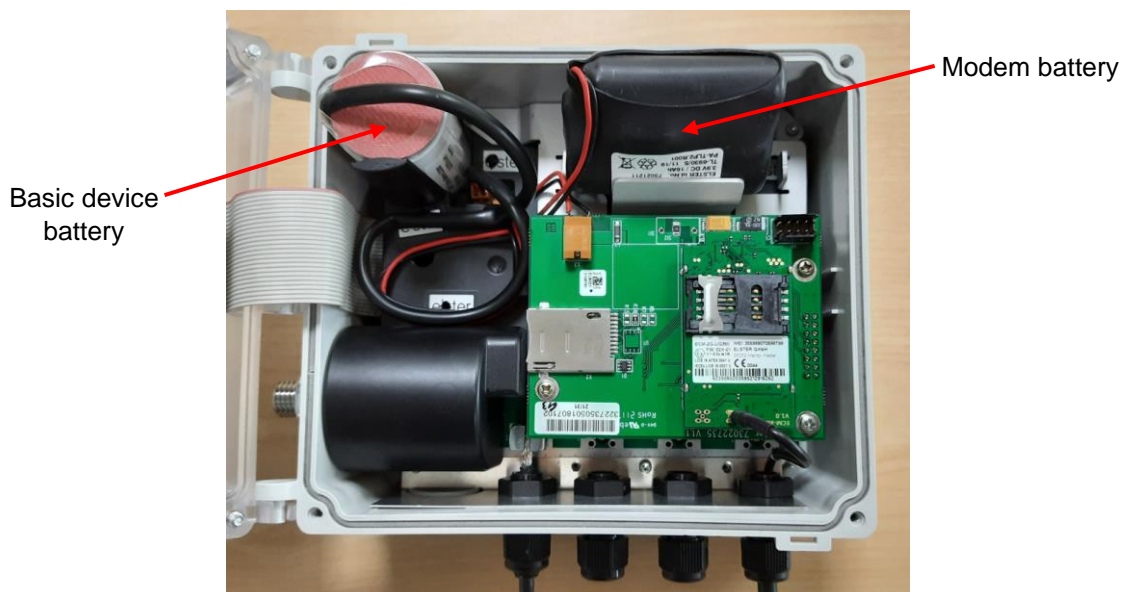


Fig. 23: EK205-M (lid opened) with modem and basic device battery installed

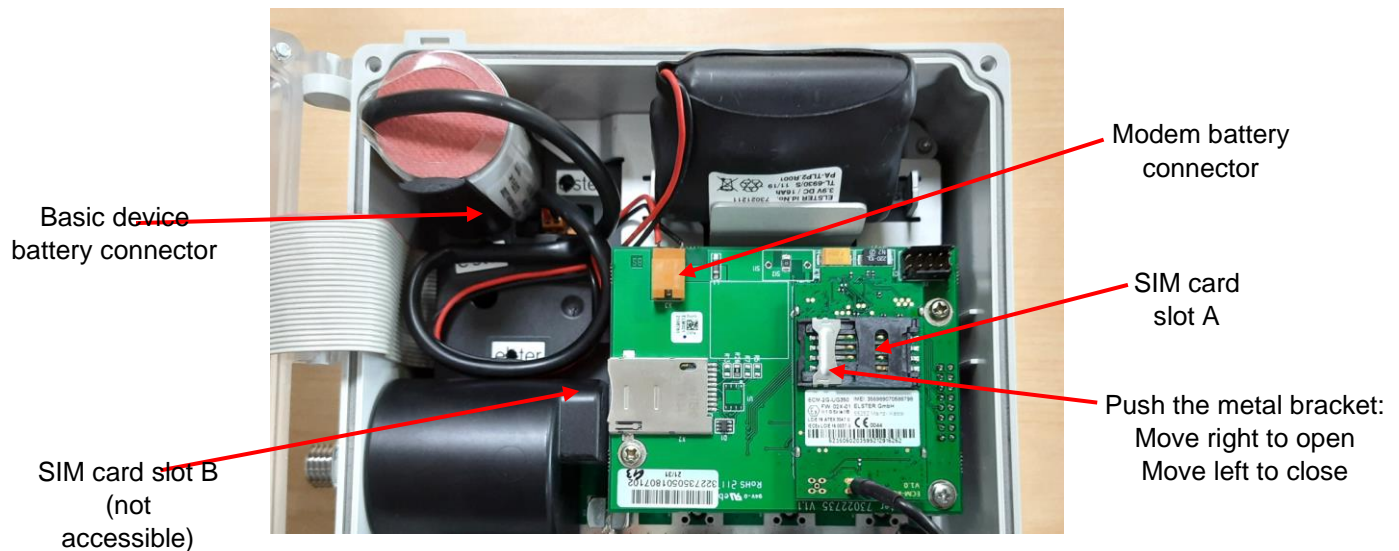


Fig. 24: Battery and SIM connectors

- Push the metal bracket in the SIM card slot back halfway (towards right in Fig. 24), and flip open the cover (see Fig. 25).



Only SIM card slot A should be used while using the EK205-M. SIM card slot B usage is not recommended.



Fig. 25: open SIM card slot



Fig. 26: SIM card inserted

- Insert the SIM card from the rear into the card slot (in the lid), so that the gold contacts face downwards in the closed end and the bevelled side is at the open end of the lid (see Fig. 26).
- Click the lid shut again and gently slide the metal bracket outwards towards left to close the lock.
- Re-connect the modem and basic device battery.



Before using the EK205-M for the first time, connect the battery to the modem. It has not been connected at the factory in order to avoid an unnecessary load on the battery!

- For EK205-M powered with external supply for basic device, switch-on the external power supply after re-connecting the modem battery supply.
- Close the housing cover and retighten the screws.



Caution

The "ECM-2G-UG350" (GSM / GPRS) modem is supplied with a battery, after connecting the modem to the battery, the modem must be quickly commissioned as described in ⇒ section 8.1.4 or 8.1.6 in order to avoid an unnecessary load on the modem battery! (Up until the first opening of a time window approx. 1 ... 5 mA, flow after the closing the first time window. After all the other time windows only 0.03 ... 0.09 mA flows!)

8.1.3 Unlocking the SIM card

- a) If necessary, the SIM card must be unlocked, the PIN must be entered.

If the inserted SIM card's PIN ("Personal Identification Number") is activated, carry out the following instructions to unlock it:

- Move the cursor to the "Serv." tab in the EK205-M's display, then to *Interfaces > internal modem > GSM and GPRS > PIN*.
- Press the *ENTER* key and enter the first PIN digit using the ▲ and ▼ arrow keys.



The PIN must be entered right aligned in the EK205-M!

- Move the cursor through the next digits using the ► key and enter them.
- After entering the last digit press the *ENTER* key, to save the input.
- Under "P.Sta" the "Pin New" is now ready for confirmation.
If "P.Sta" is not displayed, move the cursor down using the ▼ arrow keys.
- As soon as a communications time window is opened via the modem, the new PIN is used.
After a few seconds, under "P.Sta" the message "PIN OK" is displayed if the correct PIN was entered, or the message "PIN Error" if the PIN was incorrectly entered.



Further commissioning steps are necessary, before the power for the basic device is switched on again on an EK205-M with external power for the basic device.

8.1.4 GSM Operation



The 2G modem is already prepared for transmission via GPRS when delivered. If GSM operation (CSD) is explicitly desired, the modem must first be set to CSD mode according to the following section. Please note that CSD mode is no longer guaranteed by the provider.

8.1.4.1 Parameterization



For parameterization of the EK205-M, you need a connection cable for the optical interface as well as the enSuite program. enSuite can be downloaded free of charge from the Honeywell website in the "Software Downloads" section:

www.elster-instromet.com/en/software-downloads

a) Close time window / pre-allocate connections

To ensure that parameterization functions correctly, the time windows 1 to 4 need to be closed, and parameterization of the connections must be pre-allocated. To do this:

- Connect a PC or laptop with enSuite installed to the EK205-M optical interface using the connection cable.
- Start enSuite and set up the communication link to the EK205-M using the optical interface. (⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
- Send the following files to the EK205-M (⇒ section 7.6 *Send parameter file*, p. 51): *EK205 -M Reset all types of connections and time windows to factory setting (*)*¹¹
- Then wait a minute, for any communications activity in progress on the EK205-M to be safely stopped.

b) Sending parameter file

- Send one the following file to the EK205-M (⇒ section 7.6 *Send parameter file*, p. 51):
ECM-2G-UG350: EK205_1v07.. - int. GPRS-Modem (uBlox)_a.WPP mode only ()*¹¹



Caution: *Even if a GPRS modem is only to be put into operation for GPRS data transmission in the GSM network, there is a risk that unconscious costs will be incurred if no APN is entered in the EK205-M AND if an APN is stored on the SIM. In this case, the modem uses the APN from the SIM and, as a result, every time a GPRS session is set up (at each time window start), a minimum data volume (e.g. 10 or 100 kB) will be available depending on the provider and the tariff invoice! You can avoid this by using one of the parameter files listed here.*

- For the following customized settings and tests required, press "*Navigation*" on the left-hand side and then "*Parameterize online*" at the bottom of the navigation window.



All the values listed in enSuite under "Parameters" can be found on the "Serv." display tab of the EK205-M under the same path.

c) Setting time window for potential data retrievals

In the base configuration now displayed you can define cyclic time windows, during which data can be retrieved from the EK205-M via the modem. There are two available time windows, which operate on EK205-M basic device battery power only and for versions of the EK205-M with external power supply for the basic device there are two more, which operate only on mains voltage.



Make the battery power time windows only as long and frequent as absolutely necessary. Each time window reduces the EK205-M's battery life. The editable time windows are not directly accounted for in calculation of expected battery life of the "Bat.R" EK205-M batteries. Therefore, the expected battery life is not updated when the time windows are changed. Past time windows and data transfers are however used in remaining battery and service life calculation for the "BatRC".

- The two battery-power time windows for the basic device are set in the enSuite device window under:

¹¹ The "x" stands for the version of software on the device, e.g. "2v2".

The asterisk * stands for a small letter which indicates the version of the file, e.g. "a".

- *Parameters > Interfaces > Connections > Connection 1* and
- *Parameters > Interfaces > Connections > Connection 2*
- The two external power for the basic device voltage time windows are set under:
 - *Parameters > Interfaces > Connections > Connection 3* and
 - *Parameters > Interfaces > Connections > Connection 4*

If you do not need a time window, you can deactivate it by setting the time window start and end to the same value.

- Press the "*Transfer changes to device*" icon at the top of the enSuite window.

Battery Life Years		Readout Duration (minutes)		
		1	2	5
Daily Time Slot Duration	4 minutes	9.17	6.58	-
	10 minutes	8.43	6.19	3.45
	15 minutes	7.9	5.9	3.36
	30 minutes	6.65	5.17	3.11
	60 minutes	5.05	4.15	2.7

8.1.4.2 Checking GSM field strength

Before starting a data transfer via the modem, you must ensure that there is adequate reception field strength.



Danger of death!

Ensure that before you switch the external supply for the basic device, the housing on the EK205-M is securely closed.

- For an EK205-M with external supply for the basic device, reconnect the external supply now.

a) Opening the test time window on the device



The test time window only needs to be open if none of the time windows 1 to 4 are open.



The use of a test time window is only possible if an appropriate battery for the modem is available.

- Move the cursor to the "*Serv.*" tab in the EK205-M's display, then to *Interfaces > internal modem > CWTst*
- Press the ENTER key in order to enter the length of the test time window in minutes \Rightarrow "0" flashes.
- Move the cursor with the arrow keys \blacktriangleright or \blacktriangleleft to the digits and change these with the arrow keys \blacktriangleup or \blacktriangledown to 10, for example.
- After the desired digits have been changed, press the ENTER key in order to confirm the input. It is possible to abort the entry by pressing the ESC key.



Only enable the test time window for battery operation for as long as is required. Each time the test time window is open, this reduces the life of the EK205-M battery. The editable time window is not directly reflected in the forecast of the remaining battery life of the batteries "BatR" of the EK205-M. Therefore, the forecast battery life is not changed if the time window is changed. Past time windows and data transfers are however used in the remaining battery capacity "BatRK" and remaining service life forecast calculation.

b) Display GSM field strength

- Check whether corresponding bars indicating the reception level for the internal modem ("i") appear on the main EK205-M display.
- Move the cursor to the "Serv." tab in the EK205-M's display, then to *Interfaces > internal modem > GSM and GPRS > GSM.L*
- The percentage field strength is now displayed under *GSM.L*.
- In order to update the level display, move the cursor to *GSM.L*, please press the *ENTER* key of the EK205-M and then wait approx. 30 seconds. This makes it possible to determine the best installation position for an external GSM antenna.



With a field strength below 50% data transfer issues may be encountered. You can remedy this in the majority of cases with the external antenna, mounted somewhere suitable.

8.1.4.3 Retrieving data with enSuite

a) Opening the test time window for the following test retrievals with enSuite



The test time window only needs to be open if none of the time windows 1 to 4 are open.

- If the communication link to the EK205-M via the optical interface is not set up, it must be created.
(⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
- Select "*Navigation*" on the left-hand side of the enSuite window and then "*Parameterize online*" at the bottom of the navigation window.
- In the top of the device window open the path "*Parameters*" > "*Interfaces*" by clicking on the relevant plus signs, and then select "*internal modem*" (not the plus sign before).
- Click on the "0" value next to "*Test call acceptance window*" in the right-hand side of the window and enter a duration in minutes (i.e. 10), for the test time window for the test retrieval to remain open. For a battery-operated EK205-M please do not enter an excessively long duration, as this will adversely affect the battery life.
- Press the "*Transfer changes to device*" icon at the top of the enSuite window. The EK205-M is now available via the modem for the duration set.
- In enSuite press the "*Disconnect*" icon or "*Disconnect from all devices*" to terminate the optical interface communication link between enSuite and the EK205-M.

b) Test retrieval via the modem

- Set up the modem communication link (=GPRS12 connection) between enSuite and EK205-M.
(⇒ section 7.2 *Setting up the communication link to EK205-M via a modem*, p. 5050)

¹² CSD=Circuit Switched Data, line switched data service in the case of mobile telephony

- Once the communication link is set up, you can carry out checks, for instance view certain parameters. To do this press "*Navigation*" on the left-hand side of the enSuite window and then "*Parameterize online*" in the bottom of the navigation window, then click on the plus sign next to "*Parameters*" and then its subsections.
- In enSuite press the "*Disconnect*" symbol or "*Disconnect from all devices*" to end the test retrieval.

8.1.5 National Roaming – Preferred Network Operator

If the SIM card used supports "National Roaming", the modem usually first tries to connect to its own mobile network. If there is no coverage (i.e. sufficient reception field strength) at the measuring point, the modem books itself into a "foreign" mobile network, which is permitted by the "National Roaming" option of the SIM card.



For information on which "foreign" mobile networks are supported for National Roaming, please contact your mobile network operator / provider. Only he can tell you bindingly which foreign networks he allows via "National Roaming".

If "National Roaming" is not to be used automatically, but a specific network operator is preferred, the preferred network operator must first be entered and then the "Network provider selection" mode must be specified.

8.1.5.1 Input „Preferred Network Operator“

To enter or change the information for the preferred network operator, navigate in the enSuite under "*Parameterize online*" > "*Parameters*" > "*Interfaces*" > „*Internal Modem*“ > „*GSM & GPRS*“ to the entry Name of the preferred operator "*Oper.*".

The entry itself can be made either by the plain text name of the network (e.g. "t-online.de") or by its "Mobile Country & Network Code" (e.g. "26201"). If this parameter is deleted, the network provider selection mode is selected automatically, regardless of whether another mode is selected.



The entry in plain text must exactly match the provider's name specified on the SIM card. For example, "T-Mobile" is not identical to "telekom" or "T-D1". We therefore recommend that you enter the unique Mobile Country & Network code.



Lists of the possible "Mobile Country & Network Code" can be found on the Internet at <https://www.mcc-mnc.com/>, for example. However, the specifications of your mobile phone provider whose SIM cards you are using are binding.

8.1.5.2 Mode „Network Provider Selection“

To change the parameter for the "Network provider selection" mode, navigate in the enSuite under "Online parameter settings" "*Parameterize online*" > "*Parameters*" > "*Interfaces*" > "*Internal Modem*" > "*GSM & GPRS*" to the entry "Mode for logging in with an operator" "*MdLog*".

Now select one of the three possible modes. The meaning and function are described in the following table.

<i>MdLog</i>	Function
0: <i>auto</i>	Default setting, i.e. the selection of the network is left to the modem. Which network is selected depends on the local reception conditions and the tariff properties of the SIM card inserted by the respective provider. A value parameterized under "Preferred network provider" is not taken into account during selection.

<i>MdLog</i>	Function
1: <i>manually</i>	The network parameterized under "Preferred network provider" is specified here. If it is not possible to log on to this network with the SIM card inserted, the modem is switched off and an error message is displayed in the connection status.
4: <i>man. first</i>	The modem tries to log in to the network specified under "Preferred network provider". If this is not possible, however, the modem is not switched off, but a new logon attempt is started, in which the network selection is left to the modem (analogous to mode 0: <i>auto</i>). If this logon attempt is also unsuccessful, the modem is switched off and a corresponding error message is displayed in the connection status.



The mode "1: *manual*" should only be selected if it is certain that

1. the 'preferred network operator' is also authorized by the mobile operator which provided the SIM cards with the 'national roaming' option
and
2. there is also sufficient coverage (i.e. receiving field strength) at the measuring point for the preferred network.

For these reasons, this mode can only be selected via the optical interface and keyboard and should only be selected after the volume corrector has been installed on site. After selecting this mode, it is strongly recommended to open a (test) time window to check whether the modem was able to log into the parameterized network.

8.1.6 TCPserv operation (GPRS)

In this modem operating mode, you can access the EK205-M via the network (TCP/IP), to which your retrieval system is connected, i.e., you do not require an additional retrieval system modem. Data transfer is normally faster than with GSM operation, (as explained in ⇒ section 8.1.4)

Here the GPRS Modem in the EK205-M functions as a TCP-Server and may be addressed by a TCP client that is listed in its readout software through a static IP address. To allocate a static IP to the modem during the setup of the GPRS session, they must (together with their network provider) maintain a virtual private network (VPN) which must be enabled on the SIM used in the modem.

8.1.6.1 Parameterization



For parameterization of the EK205-M you need a connection cable for the optical interface as well as the enSuite program. enSuite can be downloaded free of charge from the Honeywell website in the "Software Downloads" section:

www.elster-instromet.com/en/software-downloads

a) Closing the time windows

In order that the parameterization works correctly the time windows 1 to 4 must be closed. To do this:

Connect a PC or laptop with enSuite installed to the EK205-M optical interface using the connection cable.

Start enSuite and set up the communication link to the EK205-M over the optical interface.

(⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)

Select "*Navigation*" on the left-hand side and then "*Parameterize online*" at the bottom of the navigation window.

In the top of the device window open the path "*Parameters*" > "*Interfaces*" by clicking on the relevant plus signs, and then select "*Call time windows*".

In call windows 1 to 4 set start and end to the same value for each one and then select the "Transfer changes to device" icon at the top of the enSuite window.

Then wait a minute, for any communications activity in progress on the EK205-M to be safely stopped.

b) Sending parameter file

Send the following parameter file to the EK205-M (⇒ section 7.6 *Send parameter file*, p. 51):

ECM-2G-UG350: EK205_1v07.. - int. ECM-2G-UG350 TCPServ.wpp

For the following customized settings and tests required, press "*Navigation*" on the left-hand side and then "*Parameterize online*" at the bottom of the navigation window.



All the values listed in enSuite under "*Parameters*" can be found on the "Serv." display tab of the EK205-M under the same path. However, it is not possible to enter the following APN data via keyboard but must be entered via the enSuite parameterization software.

c) Configure individual parameters

In the top of the device window open the path "*Parameters*" > "*Interfaces*" > "*Terminal Interfaces*" by clicking on the relevant plus signs, and then select "*GSM and GPRS*".

On the right-hand side of the window you will now see several values, in which the following must be entered:

Value	Input				
GPRS access point name " <i>APN</i> "	These values vary according to the SIM card and VPN (Virtual Private Network) in use. The values to be entered can normally be obtained from your IT department or SIM card provider.				
APN user name " <i>UName</i> "					
APN password " <i>PwAPN</i> "					
IP port " <i>Port</i> "	"Port" means the TCP port no. of the retrieval system in use.				
GPRS authentication protocol " <i>AutPr</i> "	<table border="0"> <tr> <td>0 = <i>None</i></td> <td rowspan="3">Depending on the provider, the protocols specified on the left can be used to log on to the GPRS network. Consultation with the provider may be required.</td> </tr> <tr> <td>1 = <i>CHAP</i> (default)</td> </tr> <tr> <td>2 = <i>PAP</i></td> </tr> </table>	0 = <i>None</i>	Depending on the provider, the protocols specified on the left can be used to log on to the GPRS network. Consultation with the provider may be required.	1 = <i>CHAP</i> (default)	2 = <i>PAP</i>
0 = <i>None</i>	Depending on the provider, the protocols specified on the left can be used to log on to the GPRS network. Consultation with the provider may be required.				
1 = <i>CHAP</i> (default)					
2 = <i>PAP</i>					



If you fail to input an Access Point Name (APN), the APN that is saved on the SIM is used. Since this is usually a public APN (no access to a VPN) and since a dynamic IP address is allocated when a GPRS session with a public APN is set up, the TCP server function cannot be used! This is because a static IP address would be needed for this purpose. In such a case, the modem could only be used as TCP client.



Caution!

Without the input of an APN there is the risk that unspecified costs may be incurred, as with every set up through a GPRS provider and based on a corresponding tariff a minimum data volume (e.g., 10 or 100 kB) will be billed!

Press the "*Transfer changes to device*" icon at the top of the enSuite window.

If required (i.e. with the aid of the enSuite user list) two further addresses for a "Domain Name System" can be entered in addresses 3:0794.0 and 3:0795.0. This is however not essential.

d) Setting time window for potential data retrievals

In the base configuration now displayed you can define time windows, during which data can be retrieved cyclically from the EK205-M via the modem. There are two available time windows. One which operate on EK205-M basic device battery power only and the other for versions of the EK205-M with external power supply for basic device.



Make the battery power time windows only as long and frequent as absolutely necessary. Each time window reduces the EK205-M's battery life.

The editable time windows are not directly accounted for in calculation of expected battery life of the "Bat.R" EK205-M batteries. Therefore, the expected battery life is not updated, when the time windows are changed. Past time windows and data transfers are however used in remaining battery and service life calculation for the "BatRC".

The two battery-power time windows for the basic device are set in the enSuite device window under:

- [Parameters](#) > [Interfaces](#)> [Connections](#) > [Connection 1](#) and
- [Parameters](#) > [Interfaces](#)> [Connections](#) > [Connection 2](#)

The two external supply for the basic device time windows are set under:

- [Parameters](#) > [Interfaces](#)> [Connections](#) > [Connection 3](#) and
- [Parameters](#) > [Interfaces](#)> [Connections](#) > [Connection 4](#)

If you do not need a time window, you can deactivate it by setting the time window start and end to the same value.

Press the "[Transfer changes to device](#)" icon at the top of the enSuite window.

8.1.6.2 Checking GSM field strength

⇒ See section 8.1.4.2 [Checking GSM field strength](#) (p. 58)

8.1.6.3 Retrieving data with enSuite

a) Opening the test time window for the following test retrievals with TCP/IP



The test time window only needs to be open if none of the time windows 1 to 4 are open.



The use of a test time window is only possible if an appropriate battery supply for the modem is available.

If the communication link to the EK205-M via the optical interface is not set up, it must be created. (⇒ section 7.1 [Setting up the communication link to the EK205-M via optical interface](#), p. 50)

Select "[Navigation](#)" on the left-hand side of the enSuite window and then "[Parameterize online](#)" at the bottom of the navigation window.

In the top of the device window open the path "[Parameters](#)" > "[Interfaces](#)" by clicking on the relevant plus signs, and then select "[internal modem](#)" (not the plus sign before).

Click on the "0" value next to "[Test call acceptance window](#)" in the right-hand side of the window and enter a duration in minutes (i.e. 10), for the test time window for the test retrieval to remain open. For a battery-operated EK205-M please do not enter an excessively long duration, as this will adversely affect the battery life.

Press the "[Transfer changes to device](#)" icon at the top of the enSuite window.

The EK205-M is now available via the modem for the duration set.

In enSuite press the "[Disconnect](#)" or "[Disconnect from all devices](#)" icon to terminate the optical interface communication link between enSuite and the EK205-M.

b) Test call up through the TCP/IP network (incl. GPRS network)

Set up the network communication link between enSuite and the EK205-M.

(⇒ section 7.3 [Setting up the communication link to EK205-M via a network \(TCP/IP\)](#))

Once the communication link is set up, you can carry out checks, for instance view certain parameters. To do this press "[Navigation](#)" on the left-hand side of the enSuite window and then

"[Parameterize online](#)" in the bottom of the navigation window, then click on the plus sign next to "[Parameters](#)" and then its subsections.

In enSuite press the "[Disconnect](#)" symbol or "[Disconnect from all devices](#)" to end the test retrieval.

8.1.7 Hiding APN access data between two "market partners"

The EK205-M has two independent interfaces that can be used for remote reading. If both interfaces are used with GPRS modems by two different market partners (e.g. network operator and supplier), it is often desired that the users cannot view the APN access data. This prevents misuse of SIM cards if they are stolen.

To use this function, the following parameter files are available, which can be individually transferred to the EK205-M using the enSuite software. The settings refer to the access rights for the "Administrator" and the "Data reader".

1. [Lock APN data - administrator modem at terminals, data reader internal modem](#)
→ The "data reader" party uses the internal interface (2G modem/ethernet card).
2. [Lock APN data - administrator internal modem, data reader modem at terminals](#)
→ Administrator access uses the internal interface (2G modem/ethernet card)



If the read and write rights for one party are removed, the return to the factory settings is only possible with the calibration switch open!

To reset the setting, i.e. the parameters can be seen under both access rights, there is an additional file
→ [Reset locking of APN data](#).

Parameter	BSNL	Vodafone	AIRTEL
3:780 – GPRS Access Point Name "APN"	bsnl.net	www	airtelgprs.com
3:781 – APN User Name	- (empty)	- (empty)	- (empty)
3:782 – APN password	- (empty)	- (empty)	- (empty)

Note: Usually the DNS1 and DNS2 are mentioned above for all operators in India unless and otherwise it is mentioned specifically.



The access data stated in the table are examples. They may differ depending on the SIM or SIM tariff. Please keep in touch with your provider!

8.1.8 Installing/changing the internal modem assembly

The EK205-M comes with the pre-installed ECM-2G-UG350 modem, the below steps are for installing/changing the modem.

- For EK205-M powered with external power supply for the basic device, the external supply must be switched off before opening the housing.



Danger of death!

For EK205-M powered with external power supply for the basic device, the external power supply voltage must be switched off before opening the housing, ensure it is not turned back on and verify that there is no voltage.

**CAUTION!****Risk of explosion caused by incorrect service environment!**

Installation/change of the internal modem must be done in a safe assembly area only. Modem power needs to be unplugged before Installation/change of the modem.

**CAUTION!**

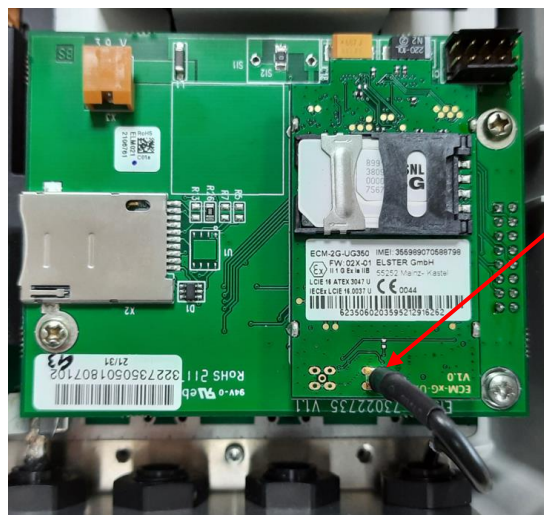
To protect the modem from electrostatic discharge, please proceed as follows:

- Before touching the modem, discharge the static electricity of your body by touching an unpainted, grounded metal surface. This may be located on a heater, for example.
- Only touch the sides of the modem, not the surface. Avoid touching pins and components.
- Do not remove the modem from its packaging until you are ready to install it, e.g. after the housing of the EK205-M has been opened.

- Remove the four screws from the top of the EK205-M and open it.

a) Replacing the modem assembly if it is already installed

- Disconnect the modem and basic device battery if already connected.
- Disconnect the antenna cable connector from the modem board if already connected. (see Fig. 27)



Antenna cable
connection

Fig. 27: Modem Assembly showing the antenna cable connection

- Remove the three screws from the top of the modem assembly and lift the modem assembly away from the bracket. (see Fig. 28)

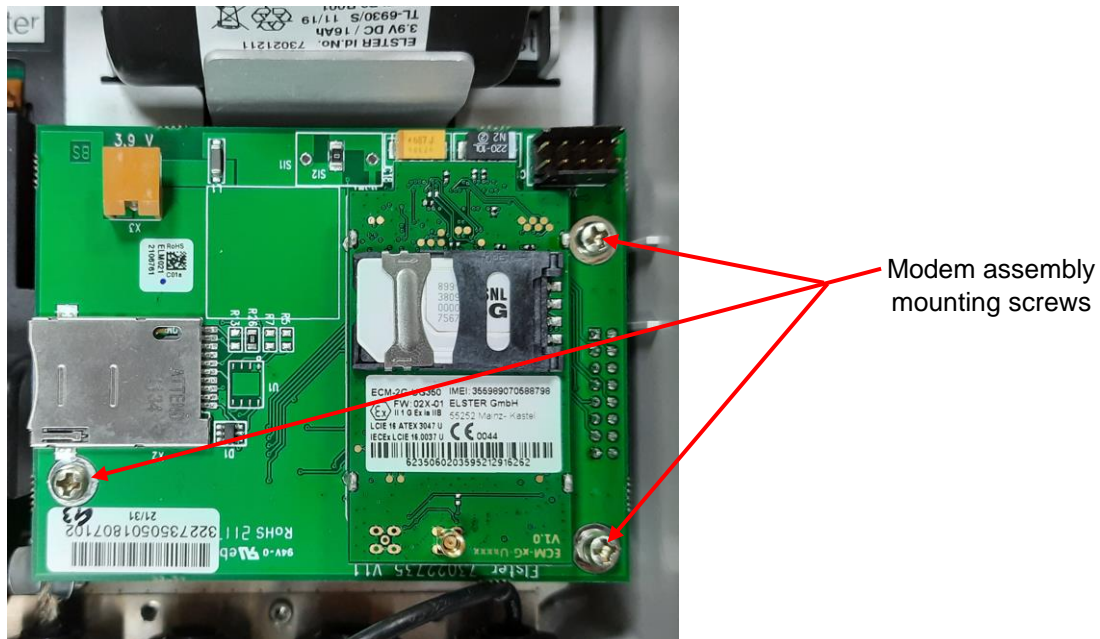


Fig. 28: Modem Assembly showing the three mounting screws

- Disconnect the ribbon cable assembly socket connector from the bottom X5 header connector of the modem assembly. (see Fig. 29)

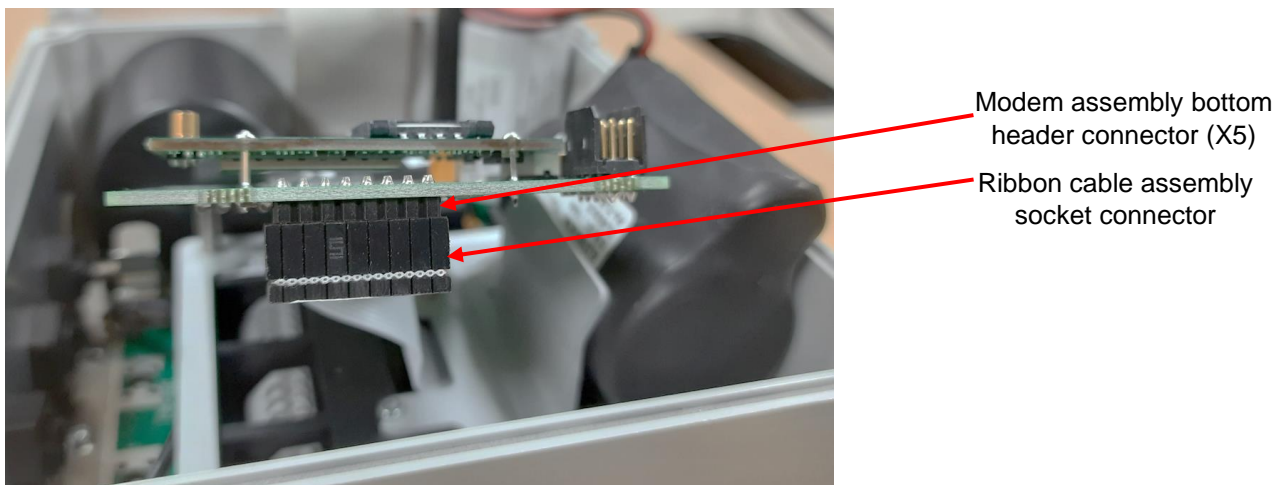


Fig. 29: Ribbon cable assembly socket connection with modem assembly X5 header connector

b) Installing a new modem assembly

- Disconnect the basic device battery if already connected.

Below steps are common to both (a) and (b)

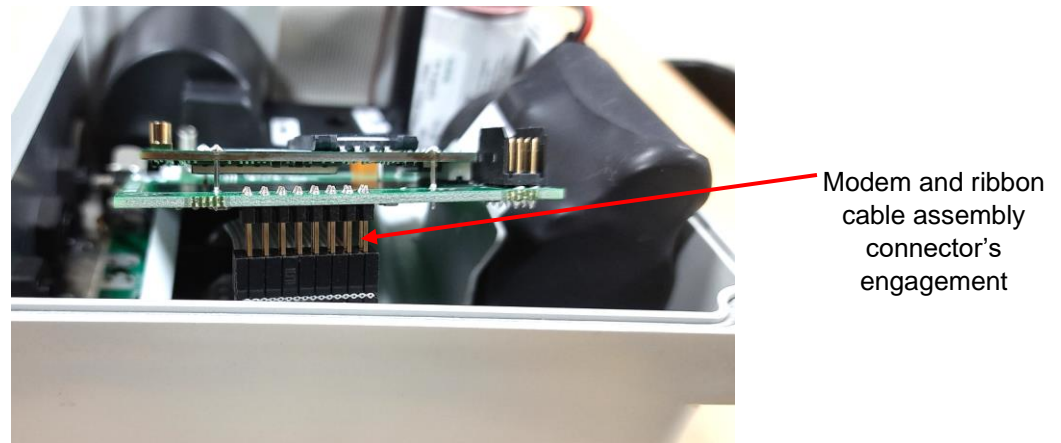


Fig. 30: Ribbon cable assembly socket connection with modem assembly X5 header connector interface

- Take the new modem assembly and connect the ribbon cable assembly connector to the bottom X5 connector of the modem assembly. Pay special attention to correct engagement of all 16 pins of the ribbon cable assembly socket strip into the modem assembly X5 header strip. (see Fig. 30)
- Carefully place the modem assembly on the bracket so the three mounting holes on the modem assembly aligns with the mounting holes of the bracket.

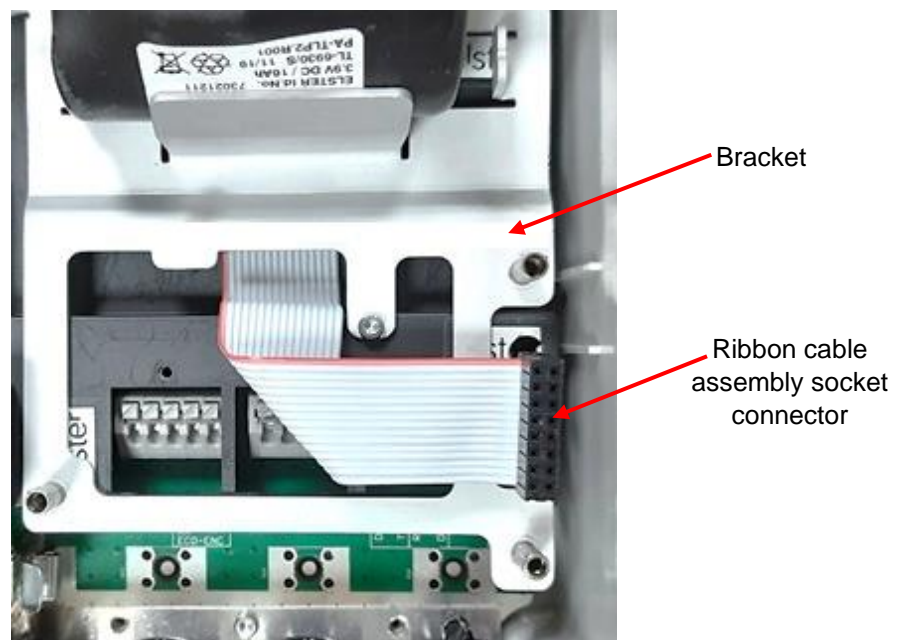


Fig. 31: Bracket with modem assembly removed showing the mounting hole along with the ribbon cable assembly socket for modem connection.

- Put the three mounting screws of the modem assembly and tightens them.
- Connect the antenna cable with the modem assembly.



Carefully press the antenna plug into the antenna socket until it clicks into place. In particular, make sure that the antenna plug does not lie skew in the bushing and that it is not stretched any longer by rotary and pull-off forces respectively.

- Insert the SIM into the SIM holder (section 8.1.2).
- Connect the modem and the basic device battery.
- For EK205-M powered with external supply for basic device, switch-on the external power supply after re-connecting the modem battery supply.



Caution!
Damage to property caused by improper device closure!

If the device is not properly closed, cables can get pinched and cause damage.

Therefore:

Ensure correct positioning of the cable guides when closing.

- Close the housing cover and retighten the screws.

To check the function, you can now use the modem for GSM and/or for TCPserv data transmission in accordance with ⇒ section 8.1.4 and/or 8.1.6.



Caution

The "ECM-2G-UG350" (GSM / GPRS)" modem is supplied with a battery, after connecting the modem to the battery, the modem must be quickly commissioned as described in ⇒ section 8.1.4 or 8.1.6 in order to avoid an unnecessary load on the modem battery! (Up until the first opening of a time window approx. 1 ... 5 mA, flow after the closing the first time window. After all the other time windows only 0.03 ... 0.09 mA flows!)

8.1.9 Installing the antenna

The EK205-M is supplied with external antenna which need to be fitted during the field installation.

- For EK205-M powered with external power supply for the basic device, the external supply must be switched off before opening the housing.



Danger of death!

For EK205-M powered with external power supply for the basic device, the external power supply voltage must be switched off before opening the housing, ensure it is not turned back on and verify that there is no voltage.

- Remove the four screws from the top of the EK205-M and open it.
- Disconnect the modem and basic device battery if already connected.
- Insert the external antenna MMCX connector end through the cable bushing as shown in the fig. 32. (the default cable bushing used for the antenna cable is the rightmost one)

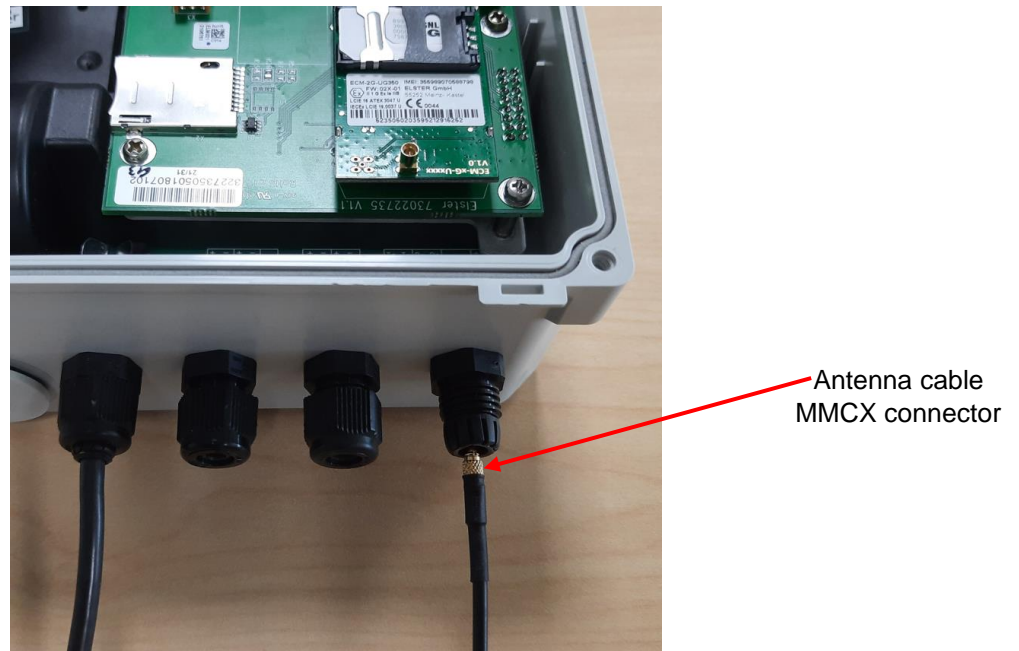


Fig. 32: External antenna cable MMCX connector with the default cable busing for antenna

- Ensure that the external antenna cable connector end sleeve evenly lies within the cable bushing. (see Fig. 33)

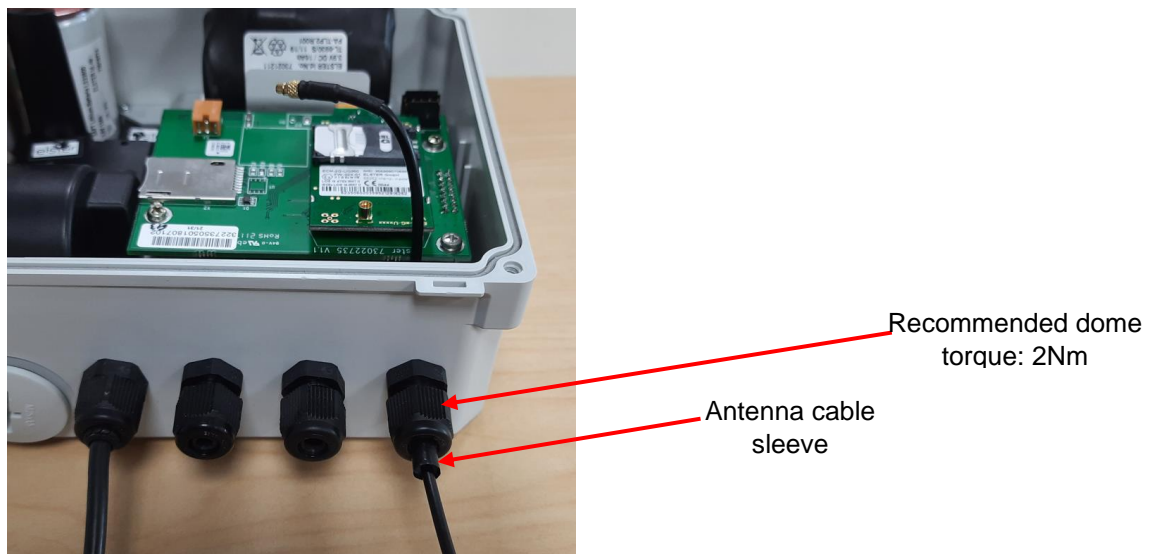


Fig. 33: External antenna cable sleeve default position



The recommended dome tightening torque for the antenna cable gland is 2Nm.

- Tighten the cable gland dome with the torque of 2Nm.
- Connect the antenna cable connector to the modem assembly antenna connector. (see Fig. 33)



Fig. 34: External antenna connected to modem assembly



Carefully press the antenna plug into the antenna socket until it clicks into place. In particular, make sure that the antenna plug does not lie skew in the bushing and that it is not stretched any longer by rotary and pull-off forces respectively.

- Re-connect the modem and the basic device battery.
- For EK205-M powered with external supply for basic device, switch-on the external power supply after re-connecting the modem battery supply.

Caution!

Damage to property caused by improper device closure!



If the device is not properly closed, cables can get pinched and cause damage.

Therefore:

Ensure correct positioning of the cable guides when closing.

- Close the housing cover and retighten the screws.



Fig. 35: EK205-M with external antenna installed



The external antenna stand base has magnet for installing it on the ferromagnetic surface.

- If available, place the antenna on the ferromagnetic surface for the firm gripping and adjust the antenna position to achieve best possible reception.

To check the function, you may now open a time window for testing and check the GSM signal quality on the EK205-M display (⇒ section [8.1.4.2 Checking GSM field strength](#), p. 58) and for a test call off with enSuite (⇒ section [8.1.4.3. Retrieving data with enSuite](#), p. 59).

If using an external address, the position of the antenna should be chosen in such a way that the best possible reception is achieved.

8.1.10 Position of the antenna for gas meter mounting with Encoder

If the EK205-M is mounted on a gas meter with encoder, the antenna must not be placed near the bottom side of the housing, else the encoder function could be disturbed during modem operation as the antenna on the bottom of the housing is too close to the encoder.

8.2 Devices on the serial interface



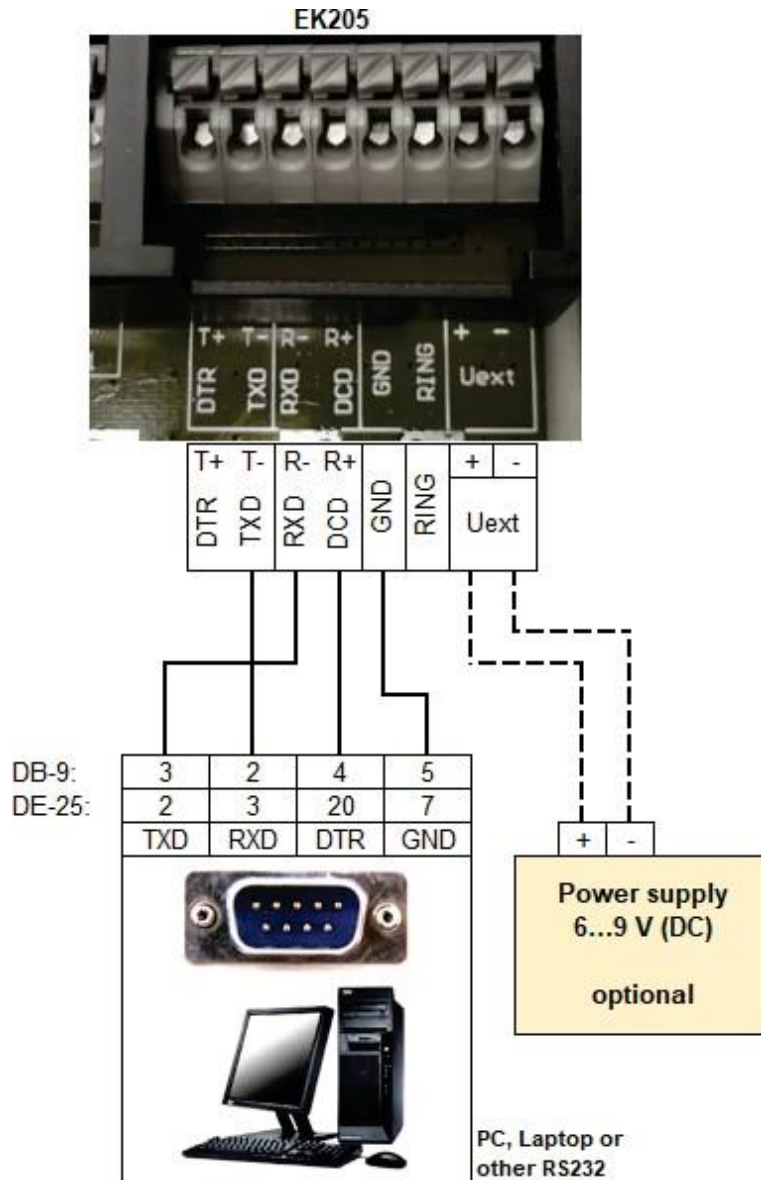
Modem and RS232/RS485 serial communications are mutually exclusive. When modem is connected, RS232/RS485 communication interface cannot be used.

8.2.1 Direct connection of the RS232 interface (e.g. COM port on a PC)



In battery operation, the battery service life can be significantly reduced by this application. Therefore, set the data call acceptance window for battery operation to the smallest possible value. (see chapter 8.2.1.2)

8.2.1.1 Connection



Connect the RS-232 interface in safe assembly area only. Modem power needs to be unplugged and removed from the enclosure to access the RS-232 interface in the field.

8.2.1.2 EK205-M parameterization



To parameterize the EK205-M, you will require a connection cable for the optical interface as well as the enSuite program, which can be downloaded free of charge from www.elster-instromet.com.

a) Closing the time windows

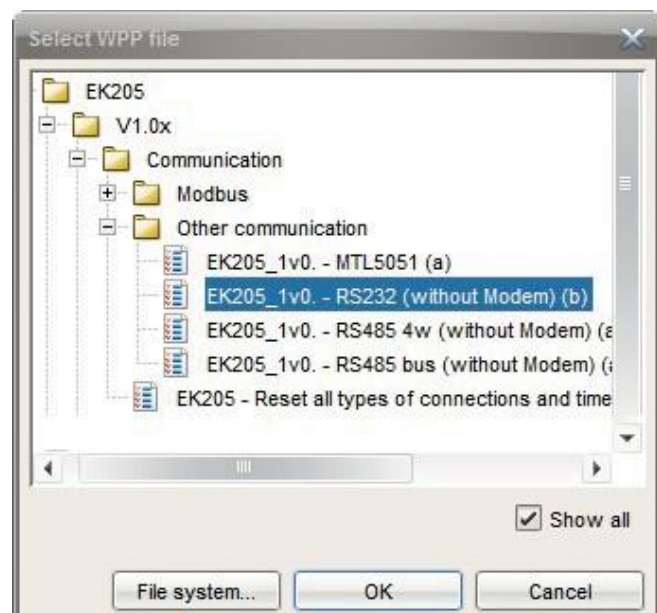
Time windows 3 and 4 must be closed for parameterization to function securely. To do this:

- Connect a PC or laptop with enSuite installed to the EK205-M optical interface using the connection cable.
- Start enSuite and establish the communication link to the EK205-M (⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
- Select “Navigation” on the left-hand side and then “Parameterize online” at the bottom of the navigation window.
- At the top of the device window, open the path “Parameters” > “Interfaces” by clicking on the relevant plus signs, and then select “Call time windows”.
- In call acceptance windows 3 and 4, set start and end to the same value for each one and send the changes using the “Transfer changes to device” icon.
- Then wait a minute for any communications activity in progress on the EK205-M to be safely stopped.

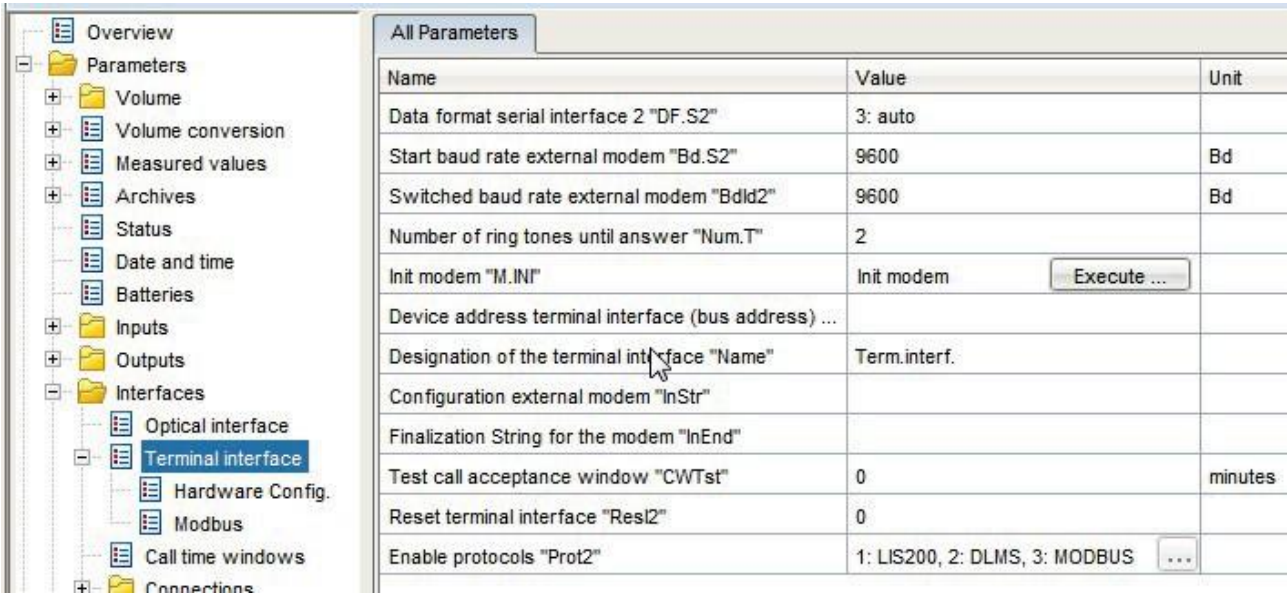
b) Sending the parameter file

- Send the following parameter file to the EK205-M (section ⇒ [7.6 Send parameter file](#), p. 51):
EK205_1v0. - RS232 (without Modem)

On the right, you can see the navigation path to this parameter file in enSuite for software versions 1.0x of the EK205-M.



For any further customized settings and tests, click on “Navigation” on the left-hand side and then on “Parameterize online” at the bottom of the navigation window.



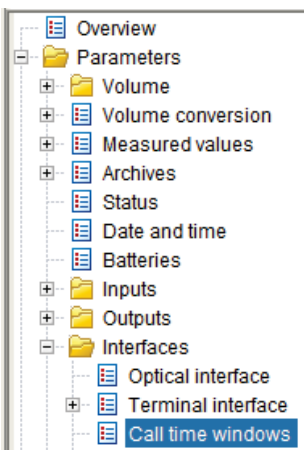
i All the values listed in enSuite under “Parameters” can be found in the “Serv.” and “Admin” display tabs of the EK205-M using the same path.

c) Setting time windows for future data retrievals

In the basic configuration now set up, you can define time windows during which data can be retrieved cyclically from the EK205-M via the modem. Time windows 1 and 3 are used here as an example.

You can deactivate time windows which are not needed by setting the start and end of the time window to the same value.

i Call acceptance window 1 is closed by default (setting: daily from 00:00 to 00:00).
 If you want to transfer data in battery mode, set call acceptance window 1 to the smallest possible time range in order to protect the battery.
 If the EK205-M is operating in battery mode and call acceptance window 1 or 2 is permanently switched on, the battery may be empty within a few weeks.



- At the top of the device window, open the path “Parameters” > “Interfaces” by clicking on the relevant plus signs, and then select “Call time windows”.
- Change call acceptance window 1 only if you also want to transfer data in battery mode. Otherwise, the start and the end time should each be at "00:00", so that the battery is saved.
- In call acceptance window 3, set the start to “00:00” and the end to “23:59”.

No.	Type	Event	Cycle	Begin	End	Interface	Supply
1	1: period		daily	00:00	00:00	2: Terminal i.	2: Battery
2	1: period		daily	00:00	00:00	2: Terminal i.	2: Battery
3	1: period		daily	00:00	23:59	2: Terminal i.	3: ext. supply
4	1: period		daily	00:00	00:00	2: Terminal i.	3: ext. supply

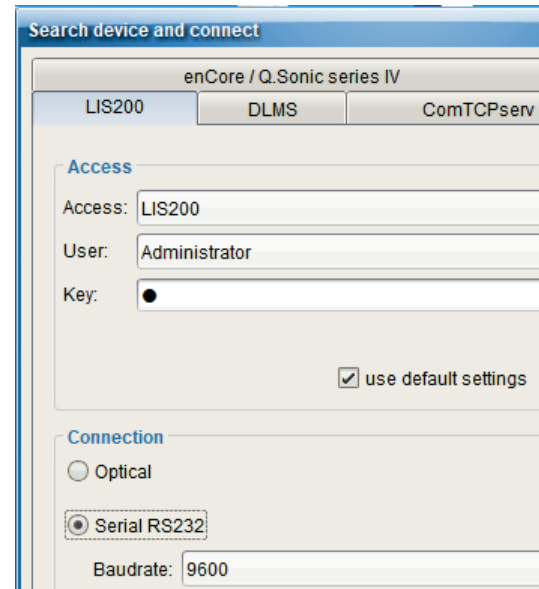
- Then click on the “Transfer changes to device” icon at the top of the enSuite window.

8.2.1.3 Retrieving data with enSuite

If the connected device is a PC with enSuite installed, you can now check the data transfer as described here.

- Start the enSuite program on the PC connected to the terminals (e.g.: [Start > All Programs > Elster > enSuite](#)).
- Click on the “[Search device...](#)” icon (magnifying glass icon).

- Click on the “[LIS200](#)” tab in the “[Search device and connect](#)” window, which then opens.
- Select
 - “[Access](#)” → “[LIS200](#)”
 - “[User](#)” → “[Administrator](#)”
 - “[Use default settings](#)”
 - “[Connection](#)” → “[Serial RS232](#)”
 - “[Baud rate](#)”: → “[9600](#)”
- Click on “[OK](#)”.
- Wait a few seconds until “[Connected](#)” is displayed at the bottom of the “[Output](#)” window.



- Once the communication link has been established, you can view certain parameters to check it. To do this, click on “[Navigation](#)” on the left-hand side of the enSuite window and then on “[Parameterize online](#)” at the bottom of the navigation window, then click on the plus sign next to “[Parameters](#)” and then its sub- items.
- Click on the “[Disconnect](#)” or “[Disconnect from all devices](#)” icon in enSuite to end the test retrieval.

8.2.2 RS485 interface

8.2.2.1 Connection



These applications only work with an external power supply to the EK205-M, not in battery mode.



If an EK205-M is connected to an RS485 bus, no terminal resistors may be connected to the bus!



Connect the RS-485 interface in safe assembly area only. Modem power needs to be unplugged and removed from the enclosure to access the RS-485 interface in the field.

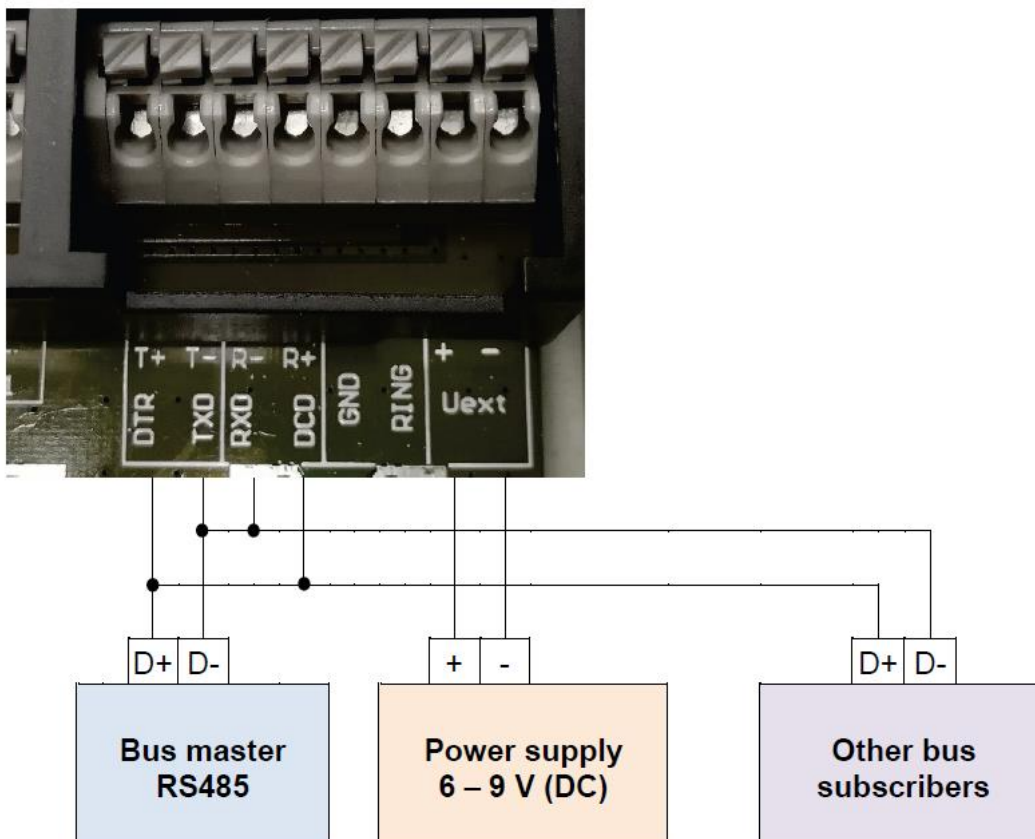
As a result of its current limit to obtain approval as an intrinsically safe apparatus, the EK205-M cannot supply enough current for the terminal resistors. The terminal resistors are not required for the data transfer rates used.

If terminal resistors are essential in your application, connect the devices as described in section 8.2.2.1.2.



For EMC reasons, we recommend that the subscribers are galvanically isolated from each other at the bus. You should therefore give preference to the installation described in section 8.2.2.1.2.

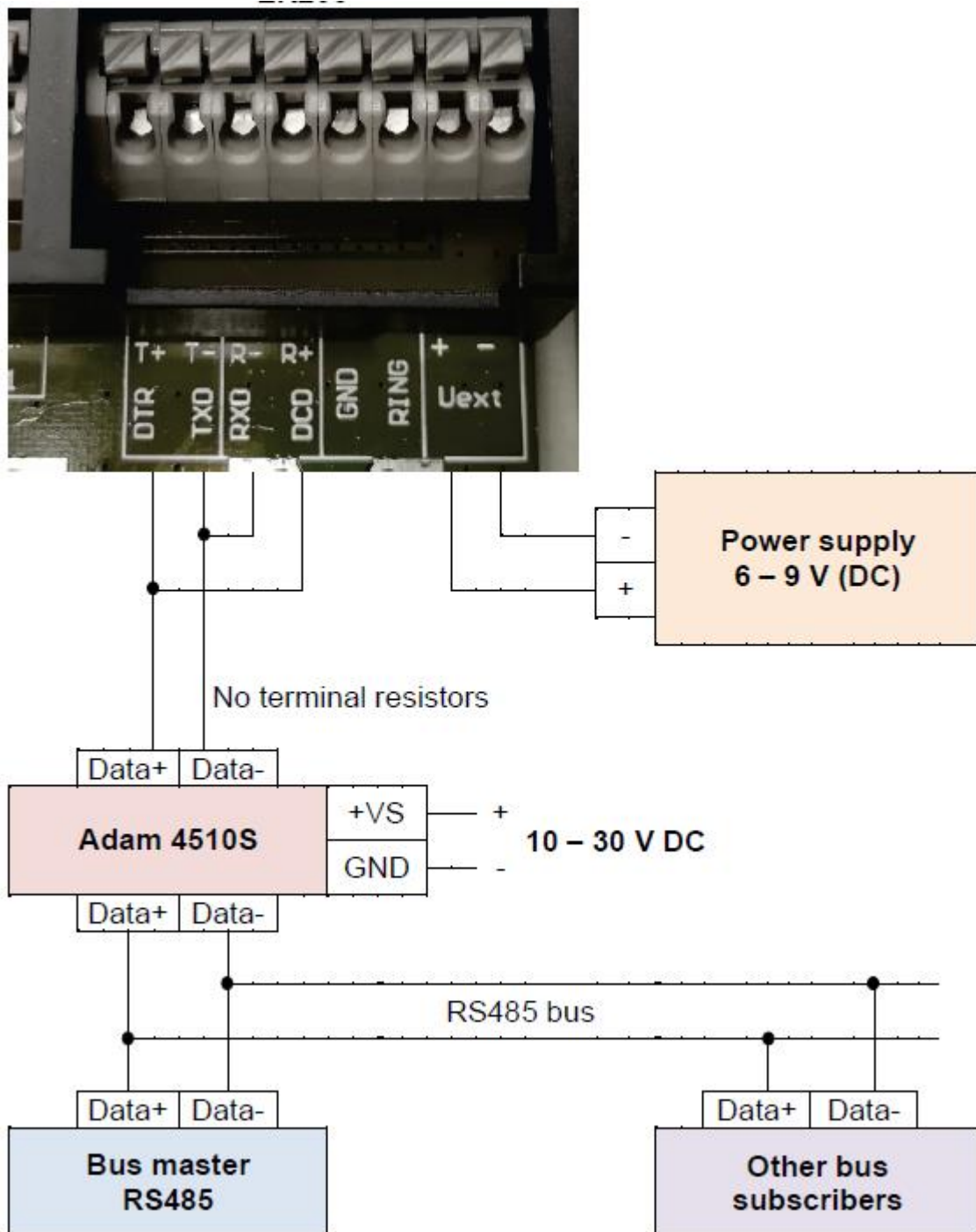
8.2.2.1.1 Two-wire simplex wiring (RS485 mode)



8.2.2.1.2 Two-wire simplex wiring (RS485 mode) with repeater

As specified in section 8.2.2.1, no bus terminal resistors may be connected to the EK205-M. However, these are present in some RS485 connections and in some circumstances cannot be removed. Furthermore, there are often multiple subscribers connected to the bus which means that electrical isolation is recommended.

For these cases, Honeywell recommends the ADAM-4510S repeater from Advantech both for the electrical isolation and for connection to a bus with terminal resistors:



8.2.2.2 EK205-M parameterization



To parameterize the EK205-M, you will require a connection cable for the optical interface as well as the enSuite program, which can be downloaded free of charge from the “Software Downloads” section of the Honeywell website: www.elster-instromet.com/en/software-downloads

This parameterization applies to both the applications described in sections 8.2.2.1.1 and 8.2.2.1.2.

a) Closing the time windows

Time windows 3 and 4 must be closed for parameterization to function securely. To do this:

- Connect a PC or laptop with enSuite installed to the EK205-M optical interface using the connection cable.
- Start enSuite and establish the communication link to the EK205-M (⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
- Select “Navigation” on the left-hand side and then “Parameterize online” at the bottom of the navigation window.
- At the top of the device window, open the path “Parameters” > “Interfaces” by clicking on the relevant plus signs, and then select “Call time windows”.
- In call acceptance windows 3 and 4, set start and end to the same value for each one and send the changes using the “Transfer changes to device” icon.
- Then wait a minute for any communications activity in progress on the EK205-M to be safely stopped.

b) Sending the parameter file

- Send the following parameter file to the EK205-M (section ⇒ 7.6 *Send parameter file*, p. 51):
EK205_xvx. - RS485-Bus (Without Modem) (*)
1
- For any further customized settings and tests, click on “Navigation” on the left-hand side and then on “Parameterize online” at the bottom of the navigation window.



All the values listed in enSuite under “Parameters” can be found in the “Serv.” display tab of the EK205-M using the same path.

c) Setting the device address

Every bus subscriber requires an individual ID (“device address” or “bus address”) so that the bus master can select precisely one subscriber for data transfer. All other bus subscribers must switch the interface to inactive so as not to interfere with the data transfer.

The device address of the EK205-M depends on which interface protocol you use:

→ Device address for LIS-200 protocol:

The device address for the LIS-200 protocol may be a text with up to 32 characters (no special symbols allowed). It has been set to the default value “1” by the above parameter file.

Proceed as follows to edit the device address of the EK205-M:

- In the top part of the enSuite device window, open the path “Parameters” > “Interfaces” by clicking on the relevant plus signs and then select “Terminal interface”.
- Edit the device address of the EK205-M in the “All parameters” window in the line “Device address terminal interface (bus address)”.

→ Device address for Modbus protocol:

The device address for the Modbus protocol may be a number between 1 and 247. The default value is “1”. Proceed as follows to edit the device address for the Modbus protocol:

- In the top part of the enSuite device window, open the path “Parameters” > “Interfaces” > “Terminal interface” by clicking on the relevant plus signs and then select “Modbus”.

¹ The “x” stands for the device software version, e.g. “1v0”.

The asterisk (*) stands for a lower-case letter which marks the version of the file, e.g. “a”.

- Edit the device address of the EK205-M in the “All parameters” window in the line “Modbus device address (slave address)”.

Further details on using the Modbus protocol are provided in document ⇒ [4] (page 1).

d) Setting time windows for future data retrievals

In the basic configuration now set up, you can define time windows during which data can be retrieved cyclically from the EK205-M via the RS485 bus. Time windows 3 and 4 are provided for operating the EK205-M with a directly connected terminal interface, with time window 3 being the one which is normally used. You can deactivate time windows which are not needed by setting the start and end of the time window to the same value.

- At the top of the device window, open the path “Parameters” > “Interfaces” by clicking on the relevant plus signs, and then select “Call time windows”.
- In call acceptance window 3, set the start to “00:00” and the end to “23:59” and then select the “Transfer changes to device” icon at the top of the enSuite window.

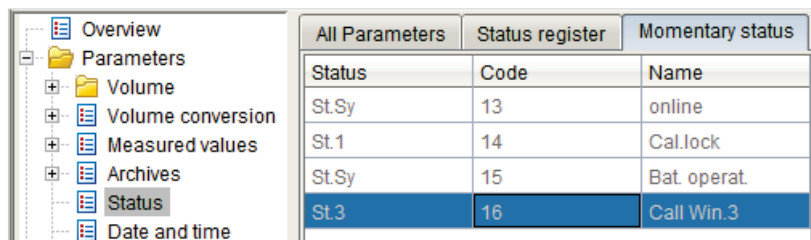
Click on the “Transfer changes to device” icon at the top of the enSuite window.

e) Data retrieval using the RS485 interface

Check the following points if data retrieval via the device connected to the RS485 interface does not now work:

- Are the wire straps between signals T+ and T- and between R+ and R- connected with the correct polarity as described in section 8.2.2.1.1 or 8.2.2.1.2?
(Attention: the sequence of “+” and “-” is different for T+ and T- than for R+ and R-!)
- Is the power supply to the “Uext” terminals on the EK205-M switched on?
- Does the connected device send the device address set as described in 8.2.2.2 c) when the connection is established?
- Is the time window set as described in 8.2.2.2 d) active? You can check this as follows:

- Start *enSuite* and establish the communication link to the EK205-M via the optical interface (⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
- Select “Navigation” on the left-hand side and then “Parameterize online” at the bottom of the navigation window.
- In the top part of the device window, open the path “Parameters” by clicking on the relevant plus sign and then select “Status” and the “Momentary status” tab in the right-hand window.
- Check whether there is a line there with the entries “St.3”, “16” and “Call Win.3”.



Status	Code	Name
St.Sy	13	online
St.1	14	Cal.lock
St.Sy	15	Bat. operat.
St.3	16	Call Win.3

- If this is not the case, set the time window as described in section 8.2.2.2 d).
- Complete a reset on the terminal interface of the EK205-M:
 - Start *enSuite* and establish the communication link to the EK205-M via the optical interface (⇒ section 7.1 *Setting up the communication link to the EK205-M via optical interface*, p. 50)
 - Select “Navigation” on the left-hand side and then “Parameterize online” at the bottom of the navigation window.
 - In the top part of the device window, open the path “Parameters” > “Interfaces” > “Terminal interface” by clicking on the relevant plus signs.

- Enter the value "1" in "Reset terminal interface "ResI2"" and then click on the "Transfer changes to device" icon at the top of the enSuite window.

8.3 Data transfer verification

The communication link (e.g. call window, modem used) to a destination must be established before the data can actually be transmitted. You can program six separate connections.



To parameterize the EK205-M, you will require a connection cable for the optical interface as well as the enSuite program, which can be downloaded free of charge from www.elster-instromet.com.

The paths described below can be found in *enSuite* under: "Parameterize online" > "Parameters" > "Interfaces"

All connections are inactive by default and preset as follows, as can be seen in *enSuite* under: "Parameterize online" > "Parameters" > "Interfaces" > "Call time windows"

Connection	Event type	Interface	Power supply
1	Time window	Terminal / ext. modem	Always
2	Time window	Terminal / ext. modem	Always
3	Time window	Terminal / ext. modem	Ext. power supply
4	Time window	Terminal / ext. modem	Ext. power supply
5	Time	Terminal / ext. modem	Always
6	Time	Terminal / ext. modem	Always

8.3.1 Time window connection

The major parameters for activating a time window connection are listed below. For parameterization, go to the following sub-menu in *enSuite*:

"Connections" > "Connection 1" to ... > "Connection 6"

Time window connection	Meaning
Cycle	Cycle of a regular time window connection (e.g. hourly, daily, weekly, monthly)
Start	Start of a time window connection (e.g. daily at 00:00 or another time)
End	End of a time window connection (e.g. daily at 23:59 or another time)
StCon	Current status of this connection

If the conditions for activating the time window connection are satisfied, then the interface is opened and the EK205-M is ready for reception. If a modem is connected to this interface, the EK205-M will only be ready for reception after a further 30 seconds.

The conditions for activating a time window connection are as follows:

- Is the current device time within the parameterized time window?
- Does the supply to the EK205-M correspond with the parameterization of the connection?



If the supply type “Always” is used, the EK205-M is active during the set time window regardless of the voltage supply! In battery mode (in the same way as for supply type “Battery”), this can result in a significant reduction in the battery service life to just a few months!

The forecast remaining battery service life “Bat.R” does not take account of this case.

8.3.2 Connection configuration status StCon

Display	Meaning
0	Establishment of a connection has not yet started.
2	The interface is being activated for the connection.
3	The interface to be used for the connection (e.g. the modem) is busy, the EK205-M will wait until the connection can be established. Either the interface is still being used for another connection or the EK205-M is waiting to try again after a failed connection attempt. This state may persist for several minutes.
4	The interface (e.g. the modem) is ready to establish a connection (e.g. the call time window is open).
5	The interface is being released for the connection.
6	The interface (e.g. the modem) is released for use by other connections (e.g. when the time window is no longer open).
7	Data transfer via DLMS protocol is in progress.
8	Data transfer via DLMS protocol is complete.
9	Data transfer via Modbus protocol is in progress.
10	Data transfer via Modbus protocol is complete.
11	Data transfer via LIS-200 protocol is in progress.
12	Data transfer via LIS-200 protocol is complete.
15	SMS transfer is in progress.
16	SMS transfer is complete.
29	No valid recipient specified.
30	A communication error occurred. This message is shown, for example, if a modem to be used has no power supply.
31	The modem's supply voltage is too low.
32	The modem cannot be used due to a SIM card error (modem message: SIM Error).
33	The modem cannot be used as an incorrect PIN has been entered.
34	The modem cannot be used as an incorrect PUK has been entered.
35	The communication link to the network cannot be established or the communication link to the network was lost before the communication link to the remote subscriber could be established.
36	The communication link to the GSM network was denied.
37	The APN parameters required to establish a GPRS communication link are missing.
38	The communication link to the APN was denied.
39	The port for server connection was not configured.
40	The destination name or port was not configured.
41	The remote subscriber has disconnected.
42	The communication link to the network was lost after a communication link to the remote subscriber had already been established.
43	The telephone number of the SMS service center is wrong or missing on the SIM card. The mobile service provider must be contacted.

44	The APN password or APN user name is wrong.
45	The APN parameters are already in use by another mobile phone subscriber.

Display	Meaning
70	Failure to establish a communication link to the remote subscriber. Possible cause: blocked by remote subscriber firewall, for example.
71	The remote subscriber did not respond (timeout). Possible causes: the remote subscriber is switched off or the remote subscriber has not been started.
72	The remote subscriber reports "unknown device type".
73	The EK205-M does not understand the remote subscriber response. Possible cause: e.g. transfer error.
74	Sending error: when attempting to send data to the remote subscriber, the modem reported an error.
255	An unknown error has occurred.

8.3.3 Status of remote subscriber "MDst"

Display	Meaning
0	No connection started to the remote subscriber.
1	The remote subscriber is not fully configured. Check the related EK205-M telephone book entry.
2	Connection to remote subscriber is being established.
3	Remote subscriber is busy.
4	Connection to remote subscriber established.
5	Disconnection from remote subscriber in progress.
6	Disconnection from remote subscriber finished.
7	Remote subscriber not reached. Check the related EK205-M telephone book entry or check the readiness for reception of the remote subscriber.
8	Remote subscriber refused the connection. Check the related EK205-M telephone book entry or check the readiness for reception of the remote subscriber.
9	Connection to remote subscriber aborted during communication.
11	Connection denied.
12	Connection denied (invalid access data).
13	Connection to the remote subscriber aborted (timeout).

9 Operation



Using the enSuite software and the data interfaces of the EK205-M, further applications than those described below are possible.

9.1 Safety

9.1.1 Personal protective equipment

When working on the device within a gas system, wearing personal protective equipment is required to minimize health hazards.

- During the activity on the device, always wear the protective equipment required within the relevant system.
- Always observe the notes on the personal protective equipment provided in the working area.

9.2 Operating staff

Below various persons are stated who are authorized to perform various activities when operating the EK205-M.

9.2.1 Trained individual

The person instructed to operate the EK205-M

- was instructed by the plant operator in an informational session on the tasks assigned to him or her, and on possible hazards in case of improper behaviour.
- is authorized to read and note values and parameters using operating elements of the EK205-M.

9.2.2 Specialist

The specialist on operating the EK205-M

- has the ability, because of their technical training, knowledge and experience, as well as their knowledge of the relevant regulations, to carry out the work to the device assigned to them, and to recognize and avoid possible hazards on their own.
- is authorized to read and note values and parameters of the operating elements of the EK205-M and to make changes not subject to calibration requirements.

9.2.3 Calibration officer

The calibration officer

- has the ability, because of their technical training, knowledge and experience, as well as their knowledge of the relevant standards and regulations, to carry out calibration-protected work to gas systems. The calibration officer is trained to work with calibration-protected devices and systems, and is acquainted with the relevant standards and regulations that apply.
- is authorized to read and note values and parameters of the operating elements of the EK205-M and to make changes subject to calibration requirements.

9.3 Basics

As already explained in the section Construction and function, you can operate and program the EK205-M using the operating elements on the front plate of the device:

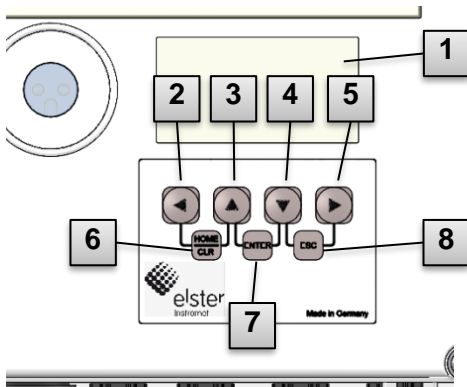


Fig. 36: Front plate of the EK205-M

- 1 Alphanumerical display
- 2 Arrow key ◀
- 3 Arrow key ▲
- 4 Arrow key ▼
- 5 Arrow key ▶
- 6 HOME/CLR key combination
- 7 ENTER key combination
- 8 ESC key combination



On plate in the housing floor, the calibration lock can be found in the form of a key that can be sealed with an adhesive label. This needs to be operated to change calibration-protected values and parameters. In the event of a calibration-protected device, this may be carried out by a calibration officer only.

9.3.1 Display

The display is divided ex works into the five tabs of Main, Cust., Admin, Serv., and Ctrl., in which the measurement values, settings and other data are displayed.

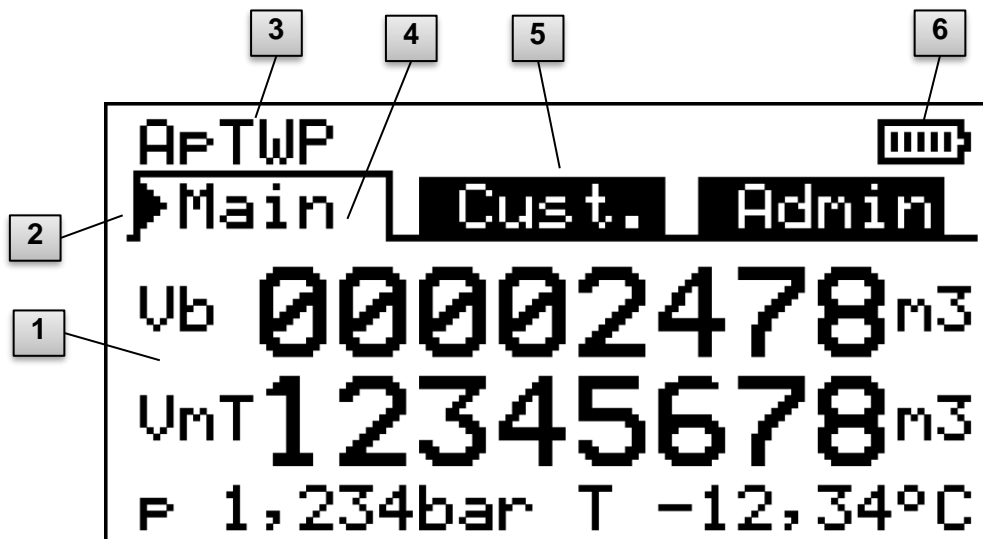


Fig. 37 Structure of the display

- | | |
|-----------------|---------------------------|
| 1 Data field | 4 Active tab |
| 2 Cursor | 5 Inactive tab |
| 3 Device status | 6 Battery charging status |

The display in the data field in Fig. 37 (starting here with Vb) is different in the tabs. All other display parts (in the top part) are the same regardless of the tab displayed.

9.3.2 Functions of the keys

The keys have the following functions:

Key	Function
▶	<ul style="list-style-type: none"> ■ jump to the right to another data list. ■ jump to the second part of a value displayed in two parts. ■ open the relevant submenu.
▼	<ul style="list-style-type: none"> ■ jump down within a data list.
◀	<ul style="list-style-type: none"> ■ jump to the left to another data list. ■ leave a submenu and jump to its start value (one menu level higher).
▲	<ul style="list-style-type: none"> ■ jump up within a data list.
▲ + ▼	<ul style="list-style-type: none"> ■ By pressing the two keys at the same time, you can execute the ENTER function regardless of the relevant data class and thereby <ul style="list-style-type: none"> ● activate the input mode. ● open the relevant submenu. ● update the relevant measurement value.
▼ + ▶	<ul style="list-style-type: none"> ■ By pressing the two keys at the same time, you can execute the ESC function regardless of the relevant data class and thereby <ul style="list-style-type: none"> ● leave a submenu and jump to its start value (one menu level higher). ● cancel an input (the input mode).
◀ + ▲	<ul style="list-style-type: none"> ■ By pressing the two keys at the same time, you can execute the HOME/CLR function and thereby <ul style="list-style-type: none"> ● display the Main tab. ● initiate a value in the input mode (reset to its start value).
▲ + ▶	<ul style="list-style-type: none"> ■ By pressing the two keys at the same time, via the context menu displayed, you can <ul style="list-style-type: none"> ● display the Main tab. ● freeze the current display. ● delete the status tab.
◀ + ▶	<ul style="list-style-type: none"> ■ Address display of the current value.

9.3.3 Calling up the data, navigation in the display

With the ►, ◀, ▲, ▼ arrow keys, you can move the cursor in the display and switch to other values.

By pressing the key combination ESC ▼ + ► several times, you reach one of the Main, Cust., Admin, Serv. or Ctrl. tabs (→ 9.3.1, Fig. 37). The active tab that the cursor is on is displayed with a bright background (Fig. 38/1). At the tab level, you can use the arrow keys ► or ◀ to move the cursor to the other tabs to display their content.

The Customer tab contains more data than can be displayed simultaneously. With the ▼ arrow key, you move the cursor from the tab to the data field (the bottom part of the display). If the cursor is at the lowest visible value, the display is moved by pressing the ▼ key again, which makes the data visible. Accordingly, the cursor can be moved up with the ▲ key and the display will be moved up at the top visible value.

If the cursor hits a value that was saved with an associated time stamp, it is displayed automatically. (Fig. 38/2)

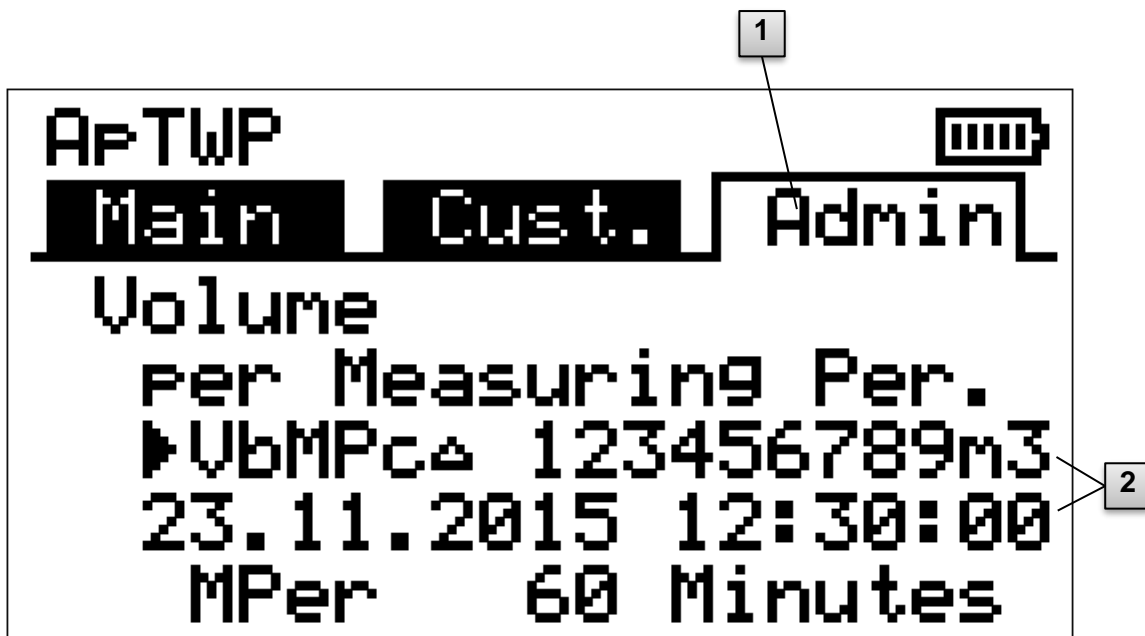


Fig. 38: Admin tab

- 1 Active tab
- 2 Value with associated time stamp

9.3.4 Meaning of the status symbols

The status symbols displayed in the first row have the following meaning:

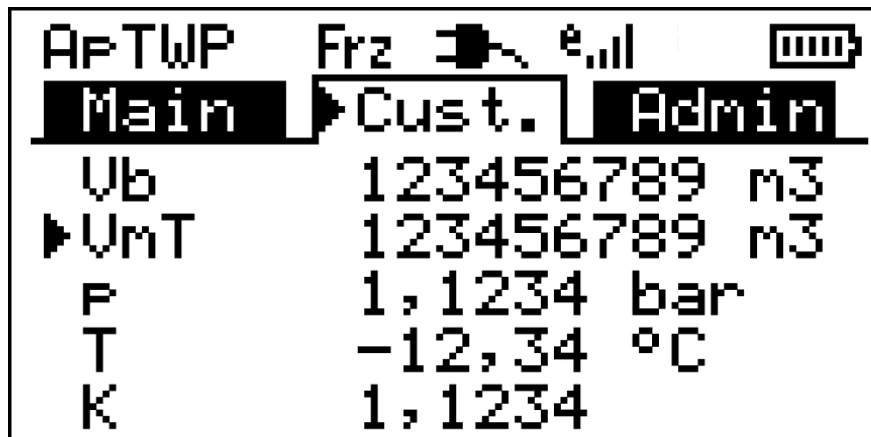





Fig. 39: Status symbols in the display

Symbol	Meaning
ApTWP	At the top left edge of the display, individual letters are displayed as symbols for the following messages:
ok.	No special messages
A	Alarm – collective message "any alarm"
p	Pressure alarm – the gas pressure cannot be measured
T	Temperature alarm – the gas temperature cannot be measured
W	Warning – collective message "any warning"
B	Battery warning – the battery is nearly empty
L¹³	Certification data log - the certification data log is full.
P	Calibration lock (programming mode) – the calibration lock is open.
o	online – data transmission is ongoing
If one of these letters flashes, the condition thereby indicated is still in place (active). If a letter is displayed consistently, the indicated status is no longer in place, but needs to be confirmed. Detailed explanations on the meaning and on any necessary procedure: see section 11.1.4 "Conduct in the event of faults"	
Frz.	Display frozen The values displayed are "frozen" (not up to date). After pressing any key, the current values are displayed. Freezing the display can be triggered after pressing the ▲ + ▶ key combination.
	External power supply If this symbol appears, the EK205-M is being supplied power from an external unit connected to the terminals.

¹³ If a calibration logbook is available in the device.

Symbol	Meaning
	Signal strength of the radio network for the external modem (connected to the terminals). This display is only shown if an external modem is connected and active.
	Charging status of the device battery

9.3.5 Error messages when entering values

If a value has been entered incorrectly via the keyboard, then input error messages will be displayed.

Figure: --x-- with x = error code according to the following table

Code	Description
1	The archive is empty, no values have been entered.
2	The archive value cannot be read. The archive may currently be opened by the interface for exporting.
4	Parameter cannot be changed (constant)
5	You are not authorized to change this value. A corresponding lock must be opened to change this value.
6	Invalid value The value entered is outside the permissible limits.
7	Wrong key The key entered (number code) is incorrect, lock is not opened.
11	Input not possible due to special settings or configuration, e.g.: - Change heat value only possible in the gas analysis list; not in the energy list
12	The input of this source (address) is not permitted.
13	Input not possible due to special settings or configuration, e.g.: The <i>Clr.X</i> function can only be performed once the time has been set to its start value (initialized) with the button combination ◀ + ▲. - The <i>Store</i> function can only be executed once the change information for the alignment of "Vm" (see section 6.3.1.4) or "Vb" (see section 6.3.1.6) was deleted.
14	Gas analysis parameters do not match.
20	Value not defined for the user-specific display The value to be displayed can be defined by entering the address of the user. As this address has not yet been entered, no value will be displayed.
21	The value can only be changed when the calibration lock is open as the PTB logbook is full.

9.3.6 Access rights

The EK205-M has the following access parties.

Access	Meaning
C	Calibration officer
CDL ¹⁴	Calibration Manual
A	Administrator
Cu	Customer
-	No access

Every access party has a lock and a matching key.

The access rights apply for both inputs by keyboard and for access via the optical, electrical (fixed wired) or integrated modem interface. If the lock is closed, all attempts to set values prompt a corresponding error message (see section 9.3.5, Error messages when entering values).

Reading values via the interfaces is also only possible within the meaning of data protection if a lock is open.

9.3.6.1 Calibration lock

The calibration lock serves to secure calibration law parameters. These include all values that influence volume counting and volume conversion.

The calibration lock is designed as a key that is placed within the EK205-M housing below the circuit board cover. It can be secured with an adhesive label (see section 6.3.1.1, Opening the calibration lock).

The calibration lock is opened by actuating the key (the P symbol flashes in the display) and closed again by actuating it a second time (P symbol extinguishes). Closing is also possible by deleting the St.ES value (see section 9.4.6, Strg. tab (control)) via the keyboard or interface. Using the enSuite software, it is also possible to set a time in minutes after which the calibration lock closes automatically.

In particular for applications outside the German calibration obligation or the MID, the protection degree of all parameters can be changed on request.

As such, parameters that are below the calibration key by default can also be protected with the administrator key or calibration logbook.

¹⁴ If a calibration logbook is available in the device.

9.3.6.2 Certification data log

The certification data log is activated by default but can be deactivated as an option. The parameters affected are then below the calibration lock.

Using the certification data log in accordance with PTB-A 50.7, some calibration law-relevant parameters can also be changed when the calibration lock is closed. The requirements for this are:

- The administrator lock must be opened (see below).
- At least three free entries must be available in the certification data log.

The parameters affected according to the factory settings are:

- *CP.I1* cp value for input 1,
- *MPer* measurement period
- *Md.KK* number mode
- *Clr.A* delete measurement archive
- *Md.I1* mode for input 1
- *QMax* maximum load (plausibility check in encoder mode)

For every change of a parameter under *CDL* with a closed calibration lock, a data row for the value is entered before and after the change.

If the certification data log is full, it can be deleted when the calibration lock is open using the *CICDL* command. (see section 6.3.1.13)



If the calibration lock is opened while the calibration logbook is open, it can only be closed again after deleting the certification data log.

9.3.6.3 Administrator lock and customer lock

Administrator and customer lock are used to secure all calibration law data that are not relevant, but that should not be changed without authorization.

The locks can be opened by entering a code (the "key") under *Cod.A* or *Cod.C* and closed by entering "0" for *St.AL* or *St.CL*.

These values can be found under the path:

[Admin](#) → [Device settings](#) → [Access](#) or

[Serv.](#) → [Device settings](#) → [Access](#)

There, a time can also be set in minutes for each lock after which it closes automatically.

9.4 Content of the data register

9.4.1 Access rights

The "Access" column in the tables of the following sections describes what lock needs to be opened to change a parameter. All changes of parameters are saved in a logbook.

Access	Meaning
C	Calibration officer
CDL ¹⁵	Calibration Manual
A	Administrator
Cu	Customer
-	No access

9.4.2 Main tab (main display)

In the Main tab, the key measurement values are displayed at a glance. The content can differ depending on the settings (see section 9.4.6.5). With this tab, there is no possibility to move the cursor for a value.¹⁶ Via the ENTER key, an update of the values displayed can be initiated.

Display	Meaning	Unit	Access	Address
Vb	Volume at base conditions	m ³	C	2:300
VmT	Total Volume at measurement conditions	m ³	C	4:302
p	Pressure	bar	-	7:310_1
T	Temperature	°C	-	6:310_1

9.4.2.1 Vb – volume in base mode

The measured volume of the gas meter connected is converted in base mode and added up in this counter.

If a fault is given (see section 11 Faults), the counter is stopped and the volume is added up in a special fault volume counter.

9.4.2.2 VmT – Total volume in operation mode

The total measured volume of the gas meter connected is added up in this counter.

Even if a fault is given (see section 11 Faults), the counter is still counting. Additionally, the disturbed volume is counted in a special fault volume counter VmD.

¹⁵ If a calibration logbook is available in the device.

¹⁶ An exception is if the Main tab was set to List (see section 9.4.6.5).

9.4.2.3p – gas pressure¹⁷

The gas pressure measured is used to calculate the volume in base conditions. The pressure is displayed as absolute pressure.

If the pressure cannot be measured due to a fault, an adjustable value is displayed and used to calculate the fault volumes. The definition of the replacement value is carried out on commissioning (→ section 6.3.1 Setting the operating parameters).

9.4.2.4 T – gas temperature

The gas temperature measured is used to calculate the volume in base conditions.

If the temperature cannot be measured due to a fault, an adjustable value is displayed and used to calculate the fault volumes. The definition of the replacement value is carried out on commissioning (→ section 6.3.1 Setting the operating parameters).

9.4.3 Customer tab

This tab is used to display and check special device settings or statuses. The application is intended for the gas customer.

This tab can be freely programmed by the user via the enSuite parameterization software.

The following parameters are programmed ex works:

Display	Meaning	Unit	Access	Address
Time	Date and time	-	-	1:400
Vb	Volume at base conditions	m ³	E	2:300
VmT	Total Volume at measurement conditions	m ³	E	4:302
p	Pressure	bar	-	7:310_1
T	Temperature	°C	-	6:310_1
K	Compressibility ratio factor	-	-	8:310
C	Conversion factor	-	-	5:310
SReg	Status register (total)	-	-	1:101
VbMP↑	Maximum measurement period counter Vb in the current month	-	-	3:161
VbDy↑	Maximum daily counter Vb in the current month	-	-	4:161
Qb	Flow at base conditions	m ³ /h	-	2:310
Qm	Actual flow rate	m ³ /h	-	4:310

9.4.3.1 Time – date and time

The time displayed is updated in battery mode every 30 and in mains mode every 2 seconds.

9.4.3.2 Values from Main tab

Vb – volume in base mode, see section 9.4.2.1

VmT – Total volume in operating mode, see section 9.4.2.2

p – gas pressure, see section 9.4.2.3

¹⁷ These values are not required in the performance as Temperature Conversion Device.

T – gas temperature, see section 9.4.2.4

9.4.3.3K – Compressibility ratio factor

The compressibility ratio factor calculated is used to calculate the volume in base conditions.

The EK205-M supports several equations to calculate the compressibility ratio factor. The equation to be used is determined by the directives and standards applicable for the usage area of the device. It can also be set when ordering or commissioning (→ section 6.3.1 Setting the operating parameters).

9.4.3.4C – conversion factor

The currently determined factor for converting the volume in operating mode to basic mode.

9.4.3.5SReg – status register (total)

All messages since the last manual clear are collected in the status register. Here, it can be seen what occurred since the last station inspection, for instance. The reports can be deleted on the device (*Serv.* → *Status* → *Clr*).

In the status tabs, only alarms and warnings (see section 11.2) are displayed.

9.4.3.6VbMP ↑ – maximum measurement period counter Vb in the current month

The time stamp of the maximum is displayed in the following row when moving the cursor to the VbMP ↑ value.

The maximum of the past 24 months can be queried in the monthly archive 1 (see section 9.4.4 Admin tab (administrator)).

9.4.3.7VbDy ↑ – maximum day counter Vb in the current month

The time stamp of the maximum is displayed in the following row when moving the cursor to the VbDy ↑ value.

The maximum of the past 24 months can be queried in the monthly archive 1 (see section 9.4.4 Admin tab (administrator)).

9.4.3.8Qb – flow at base conditions

Current flow at base conditions (standard flow rate).

$$Q_b = Q_m \cdot C \quad \text{with } Q_m = \text{actual flow rate} \\ C = \text{conversion factor}$$

The maximum imprecision of the value displayed corresponds roughly to the maximum imprecision of Q_m .

For alarm, Q_b is calculated with the replacement values of the disrupted measurement values.

9.4.3.9Qm – actual flow rate

Current actual flow rate (measurement flow rate).

The measurement insecurity of the operating load displayed depends on whether a pulse transducer is connected:

For connected pulse transducer:

With a pulse distance of a maximum of 15 minutes (at least four pulses per hour) and $cp.l1 \leq 1$, the measurement uncertainty of Qm is a maximum of 1%. For a pulse period of more than 15 minutes, Qm = 0 is displayed. After changing the gas flow, the precise value can only be displayed when the gas meter has sent at least two pulses.

9.4.4 Admin tab (administrator)

This tab is used to display and check special device settings or statuses. The application is intended for the measurement location operator.

Display	Meaning
User values ¹⁸	Submenu for user-specific parameters
Volume	Submenu for volumes and associated parameters
Volume conversion	Submenu for conversion and associated parameters
Measured values	Submenu for measurement values and associated parameters
Archives	Submenu for archives located in the device
Status	Submenu for current status, status tab and logbooks
Date and time	Submenu for date and time and associated parameters
Batteries	Submenu for device batteries and associated parameters
Inputs	Submenu for the inputs and associated parameters
Outputs	Submenu for all outputs and associated parameters
Interfaces	Submenu for the interfaces in the device
Device settings	Submenu for general device settings
Identification	Submenu for the identification of the gas system

¹⁸ In the User values submenu, the user can set via the enSuite parameterization software up to 10 and within this list in another submenu up to 12 freely programmable parameters.

9.4.5 Serv. tab (service)

This tab is used to display, check, and parameterize special device settings or statuses. The application is only intended for service technician (specialist staff) or a calibration officer when commissioning or maintaining.

Display	Meaning
Volume	Submenu for volumes and associated parameters
Volume conversion	Submenu for conversion and associated parameters
Measured values	Submenu for analogue measurement values and associated parameters
Archives	Submenu for archives located in the device
Status	Submenu for current status, status tab and logbooks
Date and time	Submenu for date and time and associated parameters
Batteries	Submenu for device batteries and associated parameters
Inputs	Submenu for the inputs and associated parameters
Outputs	Submenu for all outputs and associated parameters
Interfaces	Submenu for the interfaces in the device
Device settings	Submenu for general device settings
Identification	Submenu for the identification of the gas system
Edit and delete	Submenu for triggering various deletion functions
Examination	Submenu for freezing function and test archive
Data book	Submenu with information from the data book of the device

9.4.6 Strg. tab (control)

This tab is used to check special device settings. The application is only intended for service technician (specialist staff) or a calibration officer when commissioning or maintaining.

Display	Value	Unit	Access	Address
St.AL ¹⁹	Administrator lock: Status / close	-	-	3:170
Cod.A ¹⁹	Enter / change administrator key	-	-	3:171
St.PL	Calibration lock: Status / close	-	-	1:170
Menu	Selection of the display menu	-	C	1:1A1
Main	Content of the Main tab	-	A	2:1A1

¹⁹ Operate the device with high communication reliability (high level security, see application manual) so that this menu item is not displayed.

9.4.6.1 St.AL – administrator lock: Status / close

The administrator lock needs to be opened to change certain operating parameters. In normal mode, the administrator lock should be closed.

Display	Meaning
locked	The administrator lock is closed.
open	The administrator lock is open.

9.4.6.2 Cod.A – enter / change administrator lock

Here, by entering the correct key (hexadecimal characters) the administrator lock can be opened. After the administrator lock was opened, the existing key can be changed.

The individual characters of the key can assume the values 0 to 9 and A to F.

9.4.6.3 St.PL – calibration lock: Status / close

The calibration lock needs to be opened to change certain operating parameters. In normal mode, the calibration lock should be closed.

Display	Meaning
locked	The calibration lock is closed.
open	The calibration lock is open. In this case, the "P" at the top left also flashes in the display (see section 9.3.4 Meaning of the status symbols)

9.4.6.4 Menu – selection of the display menu

In delivery status, the display of the EK205-M has the five tabs: Main, Cust., Admin, Serv., and Ctrl. With the Menu value, for certain purposes tabs can be displayed or hidden.

9.4.6.5 Main – content of the Main tab

Here, the content of the Main display tab can be set.

The setting ex works is Volume+Measurement value. This corresponds to the content displayed in section 9.3.1.

Display	Meaning
Volume+meas.	<ul style="list-style-type: none"> - The following is displayed: Volume at base conditions, volume at measurement conditions, pressure, temperature - Format: 8 integers and 3 decimals for the meter - with brief descriptions for all values
List	<ul style="list-style-type: none"> - The following is displayed: Volume at base conditions, volume at measurement conditions, pressure, temperature, status register, compressibility ratio factor, actual flow rate, flow at base conditions, date, and time

10 Maintenance

10.1 Safety



DANGER!

Risk of life from electric current!

When coming into contact with live parts, there is an immediate risk of life. Damage to the insulation or individual components can be fatal.

Therefore:

- Cover the electric connections and live parts against possible contact.
- Immediately cut the power supply in the event of damage to the insulation and initiate the repairs.
- Have work on the electric components of the device, such as the connection of the external power supply, carried out by electrical experts only.
- For all work on the electrical plant, de-energize it and check the freedom from voltage.
- Before maintenance work, cut the voltage supply and secure it from reactivation.
- Do not bridge any fuses or deactivate them. When replacing fuses, observe the correct ampere figure.
- Keep life parts away from humidity. This may result in a short-circuit.



DANGER!

Risk of explosion due to electrostatic charging.

Avoid electrostatic charges.

Therefore:

- Clean the device only with a damp cloth.
- Avoid rubbing with non-conductive materials.



WARNING!

Risk of injury when handling batteries incorrectly!

Batteries need to be treated with special care.

Therefore:

- Do not throw the batteries in the fire or expose them to high temperatures. There is a risk of explosion.
- Do not charge the batteries. There is a risk of explosion.
- Liquid being released in the event of incorrect use may result in skin inflammations. Avoid contact with the liquid. Rinse the liquid with lots of water in the event of contact. If the liquid enters the eyes, rinse the eyes for 10 mins with water and see a doctor immediately.

**CAUTION!****Substances harmful to the environment!**

When handling substances harmful to the environment, in particular in the event of incorrect disposal, severe damage may arise for the environment.

Therefore:

- Observe the below notes at all times.
- Take suitable measures immediately if substances harmful to the environment enter the environment by mistake. In the event of doubt, inform the municipal authorities in charge of the damage.

10.1.1 Staff

Maintenance work must be carried out correctly.

- Have the maintenance work described here carried out by electrical experts only (see section Operation).

**WARNING!****Risk of injury from improperly performed maintenance work.**

Improper maintenance may result in severe personal injury or material damage.

Therefore:

- Before starting work, ensure sufficient installation freedom.
- Ensure order and cleanliness at the place of installation. Components and tools lying around and placed on top of one another loosely are sources of accidents.
- If components were removed, ensure correct installation, reinstall all fastening elements and observe screw torques.

10.1.2 Personal protective equipment

- During the maintenance work on the device, wear the protective equipment required within the relevant system.
- Always observe the notes on the personal protective equipment provided in the working area.

10.1.3 Environmental protection

Observe the following instruction during maintenance work:



The batteries used contain poisonous heavy metals. They are subject to special waste treatment and need to be disposed of at the municipal collection points or by a specialist company.

10.2 Check and replace device batteries

10.2.1 Replace and connect device batteries



DANGER!

Risk of explosion when using of wrong batteries.

Use only batteries stated in the design test certificates of the EK205-M (see section 13.3). Order number see section 13.1.4.



WARNING!

Risk of injury when handling batteries incorrectly!

Batteries need to be treated with special care.

Therefore:

- Do not throw batteries in the fire or expose them to high temperatures. There is a risk of explosion.
- Do not charge batteries. There is a risk of explosion.
- Liquid being released in the event of incorrect use may result in skin inflammations. Avoid contact with the liquid. Rinse the liquid with lots of water in the event of contact. If the liquid enters the eyes, rinse the eyes for 10 mins with water and see a doctor immediately.

The replacement of the batteries can be carried out without damaging lead seals for devices with a standard structure.

10.2.1.1 Replace and connect basic device battery



Before removing the plug of the old battery of the basic device from the plate, ensure that the new battery has already been connected. As such, the EK205-M continues to work during the battery replacement.

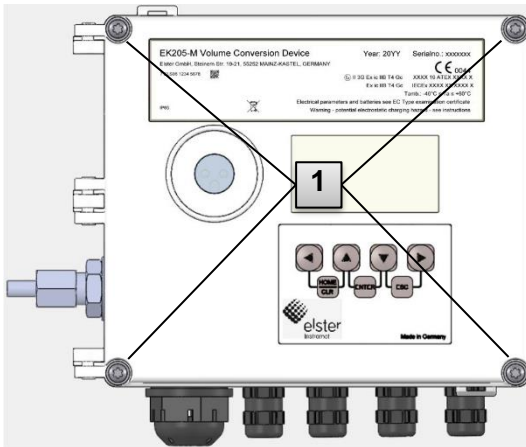


Fig. 40

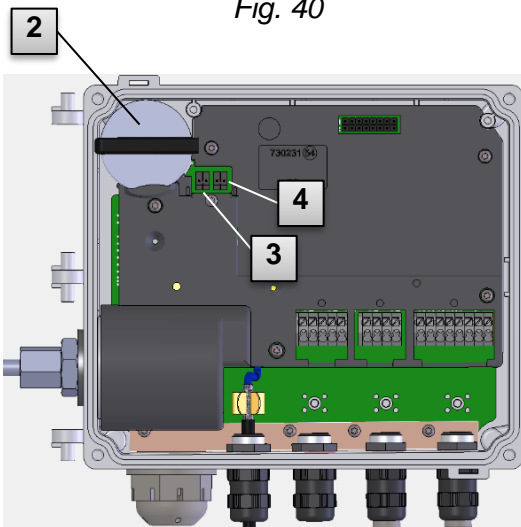


Fig. 41: EK205-M with top assemblies removed

1. Loosen the four housing screws (Fig. 40: **1**).
2. Open the lid of the EK205-M.
3. Mark the old basic device battery with a felt pen or label, for instance.
4. Remove the basic device battery (Fig. 41: **2**) from its battery holder (Fig. 41: **3**).
5. Select the free connection on the plate for connecting the new battery (K9 or K10; Fig. 41: **4**).
6. Place the new basic device battery inside (Fig. 41: **2**) and ensure that the battery is correctly anchored in the battery holder.
7. Remove the old basic device battery and dispose of it correctly.
8. Close the housing using the intended screws (Fig. 40: **1**).
9. Re-enter the start capacity of the battery as described in section 10.2.2.
10. Check of the operating period calculated as described in section 10.2.3. In standard operation mode (see section 4.2.1), the operation duration must display at least 62 months. Otherwise, compared the settings with the standard operation case and execute step 9 if applicable.



Ensure that the new basic device battery is fastened correctly and sits tight inside the EK205-M.



CAUTION!

Damage to property caused by improper device closure!

If the device is not properly closed cables can get pinched and cause damage.

Therefore:

- During closing, ensure the correct position of the cable ducts.

10.2.1.2 Replace and connect modem battery

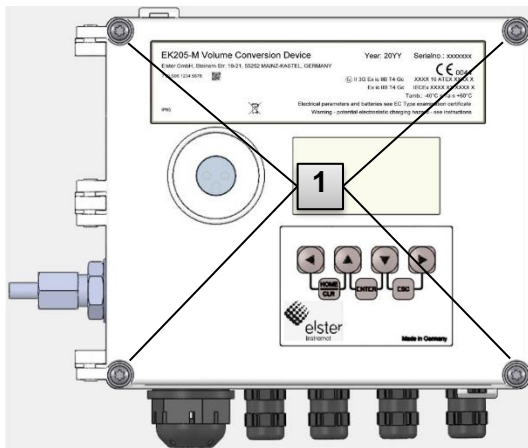


Fig. 42

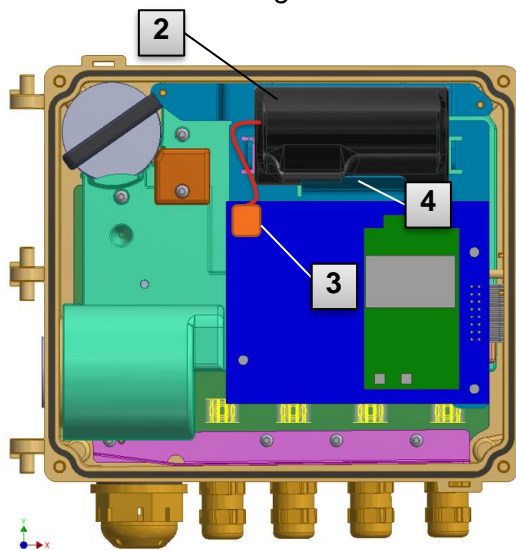


Fig. 43: EK205-M with lid removed

1. Loosen the four housing screws (Fig. 42: 1).
2. Open the lid of the EK205-M.
3. Mark the old modem battery with a felt pen or label, for instance.
4. Disconnect the modem battery from the modem assembly (Fig. 43: 3).
5. Remove the modem battery (Fig. 43: 2) from the modem battery holder (Fig. 43: 4).
6. Place the new modem battery inside (Fig. 43: 2) and ensure that the battery is correctly fitted in the modem battery holder.
7. Remove the old modem battery and dispose of it correctly.
8. Close the housing using the intended screws (Fig. 42: 1).



Ensure that the new modem battery is installed correctly and sits tight inside the EK205-M.



CAUTION!

Damage to property caused by improper device closure!

If the device is not properly closed cables can get pinched and cause damage.

Therefore:

- During closing, ensure the correct position of the cable ducts.

10.2.2 Enter battery capacity



The battery capacity needs to be re-entered after a battery replacement.

- To open the administrator lock, move the cursor to the Admin tab and via the following path to the Cod.A value (administrator key entry):

Admin. → Device settings → Access → Cod.A



After delivery, the administrator key for keyboard entry is 00000000.

- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.
- After the value has been entered, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.
- To enter the battery capacity, move the cursor to the Serv. tab and via the following path to the Bat.C value (battery capacity):
Serv. → Batteries → Bat.C
- Press the key combination ENTER ▲ + ▼ ⇒ One digit of the value flashes.
- Move the cursor with the arrow buttons ► or ◀ to the digits and change these with the arrow buttons ▲ or ▼.



When using a battery of the D value, set the Bat.C value to 13.0 Ah.

- After the value has been entered, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.
- To close the administrator lock, move the cursor to the Admin tab and via the following path to the St.AL value (administrator lock status):
- *Admin. → Device settings → Access → St.AL*
- Press the key combination ENTER ▲ + ▼ ⇒ "open" flashes.
- Move the cursor with the arrow keys ▲ or ▼ to change the value to "closed".
- After the value has been entered, press the key combination ENTER ▲ + ▼ in order to confirm the input. It is possible to abort the entry by pressing the key combination ESC ▼ + ►.

10.2.3 Display remaining operating duration of the battery



The calculation of the remaining operating duration is carried out depending on the consumed capacity (which is measured) and the consumption expected for the future (which results in the theoretical remaining operation duration). For that reason, for applications with strong power consumption may result in the remaining operating duration falling faster than the indication of the remaining operating duration promises.

A fresh calculation of the remaining operating duration is automatically carried out after entering a new battery capacity Bat.C (see above). It is not possible to edit the value.

- Move the cursor to the "Serv." tab and via the following path to the value "Bat.R" (remaining battery operating duration):

Serv. → Batteries → Bat.R



After entering a new battery capacity, in the standard operating case (see section 4.2.1) a value of at least 62 months must be displayed for "Bat.R".

11 Faults

The following section describes causes of faults of the device and possibilities of rectification.



In the event of faults that cannot be rectified with the following instructions, please contact our customer service (see section General) or our electronics hotline:

- Tel. +49 (0) 6134 / 605-123
- www.elster-instromet.com/de
- www.honeywellprocess.com/sSupport (Knowledge Base)
- E-Mail: support@elster-instromet.com

11.1 Safety



DANGER!

Risk of life from electric current!

When coming into contact with live parts, there is an immediate risk of life. Damage to the insulation or individual components can be fatal.

Therefore:

- Immediately cut the power supply in the event of damage to the insulation and initiate the repairs.
- Have work on the electric components of the device, such as the connection of the external power supply, carried out by electrical experts only.
- For all work on the electrical plant, de-energize it and check the freedom from voltage.
- Before maintenance work, cut the voltage supply and secure it from reactivation.
- Keep live parts away from humidity. This may result in a short-circuit.

11.1.1 Staff

- The work described here for fault rectification, unless indicated otherwise, can be carried out by the operator.
- Some work may only be carried out by specially trained specialist staff or exclusively by the manufacturer. Special reference to this is made in the description of the individual faults.
- Work on the electrical system may be carried out by electrical specialist staff only as a rule.

11.1.2 Personal protective equipment

- During the rectification of a fault on the device, wear the protective equipment required within the relevant system.
- Always observe the notes on the personal protective equipment provided in the working area.

11.1.3 Improper fault rectification



WARNING!

Risk of injury from improper fault rectification!

Improper fault rectification may result in severe personal injury or material damage.

Therefore:

- Before starting work, ensure sufficient installation freedom.
- Ensure order and cleanliness at the place of installation. Components and tools lying around and placed on top of one another loosely are sources of accidents.
- If components were removed, ensure correct installation, reinstall all fastening elements and observe screw torques.



The following explanations on the faults occurring provide information on who is authorized to rectify the fault.

11.1.4 Conduct in the event of faults

The following applies as a rule:

1. If work is required in the hazardous area, deactivate the overall system and secure it from restarting.
2. Determine the cause of the fault.
3. Inform the persons in charge at the place of use of the fault immediately.
4. Depending on the type of the fault, contact the manufacturer and have it rectified by authorized specialist staff or do so yourself.

11.2 Fault and other status messages

Faults (here equivalent to "alarms") during the operation of the EK205-M can be identified on the basis of the status symbols in the first row of the display (see section 9.3.4).

Further information and reports can be obtained in the Stat current status and in the SReg. status tab. They can be found:

- in the *Cust.* tab (SReg only)
- at the paths *Admin* → *Status* and *Serv.* → *Status*

Effects and recommended procedures in the event of fault and other status messages:

Message	Description, process
a) Faults, alarms:	
Restart	If this message appears whilst in operation, the device is faulty. Please contact the Elster customer service (see section 1.4 Customer service).
C-fact. err.	The conversion factor could not be calculated, as the measured gas temperature is outside -100°C to +100°C or no usable compressibility figure is available.
Data error	An error was detected during the cyclic check of the data subject to calibration regulations. Please contact the Elster customer service (see section 1.4 Customer service).

Message	Description, process
T Alarm Lim.	The gas temperature measured is outside the permissible limits. The limits can be changed when commissioning in the presence of the calibration officer. (see section "6.3.1.8", page 44)
p Alarm Lim.	The gas pressure measured is outside the permissible limits. The limits can be changed when commissioning in the presence of the calibration officer. (see section "6.3.1.8", page 44)
K-val. error	The compressibility ratio factor could not be calculated, as no valid real gas factor could be determined yet.
z-fact. err.	The real gas factor could not be calculated. At least one of the gas analysis values of Ho.n, CO ₂ , H ₂ , Rhon is outside the permissible range.
Vm-Alarm	No volume could be entered for the input used for the volume conversion.
Vm-Inp.Alarm	For the encoder connected on input 1, for 40 seconds (with external, current supply) or for the duration of two measurement cycles + 1 second (in the event of battery supply), no operating volume could be entered.
T Inp. error	The gas temperature cannot be measured due to a fault. Please contact the Elster customer service (see section 1.4 Customer service).
p Inp. error	The gas pressure cannot be measured due to a fault. Please contact the Elster customer service (see section 1.4 Customer service).
b) Warnings:	
Data restore.	The batteries of the EK205-M have failed temporarily. As a result of this, the time has not changed and no measurements have been logged. However, all data remain preserved. This message appears when old batteries are removed before connecting the new ones (see section 10.2). Procedure using the enSuite software: <ul style="list-style-type: none"> ■ Set the time of the EK205-M. ■ Delete the status register
Outp.1 Error Outp.2 Error	There should be more pulses being emitted from the specified output than are permitted under its configured settings. In order to eliminate the cause of the problem, you can use the enSuite software to either: <ul style="list-style-type: none"> ■ reduce the cp value of the output ■ or increase the output frequency In both cases, the change must be aligned with the device connected.
I1-Warning	The encoder could not be read at the end of the measurement period. The flow recording at this point is invalid.
I2 Pulse cmp	During the pulse comparison between, for instance, input 1 and input 2, too large a deviation occurred.
W Warn Lim.	The performance displayed is outside the warning limit set. The warning limit can be changed with the enSuite software.

Message	Description, process
Vb Warn Lim.	The standard volume consumption value monitored (by default: hourly consumption) is outside the warning limit set. What value is monitored, and the warning limits can, among other things, be changed with the enSuite software.
Qm Warn Lim.	The operating load (gas flow) is outside the warning limit set. The warning limit can be changed with the enSuite software.
T Warn Lim.	The gas temperature measured is outside the warning limit set. The warning limit can be changed with the enSuite software.
p Warn Lim.	The gas pressure measured is outside the warning limit set. The warning limit can be changed with the enSuite software.
z Warning	The sum of the gas analysis values with AGA-8 DC92 is larger or smaller than 100%. As such, no correct calculation of the real gas factor and the compressibility figure could be carried out.
Update error	Before the software update, an error was detected in the cached software image.
Softw. error	This message is used for factory diagnosis. Please contact the Elster customer service (see section 1.4 Customer service).
Sett. error	The programming of the device has generated an unusable combination of settings. Please contact the Elster customer service (see section 1.4 Customer service).
I2 Warn.sig.	If an input has been configured as a warning input, this message will be displayed if an active signal appears at the corresponding terminal (e.g. terminal DE2). The input configuration can be adjusted using the enSuite software.
Batt. low	The remaining battery power is less than six months. The batteries need to be changed soon.
c) Remarks:	
TA Warn Lim.	The ambient temperature measured is outside the warning limit set. The warning limit can be changed with the enSuite software.
Repair mode	The device is in revision mode
Clock n. set	The internal clock of the Volume Conversion Device has not been adjusted at the factory.
CDL full	The certification data logbook is full. Changing the parameters marked with "CDL" without a calibration lock is only possible if the content of the certification data logbook has been deleted.
U.Logb. full	The software update logbook is full. An update is only possible if the content of the software update logbook has been deleted.

Message	Description, process
online	Data is currently being transmitted via an interface (modem, optical interface or terminal interface). If this message is displayed, the "o" will flash in the "Status" field of the display (see section 9.3.4).
E2-HinwSig.	If an input has been configured as a signal input, this message will be displayed if an active signal appears at the corresponding terminal (e.g., terminal DE2). The input configuration can be adjusted using the enSuite parameter program.
Remote clock	The Volume Conversion Device has started to set its clock via RDT. It is deleted again as soon as this could be carried out successfully. If this report remains entered for more than a couple of minutes, the Automatic setting of the clock via RDT function is activated but could not be executed. In this case, please contact the Elster customer service (see section 1.4 Customer service).
Cal.lock o.	The calibration lock is open. In normal operating conditions, the calibration lock should be closed so that unauthorized changes cannot be made. To close the calibration lock, please go to <i>Ctrl. → St.ES</i> and enter the value "0".
Admin.lock	The administrator lock is open.
Cust.lock o.	The customer lock is open.
Bat. operat.	The EK205-M is in battery mode. This signal is primarily used to inform a remote data transmission system that the batteries run down more quickly during long periods of data transmission.
Dayl.Sav.Tim	The time displayed in volume convertor is daylight saving time. The switchover mode can be changed using the enSuite software.
Call Win.1 Call Win.2 Call Win.3 Call Win.4 Call Win.5 Call Win.6	The specified call pickup time window is active, i.e., the Volume Conversion Device will accept data transmission calls.
call time1 call time2	The specified call time is active, i.e., the EK205-M shall make a data transmission call to the remote terminal.

12 Decommissioning

12.1 Final decommissioning

Read the data from the device (optional).

Run the function (“Clr.X”) to delete the (basic) parameterization and all sensitive data such as volume counters, archives, and logbooks in the device:




CAUTION!

Please note that after the deletion process, it will only be possible to actuate the optical interface. All other data will be irretrievably deleted.

- Open the calibration lock (see 6.3.1.1 “Opening the calibration lock”).
 - Set the clock to its start value using key combination ◀ + ▲.
 - Move the cursor in the “Serv.” tab to “Edit and delete” > “Clr.X”.
 - Press the ENTER key combination. ⇒ “0” will flash.
 - Change the value to “1” using the ▲ or ▼ arrow key.
 - Press the ENTER key combination to confirm the set value. The input process can be cancelled by pressing the ESC key combination.
- ⇒ All data will be deleted.
-
- Remove the device battery and, if necessary, disconnect the device from the external voltage supply.
 - Remove all supply cables.
 - You can then remove the device immediately.

12.2 Disposal

EK series volume conversion devices are covered by the WEEE Directive and bear the WEEE symbol . The important thing to note here is that end-of-life devices must be processed by an individual or collective recycling and disposal system. As EU member states have transposed the WEEE Directive differently into national law, the regulations for returning end-of-life devices vary.

Please ask your Honeywell sales partner about the regulations for returning your devices.



Environmentally sound disposal under the WEEE Directive

The WEEE Directive 2012/19/EU was adopted by the European Commission. WEEE stands for “Waste Electrical and Electronic Equipment” (or e-waste). Its aim is to provide a statutory framework to achieve the sustainable production and sustainable use of electrical and electronic equipment by re-use, recycling and other forms of the recovery of end-of-life electrical and electronic equipment. The intention is to reduce the share of this equipment in household waste and to collect raw materials properly for recovery.



Remove the battery before shipping or disposing of the device.

Please note that batteries require special waste treatment. They should therefore be removed before shipping an EK series volume conversion device and sent to a collection point or disposed of by a specialist contractor.

See section 10.2.1 “Replace and connect device batteries”

13 Appendix

13.1 Replacement and accessory parts list



Figures of the following replacement and accessory parts can be found in the catalogue of the manufacturer, which can be ordered at www.elster-instromet.com.

13.1.1 Fastening parts

Replacement / spare parts	Order no.
Mounting bracket for installation on meter with meter head type MI-2	73 021 952
Mounting kit EK205/EK205-M to RABO flow direction horizontal	73 023 803
Mounting kit EK205/EK205-M to RABO flow direction vertical	73 023 804
Mounting kit EK205/EK205-M to S1, S1V, S1D, Enc. S1	73 023 805
Universal holding angle for pipe installation for various nominal widths	73 021 955
Universal holding angle for fastening with clamp to a pipe	73 018 057
EK205/EK205-M wall installation help	73 023 360
Pipe installation help, incl. screws	04 300 365



When ordering the universal holding angle with the clamps for pipe installation, state the pipe diameter.

13.1.2 Pressure connection

Replacement / spare parts	Order no.
Two-way ball cock Ermeto T-piece	03 152 266
Three-way ball cock complete	73 022 404
Flexible pressure hose $\varnothing 6 \times 700$ mm	73 017 659
Flexible pressure hose $\varnothing 6 \times 400$ mm	73 017 656
Test supports for Ermeto Minimes	03 008 298

13.1.3 Temperature sensor bags

Replacement / spare parts	Order no.
Temperature sensor bag EBL50 complete incl. welding nozzles M10 x 1	73 012 634
Temperature sensor bag EBL67 complete incl. welding nozzles M10 x 1	73 014 456
Temperature sensor bag EBL160 complete incl. welding nozzles G 3/4" and seal ring	73 012 100
Temperature sensor bag EBL250 complete incl. welding nozzles G 3/4" and seal ring	73 015 695
Adapter for older sensor bags (EBL45, 50 and 67) for fastening and sealing the 6 mm universal sensor.	73 019 951
Adapter for older sensor bags (EBL160 and 250) for fastening and sealing the 6 mm universal sensor.	73 019 950

13.1.4 Small parts and other

Replacement / spare parts	Order no.
Seal sleeve for pressure connection and temperature sensor	73 017 997
Connection cable for 2 NF pulse transducer, approx. 700 mm in length	73 017 093
Basic device: Battery module (rated voltage = 3.6 V, rated capacity = 16.5 Ah)	73 015 774
Outdoor plug / breather drain plug	73 020 775
Modem: Battery module (rated voltage = 3.9 V, rated capacity = 16 Ah)	730 212 11
EK205-M Bracket	73 025 534
External antenna	73 031 257
Ribbon cable	73 025 532

13.1.5 Documentation

Replacement / spare parts	Order no.
English manual	73 025 561

13.2 Conformity declarations²⁰



Elster GmbH

CE TEST REPORT

SCOPE OF WORK:

Article 3.1b of RE directive (2014/53/EU) – EMC report

Model:
EK205-M

REPORT NUMBER
211102927SHA-002

ISSUE DATE
Feb 9, 2022

DOCUMENT CONTROL NUMBER
TTRF301489-3_V2
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²⁰ IECEx is not available for all device types.



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TEST REPORT

Intertek Testing Services Shanghai,
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Telephone: 86 21 6127 8200

www.intertek.com

Report no. 211102927SHA-002

Applicant : Elster Gmbh
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Manufacturer : Elster Gmbh
Steinern Straße 19-21, 55252 Mainz-Kastel, Germany

Manufacturing site : Elster Gmbh
Steinern Straße 19-21, 55252 Mainz-Kastel, Germany

Summary

The equipment complies with the requirements according to the following standard(s) or Specification:

ETSI EN 301 489-1 V2.2.3: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility

Final draft ETSI EN 301 489-52 V1.2.0: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication User Equipment (UE) radio and ancillary equipment; Harmonised Standard for ElectroMagnetic Compatibility

EN 50270:2015: Electromagnetic compatibility – Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen

PREPARED BY:

REVIEWED BY:

Project Engineer
Stephanie Zhang

Reviewer
Wakeyou Wang

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Elster GmbH

CE TEST REPORT

SCOPE OF WORK:

Article 3.2 of RE directive (2014/53/EU) – RF report

MODEL:

EK205-M

REPORT NUMBER:

211102927SHA-001

ISSUE DATE:

December 30, 2021

DOCUMENT CONTROL NUMBER:

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TEST REPORT

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www.intertek.com

Report no.: 211102927SHA-001

Applicant: Elster Gmbh
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Manufacturer: Elster Gmbh
Steinern Straße 19-21, 55252 Mainz-Kastel, Germany

Manufacturing site: Elster Gmbh
Steinern Straße 19-21, 55252 Mainz-Kastel, Germany

Summary:

The equipment complies with the requirements according to the following standard(s) or Specification:

ETSI EN 301 511 V12.5.1: Global System for Mobile communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

ETSI TS 151 010-1 V13.3.0: Digital cellular telecommunications system (Phase 2+) (GSM); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 13.3.0 Release 13)

PREPARED BY:

REVIEWED BY:

Project Engineer
Stephanie Zhang




Reviewer
Wakeyou Wang

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Certificate No.: TC- 5773

TEST REPORT IEC 62368-1 Audio/video, information and communication technology equipment Part 1: Safety requirements	
Report Number..... :	ULR-TC57732100000022F
Date of issue	10-02-2022
Total number of pages	93
Name of Testing Laboratory preparing the Report	Intertek India Private Limited 'F' Wing, Tex Centre, Chandivali Farm Road, Andheri (E), Mumbai- 400 072, India.
Applicant's name	Elster GmbH
Address	Steinern Straße 19-21, 55252 Mainz-Kastel, Germany
Test specification:	
Standard	IEC 62368-1:2018
Test procedure.....	Intertek Procedure
Non-standard test method.....	N/A
An independent organization testing for safety, performance, and certification.	
<p>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product or service is or has ever been under an Intertek certification program.</p>	

Test item description	Volume Conversion Device	
Trade Mark(s)		
Manufacturer.....	Elster GmbH, Steinern Straße 19-21, 55252 Mainz-Kastel, Germany	
Model/Type reference	EK205-M	
Ratings	3.6V DC Battery or 6V to 9V DC external power for CPU Board;3.9V DC Battery for Modem board.	
Sample id.....	M211213-001	
Sample condition on receipt.....	Working condition	
Product Group.....	Audio/video, Information and communication technology	
Discipline	Electrical	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	Testing Laboratory:	Intertek India Private Limited
	Testing location/ address	'F' Wing, Tex Centre, Chandivali Farm Road, Andheri (E), Mumbai- 400 072, India.
	Tested by (name, function, signature)	Sunita Shatalwar (Sr. Engineer) 
	Approved by (name, function, signature) ..	Jayant Kathe (Sr. Technical Manager) 

13.3 Design test certifications


13.3.1 ATEX - EC Type Examination Certificate



International Center for Quality Certification
ICQC

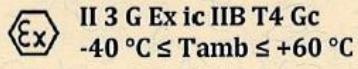
International Center for Quality Certification - ICQC LLC
63-19, Skolas street, Jurmala, LV-2016, Latvia
Phone: +371 27168371 E-mail: office@icqc.lv Web: www.icqc.lv
 SIA „International Center for Quality Certification - ICQC”
 Reg. Nr.LV40103539825
 Skolas iela 63-19, Jūrmala, LV-2016, Latvija

Notified Body 2549




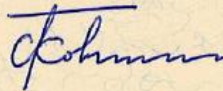
EN ISO/IEC 17065
S1-499

- 1) **EU-TYPE EXAMINATION CERTIFICATE**
- (2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**
- (3) EU-Type Examination Certificate Number: **ICQC 22 ATEX 0468 X** **Issue: 0**
- (4) Equipment: **Electronic volume corrector EK205-M**
- (5) Manufacturer: **Elster GmbH**
- (6) Address: **Steinern Straße 19-21, 55252 Mainz-Kastel, Germany**
- (7) This equipment and any acceptable variation, also documents which are specified in the schedule to this certificate.
- (8) The certification body ICQC, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in confidential report No. **468/2021/04/ATEX**
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with: **EN 60079-0:2018, EN 60079-11:2012**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This Type Examination Certificate relates only to the design and the construction of the specified equipment in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture and supply of this equipment. These are not covered by the certificate
- (12) The marking of the equipment or protective system shall include the following:



Head of Certification Body:





Sergey Kovalev

Date of issue: 21 January 2022
Jurmala, Latvia

Certificate without signature are void. This certificate may only be reproduced in its entirety and without any change, schedule included. Extracts or modifications must be authorized by SIA ICQC.

053-V-ATEX-ES tipa pārbaudes sertifikāts

Page 1 of 3

R-00-16.11.2015

(13) SCHEDULE**(14) to EU-TYPE EXAMINATION CERTIFICATE: ICQC 22 ATEX 0468 X****Issue: 0****(15) Description of Equipment:**

The electronic volume corrector model Ek205-M is intended to measure, record and monitor variable parameters provided from gas meters and pressure or temperature sensors.

The EK205-M based on the pre-certified electronic volume corrector EK205 (LCIE 16 ATEX 3007 X) and mainly consists of:

- Plastic housing
- LCD display with keypad
- Modem adapter board
- CPU board, which is powered by external supply or by batteries. It is equipped with:
 - Two intrinsically safe inputs (DE1, DE2)
 - Two intrinsically safe outputs (DA1, DA2)
 - Intrinsically safe serial interface (Uext, T+/DTR, T-/TxD, R+/DCD, R-/RxD, GND, RING) for data communication.
 - An internal pressure sensor and an external temperature sensor.

The modem-adapter board is a PCB with a mounted pre-certified radio-module (ECM-2G-UG350 or ECM-3G-UU270, LCIE 16 ATEX 3047 U), blocking diodes and current limiting resistors. The modem-adapter board is powered by a battery, equipped with an internal radio-module and an antenna for wireless data communication.

Technical characteristics:

Terminal	Intrinsic safety parameters				
	U, V	I, mA	P, mW	C, μ F	L, mH
Uext, DA1, DA2, DTR/T+, TXD/T-, RXD/R-, DCD/R+, RING	Ui: 25	Ii Σ : 144	Pi Σ : 500	Ci: 0	Li: 0
DE1	Uo: 6.6	Io: 0.66	Po: 1.1	Co: 22	Lo: 81.6
DE2	Uo: 6.6	Io: 7.34	Po: 12.2	Co: 22	Lo: 0.66

Batteries used within the equipment

for supply of CPU board:

- Elster N° 73015774 (SAFT LS33600), rated voltage = 3.6 V, rated capacity = 16.5 Ah.
- Elster N° 73023226 (Tekcell SB-D02), rated voltage = 3.6 V, rated capacity = 19 Ah.
- Elster N° 73020663 (Tadiran SL-2880), rated voltage = 3.6 V, rated capacity = 19 Ah.

for supply of Modem-adapter board:

- Elster N°73021211 (Tadiran TL 6930/S + HLC 1550/S), rated voltage = 3.9 V, rated capacity = 16 Ah

Warning markings:

"WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS"

"WARNING - USE ONLY ELSTER BATTERY N° 73015774, N° 73020663, N°73023226 FOR CPU AND N° 73021211 FOR MODEM".

Attention sign: "Electrical parameters see Type examination certificate"

(16) Descriptive Documents:

EK205-M Operating manual 73025561

The drawings are listed in Evaluation report No: 468/2022/04/ATEX

Certificate History:

Issue/Date	Evaluation report	Comment
Issue 0 from 21.01.2022	468/2022/04/ATEX	The release of the prime certificate.

Certificate without signature are void. This certificate may only be reproduced in its entirety and without any change, schedule included. Extracts or modifications must be authorized by SIA ICQC.

(17) Specific conditions of use:

17.1 The equipment must be only connected to certified associated intrinsically safe equipment. This combination must be compatible as regards the intrinsic safety rules.

17.2 Only temperature or pressure sensors defined in the manufacturer's technical file can be used.

(18) Essential Health and Safety Requirements:

Met by compliance with the standards mentioned in clause (9).

13.3.2 IECEx Certificate of Conformity²¹

		<h1>IECEX Certificate of Conformity</h1>	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres <small>for rules and details of the IECEx Scheme visit www.iecex.com</small>			
Certificate No.:	IECEX KLCS 21.0025X	Page 1 of 3	<u>Certificate history:</u>
Status:	Current	Issue No: 0	
Date of Issue:	2022-01-15		
Applicant:	ELSTER GmbH Steinem Straße 19-21 55252 Mainz-Kastel, Germany Germany		
Equipment:	Volume Conversion Device		
Optional accessory:			
Type of Protection:	Intrinsic safety 'ic'		
Marking:	Ex ic IIB T4 Gc (-40°C ≤ Ta ≤ +60°C)		
Approved for issue on behalf of the IECEx Certification Body:		Ravi Paranjpe	
Position:		Director (Operations)	
Signature: (for printed version)		_____	
Date:		_____	
<ol style="list-style-type: none"> This certificate and schedule may only be reproduced in full. This certificate is not transferable and remains the property of the issuing body. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code. 			
Certificate issued by:			
Karandikar Laboratories Certification Services Gat No. 142, Boisar Chillar Rd., Opp. Union Park, At Betegaon, Boisar (E), Tal- Palghar Maharashtra 401501 India			

²¹ Not available for all device types.



IECEX Certificate of Conformity

Certificate No.: **IECEX KLCS 21.0025X**

Page 2 of 3

Date of issue: **2022-01-15**

Issue No: 0

Manufacturer: **ELSTER GmbH**
Steinem Straße 19-21
55252 Mainz-Kastel, Germany
Germany

Additional
manufacturing
locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report

[IN/KLCS/ExTR21.0026/00](#)

Quality Assessment Report:

[DE/TUN/QAR11.0003/06](#)



IECEX Certificate of Conformity

Certificate No.: **IECEX KLCS 21.0025X**

Page 3 of 3

Date of issue: 2022-01-15

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The volume conversion device, model: Ek205-M is intended to measure, record and monitor variable parameters provided from gas meters and pressure or temperature sensors.

The EK205-M mainly consists of:

The Modem-adapter board is pre-certified and powered by a battery, equipped with an internal radio-module and an antenna for wireless data communication.

The following Ex component is assessed as part of the equipment

Product	Make	Model	Certificate no.
Radio module	Elster GmbH	ECM-2G-UG350 or ECM-3G-UU270	IECEX LCIE 16.0037U

Specific parameters of the concerned protection mode:

Batteries used within the apparatus are as follows:

- for CPU board: Elster N°73015774, N°73020663 or N°73023225
- for Modem-adapter board : Elster N°73021211.

Electrical parameters of intrinsically safe connectors:

Terminal	Intrinsic safety parameters				
	<i>I_n</i> V	<i>I_n</i> mA	<i>I_n</i> mW	<i>I_n</i> µF	<i>I_n</i> H
Uext, DA1, DA2, DTR/T+, TXD/T-, RXD/R-, DCD/R+, RING	<i>U_i</i> : 25	<i>I_i</i> Σ: 144	<i>P_i</i> Σ: 500	<i>C_i</i> : 0	<i>L_i</i> : 0
DE1	<i>U_o</i> : 6.6	<i>I_o</i> : 0.66	<i>P_o</i> : 1.1	<i>C_o</i> : 22	<i>L_o</i> : 81.6
DE2	<i>U_o</i> : 6.6	<i>I_o</i> : 7.34	<i>P_o</i> : 12.2	<i>C_o</i> : 22	<i>L_o</i> : 0.66

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The equipment must be only connected to a certified associated intrinsically safe equipment. This combination must be compatible as regards the intrinsically safe rules.
2. Only temperature or pressure sensor defined in the manufacturer's technical file can be used.