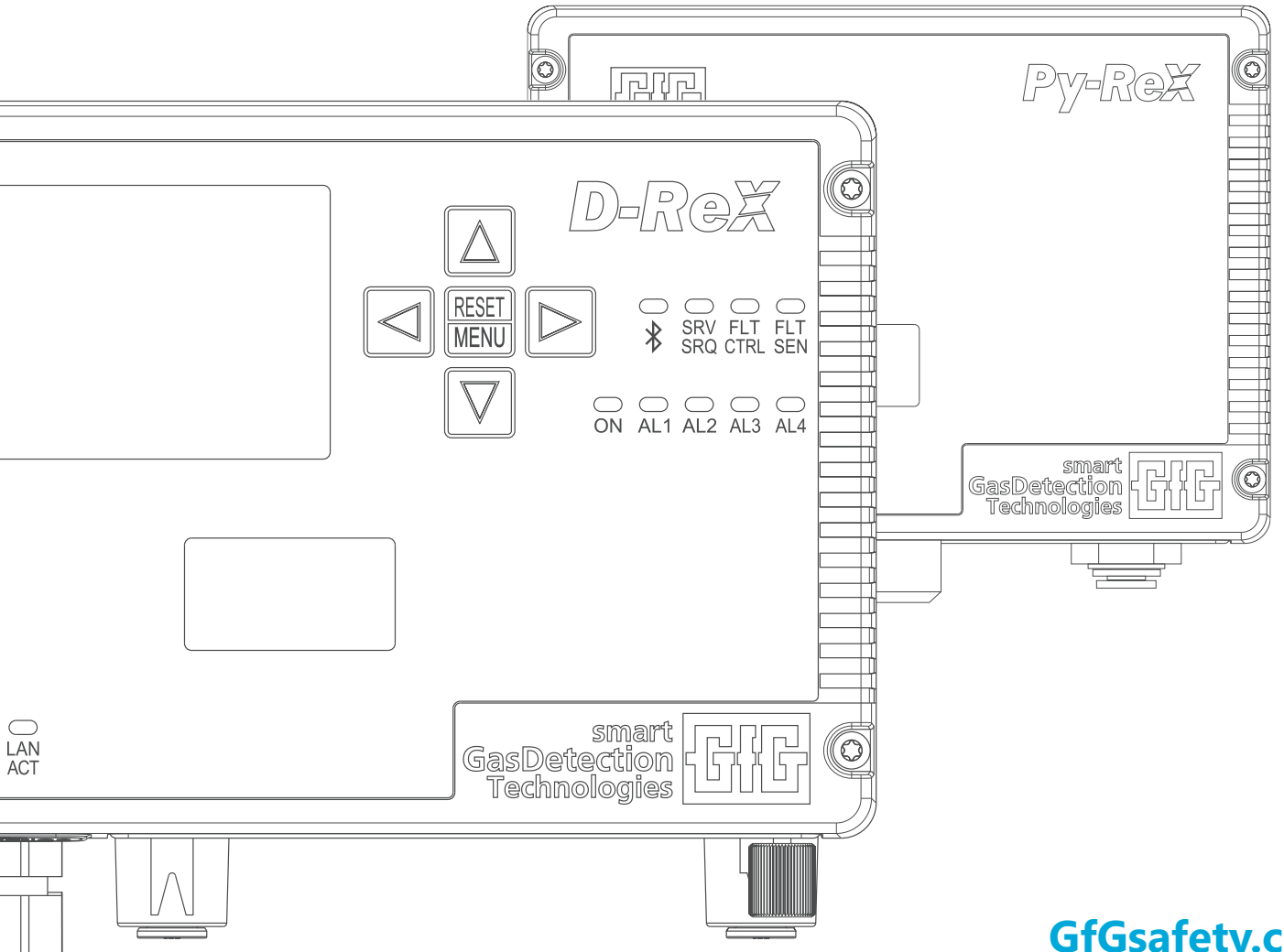
Gas detection system
for DIN rail mounting

smart
GasDetection
Technologies

Operation manual
D-ReX PoS

Translation of the operation manual
245-002.31_OM_D-ReX_PoS
Version 1 of December 17, 2024



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The original operation manual was created in German.

Information on the operation manual

This operation manual enables you to safely and efficiently use the D-ReX®* PoS 1-gas detection system. It is part of the product and must be kept close to the gas detection system, available to any user, at any time.

ATTENTION

Read this operation manual carefully before beginning any work.
Observe all stated safety and operation instructions.
Observe all national and international safety and accident prevention regulations.

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Revision history

Revision	Date of issue	Change	Editing	Approval
1	Dec. 17, 2024	First edition	Mironiuk	Böttger

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1. Overview

The D-ReX®* PoS (Point of Sampling), called only “D-ReX” in the following text for simplicity's sake, is an independent 1-gas detection system for DIN rail mounting. It is used for monitoring gas concentrations at the point of sampling via an intake pump. It can monitor the oxygen concentration as well as toxic or combustible gases and vapors. The D-ReX may only be mounted outside of Ex zones. However, if you are using a flame arrester, you may also sample gas from Ex zones.

ATTENTION

Not suitable for monitoring reactive gases in Ex zones

The flame arresters’ sinter metal causes absorption effects in reactive gases, such as ozone (O3), which falsify or even prevent correct measurements of the target gas. Contact GfG if you need to monitor reactive gases in Ex zones with a D-ReX. We are happy to offer advice.

The D-ReX comes with a high-resolution color display, 11 status LEDs and 5 control buttons and offers a variety of communication options, including Bluetooth®* and PoE communication.

Optional add-ons:
- 5 internal relays
- LonWorks®*-communication module
- IP64** version
- Py-ReX pyrolizer

D-ReX models and pyrolyzer

Aside from the D-ReX PoS, the D-ReX series also includes a pyrolyzer and the following model versions:

- **D-ReX PoU (Point of Use)**
  A version featuring an internal sensor cartridge for monitoring gas concentrations at its installation location using diffusion.

- **D-ReX PoI (Point of Installation)**
  A version with detached sensor cartridge. The distance between the D-ReX and the sensor cartridge containing the sensor can be up to 30 meters.

- **Py-ReX®***
  External pyrolyzer for pyrolytic disintegration of gases that can either not be monitored directly or are too dangerous. The sensor will then monitor the flow of gas for disintegration byproducts of the target gas, whose equivalent is used to calculate the concentration of target gas. The Px-ReX can only be used in combination with the D-ReX PoS and is installed upstream from it. The maximum absorption distance is up to 30 meters.

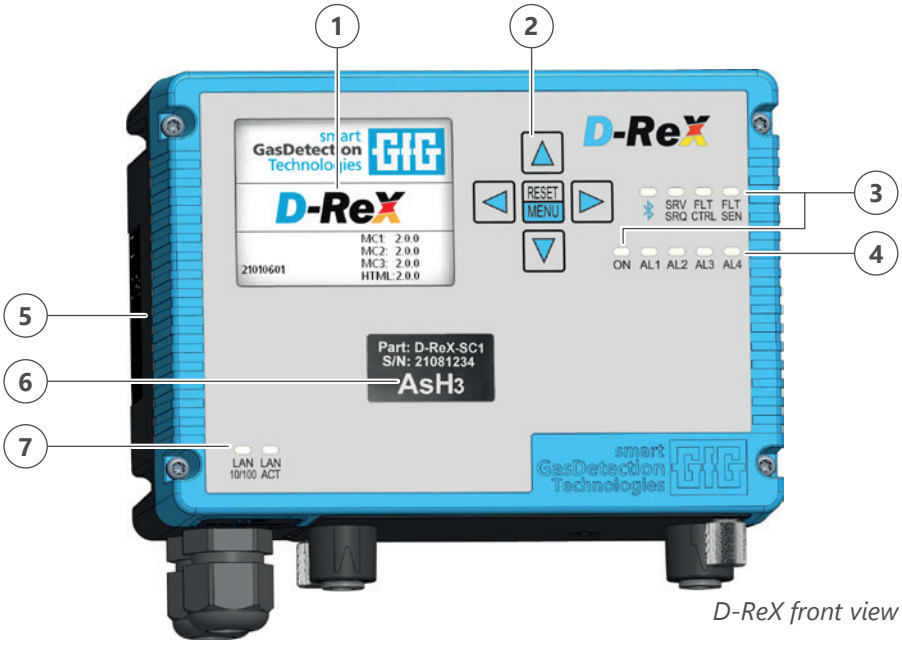
* Bluetooth® and LonWorks® are registered trademarks of their respective owners.
D-ReX® and Py-ReX® are registered trademarks of GfG Gesellschaft für Gerätebau mbH.

** To qualify for protection class IP64, both the RJ-45 connector as well as an opening at the back of the D-ReX must be permanently sealed. The ethernet connection or “Power over Ethernet” (PoE) cannot be used in this case.

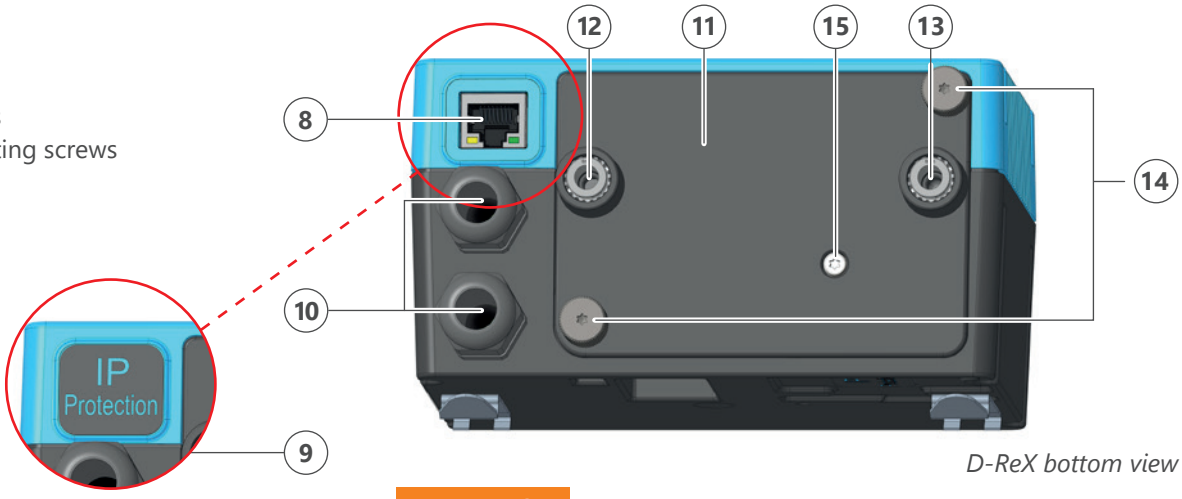
1.1 Design D-ReX PoS

1.1.1 Housing

1 Color display
2 Control buttons
3 Status LEDs
4 Alarm LEDs
5 Type label with serial number (on the side)
6 Sensor cartridge (Type of gas and measuring range)
7 Status LEDs LAN
8 RJ-45 socket9IP-Schutzaufkleber (optional)
9 IP protection sticker (optional)
10 Cable gland M16 x 1.5
11 Pump cover
12 Gas inlet
13 Gas outlet
14 Fixing screws
15 Pump mounting screws



D-ReX front view

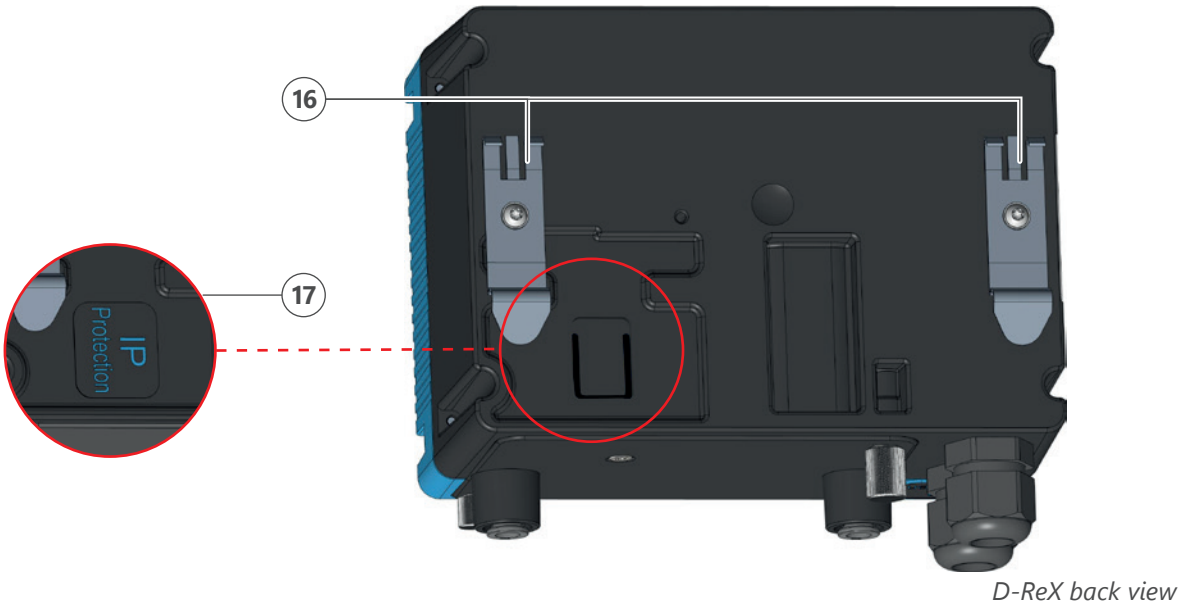


D-ReX bottom view

16 DIN rail clip
17 IP protection sticker (optional)

ATTENTION

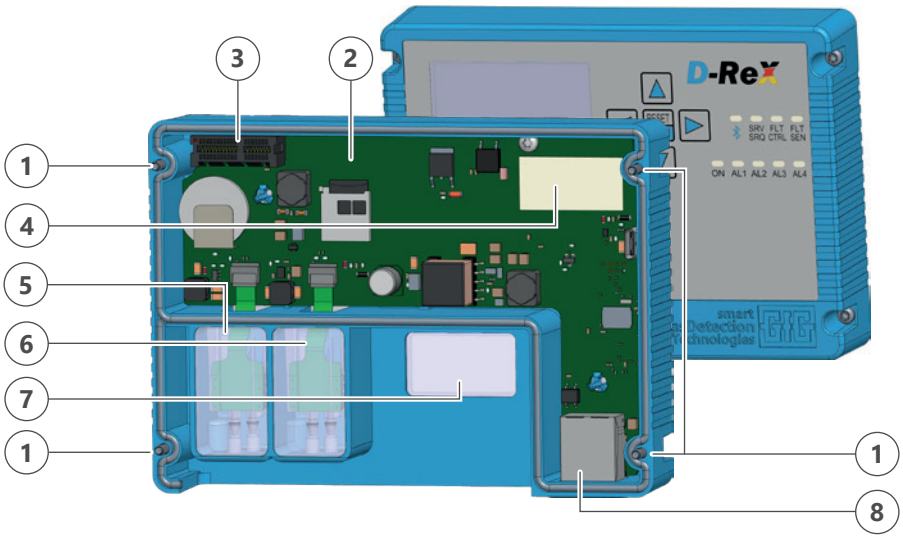
Do not loosen mounting screw when opening the device!
The mechanical component of the D-ReX's pump is secured with a mounting screw. Do not loosen this screw when you open the device. Instead, pull the pump cover out of the sensor cartridge together with the pump module.



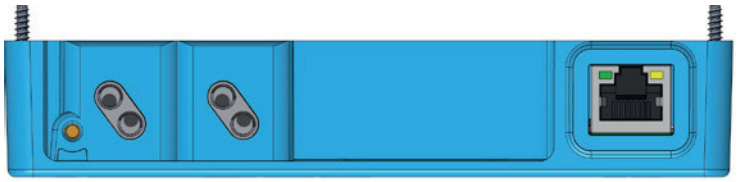
D-ReX back view

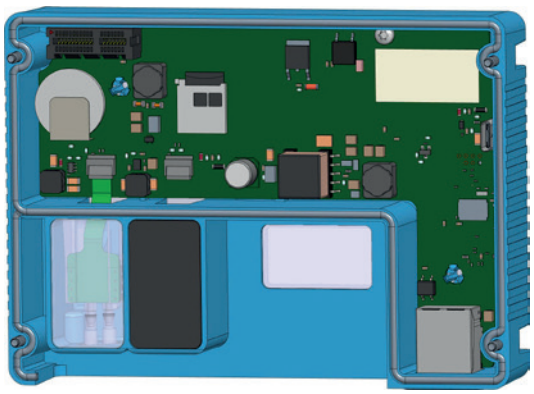
1.1.2 Housing cover (front)

1 Housing cover screws (Torx T10)
2 Main board with display
3 Plug for connection to the terminal block board
4 Label: MAC address and serial number
5 Diffusion pressure sensor: Pump
6 Diffusion pressure sensor: Line Integrity
7 Window to sensor cartridge
8 RJ-45 socket

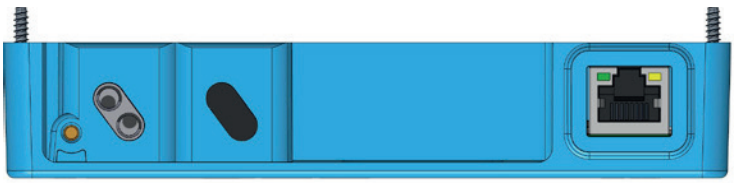


D-ReX housing cover interior view, with LIM



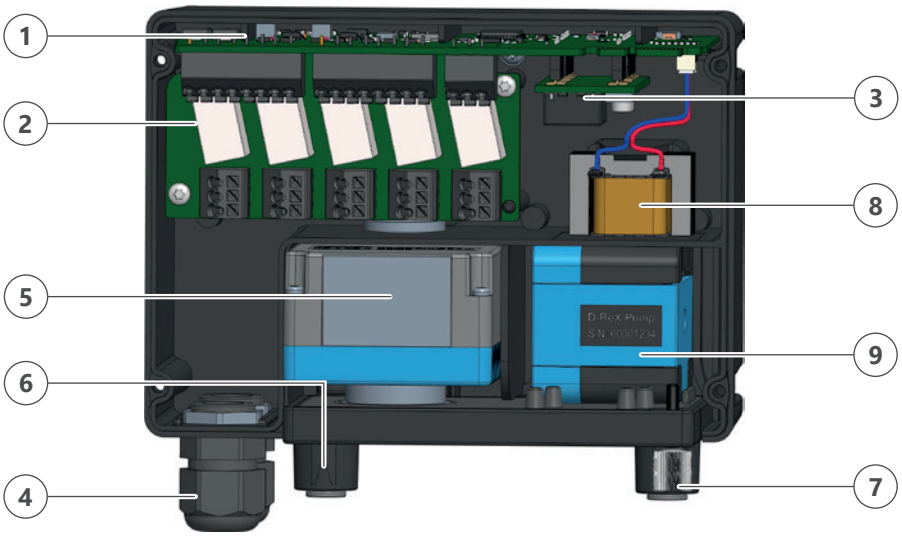


D-ReX housing cover interior view without LIM



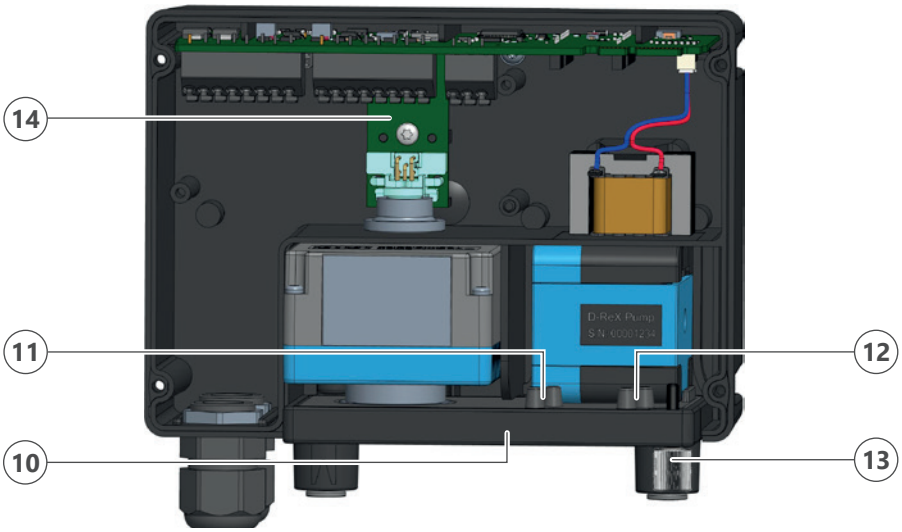
1.1.3 Housing interior

1 Terminal block PCB
2 Relay PCB (optional)
3 LonWorks module (optional)
4 Cable glands M16 x 1.5
5 Sensor cartridge
6 Gas inlet
7 Gas outlet
8 Pump: electronic component
9 Pump: mechanical component
10 Pump cover
11 Connector for diffusion pressure sensor: Line Integrity
12 Connector for diffusion pressure sensor: Pump
13 Fixing screw



D-ReX housing interior with relay and LonWorks module

14 Connector PCB



D-ReX housing interior without optional components

1.2 Optional components

The following add-ons are available for the D-ReX PoS:

Add-on	Item no.
Sensor cartridge (internal) for EC/IR/PID sensors, without sensor	3601001
Sensor cartridge (internal) for CC sensors, without sensor	3601002
DIN rail for D-ReX or Py-ReX 35/15 500 mm Length	3605101
Flame arrester, Type FA30 EC type-examination certificate: IBExU 11 ATEX 2110 X ATEX label: Ex G IIC	2203051
PTFE hose 6/4x1 mm, plain, by the meter	1000223
Angle clamps 90° for PTFE hose, PU = 2	3605100
Particle filter 1 Single-use particle filters for non-reactive and non-corrosive gases. 6 mm outer diameter, Pore size: 10 µm, PU = 2	3604060
Particle filter 2 Reusable particle filters for non-reactive and non-corrosive gases. Double-ended connection for hoses with 6 mm outer diameter, replaceable filter element, pore size: 5 µm, PU = 1	3604061
Particle filter 3 PTFE Single-use particle filter made from PTFE for reactive gases. Double-ended connection for hoses with 6 mm outer diameter, replaceable filter element, pore size: 5 µm, PU = 1	3604063
Push-pull hose plug adapter for outer diameters of 6 mm, PU = 2	3604055

The following spare parts are available for the D-ReX PoS:

Spare part	Artikelnummer
Spare part: Bayonet lock for internal sensor cartridges	3601000
Spare part: Pump module (mechanical components)	3604202
Spare part: D-ReX PoS cover	3604201
Spare part: D-ReX PoS cover including pump module	3604203
Spare part: Replacement filter elements for particle filter 2 Replacement filter elements for particle filter 2, Pore size: 5 µm, PU = 10	3604062

1.3 Further applicable documents

This technical document is complete in itself.

The following table lists all further applicable documents.
If required, GfG will send you more information and additional copies of these documents.

» Configuration	Included upon delivery
» Testing protocol	Included upon delivery
» Declaration of Conformity	(► Seite 109)
» Dimensioning	(► Seite 108)

Depending on the application configuration: Document number:

» Annex “Modbus implementation“	245-002.22_ABA_DReX-Modbus
» Annex “LonWorks implementation“	245-002.23_ABA_DReX-LonWorks
» Sensor data sheet	Depends on used sensor
» OM external relay module	222-000.24_OM_GMA200-RT

You must also adhere to all relevant laws, norms and guidelines for accident prevention and environmental protection of the country the product is used in.

If you think this operation manual contains any mistakes, discrepancies or ambiguities, contact the manufacturer before using this product.

2. Safety

This operation manual contains detailed descriptions for the safe and proper installation, connection, commissioning, use, maintenance and testing of the product. It also contains safety instructions and general information about the product.

It is intended exclusively for specially trained users and authorized technical personnel.

Read this technical document carefully to familiarize yourself with the product. Pay special attention to the information in this chapter.

2.1 Manufacturer

Manufacturer of the product is:

GfG Gesellschaft für Gerätebau mbH
Klönnestraße 99
44143 Dortmund
Germany

Phone: +49 231 564 00-0
Fax: +49 231 564 00-895
Email: info@gfg-mbh.com
Web: GfGsafety.com

If required, you will receive further information about the product and additional copies of this technical document from this address.

2.2 Disclaimer

All information and notes in this technical document have been compiled taking into account the applicable standards and regulations, current state of the art technology and our many years of knowledge and experience.

The manufacturer does not assume liability for damages due to:

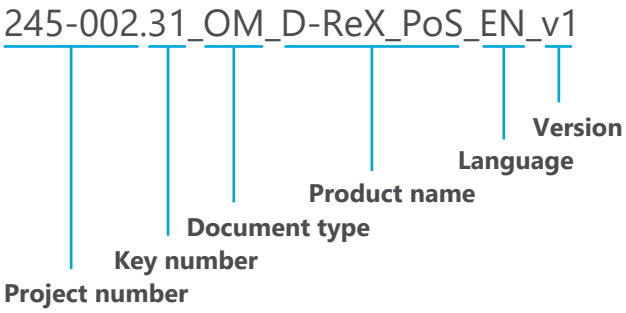
- the use of unauthorized accessories
- the use of non-approved spare parts
- technical modifications
- failure to comply with these instructions
- use not in accordance with the intended purpose
- unauthorized modification
- operation by employees without appropriate training or specialist knowledge

The obligations agreed in the delivery contract, the general terms and conditions and delivery conditions of the manufacturer as well as the legal regulations valid at the time of the conclusion of the contract shall apply.

2.3 Subject to alterations

The information contained in this technical document corresponds to the technical specifications released at the time of publication. Changes will be taken into account in a new edition of the operation manual.

Composition of the document number:



2.4 Place of storage

This document as well as any further applicable documents must be kept on hand and accessible at all times for later use.

2.5 Symbols in this manual

Safety instructions are identified by symbols in this manual. The safety instructions are introduced by a signal word expressing the extent of the hazard.

DANGER

Specific designation of the type of hazard
Behavior to avoid danger

This combination of symbol and signal word indicates an **imminently** hazardous situation which, if not avoided, will result in **death or serious injury**.

WARNING

Specific designation of the type of hazard
Behavior to avoid danger

This combination of symbol and signal word indicates a **potentially** hazardous situation which, if not avoided, could result in **death or serious injury**.

CAUTION

Specific designation of the type of hazard
Behavior to avoid danger

This combination of symbol and signal word indicates a **potentially** hazardous situation which, if not avoided, may result in **minor injury or moderate injury**.

ATTENTION

Specific designation of the type of hazard
Behavior to avoid danger

This combination of symbol and signal word indicates a **potentially** hazardous situation which, if not avoided, may result in **property damage**.

2.6 Safety information in handling instructions

Safety instructions may refer to individual instructions for action. Such safety instructions are embedded in the action instruction so that they do not interrupt the flow of reading while performing the action. The previously described signal words are used.

Example:

Contaminations on the device's exterior may be removed with a damp cloth. Do not use solvents or cleaning agents!

ATTENTION

Possible damages to the D-ReX or sensor
Solvents can damage the housing of the D-ReX. Some cleaning agents also contain ingredients which may act as sensor poisons and could thus affect the function and / or lifetime of the sensor!*

* This example refers to the manner of presentation and not the content of this technical document.

2.7 Warning signs used in this document

The following warning signs are used to draw attention to particular hazards in safety instructions:

Warning sign	Type of danger
	General warning sign
	Warning of dangerous electrical voltage
	Fire hazard

Tips and recommendations

This symbol highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

Reference to another chapter in this document.

2.8 Other markings

The following paragraphs provide an overview of the spelling and abbreviations used in these operating instructions.

2.8.1 General notation

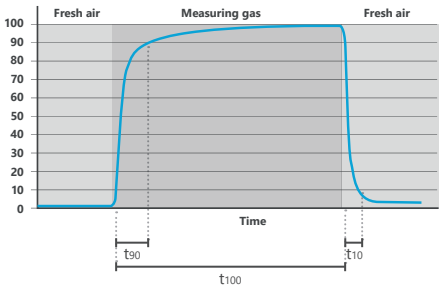
Within this document, certain information is highlighted by special notations to ensure better readability.

Notation	Usage	Example
VERSALIA	Hardware operating element	ON/OFF switch
Underlined	Software operating element	Press Next button
[Bracket]	Keyboard key	[ctrl] + [alt]
Bold	System notification	**Alarm1** limit value exceeded
Text > Text	Menu path	Parameter > Control parameter
(► page page number)	Cross reference	(► page 23)
1. Text 1 2. Text 2	Step by step instructions	1. Disconnect mains plug 2. Remove housing cover. For this...
» ...	Enumeration without order	

2.8.2 Definition of terms

For better comprehension, some definitions of terms used in these operating instructions are listed below:

- **Measured gas:** The gas or gas compound you are monitoring. It usually consists of air, the target gas and other components. In case of the D-ReX, it reaches the sensor by diffusion.
- **Target gas:** Gaseous substance you are trying to detect in the measured gas and want to be warned of.
- **Test gas:** Gas compounds of known composition used for calibration and adjustment of gas detection systems.
- **Replacement test gas:** Gas/air mixture used as a substitute for difficult-to-handle gas.
- **Zero gas:** Test gas that contains neither the target gas nor interfering impurities.
- **Interfering gas:** A gas that causes the sensor to react even if the target gas is not present, or that falsifies the measurement result when target gas is present.
- **Cross sensitivity:** It represents the sensitivity of a measuring device to quantities other than the measurand.
- **Calibration:** Comparison of a gas detector's / sensor's displayed result with a known test gas concentration without adjusting. Depending on the degree of deviation detected, the device:
  - can continue to be operated within the permissible deviation from the set value
  - must be adjusted
  - must be repaired
- **Adjustment:** Adjustments of the zero point and sensitivity of the gas detector / sensor with a known zero gas or test gas.



- **Adjustment time:** The adjustment time **t100** is the time span required by a measuring device to react to sudden changes in the value of the measurand with a corresponding change of the measuring signal. The change in measurement signal itself is not abrupt but rather follows the shape of a curve, which gradually approaches the target value. The shorter the adjustment time, the faster a transmitter will display the actual current concentration of a gas.

  Since it takes a disproportionately long time to settle to the last 10 % accuracy both when rising and when falling, intermediate values such as **t90**, **t50** or, in the case of decreasing gas concentration, **t10** are much more important. They provide significantly better response times with sufficient accuracy.

  Detailed information on the **t90** times of D-ReX sensors can be found in the sensors' data sheets.

» **Non-latching alarm:** A non-latching alarm is reset automatically as soon as the target gas concentration falls back below (or, in case of O_2, rises above) alarm threshold 1. The assigned relays will also be deactivated.

» **Latching alarm:** A latching alarm will stay active when the target gas concentration falls back below (or, in case of O_2, rises above) alarm threshold 1. It has to be reset manually. The assigned relays will stay active during this time.

» **Occupational exposure limits (OEL):** The occupational exposure limit is the limit for time-weighted average concentrations of a substance in the ambient air at the workplace within a given reference time. It indicates the concentration of a substance up to which acute or chronic harmful effects on the health of employees are generally not to be expected. The occupational exposure limit is displayed in ml/m³ (ppm). The most common international occupational exposure limits include STEL (short-term exposure limit) and PEL (permissible exposure limit). In any case, the national guidelines of the country the device was installed in apply.

» **STEL (short-term exposure limit):** The short-term exposure limit (STEL) is the permissible average exposure for a short time, usually 15 minutes, as long as the time-weighted average (TWA) is not exceeded.

» **PEL (permissible exposure limit):** The permissible exposure limit (PEL or OSHA PEL) is a national limit value guideline in the United States which regulates the exposure of an employee to a chemical substance. PELs are usually given as time-weighted averages (TWA).

» **TWA (time-weighted average):** The TWA value is the average exposure over a certain amount of time, usually eight hours. This means that a worker may be exposed to concentration levels above the PEL for limited periods of time as long as the TWA value is not exceeded. In many places, the term TWA is used as a synonym for the occupational exposure limits for times of up to eight hours.

2.8.3 Abbreviations and SI units

In this document, abbreviations are shown and used in the same way as they are shown in the display for reasons of space. SI units are used according to international guidelines.

2.9 Intended use

The D-ReX PoS is an independent 1-gas detection system for DIN rail mounting. It is used for monitoring gas concentrations at the installation location via an intake pump. It can monitor oxygen as well as toxic and combustible gases and vapors. The D-ReX may only be mounted outside of Ex zones. However, if you are using a flame arrester, you may also sample gas from Ex zones.

WARNING

Explosion hazard

The device may not be mounted in Ex zones!

When used as intended and according to the requirements and conditions specified in this technical document as well as the safety instructions in this technical document and on the product itself, the product poses no danger to people, property or the environment. This applies throughout its entire service life, from delivery, installation and operation to disassembly and disposal.

Adjustments in service mode may only be carried out by professionally qualified personnel. Any use beyond the intended use is considered misuse.

Some gases require you to use a pyrolyzer for safe detection. It needs to be installed upstream of the D-ReX. Please adhere to the following guidelines:

» Always use the pyrolyzer specified for your target gas
» Connect the pyrolyzer to the D-ReX as instructed
» Always use PTFE hoses for these gases. This also applies to the connection between Py-ReX and D-ReX

WARNING

Operate the Py-ReX pyrolyzer exclusively with a D-Rex PoS to avoid hazardous situations or damage.
The Py-ReX was developed exclusively for use with the D-ReX PoS. The D-ReX monitors the parameters of the pyrolyzer and simultaneously ensures permissible operating parameters. Any other use constitutes non-intended use

2.10 Due diligence of the operator

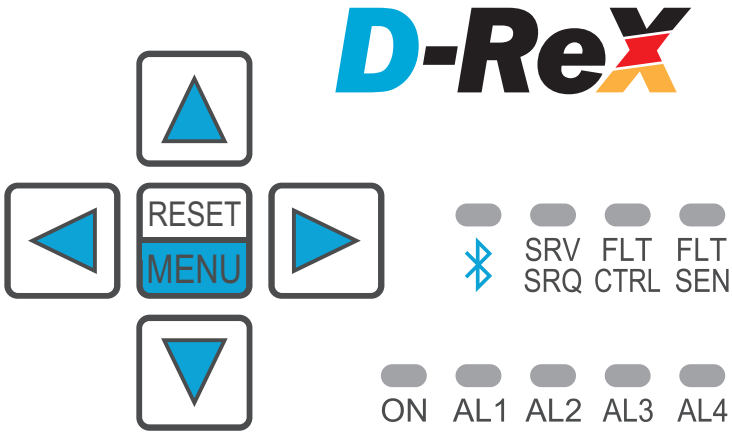
To avoid accidents, malfunctions and undue effects on the environment, those responsible for installation, operation, maintenance and disposal must ensure the following:

- All safety instructions and hazard warnings must be observed
- Employees are instructed regarding occupational safety and proper use of the product, especially with regards to the safety instructions in this operation manual
- Regulations, operating instructions for safe handling and the instructions on staff behavior in case of alarms are kept easily accessible at all times. If necessary, that means posting them on the premises.
- The product is only used in perfect, functional condition
- The scheduled inspection intervals and maintenance cycles are adhered to.
- Only spare parts and auxiliary materials approved by the manufacturer are used
- The specified operating conditions and requirements regarding the installation location are observed
- Installation, electrical connection and commissioning of the product are carried out exclusively by qualified, trained staff

The operator is responsible for ensuring that the product is used as intended.

3. Functional design

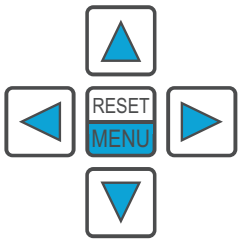
3.1 Control buttons and display



The following elements are located at the front of the D-ReX:

- 5 control buttons
  - Alarm acknowledgement and selection button RESET/MENU
  - 4 arrow buttons for navigation (UP, DOWN, RIGHT, LEFT)
- Status LED for Bluetooth
- Status LEDs for operating conditions
- Status LED for power supply
- Status LEDs for alarms
- A window to the sensor cartridge's label
- Status LEDs for LAN connection

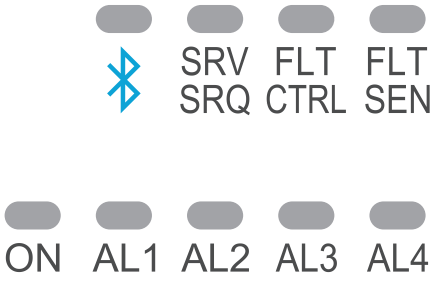
3.1.1 Control buttons



In measuring mode, use the control buttons to switch between different display presentations of the measured values or return to the overview. The RESET/MENU button is used for alarm acknowledgement and to enter the main menu.

Use the control buttons in the main menu and service menu to navigate the menus or adjust the settings.
For more detailed information, refer to section 5.1 Keypad and controls (► page 35)

3.1.2 Status-LEDs



Status LED Bluetooth
The upper left LED is labeled with the Bluetooth symbol . It provides information on the status of the Bluetooth connection.

LED off	Bluetooth is deactivated in the settings
LED flashes (blue)	Bluetooth is activated in the settings
LED is lit (blue)	Active Bluetooth connection

Status LED Service
The second LED in the upper column is labeled SRV/SRQ. It informs you if the D-ReX is in service mode (SRV) or when servicing is overdue (service request – SRQ).

LED off	Normal operation
LED flashes (yellow)	Date for next servicing has been exceeded. The D-ReX will continue operating as usual.
LED is lit (yellow)	D-ReX is in service mode

Status LED Device error
The third LED in the upper column is labeled FLT/CTRL. It provides information on the status of the D-ReX.

LED off	Normal operation
LED is lit (yellow)	An error has occurred on the D-ReX

Status LED Sensor error
The fourth LED in the upper column is labeled FLT/SEN. It provides information on the status of the sensor and the sensor cartridge.

LED off	Normal operation
LED is lit (yellow)	An error has occurred during communication with the sensor

Status LED Power supply
The first LED in the lower column is labeled ON and indicates whether the D-ReX is being supplied with power (mains supply or Power over Ethernet, PoE)

LED off	no power supply
LED is lit (green)	Supply voltage is applied

Alarm LEDs 1 to 4
LEDs two to five of the lower column are labeled AL1 to AL4 and give information on whether any set alarm thresholds have been exceeded.

All LEDs off	Normal operation
LED flashes (red)	this alarm threshold was exceeded
LED is lit (red)	this alarm has been acknowledged, but the alarm threshold is still exceeded

If more than one alarm thresholds are exceeded, all corresponding LEDs will flash.
Example: If **AL2** is exceeded, **AL1** will also continue flashing.
Additionally, information on the alarms is indicated on the display and the alarm status is highlighted by corresponding colors.

The alarms on the D-ReX can generally be configured freely and can be set to current values and average values. The alarm thresholds for alarm **AL1** and **AL2** are initially set automatically to the values stored in the D-ReX alarm table, which are based on health and safety regulations, as soon as a sensor is inserted and recognized.

For more information on setting alarms, refer to section 5.4.1.1.3 Alarms
(► page „5.4.1.1.3 Alarms“ auf Seite 71)

Status-LEDs LAN
Two LAN status LEDs are located in the bottom left corner of the housing cover, above the RJ45 plug.

They correspond to the LEDs located on the RJ45 plug in regards to the information they supply. Since these are facing downwards on the D-ReX (and are also covered by the CAT cable), the information is additionally shown on the device's front.

The left LED is labeled LAN / 10/100.
LED off no LAN connection
LED is lit (green) LAN connection (usually 100 Mbit) active

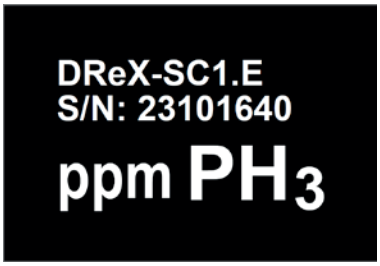
The right LED is labeled LAN/ACT.
LED off no data transfer
LED flashes (green) data transfer active

3.1.4 Window to sensor cartridge

Below the display, there is a window allowing you to see the label of the inserted sensor cartridge.

Sensor cartridge without sensor

Sensor cartridge without sensor:
» Type of cartridge
SC1.E = Cartridge for electrochemical and infrared sensors
SC1.C = Cartridge for catalytic sensors
» Serial number
» Smart GS (Gas sensor)
» Suitable for the following types of sensor



Sensor cartridge with sensor

Sensor cartridge with sensor:
» Type of cartridge
SC1.E = Cartridge for electrochemical sensors
SC1.C = Cartridge for catalytic sensors
» Serial number
» Unit
» Molecular formula

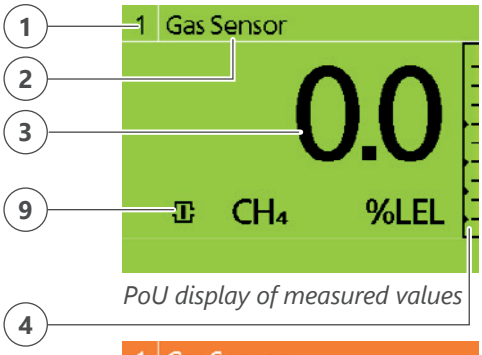
3.1.5 TFT color display

The D-ReX's screen can display different measured values and system information. The measured values displayed by default depend on the D-ReX configuration you ordered. They can be adapted individually on site.

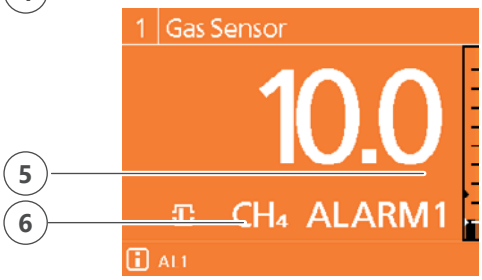
The 2.4" (320 x 240 Pixel) TFT color screen displays up to 16 16 million colors and information in clear text. Currently, information can be displayed in German or English. More languages will be added later.

3.1.5.1 Display of measured values

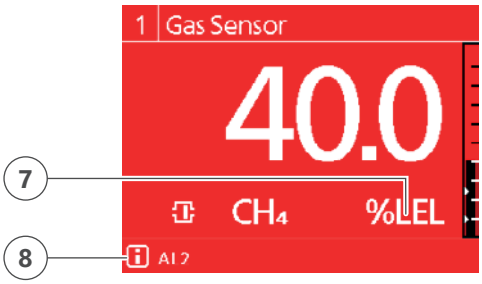
In normal operation, the measured values are displayed with the screen backlit in green. The background's color will switch to orange or red in case of an alarm. The alarm's number, for example "ALARM 1" and the unit the gas is measured in are displayed in alternation.



PoU display of measured values



View Alarm 1



View Alarm 2 to 4

ATTENTION

Alarm's signal color depends on alarm number

Regardless of whether a measured value or an average value is used as an alarm threshold for Alarm 1, the background is always lit orange. On alarms 2 to 4, it will always be red.

The following information is also displayed:

1 **Position of measured value**
IYou can access additional information on a measured value position in from the main menu.

2 **Designation of the measured value position**
The designation can be changed using the D-ReX configuration program.

3 **Current measured value**

4 **Bar graph**
The current measured value is additionally displayed in a bar graph, using the percentage of the sensor's measuring range.

5 **Alarm threshold markers**
Small triangles ► mark the set alarm thresholds. Up to 4 alarm thresholds can be set at a time

Alarm thresholds for the target gas can be set either for when the measured value exceeds them (or, in case of O2, falls below) or for time-weighted average concentrations (STEL / TWA). In case of time-weighted average alarms, the current gas value may exceed the nominal alarm threshold without triggering an alarm, since the average over time is still not critically dangerous

6 **Type of gas**

7 **Unit or Unit / Alarm number in alternation**

8 **[i] Info-Icon** followed by a note on the error or operational status, e.g. **AL1**, **AL2** or **FLT**, **Start up**.

9 **Pump Icon**
Animated if pump is active

Change measured value view

Actions:

Control button DOWN:
Scroll down through the measured value positions

Control button UP:
Scroll up through the measured value positions

Control button RIGHT:
Access the overview of measured value positions

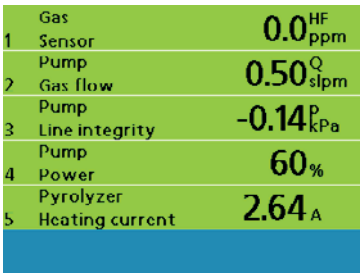
Control button RESET/MENU:
Hold down for > 3 s to switch to the main menu

Control button LEFT:
Switch to measured value overview

In measuring mode, use the control buttons to switch between different display presentations of the measured values or return to the overview. The RESET/MENU button is used for alarm acknowledgement and to enter the main menu.

Use the control buttons in the main menu and service menu to navigate the menus or adjust the settings.
For more detailed information, refer to section 5.1 Keypad and controls (► page 35)

3.1.5.2 Overview of measured values and default designations



Measured value positions view PoS Including Py-ReX pyrolyzer

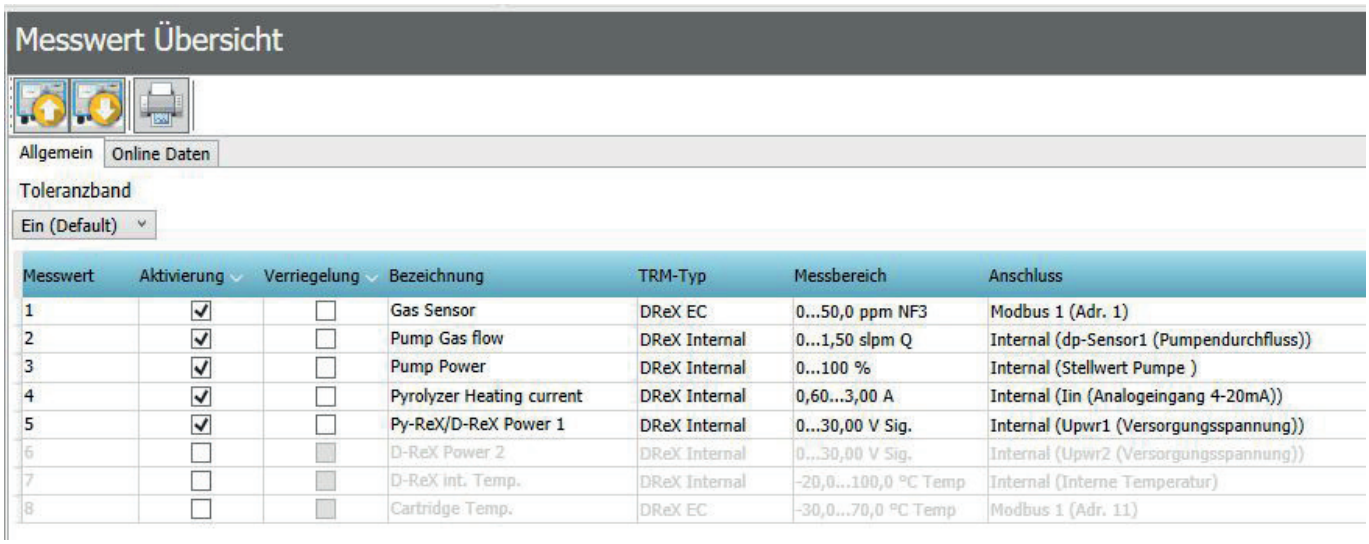
Das D-ReX PoS kann neben den Messwertinformationen des zu überwachenden Gases bis zu 8 weitere Messwerte und Funktionen überwachen.

Diese haben jeweils eine eigene Messwert- und eine eigene Übersichtsansicht mit zugehöriger Messwertposition.

Die Übersicht zeigt an, welche Parameter derzeit aktiv überwacht werden.
Das D-ReX PoS kann die nachfolgenden 8 Funktionen und Werte überwachen:

Measured value position	Default designation
1	Gas sensor
2	Pump gas flow
3	Pump power
4	Pyrolyzer heating current
5	Py-ReX/D-ReX power 1
6	D-ReX power 2
7	D-ReX int. temp.
8	Cartridge temp.

The digit in front of the designation specifies the measured value position. The designation itself can be adjusted individually using the DReX-Config software.



Messwert	Aktivierung	Verriegelung	Bezeichnung	TRM-Typ	Messbereich	Anschluss
1	☑	☐	Gas Sensor	DReX EC	0...50,0 ppm NF3	Modbus 1 (Adr. 1)
2	☑	☐	Pump Gas flow	DReX Internal	0...1,50 slpm Q	Internal (dp-Sensor1 (Pumpendurchfluss))
3	☑	☐	Pump Power	DReX Internal	0...100 %	Internal (Stellwert Pumpe)
4	☑	☐	Pyrolyzer Heating current	DReX Internal	0,60...3,00 A	Internal (Iin (Analogeingang 4-20mA))
5	☑	☐	Py-ReX/D-ReX Power 1	DReX Internal	0...30,00 V Sig.	Internal (Upwr1 (Versorgungsspannung))
6	☐	☐	D-ReX Power 2	DReX Internal	0...30,00 V Sig.	Internal (Upwr2 (Versorgungsspannung))
7	☐	☐	D-ReX int. Temp.	DReX Internal	-20,0...100,0 °C Temp	Internal (Interne Temperatur)
8	☐	☐	Cartridge Temp.	DReX EC	-30,0...70,0 °C Temp	Modbus 1 (Adr. 11)

Overview of measured values in the DReX-Config software

The digit of the following measured value positions will not change if one or more of the previous measured values are deactivated.

You can access more information on a measured value position from the main menu.

ATTENTION

Deactivated measured values are not monitored!
Activating / deactivating the measured value does not only refer to the display of the value. If a measured value is deactivated, it is not monitored.

Actions:

Control button DOWN:
Scroll down if there are more than 6 measured value positions

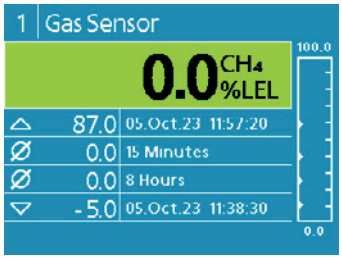
Control button UP:
Scroll up if there are more than 6 measured value positions

Control button RIGHT:
Back to the measured value 1's view of measured values

3.1.5.3 Overview

The current measured value is highlighted green in the overview as well.
If one of the alarm thresholds is exceeded, the green bar will turn either orange or red, depending on the triggered alarm.

Depending on the measured value position you selected, additional information is also displayed. For position 1 "Gas sensor", for example:



Overview

Overview

In the overview, the current measured value is also backlit green in normal operation. If it exceeds an alarm threshold, the green bar will turn either orange or red, depending on the triggered alarm.

The following information are also displayed in this view:

1 Measured value position
2 Designation of measured value position
3 Current measured value
4 Lower and upper values of the measuring range; in this example: 0-100 % LEL
5 Bar graph
6 Alarm threshold markers
7 Maximum value with time stamp since system start-up or last reset of the value
8 Average value (TWA), e.g. 15 minutes (time frame can be adjusted)
9 Average value (TWA) e.g. 8 hours (time frame can be adjusted)
10 Minimum value with time stamp since system start-up or last reset of the value

Actions:

Control button RIGHT:
Hold down for 3 seconds to set the minimum and maximum value to zero or respectively reset the current gas concentration. The previous values cannot be restored or displayed after this.

Control button LEFT:
Switch to measured value view

3.2 Visual and acoustic alarms

The D-ReX will warn you visually by changing its display color from green to orange or red (► page 21) and by the respective error or alarm LEDs being lit up.

An acoustic and additional visual alarm can be triggered either via the internal relays (optional) or an external relay module (GMA200-RT or GMA200-RTD).

More detailed information on the different alarms can be found in section 5.4.1.1.3 Alarm configuration (► page 71).

3.3 Digital RS-485 interface

The D-ReX features two useable, digital RS-485 interfaces, Modbus 2 and Modbus 3. Modbus 1 is used for internal communication of the D-ReX.

Modbus 2 (middle terminal block X71 to X73) is used for connecting a type GMA200-RT or GMA200-RTD external relay module to the D-ReX. Both relay modules will give you access to an additional 16 relays.

Modbus 3 (left terminal block X66 to X68) is used for connecting the D-ReX to, for example, a PLC.

3.4 Relays

3.4.1 Internal relays (optional)

The D-ReX is optionally also available with five internal relays with one floating changeover contact each (max. 3 A / 30 V DC or min. 10 mA / 5V) for transmitting information on exceeded thresholds as well as fault and maintenance notifications.

All relays can be configured freely, with the exception of one relay having to be configured as a fault relay and one as a service relay. You can either use a separate relay for this purpose or configure the alarm relay as a combined alarm / service relay.

More detailed information on the internal relays can be found in section 5.3.2.3 Main menu > Info relays (► page 109).
If the internal relays are not sufficient for the safety concept you are planning, an additional external relay module can also be connected.

3.4.2 External relay module (optional)

The D-ReX can be expanded by 16 freely configurable relays with one floating changeover contact each by connecting either a GMA200-RT or GMA200-RTD (D = comes with its own display and control buttons) external relay module.
They are connected via the RS-485 interface. The relay module can be located up to 1200 m away from the D-ReX itself. Data is typically transferred with cycle time of 1.0 sec. In case of temporary disruptions, the relay module's reaction time may increase to up to <4 sec.

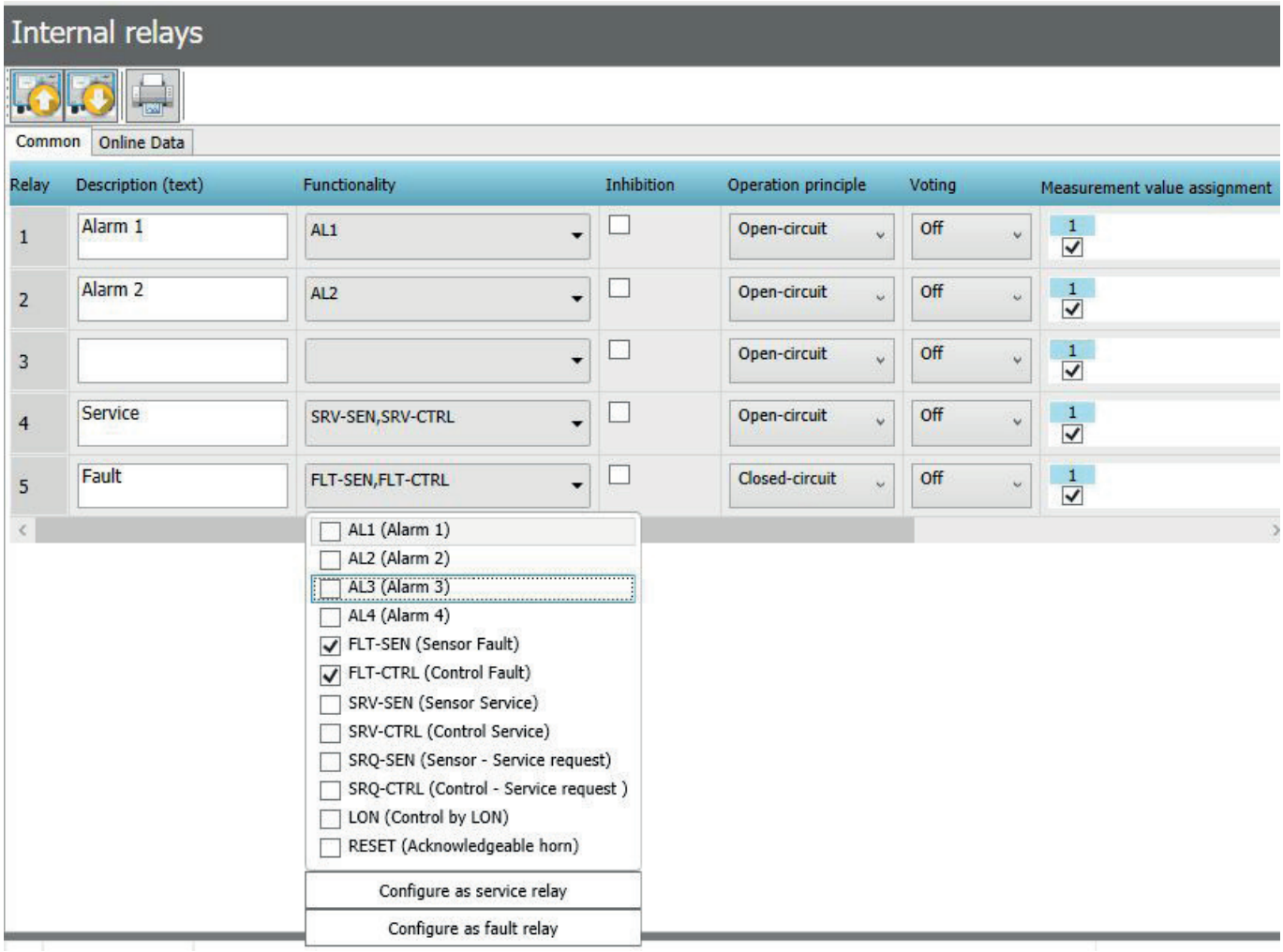
If data transmission to the relay is disrupted for longer amounts of time, the D-ReX will indicate a fault, beginning with the third consecutive faulty data transmission.

The relay modules are not part of this operation manual. For further information, please refer to operation manual GMA200-RT/RTD (222-000.24_BA_GMA200-RT).

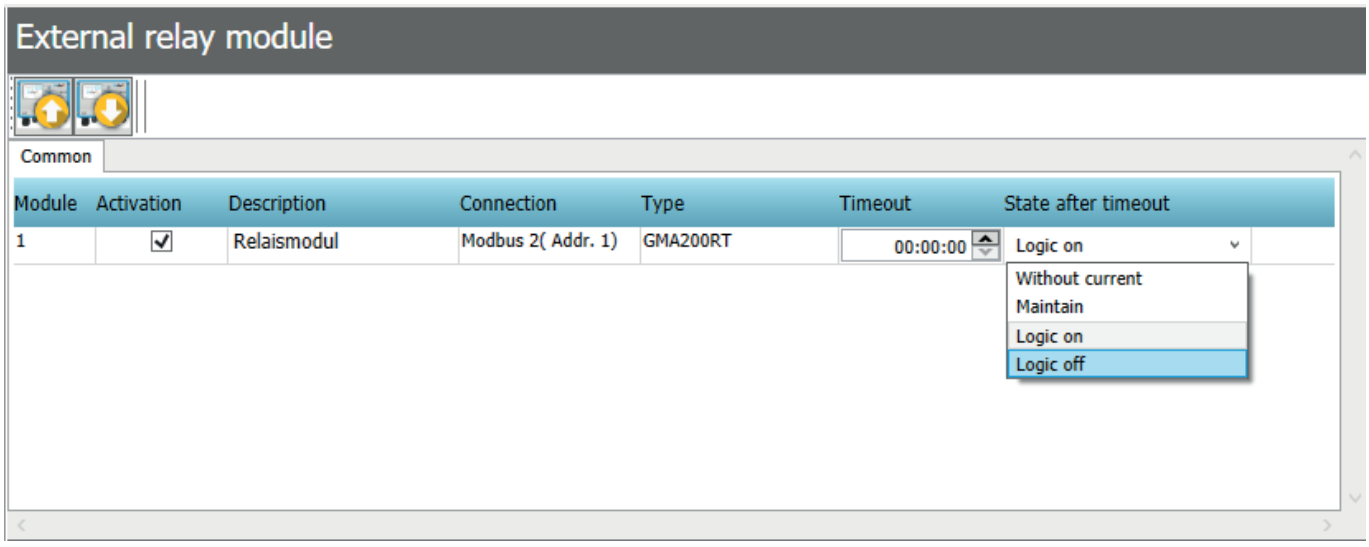
3.4.3 Configuration of the relays

The internal relays are configured using the DReX-Config software. It offers extensive options to assign the relays to alarm functions and measuring points or measurement groups.

Configuration options:
» Open circuit principle/Closed circuit principle
» Single alarms per measuring point and alarm threshold
» Collective or group alarms
» Fault notifications
» Configuration of And/Or connections



The DReX-Config software is also used to configure the communication with the external relay module.



The 16 additional relays are still configured using the GMA200-Config software.

3.5 Analog outlet

The D-ReX has an analog 4-20 mA outlet which emits a voltage proportional to the measured value. This analog signal can be further processed by superordinate control systems, since the measured value is already linearized.

The following table lists output currents and their corresponding D-ReX status.

Output current	**Status in measuring mode and special statuses**
approx. 0.0 mA	no active measuring point assigned
approx. 0.0 mA	D-ReX in start-up phase
approx. 0.0 mA	D-ReX in fault condition (influencing the measuring points measuring ability)
1.2 mA	assigned measuring point in fault condition
1.6 mA	assigned measuring point in start-up
2.0 mA	D-ReX in configuration mode (maintenance)
2.4 mA	assigned measuring point in maintenance mode
2.8 mA	measured value ≤ -7.5 % of the measuring range (if Clamping* is not active)
2.8 to 4.0 mA	measured value ≤ 0 % of the measuring range (if Clamping* is not active)
4.0 mA	measured value ≤ 0 % of the measuring range (if Clamping* is active)
4.0 to 20 (22) mA	measured value 0 to 100 (112.5) % of the measuring range
22.0 mA	measured value ≥ 112.5 % of the measuring range
Manual specification	Test mode active (maintenance)

* Clamping prevents the output current from becoming < 4 mA in measuring mode for measured values below the measuring range. Without this in place, problems could arise for interactions with PLCs. Clamping can be activated and deactivated using the DReX-Config software.

3.6 Sensors

The D-ReX exclusively uses smart sensors. In this case, “smart” means:

- The D-ReX sensoren come with their own memory chip (EEPROM) which is used for storing individual information, such as the serial number, production date, look-up tables for measured value compensation or coefficients for calculations.
- The D-ReX sensors are pre-calibrated and pre-adjusted. This information, as well as further related parameters, are also stored on the EEPROM and can be read out by the D-ReX. The sensors are thus ready to be used immediately.
- If you receive D-ReX sensors and a sensor cartridge collectively, the sensors and cartridge will have been adjusted and calibrated together.
- The D-ReX will configure itself according to the sensor’s data. Each D-ReX is thus able to measure every gas.
- The only exceptions to this are gases which need an additional pyrolyzer to be detected and must therefore be drawn in. These can only be monitored with a combination of pyrolyzer and D-ReX PoS (Point of Sampling).
- To replace a sensor, only the sensor itself has to be switched out, not the entire cartridge. You can continue to use the same sensor cartridge, reducing both costs and the amount of electronical waste.
- To change the monitored type of gas, you simply replace the sensor or insert a new sensor cartridge with appropriate new sensors into the D-ReX.

ATTENTION!

Interaction between sensor cartridge and sensor

Even if the D-ReX sensors are ready to use upon delivery, we recommend adjusting and, if necessary, calibrate them (and the sensor cartridge) before commissioning. There might be minor deviations regarding readouts. For sensors which are delivered in combination their sensor cartridge, this step is not necessary. Adhere to any national regulation or internal business guidelines deviating from this recommendation and specifying that this check as mandatory instead.

3.6.1 Smart electrochemical sensors (EC)

The D-ReX' EC sensors are used in combination with the internal sensor cartridge for EC/IR/PID sensors (item no. 3601001). Refer to the table below for a list of available sensors sorted by gases

3.6.1.1 Smart electrochemical sensors (EC) – Standard gases

Gas	Formula	Measuring range	Type	Item no.
Ammonia	NH_3	0-100 ppm	MK393-10	3600068
Ammonia	NH_3	0-1000 ppm	MK399-10	3600069
Ammonia	NH_3	0-5000 ppm	MK455-10	3600070
Arsine	AsH_3	0-1 ppm	MK482-10	3600040
Arsine	AsH_3	0-1 ppm (no cross-sensitivity to H2)	MK483-10	3600041
Arsine LT[1] LDL[2]	AsH_3	0-1 ppm	MK490-10	3600042
Bromine	Br_2	0-5 ppm	MK474-11	3600048
Hydrogen bromide	HBr	0-30 ppm	MK479-11	3600061
Chlorine	Cl_2	0-10 ppm	MK474-10	3600053
Chlorine dioxide	ClO_2	0-2 ppm	MK391-10	3600055
Chlorine trifluoride	ClF_3	0-1 ppm	MK391-11	3600086
Hydrogen chloride	HCl	0-30 ppm	MK479-10	3600062
Hydrogen cyanide	HCN	0-30 ppm	MK409-10	3600064
Diborane	B_2H_6	0-1 ppm	MK484-10	3600043
Dichlorosilane	DCS	0-30 ppm	MK479-12	3600078
Ethylene oxide	ETO	0-20 ppm	MK452-10	3600085
Fluorine	F_2	0-5 ppm	MK414-10	3600087
Hydrogen fluoride	HF	0-10 ppm	MK475-10	3600066
Germanium	GeH_4	0-5 ppm	MK484-10	3600088
Hexamethyl disilazane	HMDS	0-0.5 vol %	MK399-11	3600092
Hydrazine	N_2H_4	0-1 ppm	MK486-10	3600090
Carbon monoxide	CO	0-500 ppm	MK443-10	3600050
Ozone	O_3	0-1 ppm	MK411-10	3600073
Ozone	O_3	0-5 ppm	MK473-10	3600074
Phosgene	$COCl_2$	0-2 ppm	MK349-10	3600052
Phosphine	PH_3	0-1 ppm	MK478-10	3600075
Oxygen	O_2	0-25 vol % (5-year sensor, lead-free)	MK466-10	3600071
Sulfur dioxide	SO_2	0-10 ppm	MK480-10	3600080
Hydrogen sulfide	H_2S	0-100 ppm	MK445-10	3600059
Hydrogen selenide	H_2Se	0-5 ppm	MK485-10	3600089
Silane	SiH_4	0-50 ppm	MK477-10	3600079
Nitrogen	NO	0-100 ppm	MK456-10	3600093
Nitrogen dioxide	NO_2	0-30 ppm	MK459-10	3600095
Tetraethyl orthosilicate	TEOS	0-100 ppm	MK481-10	3600081
Trimethylborate	TMB	0-500 ppm	MK481-11	3600082
Hydrogen	H_2	0-2000 ppm	MK401-10	3600056
Hydrogen	H_2	0-1 vol %	MK402-10	3600057
Hydrogen	H_2	0-4 vol %	MK403-10	3600058

[1] Long-time: Sensor with ionic liquid electrolyte for long service life, even in difficult conditions (e.g. high temperatures)

[2] Lower Detectable Limit. Refer to sensor data sheet for details.

3.6.1.2 Smart electrochemical sensors (EC) – Pyrolyzer required

Some highly toxic or chemically inactive gases cannot be detected directly. In these cases, the target gas is decomposed by a Py-ReX pyrolyzer connected upstream of the D-ReX. The amount of decomposition products is then used to calculate the target gas concentration

Gas	Formula	Measuring range	Type	Item no.
Nitrogen trifluoride	NF_3	0-50 ppm	MK475-11	3600067

3.6.2 Smart Infrared sensors (IR)

The D-ReX' IR sensors are used in combination with the internal sensor cartridge for EC/IR/PID sensors (item no. 3601001). Refer to the table below for a list of available sensors sorted by gases.

Smart IR Sensors

Gas	Formula	Measuring range	Type	Item no.
Carbon dioxide	CO_2	0-1 vol %	MK251-10	3600201
Carbon dioxide	CO_2	0-5 vol %	MK250-10	3600200
Carbon dioxide	CO_2	0-10 vol %	MK260-10	3600202
Carbon dioxide	CO_2	0-25 vol %	MK252-10	3600203
Methane	CH_4	0-5 vol %	MK254-10	3600205
Propane	C_3H_8	0-2 vol %	MK253-10	3600206

3.6.3 Smart catalytic sensors (CC)

The D-ReX' CC sensors (also called pellistor) are used in combination with the internal sensor cartridge for CC sensors (item no. 3601002). Refer to the table below for a list of available sensors sorted by gases.

Smart CC Sensors

Gas	Formula	Measuring range	Type	Item no.
Acetylene	C_2H_2	0-100 % LEL	MK221-10	3600156
Butane	C_4H_{10}	0-100 % LEL	MK221-10	3600153
Ethane	C_2H_6	0-100 % LEL	MK221-10	3600158
Ethylene	C_2H_4	0-100 % LEL	MK221-10	3600157
Hexane	C_6H_{14}	0-100 % LEL	MK221-10	3600155
Methane	CH_4	0-100 % LEL	MK221-10	3600150
Pentane	C_5H_{12}	0-100 % LEL	MK221-10	3600154
Propane	C_3H_8	0-100 % LEL	MK221-10	3600152
Hydrogen	H_2	0-100 % LEL	MK221-10	3600151

3.6.4 Smart photoionic sensors (PID)

The D-ReX' PID sensors are used in combination with the internal sensor cartridge for EC/IR/PID sensors (item no. 3601001). Refer to the table below for a list of available sensors sorted by gases

Smarte PID-Sensoren

Gas	Formula	Measuring range	Type	Item no.
Isobutylene	i-C_4H_8	0-2000 ppm	MK463-10	3600250

3.6.4 Advanced sensor data

For further information and specifications, please refer to the sensor data sheet.

4. Mounting and installation

4.1 Mounting location

The D-ReX is intended for DIN rail mounting (TH35, previously TS35), according to DIN EN 60715, in altitudes of up to 2000 meters above sea level. Installations in suitable wall-mounted housings and control cabinets are also included in this. Versions with an increased IP protection class (IP64) may also be mounted outside. Additional protection measures both for the device and sensor may be necessary in this case.

WARNING

Explosion hazard
The device may not be mounted in Ex zones!
It is approved only for use outside of Ex zones.

The D-ReX PoS operates in extraction mode. It uses its integrated pump to take in gas.
Consider the aspects below when mounting the device:

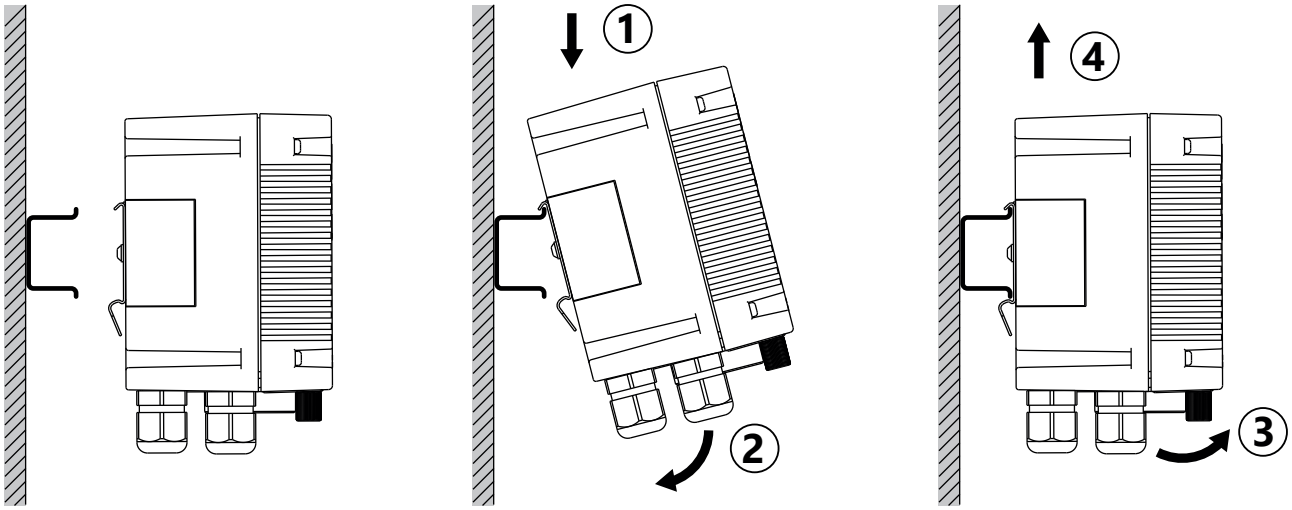
» The maximum intake length (technical) is 30 m. This also applies if you are using additional filters or the Py-Rex pyrolyzer.
» The effective intake length depends on the reactivity of the target gas and the material of the hose you are using. Details on the effective hose length can be found on the sensor data sheets.

GfG recommends using exclusively PTFE hoses to optimize measurement results.

» The maximum length of the recirculation hose (if necessary) is also 30 m.

4.2 Mounting the housing

Mount the DIN rail the D-ReX is attached to horizontally, so the connectors and sensor opening of the device point down when the D-ReX is mounted.



Mounting the device:

» Hook the D-ReX onto the DIN rail at its clip (1)

» Gently press down on its lower edge until it clicks into place (2).

Removing the device:

» Grasp the bottom of the D-ReX and gently pull it out of the DIN rail (3).

» Then, pull it upwards to remove it (4).

4.3 Mounting the hose

The D-ReX's quick-plug connectors are designed for hoses with an outer diameter of 6 mm. We recommend using a 6 x 4PTFE hose for all gases.

To connect hoses with inch units, use an additional push-pull hose plug adapter for outer diameters of ¼'' (Item no. 3604055, PU = 2).

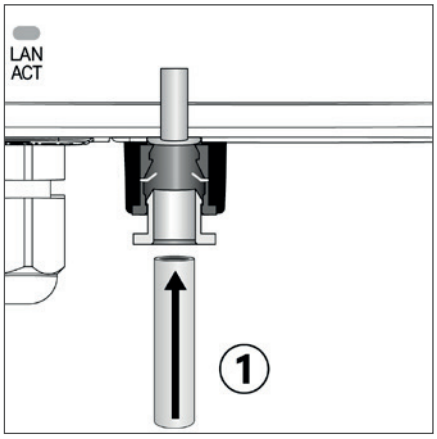
Mount the hose by following these instructions:

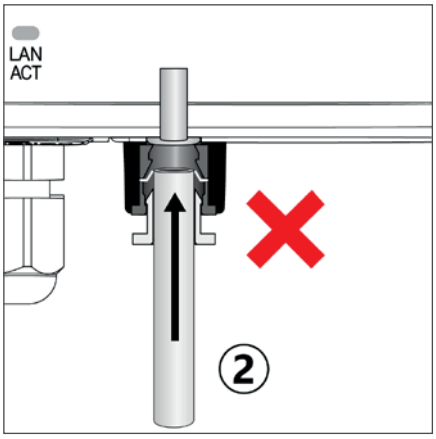
» Cut off a piece of hose in a straight line without damaging the outer surface. You will get the best results using a hose and pipe cutter, since you can only achieve optimal sealing results if the end of the hose is not oval-shaped.

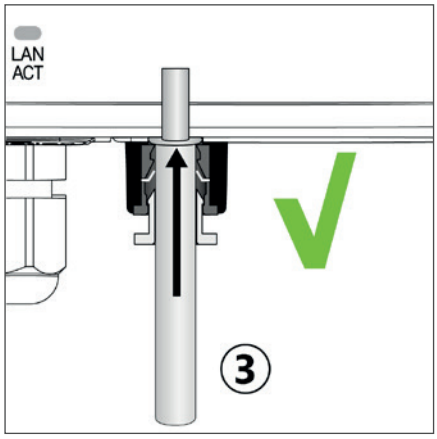
» Clean the end of the hose and remove any burrs.
» Plug the end of the hose into the quick-plug connector through the fastening clips and the seal. Make sure to push it in as far as it will go.

ATTENTION

Incomplete installation may result in leakages or the hose coming loose.



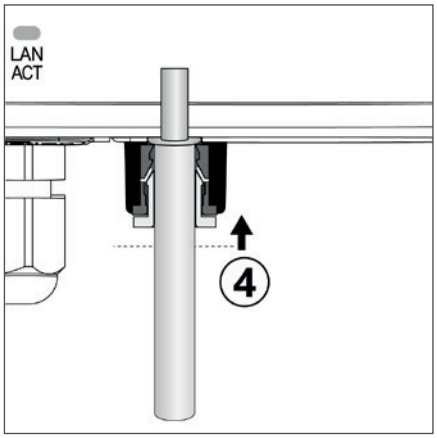


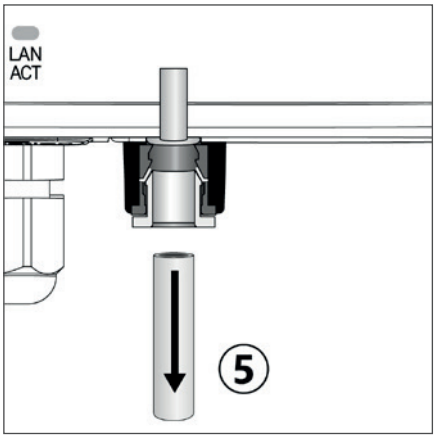


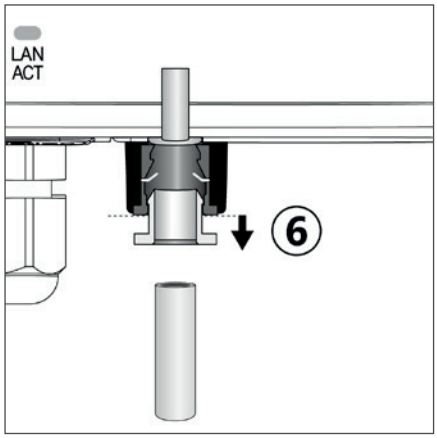
» Check if the connection is securely tightened by briefly pulling on it

To disconnect the hose, follow the instructions below:

» Press down on both sides of the ring, applying equal pressure and pushing them down far enough to evenly open the retaining claws.
» Pull the hose out of the plug connector using a slight twisting motion.







4.4 Electrical connections

ATTENTION

Defects caused by faulty electrical installation

Adhere to DIN VDE 0100 or the corresponding national guidelines when installing the device.

The cables used must be suitable for the intended application. Insulated wires and cables must be flame retardant.

All overcurrent protection devices (fuses, circuit breakers) of the electrical circuit must fulfill the standard requirements of installations inside buildings.

4.4.1 Current supply

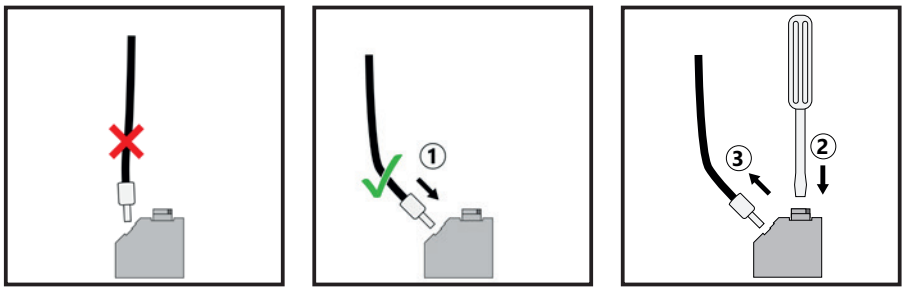
An external 24 V CD power supply provides the current for the D-ReX. This current is connected to the X61 (GND) and X62 (Ub1 – 24 V DC) terminals. Optionally, a second 24 V DC power supply can be connected to the X63 (Ub2 - 24 V DC) and X64 (GND) terminals for redundant power supply.

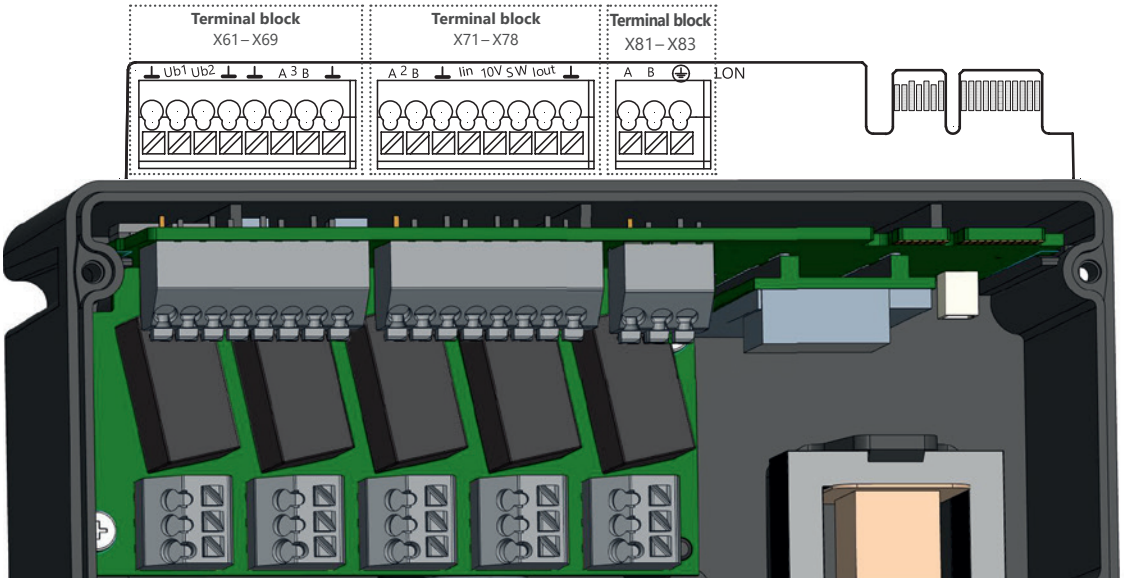
The 24 V DC supply must be either a regulated safety extra-low voltage (SELV) or a protective extra-low voltage (PELV). The power of the power supply units must be sufficient for the D-Rex and any other supplied components.

4.4.2 Terminal assignment plan – connecting the device

All connections (power supply, communication, relays) have to be made according to the terminal assignment diagram.

Plug the cables into their corresponding terminals (1), taking care not to insert them perpendicularly, but at an angle (approx. 45°), as shown in the image below. To remove a cable, hold down the locking mechanism with a small screwdriver (2) and pull out the cable (at an angle as well) (3).





Left terminal block

No.	Abbreviation	Description	Note
X61	GND	Ground	Current supply 1 (SELV/PELV)
X62	Ub1	Power supply input 1– 24 V DC (20 bis 30 V DC)	
X63	Ub2	Power supply input 2– 24 V DC (20 bis 30 V DC)	Current supply 2 (SELV/PELV)
X64	GND	Ground	
X65	GND	Ground	
X66	A 3 (D1+)	Modbus 3 (RS485)	e.g. for connecting to a PLC
X67	B 3 (D0-)	Modbus 3 (RS485)	
X68	GND	Ground	

Center terminal block

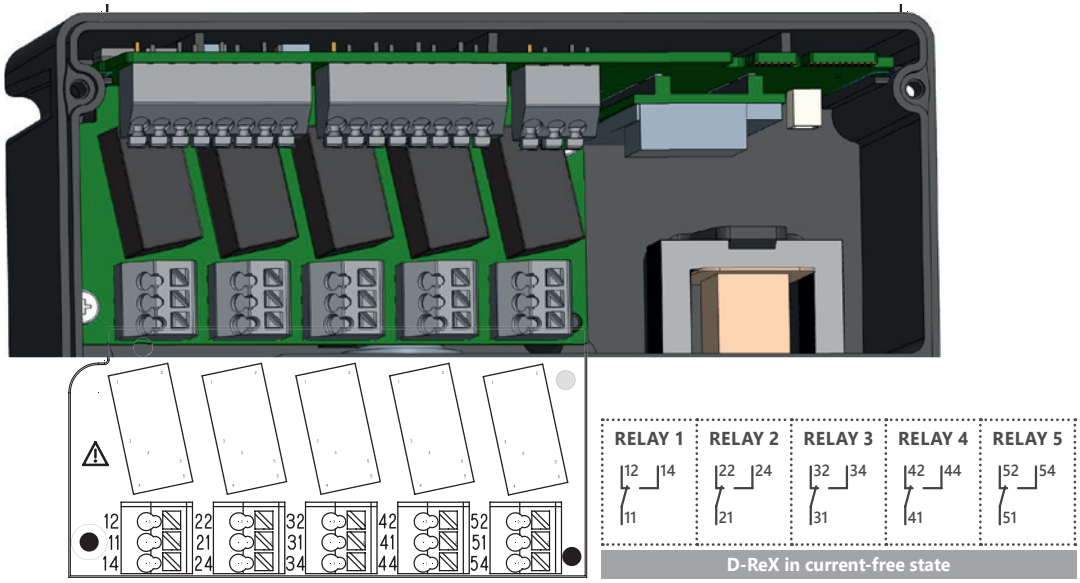
No.	Abbreviation	Description	Note
X71	A 2 (D1+)	Modbus 2 (RS485)	e.g. for connecting an external relay GMA200-RT/RTD
X72	B 2 (D0-)	Modbus 2 (RS485)	
X73	GND	Ground	
X74	Iin	4– 20 mA, input	for Iout of the Py-ReX
X75	10V DC	10 V DC, max. 0.5 A	10 V DC, max. 0.5 A
X76	SW	reserve	
X77	Iout	4– 20 mA, output	for signal evaluation
X78	GND	Ground	

Right terminal block

No.	Abbreviation	Descriptions	Note
X81	A	LON A	Connection of the LONWorks network
X82	B	LON B	
X83	SHLD	Shield	

Current supply 4– 20 mA current output
A freely configurable 4-20 mA current output (Iout) is located at terminals X77 (see table and fig. above). This outlet can be connected to a recorder or external recording device against GND. Terminal X78 is recommended as GND.

4.4.3 Terminal assignment plan – relays



Terminal block relays 1

No.	Abbreviation	Description		Note
X12	12	Relay 1 NC contact	NC (de-energized)	max. 30 V DC/ 3 A (min. 10 mA/ 5 V)
X11	11	Relay 1 switching output	COM	
X14	14	Relay 1 NO contact	NO (de-energized)	

Terminal block relays 2

No.	Abbreviation	Description		Note
X12	22	Relay 2 NC contact	NC (de-energized)	max. 30 V DC/3 A (min. 10 mA/5 V)
X11	21	Relay 2 switching output	COM	
X14	24	Relay 2 NO contact	NO (de-energized)	

Terminal block relays 3

No.	Abbreviation	Description		Note
X12	32	Relay 3 NC contact	NC (de-energized)	max. 30 V DC/3 A (min. 10 mA/5 V)
X11	31	Relay 3 switching output	COM	
X14	34	Relay 3 NO contact	NO (de-energized)	

Terminal block relays 4

No.	Abbreviation	Description		Note
X12	42	Relay 4 NC contact	NC (de-energized)	max. 30 V DC/3 A (min. 10 mA/5 V)
X11	41	Relay 4 switching output	COM	
X14	44	Relay 4 NO contact	NO (de-energized)	

Terminal block relays 5

No.	Abbreviation	Description		Note
X12	52	Relay 5 NC contact	NC (de-energized)	max. 30 V DC/3 A (min. 10 mA/5 V)
X11	51	Relay 5 switching output	COM	
X14	54	Relay 5 NO contact	NO (de-energized)	

4.5 Commissioning

Commissioning can be carried out after the D-ReX, including all add-ons as well as any applicable additional control modules have been installed and the power supply has been ensured. Gas detection devices must be tested for proper functioning by a qualified person according to national guidelines after their installation but before putting them in operation (initial commissioning).

In Germany, the applicable regulations are "DGUV Information 213-056 (Leaflet T 021 Section 8.1)" and "DGUV Information 213-057 (Leaflet T 023 Section 8.1)". You must also adhere to the corresponding standards and regulations of the country the D-ReX is installed in.

5. Operation instructions

5.1 Keypad and operation

The D-ReX has five operating buttons

RIGHT LEFT UP DOWN RESET/MENU

In measuring mode as well as in the main menu or service menu, the buttons have the following functions:

» The UP and DOWN buttons are used to navigate upwards and downwards.
» When entering characters, they allow you to scroll through all available characters (forwards and backwards respectively).
» When entering values, they allow you to scroll through all available values (forwards and backwards respectively).

» The RIGHT and LEFT buttons are used to navigate up or down one level of detail.
» When entering characters, they allow you to move to the next or previous position.
» When entering values, they allow you to move to the next or previous value.

Special feature
» Hold down the RIGHT button for 3 seconds in the overview to set the maximum value and minimum value to the current value and begins a new monitoring period. The previous maximum and minimum value are not saved.

The function button RESET/MENU has the following functions, depending on the D-ReX' operation status and current menu:

Operation status	Action	Function
Measuring mode	Hold down for 3 s	Activates the main menu
Alarm	Press	Acknowledges latching alarms Deactivates the acoustic alarm* for non-latching alarms
Main menu	Press	confirms entered character or values and moves to next position / confirms your entry
Service Menu	Press	confirms entered characters and values and moves to next position / confirms your entry

* An acoustic alarm can only be actuated via an external buzzer which is connected to a relay.

5.2 Measuring mode

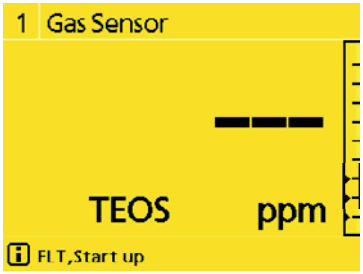
For most sensors, the D-ReX' normal measuring mode begins 60 seconds after switching on the power supply.
Sensors with a bias, such as the ethylene oxide sensor (ETO) or the oxygen sensor (O_2) *, will need a significantly longer adjustment time of up to 15 minutes.

The exact time of the start-up process therefore depends on the sensor you are using and the amount of time the D-ReX or sensor were turned off.

* While the oxygen sensor is ready to monitor after at most 15 minutes, depending on how long was turned off, it may still take a while to indicate a stable value. Adjust or calibrate the sensor only after it has been showing a stable value for some time.

Starting screen

You will be greeted with a starting screen containing the following information:
» Firmware version of the microcontrollers 1 (MC1)
» Firmware version of the microcontrollers 2 (MC2)
» Firmware version HTML software (HTML)
» Serial number of the D-ReX

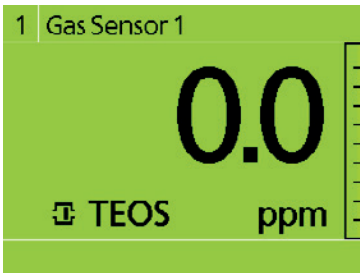


Start-up screen

Shortly after, the D-ReX will switch to a start-up screen containing the following information:
» Measured value position
» Designation of measured value positions
--- in place of the current measured value
» Bar graph with no markers for alarm threshold set yet
» Type of gas
» Unit
» [i] Info icon followed by a message regarding the operation status, in this case:
FLT, Start-up

Sensor

During the warm-up phase, the FLT/SEN-LED will light up yellow. This is not indicating a fault but only shows that the sensor is not yet ready for operation.



Measured value view

As soon as the start-up phase is completed, the device will switch to measured value view.

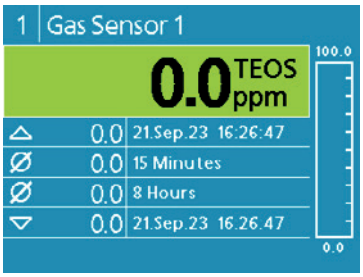
Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT button:
Switch to the measured value overview

LEFT button:
Switch to the display of all measured values



Overview

The overview shows not only the current measured value, but also the maximum and minimum value since the system was started up (or since the last reset) as well as two averaged measured values (usually for eight hours and 15 minutes).

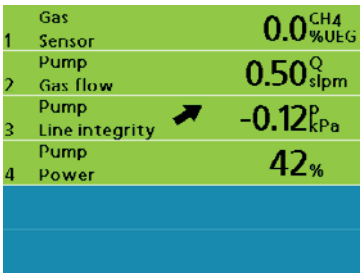
Actions:

Hold down RIGHT button for 3 seconds:
Set the maximum value and minimum value to the current measured value. Previous values cannot be recovered or be displayed after this.

LEFT button:
Switch to measured value view

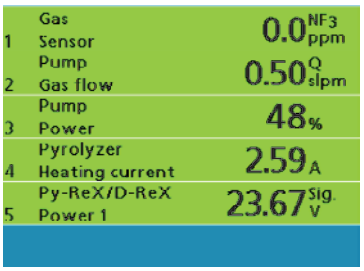
Hold down RIGHT button for 3 seconds:
Set the maximum value and minimum value to the current measured value. Previous values cannot be recovered or be displayed after this.

LEFT button:
Switch to measured value view



View of the measured values including Line Integrity

The display shows all measured values for the respective configuration. The display on the left shows a configuration with Line Integrity Monitoring. For example, for devices with a connected pyrolyzer, its function is also monitored and displayed. A total of up to 8 measured values can be monitored and displayed simultaneously.



View of the measured values including pyrolyzer

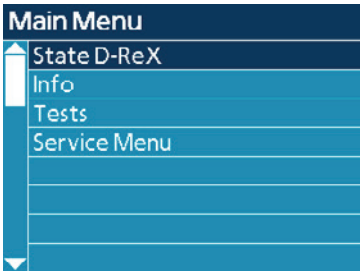
Actions:

DOWN button::
Scroll down through the measured values if there are more than six displayed.

UP button:
Scroll up through the measured values if there are more than six displayed.

RIGHT button:
Switch to the measured value display.

5.3 Main menu



Main menu

The main menu contains a variety of system settings.
It also allows you to trigger various system tests and lets you switch to the service menu.

To enter the main menu, hold the RESET/MENU button for 3 seconds while in measured value view or the overview.

The following menu items are available from the main menu:
State D-ReX
Info
Tests
Service menu

Actions:

DOWN button:
Scroll down through the menu

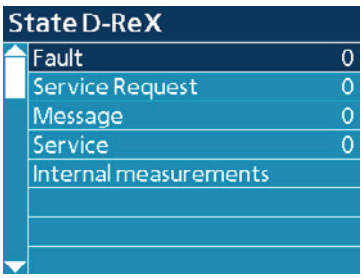
UP button:
Scroll up through the menu

RIGHT button:
Open the highlighted menu

RESET/MENU button:
Open the highlighted menu

LEFT button:
Back to measured value view

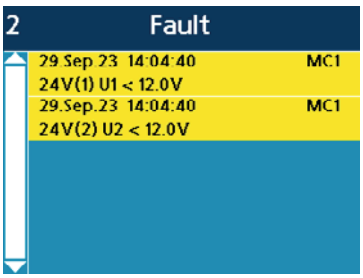
5.3.1 State D-ReX



State D-ReX

The following items are available in the State D-ReX menu:
Fault
Service request
Message
Service
Internal measurements

The numerical value behind the first four menu items (“0” in the adjacent image) indicates the number of active notifications of the individual menus.



Example Fault notification

Actions:

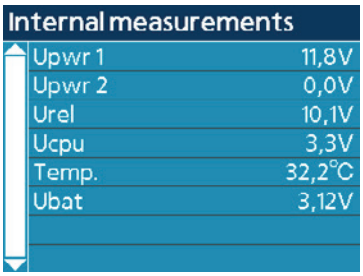
DOWN button:
Scroll down the screen

UP button:
Scroll up the screen

RIGHT or RESET/MENU button:
» If there are notifications available, display notifications
» Display internal measurements

LEFT button:
Back to main menu

If there are no active notifications, this menu item cannot be displayed.



Internal measurements

The internal measurements view can always be accessed. It contains the following information:

Upwr1 Power supply voltage 1 (X61/X62)
Upwr2 Power supply voltage 2 (X63/X64)
Urel Relay voltage
Ucpu CPU voltage
Temp. Temperature inside D-ReX
Ubat Battery Voltage
(The battery supplies the D-ReX’ internal clock with power while it is switched off)

5.3.2 Info

Info

The Info menu contains the following items:
Info: D-ReX
Info: Measurements
Info: Internal relays
Help

Actions:

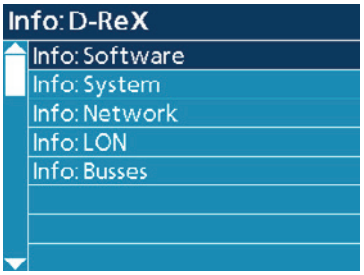
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to the main menu

5.3.2.1 Info: D-ReX



Info: D-ReX

The Info: D-ReX menu contains the following items:
Info: Software
Info: System
Info: Network
Info: LON
Info: Busses

Actions:

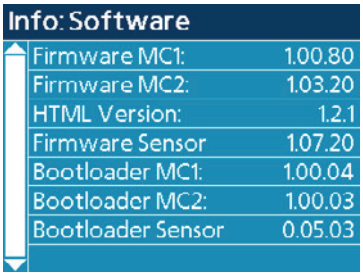
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to the main menu

5.3.2.1.1 Info: Software



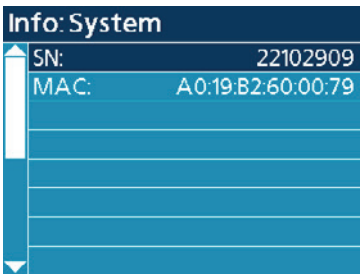
Info: Software

The Info: Software menu informs you about each software's current version number. It contains the following information:
Firmware MC1: & Versionsnummer
Firmware MC2: & Versionsnummer
HTML Version: & Versionsnummer
Firmware Sensor & Versionsnummer
Bootloader MC1: & Versionsnummer
Bootloader MC2: & Versionsnummer
Bootloader Sensor & Versionsnummer

Action:

LEFT button:
Back to Info: D-ReX

5.3.2.1.2 Info: System



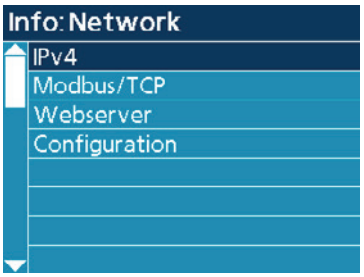
Info: System

The Info: System menu gives you an overview about the D-ReX' serial number and the set MAC address (Media-Access-Control).
It contains the following information:
SN: & serial number
MAC: & MAC address

Actions:

LEFT button:
Back to Info: D-ReX

5.3.2.1.3 Info: Network



Info: Network

The Info: Network menu contains the following menu items:
IPv4
Modbus/TCP
Webserver
Configuration

Actions:

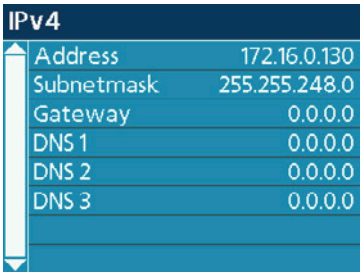
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to Info: D-ReX

5.3.2.1.3.a IPv4



State IPv4

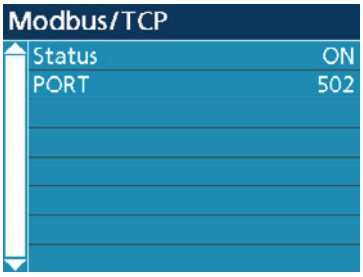
The IPv4 menu gives an overview of all network settings. It displays the following information:
Address (network address) & set value
Subnet mask & set value
Gateway & set value*
DNS 1 & set value *
DNS 2 & set value*
DNS 3 & set value*

* Support for requests concerning the Domain Name System (DNS) are currently in development.
If you need this feature for your network, please contact GfG.

Actions:

LEFT button:
Back to Info: Network

5.3.2.1.3.b Modbus/TCP



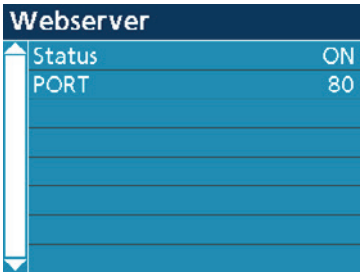
State Modbus/TCP

The Modbus/TCP menu gives an overview of all Modbus settings.
It contains the following information:
Status (On/Off)
PORT & Port number

Actions:

LEFT button:
Back to Info: Network

5.3.2.1.3.c Webserver



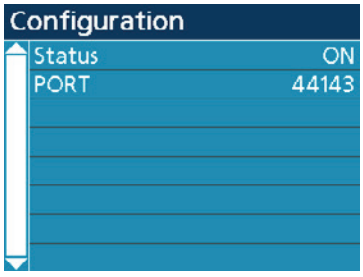
State Webserver

The Webserver menu is an overview of settings for webserver communication.
It contains the following information:
Status (On/Off)
PORT & Port number

Actions:

LEFT button:
Back to Info: Network

5.3.2.1.3.d Configuration



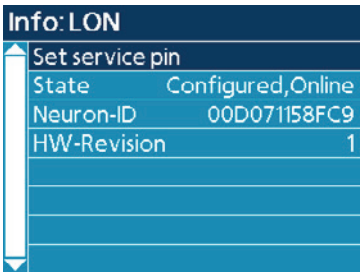
State Configuration

The Configuration menu is an overview of the following settings.
It contains the information below:
Status (On/Off)
PORT & Port number

Actions:

LEFT button:
Back to Info: Network

5.3.2.1.4 Info: LON



Logging in to LonWorks network

The LON menu is used to activate the D-ReX in the LonWorks network. This software button is an equivalent of the buttons commonly used on many LonWorks compatible devices.

It also contains the following information on the device:
Status:

Configured, online	LonWorks active
Configured, offline	LonWorks not active
Not configured	Module has never been configured for a LON network
No application	No suitable application has been installed on the module
N/A	Not available. The available LonWorks module has been deactivated using the configuration software.
Neuron ID:	A Neuron ID is a unique address assigned to an individual Neuron processor within a LonWorks device.
HW Revision:	Hardware revision number

Actions:

RESET/MENU button:
Trigger login.

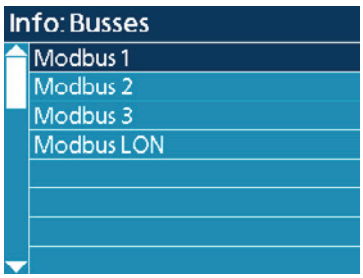
LEFT button:
Back to Info: D-Rex.

Confirmation screen

Pressing the functional button Set service pin will trigger a confirmation screen which will disappear by itself after a few moments.

You will then return to Info: LON.

5.3.2.1.5 Info: Busses



State Busses

The Info: Busses menu contains the following item menu:
Modbus 1
Modbus 2
Modbus 3
Modbus LON

Actions:

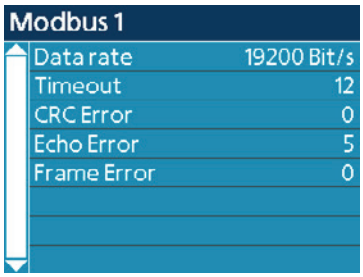
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to Info: D-ReX

5.3.2.1.5.a Modbus 1



State Modbus 1

The Modbus 1 menu gives an overview of the Modbus 1's current status, which is used for the device's internal communication. It contains the following information:
Data rate & set value
Timeout & value*
CRC error & value*
Echo error & value*
Frame error & value*

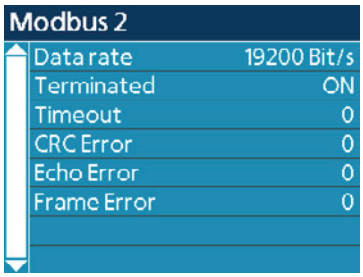
* Accumulated Modbus errors since last system restart. Since errors like these commonly happen because of external influences, individual errors are ignored, but documented according to their type.

The D-ReX will only trigger an error notification after three subsequent failed communication attempts. This information can then be used to examine the source of the error.

Actions:

LEFT button:
Back to Info: Busses

5.3.2.1.5.b Modbus 2



State Modbus 2

The Modbus 2 menu gives an overview of the Modbus 2's current status, which is used for attaching e.g. a type GMA200-RT or GMA200-RTD module external relay module by GfG. It contains the following information:
Data rate & set value
Terminated (On/Off)
Timeout & value*
CRC error & value*
Echo error & value*
Frame error & value*

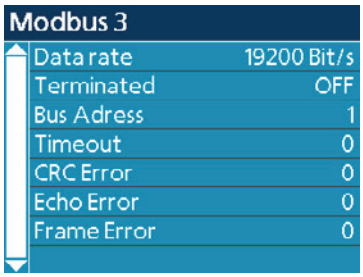
* Accumulated Modbus errors since last system restart. Since errors like these commonly happen because of external influences, individual errors are ignored, but documented according to their type.

The D-ReX will only trigger an error notification after three subsequent failed communication attempts. This information can then be used to examine the source of the error.

Actions:

LEFT button:
Back to Info: Busses

5.3.2.1.5.c Modbus 3



State Modbus 3

The Modbus 3 menu gives an overview of the Modbus 3's current status, which can be connected to e.g. a PLC. It contains the following information:
Data & set value
Terminated (On/Off)
Bus address & set value
Timeout & value*
CRC error & value*
Echo error & value*
Frame error & value*

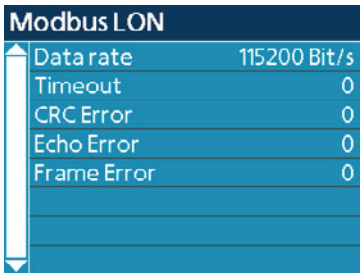
* Accumulated Modbus errors since last system restart. Since errors like these commonly happen because of external influences, individual errors are ignored, but documented according to their type.

The D-ReX will only trigger an error notification after three subsequent failed communication attempts. This information can then be used to examine the source of the error.

Actions:

LEFT button:
Back to Info: Busses

5.3.2.1.5.d Modbus LON



State Modbus LON

The Modbus LON menu gives an overview of the Modbus LON's current status, which is used exclusively for internal communication of the device and is located between the D-ReX and the optional LonWorks module. It contains the following information:
Data rate & set value
Timeout & value*
CRC error & value*
Echo error & value*
Frame error & value*

* Accumulated Modbus errors since last system restart. Since errors like these commonly happen because of external influences, individual errors are ignored, but documented according to their type.

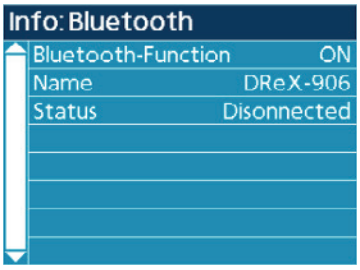
The D-ReX will only trigger an error notification after three subsequent failed communication attempts. This information can then be used to examine the source of the error.

Actions:

LEFT button:
Back to Info: Busses

The Modbus LON menu is also displayed on devices without a Modbus module, since these settings are made to all devices by default.

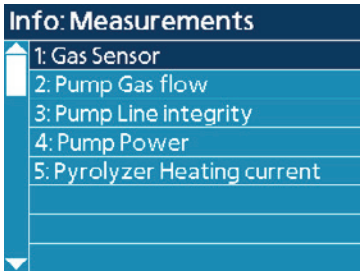
5.3.2.1.6 Info: Bluetooth



State Bluetooth

The menu Info: Bluetooth contains the following information:
Bluetooth-Function On/OFF
Name and designation of this device in the app
State Disconnected/Connected

5.3.2.2 Info: Measurements



Info: Measurements

The Info: Measurements menu contains the following menu items:
1: Gas Sensor
2: Pump Gas flow
3: Pump Line integrity
4: Pump Power
5: Pyrolyzer Heating current*
6: Py-ReX/D-ReX Power 1*

* only when a pyrolyzer is connected

Actions:

DOWN button:
Scroll down through the menu

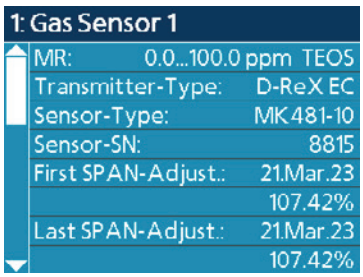
UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to Info: Measurements

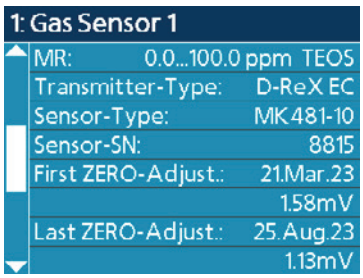
5.3.2.2.1 1: Gas Sensor

The 1: Gas Sensor menu is an overview of information on the active sensor. Three screens, which can be accessed by scrolling, contain the following information:



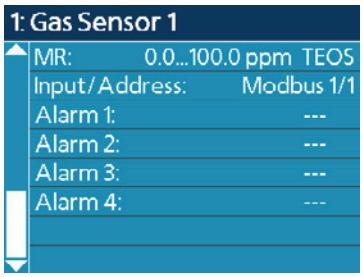
Screen 1

Screen 1
» MR & Measuring range, unit, gas
» Transmitter type & Measuring principle
  » D-ReX EC = electrochemical
  » D-ReX IR = infrared
  » D-ReX CC = catalytic (pellistor)
  » D-ReX PID = Photoionisation
» Sensor type & GfG MK number
» Sensor-SN & sensor serial number
» First SPAN- Adjust.*: & Date
  Relation to nominal value in %
» Last SPAN-Adjust.*: & Date
  Relation to nominal value in %



Screen 2

Screen 2
» MR & measuring range, unit, gas
» Transmitter type & measuring principle
  » D-ReX EC = electrochemical
  » D-ReX IR = infrared
  » D-ReX CC = catalytic (pellistor)
» Sensor type & GfG MK number
» Sensor-SN & sensor serial number
» First ZERO-Adjust.*: & Date
  Relation to nominal value in mV
» Last Zero-Adjust.*: & Date
  Relation to nominal value in mV



Screen 3 without alarms

Screen 3
» MR & measuring range, unit, gas
» Input/Adress: & Details
  » Communication protocol
  » Input 1 / Modbus address 1
» Alarm number & settings
  » Alarm threshold
  » ▲/▼ alarm on exceeding or falling below
  » (ICON pin / crossed-out pin)
    latching / non-latching
  » (ICON average = Circle with diagonal line)
  Additional information about the average value (e.g. 15 15 minutes / 8 hours) in the lower part of the screen

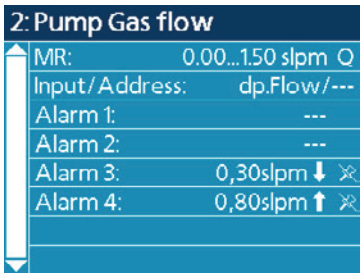
Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

LEFT button:
Back to Info: Measurements

5.3.2.2.2 2: Pump Gas flow



Pump Gas Flow

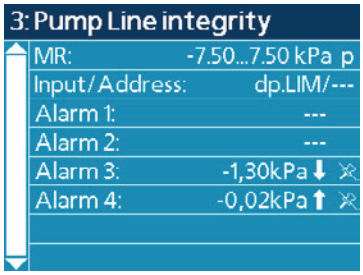
The menu 2: Pump Gas flow provides information about the integrated pump. The following information is displayed:

MR: **measuring range in standard liters per minute (slpm) and Q for flow**
Input/Adress: **dp.Flow for differential pressure measurement of the flow**
Alarm 1:
Alarm 2:
Alarm 3: **alarm threshold for insufficient flow**
Alarm 4: **alarm threshold for excessive flow**

Aktionen:

LEFT button:
Back to Info: Measurements

5.3.2.2.2 3: Pump Line integrity



Pump Line integrity

The menu 3: Pump Line Integrity provides information about monitoring the suction line for leaks. The following information is displayed:

MR: **measuring range in kPA and "p" for pressure**
Input/Adress: **dp.LIM for differential pressure measurement using the second sensor of the LIM module (comparison of ambient pressure / pressure inside the intake line)**
Alarm 1:
Alarm 2:
Alarm 3: **Alarm threshold for excessive pressure difference**
Alarm 4: **Alarm threshold for insufficient pressure difference**

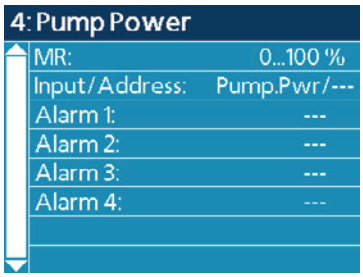
ATTENTION

Alarms must be configured individually before commissioning
The settings for the alarm thresholds of the Line Integrity Monitoring (LIM) must be determined and set for each specific unit during installation. Parameters such as the length of the intake hose, the internal diameter of the hose, filters, condensate traps, etc. affect the vacuum in normal operation. A blockage in the line during operation will result in a high pressure difference, while a leak in the supply will result in an insufficiently high pressure difference during the measurement. Select the alarm thresholds accordingly above and below the value in normal operation.

Actions:

LEFT button:
Back to Info: measuring points

5.3.2.2.4 4: Pump Power



Pump Power

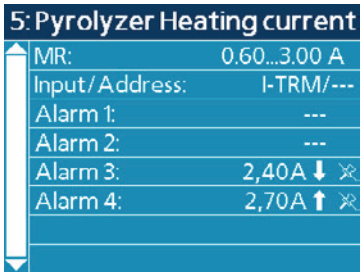
The menu 4: Pump Power provides information about the power supply to the integrated pump. The following information is displayed:

MR: **measuring range power suply**
Input/Adress: **Pump.PWR measuring point**
Alarm 1:
Alarm 2:
Alarm 3: **alarm threshold for insufficient flow**
Alarm 4: **alarm threshold for excessive flow**

Aktionen:

LEFT button:
Back to Info: measuring points

5.3.2.2.5 5: Pyrolyzer Heating current



Pyrolyzer Heating current

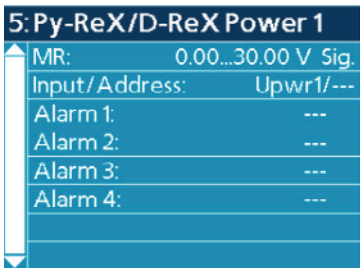
The menu 5: Pyrolyzer Heating current is only displayed when a pyrolyzer is connected. It provides information on the heating current of the pyrolyzer. The following information is displayed:

MR: **Measuring range of the heating current in amperes (A)**
Input/Adress: **I-TRM measuring point**
Alarm 1:
Alarm 2:
Alarm 3: **Heating current alarm threshold undershot**
Alarm 4: **Heating current alarm threshold exceeded**

Actions:

LEFT button:
Back to Info: measuring points

5.3.2.2.6 6: Py-ReX/D-ReX Power 1



Py-ReX/D-ReX Power 1

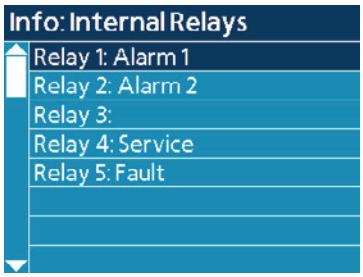
The menu 6: Py-ReX/D-ReX Power 1 is only displayed when a pyrolyzer is connected. It provides information about the power supply of the pyrolyzer and the associated D-ReX. The following information is displayed:

MR: **Measuring range of the supply voltage in volts (V)**
Input/Adress: **Upwr1 measuring point**
Alarm 1:
Alarm 2:
Alarm 3:
Alarm 4:

Aktionen:

LEFT button:
Back to Info: measuring points

5.3.2.3 Info: Internal Relays



Info: Internal Relays

The Info: Internal relays menu contains the following menu items:

Relay 1 & Active Alarm	e.g. Alarm1
Relay 2 & Active Alarm	e.g. Alarm2
Relay 3 & Active Alarm	
Relay 4 & Active Alarm	e.g. Service
Relay 5 & Active Alarm	e.g. Fault

Actions:

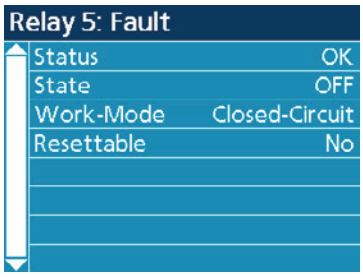
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to Info

5.3.2.3.1 Relays (1-5) Alarm X



Relays (1-5) Alarm X

The following screen applies to all 5 relays equally. The information behind the relay number indicates the configuration of each relay. The one in the image to the left, for example, is a fault relay.

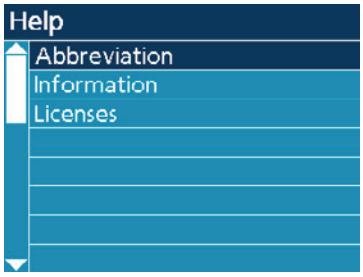
The Relay (1-5) menu Alarm X menu is an overview of the set alarm. It contains the following information:

Status	Operation status
	Possible relay statuses:
	--- Communication fault with MC1 (terminal) or an external relay module
	Inhibit Relay is inhibited
	Urel>10.7V Relay voltage too high
	Urel<9.5V Relay voltage too low
	Fault Relay fault
	OK Relay working as intended
State	ON / OFF
Work-Mode	Closed-circuit / Open-circuit
Resettable	Yes / No

Actions:

LEFT button:
Back to Info: Internal relays

5.3.2.4 Help



Help

The Help menu contains the following menu items:
Abbreviation
Information
Licenses

Actions:

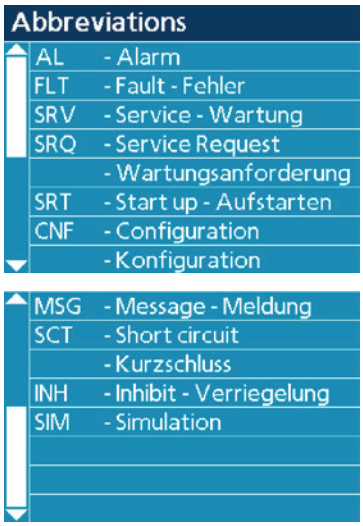
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select menu item

LEFT button:
Back to Info

5.3.2.4.1 Abbreviation



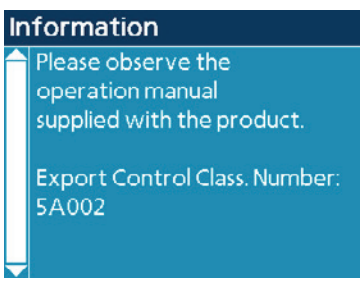
Abbreviation

The Abbreviation menu is an overview of the abbreviations used in the D-ReX' user interface.

Actions:

LEFT button:
Back to Help

5.3.2.4.2 Information



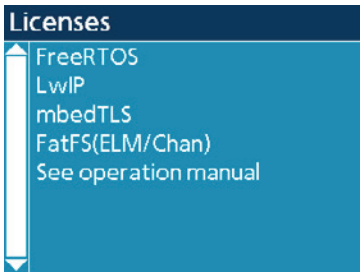
Information

The information menu displays the D-ReX' Export Control Classification Number (ECCN).

Actions:

LEFT button:
Back to help

5.3.2.4.3 Licenses



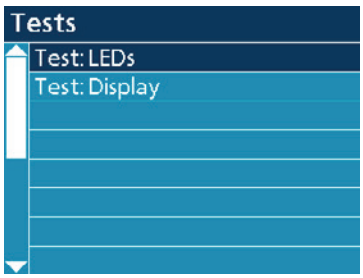
Licenses

The Licenses menu gives information on those software elements that are subject to special license conditions, as they are Open Source etc.

Actions:

LEFT button:
Back to Help

5.3.3 Tests



Tests

The Tests menu can be used to manually trigger tests for a visual check of the D-ReX. It contains the following menu items:
Test: LEDs
Test: Display

Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

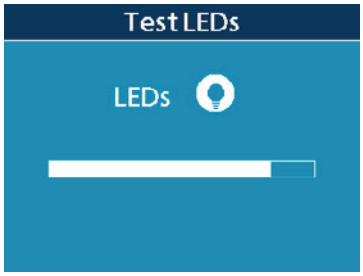
RIGHT or RESET/MENU button:
Trigger test

LEFT button:
Back to main menu

ATTENTION

You will not be notified automatically in case of faults. Only the LEDs and the display will be activated to facilitate performing a visual check.

5.3.3.1 Test: LEDs

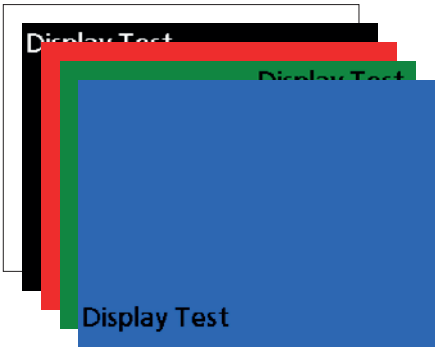


Test: LEDs

During the LED test, the LED test screen will be displayed. It contains a progress bar which will slowly fill. A total of 4 sequences will be addressed.

The D-ReX will then automatically return to the Tests menu.

5.3.3.3 Display Test



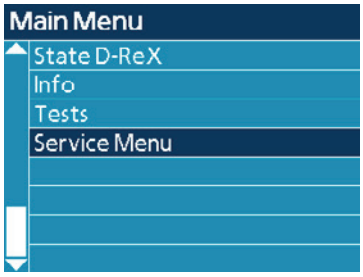
Display Test Screens

During the display test, the entire screen will light up in color to pull attention to any faulty pixels. Additionally, the text “Display Test” will be shown in different positions across the screen.

The sequence of colors is as follows:
- » White (Text in center)
- » Black (Text in upper left / in white)
- » Red (Text in lower right)
- » Green (Text in upper right)
- » Blue (Text in lower left)

The D-ReX will then automatically return to the Tests menu.

5.3.4 Access to the Service menu

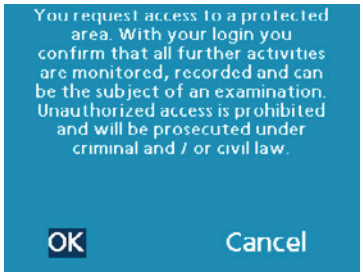


Main menu > Service

To access the service menu, simply select the menu item of the same name in the main menu.

Actions:

RIGHT or RESET/MENU button:
Enter the Service menu.

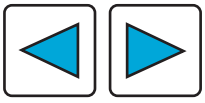


Warning Service menu

You will first receive a warning informing you that you are about to enter a secure area, including the information that any access and changes will be documented.

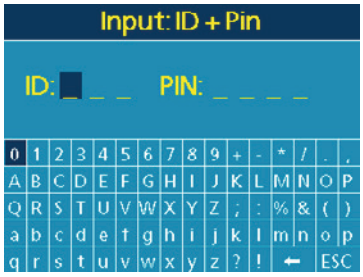
OK Continue to login screen (ID and PIN)
Cancel Back to main menu

Actions:

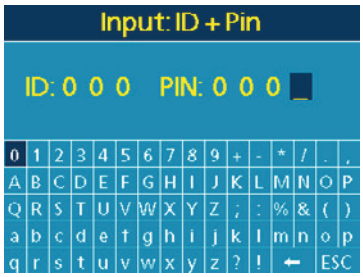


LEFT or Right button:
Switch between OK and Cancel

RESET/MENU button:
Confirm selection



Entering ID + PIN



Entering ID + PIN

After confirming your access with OK, you will be forwarded to a login screen containing prompts for your User-ID and PIN and a virtual keyboard. The User-ID and PIN are specific to certain groups of users (e.g. admins, service technicians or general users) and alphanumerical. Up to eight user groups with individual rights can be specified.

The standard configuration upon delivery is:
ID = 000
PIN = 0000

ATTENTION

Change the User-ID and PIN after installation to prevent unauthorized changes to the service menu. To learn more about user groups, refer to chapter Service menu (► page 64).

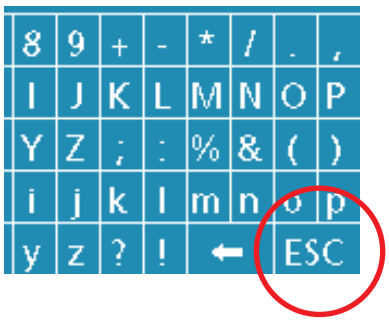
Actions:

DOWN button:
Navigate down on the virtual keyboard

UP button:
Navigate up on the virtual keyboard

Right button:
Navigate to the right on the virtual keyboard

LEFT button:
Navigate to the left on the virtual keyboard

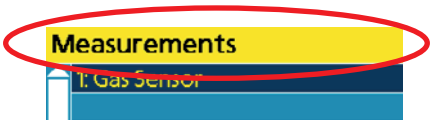


RESET/MENU button:
Confirm selection

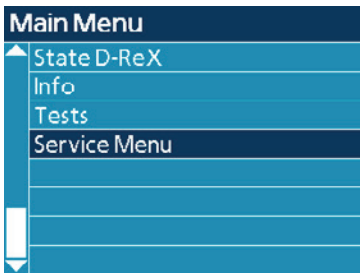
RESET/MENU button on ESC
Back to the main menu

A notification saying **Login failed** will appear if you enter an incorrect User-ID or PIN. The screen containing the warning and prompt for confirmation or cancelation will then be displayed again.

5.4 Service Menu



The Service menu can be used to adjust various system settings. The fact that you are currently in the Service menu is indicated by the menu column being highlighted in yellow at all times.



Main menu > Service

You can access the service menu from the main menu. It is protected by a password for security reasons. For detailed information on the login process, refer to chapter 5.3.4 Access to the service menu (page > 62).

ATTENTION

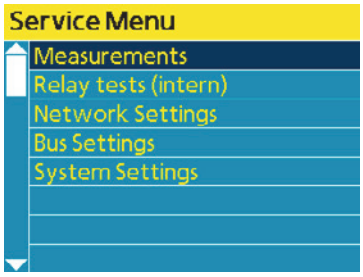
Changing the default ID and PIN

Change the ID and PIN after installing the device to prevent unauthorized changes to the service menu.

WARNING

Unauthorized access to the D-ReX' settings

The Service menu may only be used by specially trained users and professionals. Accidental or deliberate changes to the gas detection system's settings can have severe consequences.



Service menu

The Service menu contains the following menu items:

Measurements
Relay tests (intern)
Network settings
Bus Settings
System Settings

Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select highlighted menu item

LEFT button:
Back to main menu

5.4.1 Measurements

Measurements

The Measurements menu contains the following menu item:
1: Gas Sensor
2: Pump Gas flow
3: Pump Line integrity
4: Pump Power
5: Pyrolyzer Heating current*
6: Py-ReX/D-ReX Power 1*
Measurements inhibit
Quit all Simulations

* Only if a pyrolyzer is attached

Simulated alarms
D-ReX can simulate measured value alarms to check the functionality of alarm devices and alarm chains. It can simulate a single alarm, such as a limit violation, but also multiple events that occur simultaneously.

The grayed out menu item “Quit all Simulations” on the left is displayed in yellow as soon as at least one simulation is active. If it is clicked, it immediately stops all simulations. D-ReX returns to measurement mode.

Actions:

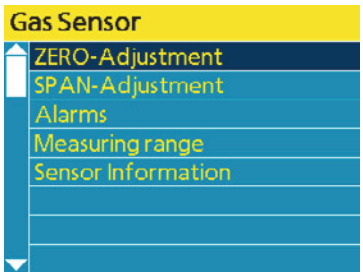
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select highlighted menu item

LEFT button:
Back to service menu

5.4.1.1 Gas Sensor



Gas Sensor

The Gas Sensor menu contains the following menu item:
ZERO-Adjustment
SPAN-Adjustment
Alarms
Measuring range
Sensor Information

Actions:

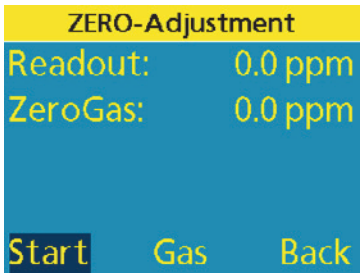
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RIGHT or RESET/MENU button:
Select highlighted menu item

LEFT button:
Back to Measurements

5.4.1.1.1 ZERO-Adjustment



ZERO-Adjustment

SRV/SRQ-LED yellow

The ZERO-Adjustment menu is used to adjust the sensor's zero point.

The SRV/SRQ LED will switch to yellow as soon as you access the menu. It will stay yellow until you return to the main menu.

The screen will display the following informations:
Readout: The current measured concentration of target gas
ZeroGas: 0.0 and the unit

Three control buttons

Start	Starts the adjustment
Gas	Allows you to manually change the Zero gas concentration
Back	Back to gas Gas Sensor menu

Actions:

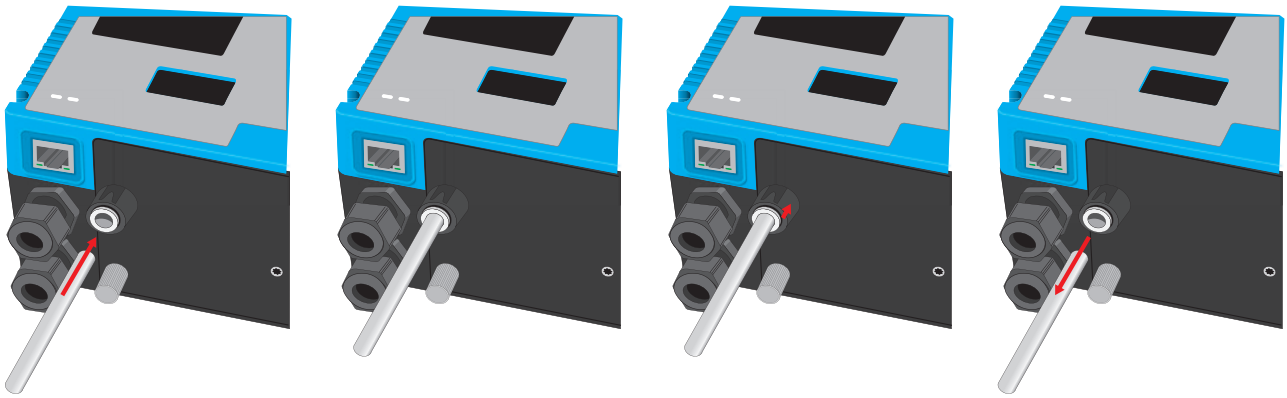
DOWN button:
Manually lower the value in the Gas function field

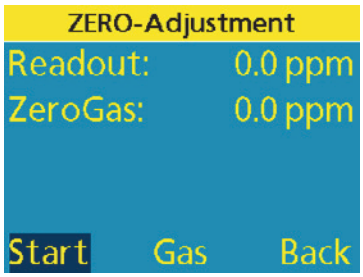
UP button:
Manually raise the value in the Gas function field

RIGHT button:
Navigate to the right through the control buttons

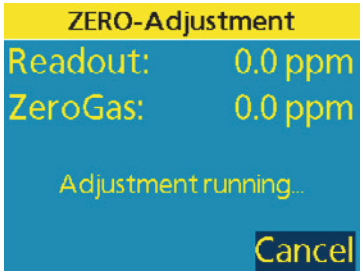
RESET/MENU button:
Select control button
In the Gas function field, confirm the set value and go back to the control keys

LEFT button:
Navigate to the left through the control buttons

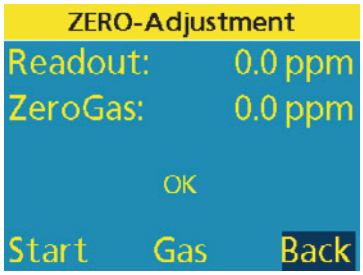




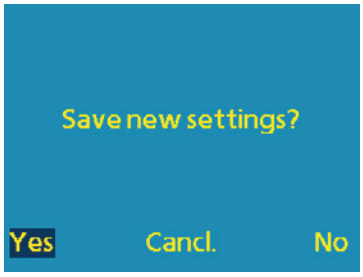
Start ZERO-Ajustment



Active ZERO-Adjustment



ZERO-Adjustment completed



Save settings

To adjust the sensor, follow these steps:

1. Disconnect the sampling line from the gas inlet of the D-ReX.

2. Connect the test gas cylinder to the gas inlet of the D-ReX.

3. Switch to service menu and select the zero adjustment item:
   Measured values > Gas sensor > ZERO-Adjustment.

4. Open the test gas cylinder.

5. Wait until the value on the display has stabilized

6. Scroll to the Start function key and confirm with RESET/MENU.

7. The status and result of the adjustment are displayed during the process.

8. Exit the adjustment via Back.

9. Close the test gas bottle.

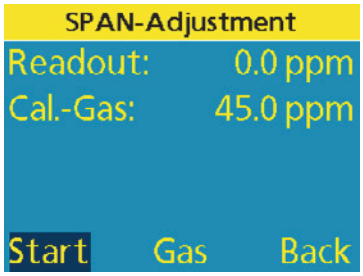
10. Remove the test gas cylinder, reattach the intake line and exit the service menu

11. Save the settings
    BWhen you exit the service menu, you will be asked whether you want to save the changed settings.

There are three function keys to choose from:

Yes	Data is accepted Continue with main menu
Cancl.	Data are not accepted Continue with service menu
No	Data are not accepted Continue with main menu

5.4.1.1.2 SPAN-Adjustment



SPAN-Adjustment

SRV/SRQ-LED yellow

The SPAN-Adjustment menu is used to adjust the sensor's sensitivity.

The SRV/SRQ LED will switch to yellow as soon as you access the menu. It will stay yellow until you return to the main menu.

The screen will display the following informations:
Readout: The current measured concentration of target gas
Cal.-Gas: 0.0 and the unit set before the first adjustment or the last set value of the calibration gas and its unit (in this example: 45.0 ppm)

Three control buttons
Start Starts the adjustment
Gas Allows you to change the calibration gas concentration manually
Back Back to the Gas Sensor menu

Actions:

DOWN button:
Lower the value manually in the Gas function field. The value must match the concentration stated on the test gas cylinder, according to the analysis certificate.*

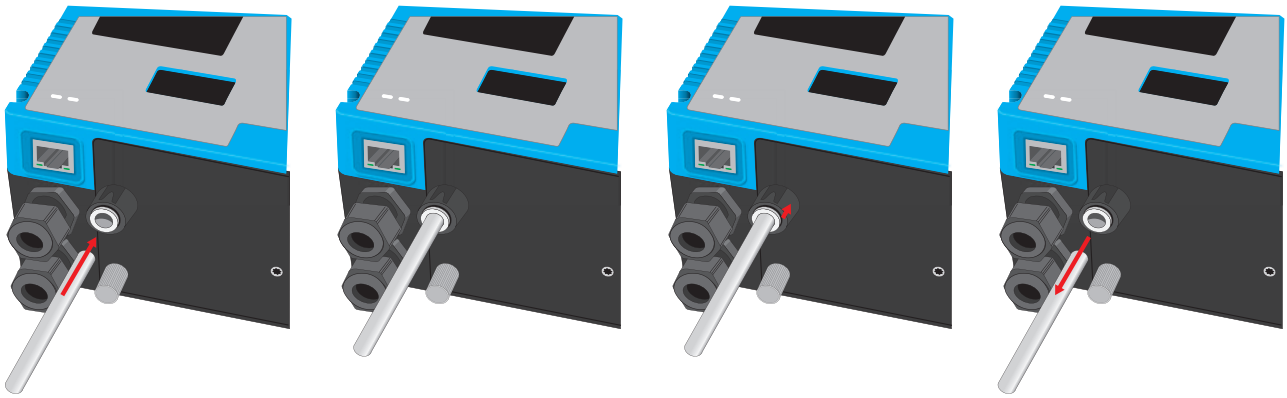
UP button:
Raise the value manually in the Gas function field. The value must match the concentration stated on the test gas cylinder, according to the analysis certificate.*

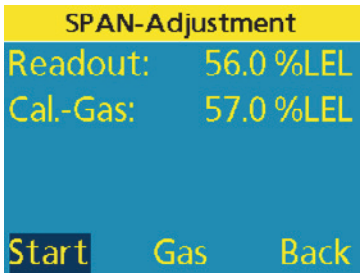
RIGHT button:
Navigate to the right through the control buttons

RESET/MENU button:
Select control button
In the Gas function field, confirm the set value and go back to the control buttons

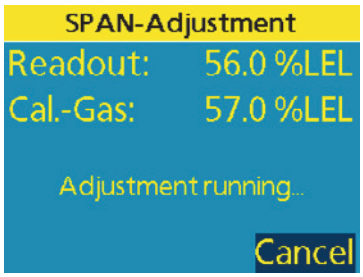
LEFT button:
Navigate to the left through the control buttons

* You may use fresh air instead of test gas for oxygen sensors. If you are using a substitute test gas instead of the target gas, take the sensor's cross-sensitivity into account. Only substitute test gases recommended by GfG should be used for this purpose.

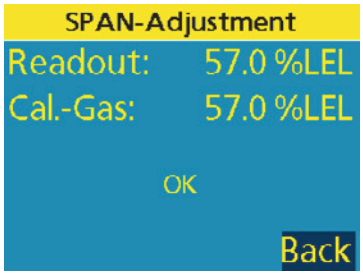




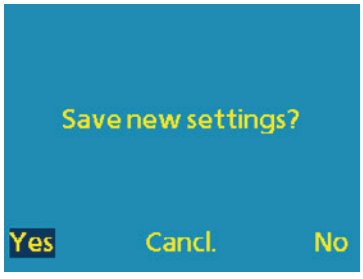
Start SPAN-Adjustment



Active SPAN-Adjustment



SPAN-Adjustment completed



Save settings

To adjust the sensor, follow these steps:

1. Disconnect the sampling line from the gas inlet of the D-ReX.

2. Connect the test gas cylinder to the gas inlet of the D-ReX.

3. Switch to service menu and select the SPAN-adjustment item:
   Measured values > Gas sensor > SPAN-Adjustment.

4. Open the test gas cylinder.

5. Wait until the value on the display has stabilized

6. Scroll to the Start function key and confirm with RESET/MENU

7. The status and result of the adjustment are displayed during the process.

8. Exit the adjustment via Back

9. Close the test gas bottle.

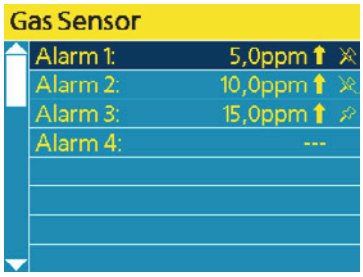
10. Remove the test gas cylinder, reattach the intake line and exit the service menu.

11. Save the settings
    When you exit the service menu, you will be asked whether you want to save the changed settings.

There are three function keys to choose from:

Yes	Data is accepted Continue with main menu
Cancl.	Data are not accepted Continue with service menu
No	Data are not accepted Continue with main menu

5.4.1.1.3 Alarms



Gas Sensor Alarms

In the Alarms menu, the information in the top line differs from the name of the menu item called up. It will still read Gas Sensor, to make it easier to clearly assign the alarm thresholds to the displayed measured values.

ATTENTION

Limited setting options on the D-ReX

Not all alarm setting options that are available on the DReX-Config-software can also be accessed via the D-ReX' buttons.

The first time a new type of sensor is inserted, the data for Alarm 1 and Alarm 2 are automatically entered according to the information specified in the D-ReX' alarm table.

If a sensor is just replaced and if an alarm threshold was changed in the past, or if additional alarm thresholds have been added, these values will also be used for the replacement sensor.

You can adjust the following:

» The value of the alarm thresholds for measured value alarms. The size of its change intervals corresponds to the sensor's resolution for this measuring range.

» Alarms for values exceeding ▲ or falling below ▼ the thresholds

ATTENTION

Increasing alarm number indicates higher level of danger

For measured value alarms, Alarm 1 cannot be set to a higher value (for exceeding alarms; smaller value for those of values falling below the threshold) than Alarm 2, since it implies a higher level of danger. This does not apply to average value alarms.

» Alarms latching or non-latching

Actions:

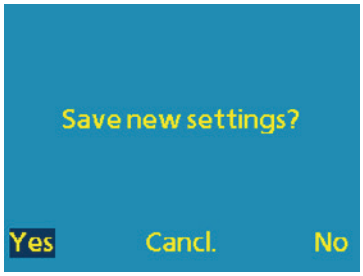
DOWN button:
Scroll down through the four alarms
After selecting an alarm:
» Pressing briefly: Reduce alarm threshold in individual steps
» Holding down: Rapidly lower alarm thresholds
After selecting direction of alarm
» Switch between alarm upon exceeding or falling below
After selecting latching mode
» Switch between latching and non-latching

UP button:
Scroll up through the four alarm
After selecting an alarm:
» Pressing briefly: Reduce alarm thresholds in individual steps
Holding down: Rapidly lower alarm threshold
» After selecting direction of alarm
» Switch between alarm upon exceeding or falling below
After selecting latching mode
» Switch between latching and non-latching

RIGHT button:
Switch to the alarm's editing mode

RESET/MENU button:
Switch to the alarm's editing mode
In editing mode, confirm the set value and jump to next position or leave the editing mode

LEFT button:
Back to Gas Sensor



Save settings

If you changed the alarm settings, the change will have to be either confirmed or discarded when you leave the menu.

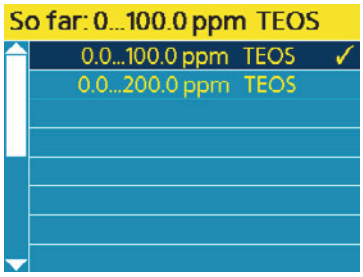
There are three control buttons available:

Yes — Data is saved.
Continue to main menu.

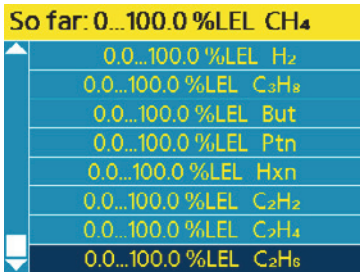
Cancl. — Data is not saved.
Continue to Service menu.

No — Data is not saved.
Continue with main menu.

5.4.1.1.4 Measuring range



Measuring ranges EC/IR sensor



Gases & Measuring ranges CC sensor

The measuring range menu shows all available measuring ranges for the specific sensors.

The sensor is by default adjusted to the gas it was ordered for.

The following information is displayed:
» Previously: Measuring range, unit and gas
The line is highlighted in yellow and shows the measuring range that is currently active, including the gas. It will only change when this menu is opened again after the measuring range or gas has been changed.
» The active measuring range or the active gas with a check mark at the end.
» The currently selected line, highlighted in dark blue.
» All other options, highlighted in light blue.

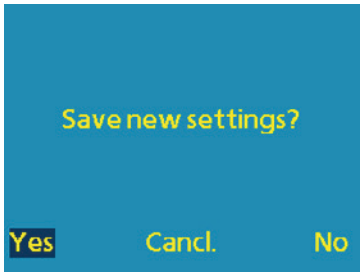
Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RESET/MENU button:
Select measuring range or gas

LEFT button:
Back to Gas Sensor or the security prompt



Saving the settings

If you changed the measuring range or selected another gas, you will have to confirm or discard the change when leaving the menu.
Three function buttons are available:

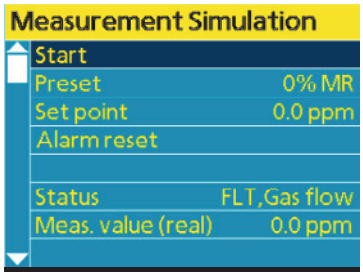
Yes	Data is saved. Continue to Gas Sensor
Cancl.	Data is not saved. Continue to Measuring range
No	Data is not saved. Continue to Gas Sensor

WARNING

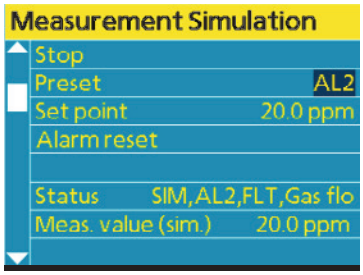
Adjustment necessary when changing gas!
If you change the type of gas on a sensor, you must readjust the sensor to ensure it is functioning correctly.

For information on adjusting sensors, refer to chapter 5.4.1.1 Gas sensor (► page 66).

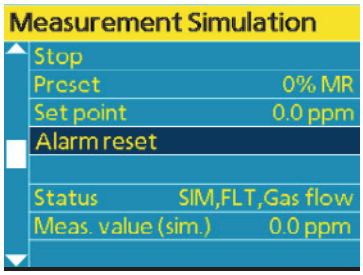
5.4.1.1.5 Measurement Simulation



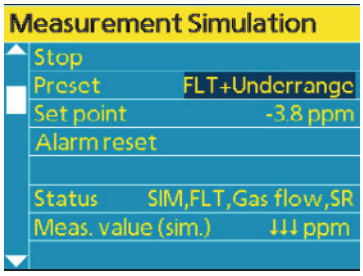
Measurement Simulation



Selected preset Alarm 2



Active setpoint simulation 12.0 ppm



Active setpoint simulation FLT+Underrange

With the Measurement Simulation in the menu item Gas Sensor, gas alarms can be simulated without the use of target gas or test gas.

The following menu items are available in the menu Measurement Simulation :

Start / Stop: Starts or stops the simulation

Preset and alarm status: The alarm to be simulated can be selected here

The options are as follows:

- » FLT + Overrange
- » Overrange
- » 100 % MR (Measuring Range)
- » AL4 (Alarm 4)
- » AL3 (Alarm 3)
- » AL2 (Alarm 2)
- » AL1 (Alarm 1)
- » 0 % MR (current reading) = default setting
- » Underrange
- » FLT + Underrange

Setpoint with value and unit: Option to manually enter a gas concentration

Alarm-Reset: Resets self-latching alarms

Status: Displays the D-ReX status triggered by the set target point or the manually set gas concentration.

The image on the left shows active setpoint simulation at 12.0 ppm SIM for the status Simulation and AL1 for exceeding alarm threshold 1

Das Bild links Aktive Zielpunktsimulation FLT+Underrange, also ein Sensorfehler durch unterschreiten des Messbereichs, zeigt beim Status zusätzlich SRQ für den in diesem Fall ausgelösten Service Request.

Measured value (real/sim.) with value and unit: Displays the currently measured value of the sensor when the simulation has not yet started and the specified measured value when the simulation has started, or symbols for exceeding/falling below the measuring range.

Aktionen:

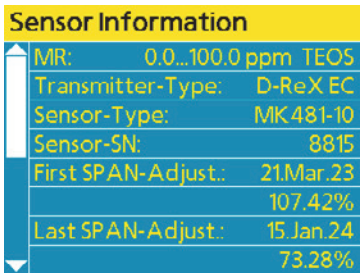
DOWN button:
Scroll down through the menu, select target point or enter target value

UP button:
Scroll up through the menu, select target point or enter target value

RESET/MENU or RIGHT button:
Select highlighted menu item or confirm menu item or value

LEFT button:
Back to measurement simulation

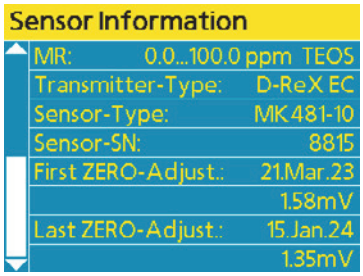
5.4.1.1.6 Sensor Information



Sensor Information & SPAN

The Sensor Information menu contains the following information:

MR:*	Measuring range, unit and gas
Transmitter-Type:	Type of sensor and measuring principle
Sensor-Type:	Internal designation of the sensor (MK)
Sensor-SN:	Sensor serial number
First SPAN-Adjust.:	Date of the first SPAN adjustment and displayed value
Last SPAN-Adjust.:	Date of the last SPAN adjustment and displayed value



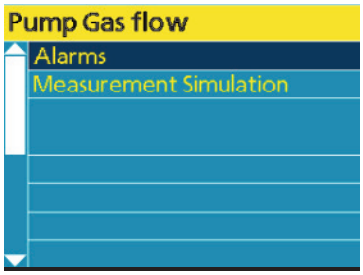
Sensor Information & ZERO

Scroll down to switch from information on SPAN adjustment to information on ZERO adjustment

First ZERO-Adjust.:	Date of the first ZERO adjustment and displayed value
Last ZERO-Adjust.:	Date of the last ZERO adjustment and displayed value

* MR = Measuring Range

5.4.1.2 Pump Gas flow



Pump Gas flow

The following menu items are available in the menu Pump Gas flow:
Alarms
Measurement Simulation

Actions:

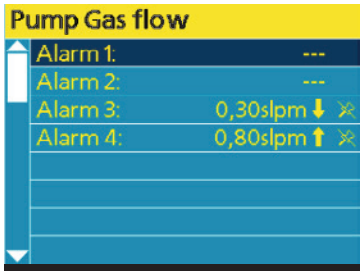
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu


RESET/MENU or RIGHT button:
Select highlighted menu item

LEFT button:
Back to service menu

5.4.1.2.1 Pump Gas flow (Alarms)



Pump Gas flow (Alarms)

The following menu items are available in the menu Pump Gas flow (Alarms) for monitoring the pump performance:
Alarm 1 and set alarm threshold
Alarm 2 and set alarm threshold
Alarm 3 and set alarm threshold
Alarm 4 and set alarm threshold

The factory settings of the D-ReX are configured in such a way that the pump alarms 3 and 4 also trigger a fault in the gas detection.

Actions:

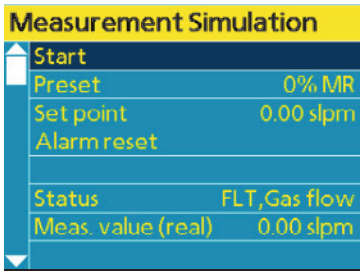
DOWN button:
Scroll down through the menu or enter the alarm threshold

UP button:
Scroll up through the menu or enter the alarm threshold


RIGHT or RESET/MENU button:
View or confirm the alarm to be set

LEFT button:
Back to Gas Sensor

5.4.1.2.2 Measurement Simulation Pump



Measurement Simulation Pumpe

Use the Measurement Simulation in the Pump Gas flow menu to simulate pump errors.

The following menu items are available in the menu Measurement Simulation:

Start / Stop — Starts or stops the simulation

Preset and alarm status — The alarm to be simulated can be selected here

The options are as follows:
- » FLT + Overrange
- » Overrange
- » 100 % MR (Measuring Range)
- » AL4 (Alarm 4)
- » AL3 (Alarm 3)
- » AL2 (Alarm 2)
- » AL1 (Alarm 1)
- » 0 % MR (current reading) = default setting
- » Underrange
- » FLT + Underrange

Setpoint with value and unit — Option to manually enter a gas concentration

Alarm-Reset — Resets self-latching alarms

Status — Displays the D-ReX status triggered by the set target point or the manually set gas concentration.

Measured value (real/sim.) with value and unit — Displays the currently measured value of the sensor when the simulation has not yet started and the specified measured value when the simulation has started, or symbols for exceeding/falling below the measuring range.

Actions:

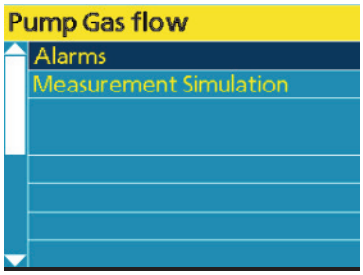
DOWN button:
Scroll down through the menu or enter value

UP button:
Scroll up through the menu or enter value

RIGHT or RESET/MENU button:
View or confirm the alarm to be set

LEFT button:
Back to Measurements

5.4.1.3 Pump Power



Pump Power

The following menu items are available in the menu Pump Power:
Alarms
Measurement Simulation

Actions:

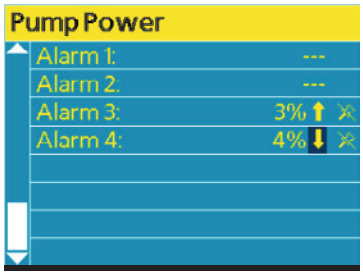
DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu


RIGHT or RESET/MENU button:
Select highlighted menu item

LEFT button:
Back to Measurements

5.4.1.3.1 Pump Power (Alarms)



Pump Power (Alarme)

The following menu items are available in the Pump Power (Alarms) menu for monitoring pump performance:
Alarm 1 and set alarm threshold in %, exceeding/falling short, inhibit
Alarm 2 and set alarm threshold in %, exceeding/falling short, inhibit
Alarm 3 and set alarm threshold in %, exceeding/falling short, inhibit
Alarm 4 and set alarm threshold in %, exceeding/falling short, inhibit

Actions:

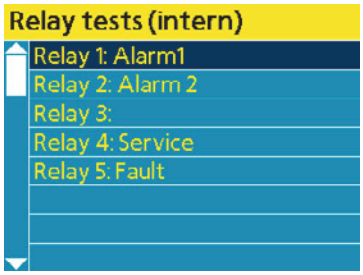
DOWN button:
Scroll down through the menu or enter alarm threshold

UP button:
Scroll up through the menu or enter alarm threshold


RIGHT or RESET/MENU button:
View or confirm the alarm to be set

LEFT button:
Back to Pump Power

5.4.2 Relay tests (intern)



Overview relays

The Relay tests (intern) menu can only be accessed from the service menu if the D-ReX is equipped with internal relays. Otherwise, it does not show up in the list.

The Relay tests (intern) menu contains the following menu items:
Relays 1: and the set alarm
Relays 2: and the set alarm
Relays 3: and the set alarm
Relays 4: and the set alarm
Relays 5: and the set alarm

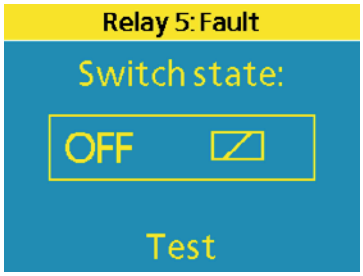
Actions:

DOWN button:
Scroll down through the menu

UP button:
Scroll up through the menu

RESET/MENU or RIGHT button:
Select relay and open test screen

LEFT button:
Back to service menu



Closed-circuit or OFF

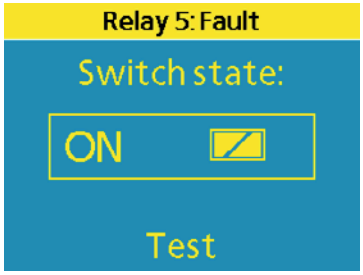
After selecting a relay, a test screen containing the following information is displayed:

Relays incl. number and set alarm
Switching status (Switchstate) OFF or ON
The switching status depends on whether the relay works on closed-circuit on operating circuit principle. It is configured using the DReX-Config software.
Test (merely an in indication of the fact that the function test is activated with the RESET/MENU button).

Actions:

RESET/MENU button:
Activate relay. You will hear a clicking sound which indicates that alarms or other controlled devices are activated.

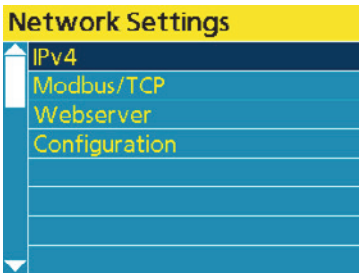
LEFT button:
Back to Relay tests (intern)



Operating current or ON

This test is identical for all five relays.

5.4.3 Network Settings



Network Settings

The Network Settings menu contains the following submenus:

IPv4
Modbus/TCP
Webserver
Configuration

Actions:

DOWN button:
Scroll down through the menu.

UP button:
Scroll up through the menu.

RESET/MENU or RIGHT button:
Select highlighted menu item.

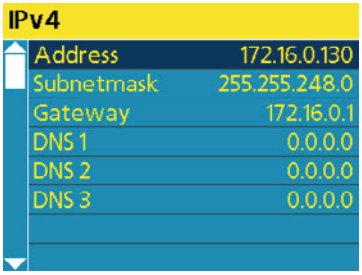
LEFT button:
Back to Service menu.

ATTENTION

All changes to the network settings require the MC2 communication processor to be rebooted

You will have to reboot the MC2 communication processor after making any changes to the network settings. For more information on this, refer to chapter 5.4.5.6 Reboot (► page 93).

5.4.3.1 IPv4



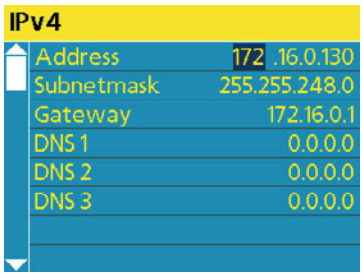
IPv4 Settings

Use the IPv4 menu to make changes to the IP address, the sub net mask and the Gateway. It contains the following menu items:
Address and value of this D-ReX' IP address
Subnet mask and value of the subnet mask
Gateway and gateway value

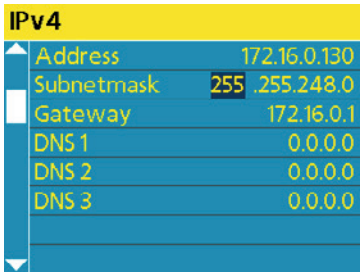
ATTENTION

DNS input is still in development

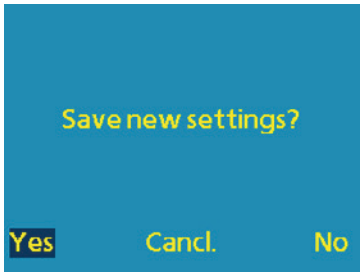
DNS 1 to 3 will later be used to store DNS server addresses if the D-ReX needs to be connected to the internet. This option is not yet available.



Changing the IP address



Changing the subnet mask's address



Save settings

Actions:

DOWN button:
Scroll down through the menu or decrease the value by one.

UP button:
Scroll up through the menu or increase the value by one.

RESET/MENU or RIGHT button:
Switch to next value within this submenu.

LEFT button:
Back to network settings or trigger security query.

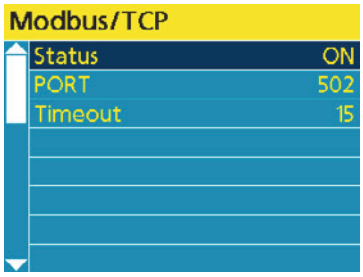
If an address has been changed, the changes must be confirmed or dismissed upon leaving the menu.
The following three options are available:

Yes — Data is saved.
Continue to Gas Sensor

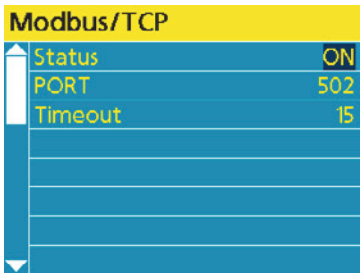
Cancl. — Data is not saved.
Continue to measuring range

No — Data is not saved.
Continue to Gas Sensor

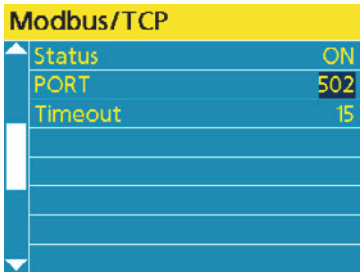
5.4.3.2 Modbus/TCP



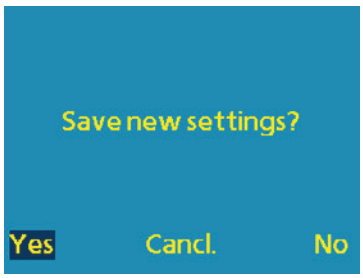
Modbus/TCP



Change status



Change port



Save settings

The Modbus/TCP menu is used to activate or deactivate Modbus as well as to make changes to the Bus settings. It contains the following menu items:
Status ON/OFF
PORT and port value
Timeout and timeout value

Actions:

DOWN button:
Scroll down through the menu or change the value / decrease it by 1.

UP button:
Scroll up through the menu or change the value / increase it by 1.

RESET/MENU or RIGHT button:
Select or confirm a value you want to change within the submenu.

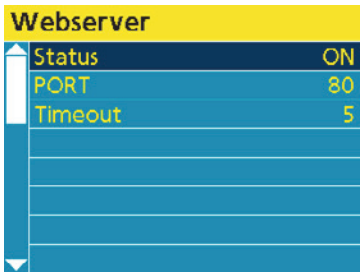
RIGHT button:
Select a value to change within the submenu

LEFT button:
Back to Network Settings or trigger security query.

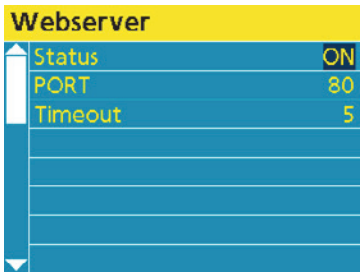
If the address has been changed, the changes must be confirmed or dismissed upon leaving the menu.
The following three options are available:

Yes	Data is saved. Continue to Gas Sensor
Cancl.	Data is not saved. Continue to Measuring range
No	Data is not saved. Continue to Gas Sensor

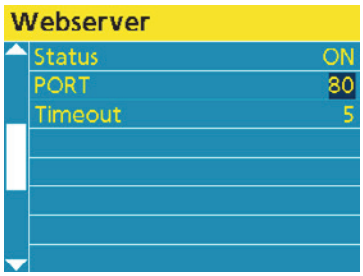
5.4.3.3 Web server



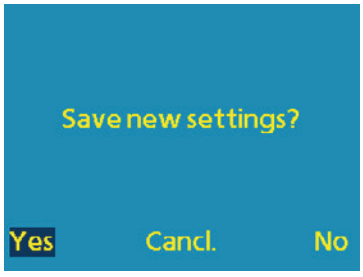
Web server



Change status



Change port



Save settings

The Web server menu is used to activate or deactivate the web server as well as to make changes to its settings. It contains the following menu items:
Status ON/OFF
PORT and port value
Timeout and timeout value

Actions:

DOWN button:
Scroll down through the menu or change value / decrease it by 1.

UP button:
Scroll up through the menu or change the value / increase by 1.

RESET/MENU button:
Select or confirm a value you want to change within the submenu.

RIGHT button:
Select a value to change within the submenu.

LEFT button:
Back to Network Setting or trigger security query.

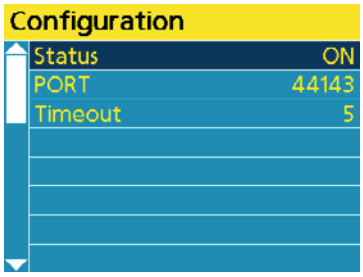
If an address has been changed, the change must be confirmed or dismissed upon exiting the menu.
The following three options are available:

Yes — Data is saved.
Continue to Gas Sensor

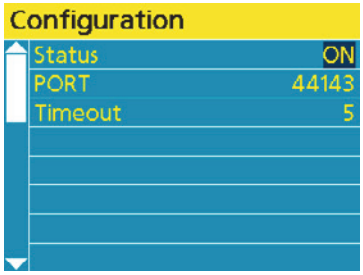
Cancl. — Data is not saved.
Continue to Measuring range

No — Data is not saved.
Continue to Gas Sensor

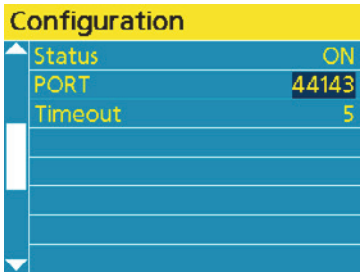
5.4.3.4 Configuration



Configuration



DReX-Config ON/OFF



Change port

The Configuration menu is used to activate or deactivate access from the DReX-Config configuration software as well as to change the associated settings. It contains the following menu items:
Status ON/OFF
PORT and port value
Timeout and time (in minutes) to automatic deactivation of the connection to the DReX-Config software, if no further changes are made. If another change is made within this time frame, the timer is reset.

Actions:

DOWN button:
Scroll down through the menu or change the value / decrease it by 1.

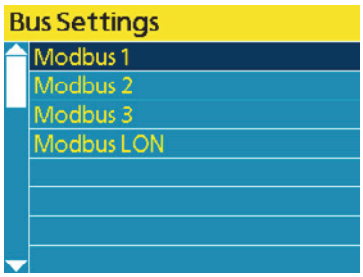
UP button:
Scroll up through the menu or change the value / increase it by 1.

RESET/MENU button:
Select or confirm a value you want to change within the submenu.

RIGHT button:
Select a value to change within the submenu.

LEFT button:
Back to Network Settings or trigger security query.

5.4.4 Bus Settings



Bus selection

The Bus Settings menu contains the following menu items which are used to configure the individual Busses:
Modbus 1
Modbus 2
Modbus 3
Modbus LON

Actions:

DOWN button:
Scroll down through the menu.

UP button:
Scroll up through the menu.

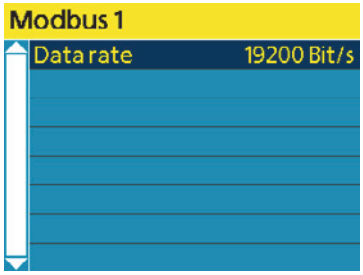
RESET/MENU or RIGHT button:
Select menu item.

LEFT button:
Back to Service menu or trigger security query.

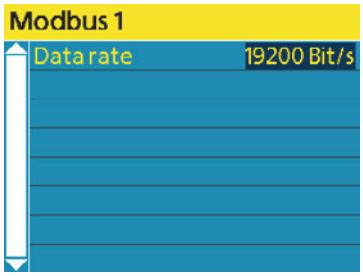
5.4.4.1 Modbus 1

ATTENTION

Do not change the Modbus 1 factory setting!
Changes to the Modbus 1 data rate can result in the D-ReX malfunctioning. Changes may only be made by GfG employees or specially trained professionals.



Modbus 1



Settings

The Modbus 1 menu is used to change the internal communication data rate via Modbus 1.

Factory setting: 19200 Bit/s
Available transmission rates: 9600 Bit/s, 19200 Bit/s, 38400 Bit/s, 57600 Bit/s, 115200 Bit/s, 230400 Bit/s.

Actions:

DOWN button:
Decrease transmission rate.

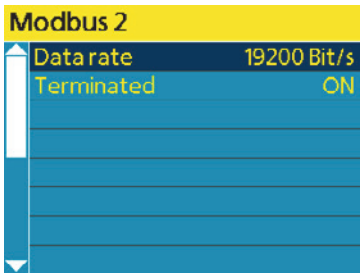
UP button:
Increase transmission rate.

RESET/MENU or RIGHT button:
Select menu item or back to Modbus 1.

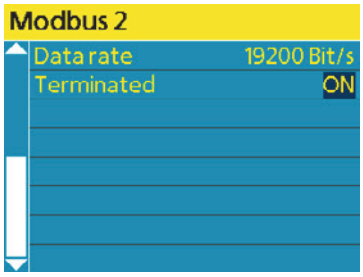
RIGHT button:
Select menu item.

LEFT button:
Back to Modbus 1 or trigger security query.

5.4.4.2 Modbus 2



Modbus 2



Einstellungen

Use the Modbus 2 menu to change the data rate and termination status of Modbus 2

Factory setting: 19200 Bit/s and Termination ON
Available transmission rates: 9600 Bit/s, 19200 Bit/s, 38400 Bit/s, 57600 Bit/s, 115200 Bit/s, 230400 Bit/s.

The menu contains the following menu items:
Data rate
Termination

Actions:

DOWN button:
Scroll down or change / decrease value.

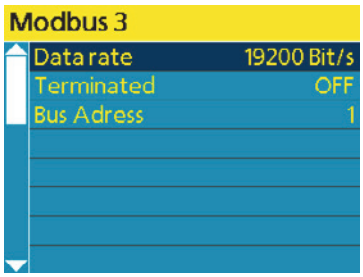
UP button:
Scroll up or change / increase value.

RESET/MENU or RIGHT button:
Select menu item or back to Modbus 2.

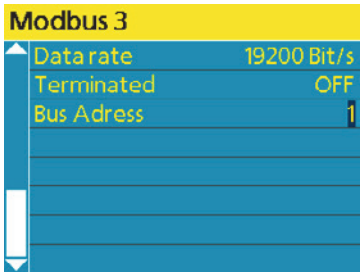
RIGHT button:
Select menu item.

LEFT button:
Back to Modbus 2 or trigger security query.

5.4.4.3 Modbus 3



Modbus 3



Settings

Use the Modbus 3 menu to change the data rate, termination status or Bus address of Modbus 3.

Factory setting: 19200 Bit/s, Termination ON and Bus address 1
Available transmission rates: 9600 Bit/s, 19200 Bit/s, 38400 Bit/s, 57600 Bit/s, 115200 Bit/s, 230400 Bit/s.

The menu contains the following menu items:
Data rate
Termination
Bus address

Actions:

DOWN button:
Scroll down or change / decrease value.

UP button:
Scroll up or change / increase value.


RESET/MENU or RIGHT button:
Select menu item or back to Modbus 3.

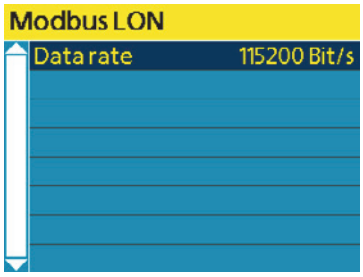
RIGHT button:
Select menu item.

LEFT button:
Back to Modbus 3 or trigger security query.

5.4.4.4 Modbus LON

ATTENTION

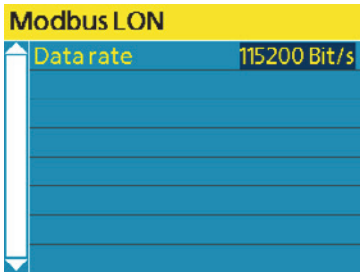
Do not change the Modbus LON factory settings!
Changes to the Modbus LON data rate can result in the D-ReX malfunctioning. Changes may only be made by GfG employees or specially trained professionals.



Modbus LON

Use the Modbus LON menu to change the internal communication data rate via Modbus LON.

Factory setting: 115200 Bit/s
Available transmission rates: 9600 Bit/s, 19200 Bit/s, 38400 Bit/s, 57600 Bit/s, 115200 Bit/s, 230400 Bit/s.



Settings

Actions:

DOWN button:
Decrease transmission rate.

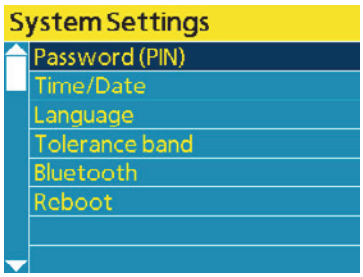
UP button:
Increase transmission rate.

RESET/MENU or RIGHT button:
Select menu item or back to Modbus 1.

RIGHT button:
Select menu item.

LEFT button:
Back to Modbus 1 or trigger security query.

5.4.5 System Settings



System Settings

The System Settings menu contains the following menu items:
Password (PIN)
Time/Date
Language
Tolerance band
Bluetooth
Reboot

Actions:

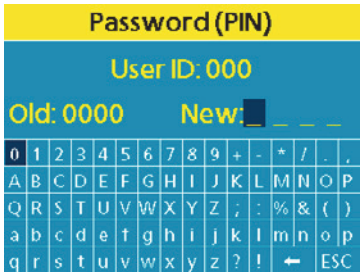
DOWN button:
Scroll down through the menu.

UP button:
Scroll up through the menu.

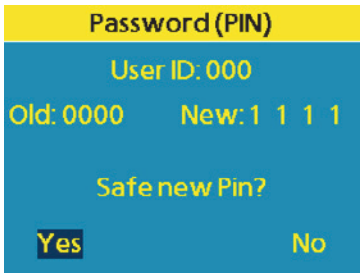
RESET/MENU or RIGHT button:
Select menu item.

LEFT button:
Back to Service menu or trigger security query.

5.4.5.1 Passwort (PIN)



Change password



Confirm password

Use the Password menu to create a new password for the user ID that is currently logged in.

Factory setting: 0000

Actions:

DOWN button:
Scroll down on the virtual keyboard.

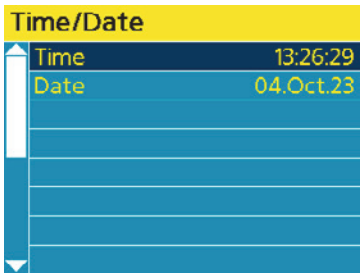
UP button:
Scroll up on the virtual keyboard.

RESET/MENU button:
Select value or cancel input using ESC (Escape).

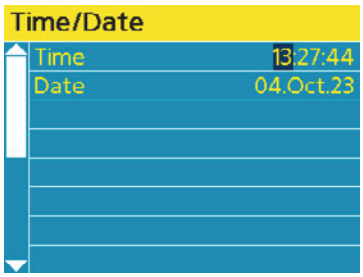
RIGHT button:
Scroll to the right on virtual keyboard.

LEFT button:
Scroll to the left on virtual keyboard.

5.4.5.2 Time/Date



Time and Date



Change value

Use the Time/Date menu to change the system clock's time and date. It contains the following menu items:

Time
Date

Actions:

DOWN button:
Scroll down or decrease value.

UP button:
Scroll up or increase value.

RESET/MENU button:
Select menu item or confirm value.

RIGHT button:
Select menu item or go to next value.

LEFT button:
Back to System Settings or trigger security query.

5.4.5.3 Language

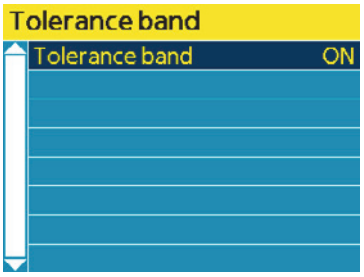
Language selection

Use the Language menu to change the display's language. The following languages are available:

English
German

Changing the language only affects the displayed data, but not the D-ReX' configuration.

5.4.5.4 Tolerance band



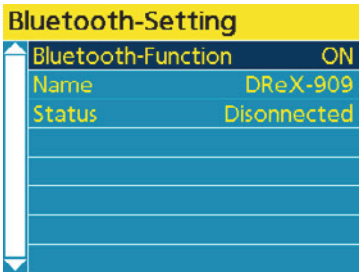
Tolerance band

Use the tolerance band menu to activate or deactivate the sensor's tolerance band.

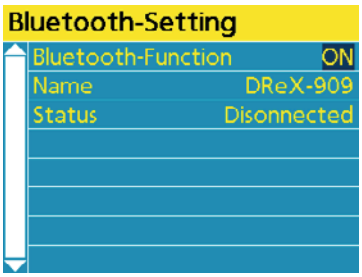
Factory setting: ON

The tolerance band is used to suppress small fluctuations near the zero point, which are often not caused by the target gas itself but by external influences (temperature, draught, etc.). The displayed gas concentration corresponds to the real gas concentration starting from twice the value of the tolerance band.

5.4.5.5 Bluetooth



Bluetooth



Settings

Use the Bluetooth menu to activate and deactivate the Bluetooth interface. It also displays the device's name and connection status. Information on the status is hidden if Bluetooth is deactivated.

Factory setting: ON

Actions:

DOWN button:
Bluetooth ON/OFF.

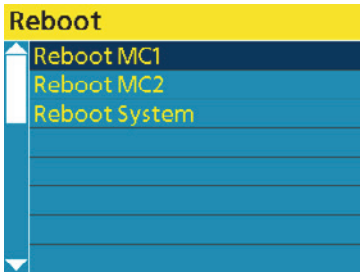
UP button:
Bluetooth ON/OFF.

RESET/MENU or RIGHT button:
Confirm.

RIGHT button:
Select menu item.

LEFT button:
Back to System Settings or trigger security query.

5.4.5.6 Reboot



Reboot

Use the Reboot menu to reboot the D-ReX or individual processors. The following options are available:

Reboot MC1 – Rebooting the terminal processor is primarily used to locate unknown faults.

Reboot MC2 – Rebooting the communications processor has two main functions:
- » Saving changes to the network settings
- » Locating unknown faults.

Reboot System – Reboots the D-ReX.

Actions:

DOWN button:
Scroll down through the menu.

UP button:
Scroll up through the menu.

RESET/MENU button:
Trigger a reboot.

LEFT button:
Back to System Settings.

6. Service

To maintain the functionality of a gas detection system, regular maintenance is required. It requires appropriate knowledge and, in accordance with national regulations, a certificate of competence of the person performing the work, if applicable.

WARNING

Danger due to incorrect inspection or maintenance

All inspection and maintenance work may only be carried out by competent persons.

If there are no suitably qualified employees in the company, please contact GfG. We offer appropriate training and refresher courses for your employees as well as suitable service contracts for all maintenance tasks.

6.1 Cleaning and Care

WARNING

Danger due to electrical shock

Only clean the device when it is disconnected from the power supply. Switch off all power supplies and secure them against being switched on again before starting any work.

External contaminations of the device's housing can be removed with a damp cloth. Do not use solvents or cleaning agents!

6.2 Service and maintenance

According to DIN EN 60079-29-2 section 11 and DIN EN 45544-4 section 8, maintenance and servicing include testing and inspection during operation as well as repair of the gas detection system.

Also observe all other applicable national and international regulations. In Germany, for example, this would be "DGUV Information 213-056 (Leaflet T 021 Section 9)" and "DGUV Information 213-057 (Leaflet T 023 Section 9)".

Depending on the results, it may be necessary to arrange for or carry out adjustment work and repairs. Any defects found must be rectified immediately!

6.2.1 Visual check

Perform visual checks on a regular basis. The interval between checks must not exceed **1 month**.
The visual check includes:

- Checking the operation indication and status notifications, e.g. operation indication “On”, alarm and fault indications “Off”
- Checking the housing (e.g. for mechanical and damage external contamination)
- Checking the sampling system (e.g. for mechanical damage and condensation)
- Checking the gas inlets for contamination and clogging
- Documenting the check

The corresponding documentation must include:

- Identification of the gas detection system (e.g. plant section, measuring point)
- Confirmation of the completion of the check
- Found defects
- Date and name

6.2.2 Functional check

The functional check can be performed at intervals, depending on the gas hazard you need to monitor. Adhere to the respective national regulations for this.

As an example, the inspection interval for gas detection systems monitoring toxic gases/vapors and oxygen as well as for gas detection systems for explosion protection, in Germany is **4 months**.

The functional check includes:

- Visual check according to section 6.2.1 “Visual check”
- Supplying zero and test gas
  - For checking and evaluating the display of measured values (calibration) and, if necessary, adjusting it
  - For checking and evaluating the response time in accordance with the information in the manufacturer’s operation manual
  - For comparison with the results of previous functional checks
  - Checking the equipment for transportation and preparation of the sample gas, as well as associated monitoring equipment
  - Checking the flow rate
  - Additional supply of test gas at the measuring point to check and evaluate the display of measured values and response time
  - Checking the impermeability and flow rate
- Triggering device-specific test function of display elements during operation, without triggering the switching functions
- Checking the stored notifications, faults and maintenance requests
- Documenting the check

The corresponding documentation must include:

- Identification of the gas detection system (e.g. plant section, measuring point)
- Composition of the test gases used
- Measured values for zero gas and test gas before and after calibrating / adjusting
- Evaluation of the response times
- Found defects
- Performed work
- Date and name

A function check eliminates the need to perform a visual check which is due at the same time.

6.2.3 System check (Proof Test)

The system check must be performed at regular intervals. The period between system checks may not exceed **1 year.**

The system check includes:

- Functional check according to section 6.2.2 Functional check
- Checking all safety functions, including triggering of switching functions (e.g. start-up of a technical ventilation system or other measures listed in the risk assessment)
- Checking the parameterization by comparison of target / actual value
- Checking the signaling and recording devices
- Documenting the check

The corresponding documentation must include:

- Identification of the components of the gas detection system (e.g. plant section, measuring point) and any downstream safety equipment
- Composition of the test gases used
- Deviations of the parameterization from the set values
- Measured values for zero gas and test gas before and after calibrating / adjusting
- Evaluation of the response times
- Found defects
- Performed work
- Date and name

The system check eliminates the need for a function check or visual check that is due at the same time.

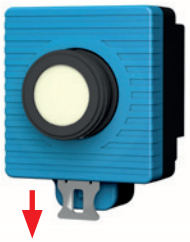
WARNING

Danger due to isolated examination of the gas detection system

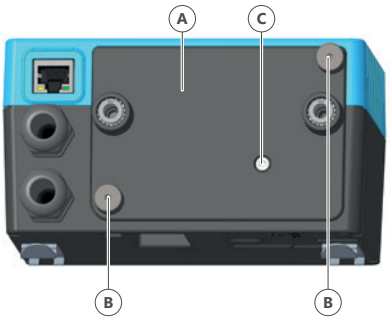
The system check performed by a qualified person must be carried out in close cooperation with the operator of the plant, especially when checking the safety functions.

If this is not feasible for operational reasons, set points up to which the system check is to be carried out must be determined and documented.

6.2.4 Sensor replacement for internal sensor cartridges

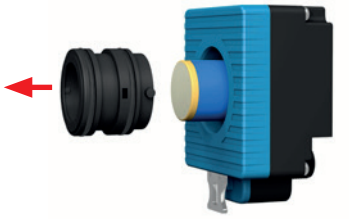


Remove the pump cover
To remove the sensor cassette from the D-ReX, loosen the two knurled screws (B) and pull off the pump cover (A).



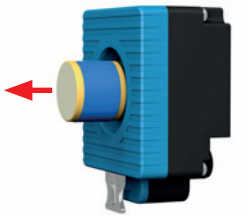
ATTENTION
Do not loosen the Torx screw (C) to remove the cover!

1. Pull the bayonet lock's safety pin downwards to detach the sensor cover.

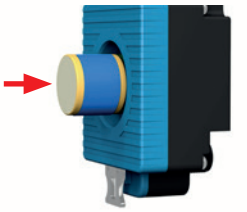


2. Twist the bayonet lock by 90° (anticlockwise).

3. Pull off the bayonet lock.

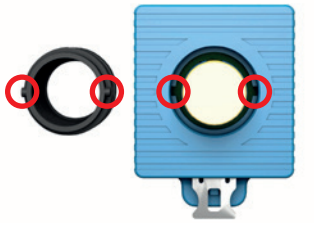


4. Pull the sensor out of the cartridge.



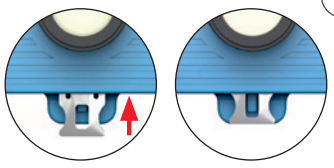
5. Insert the new sensor into the cartridge.

6. Reinsert the bayonet lock. Ensure that the pins are aligned correctly. They must be positioned in the grooves specifically designed for this purpose.



7. Twist the bayonet lock by 90° (clockwise).

8. Push the safety pin back up to seal the bayonet lock. If the safety pin cannot be pushed all the way up, the bayonet lock has to be twisted further.



ATTENTION
The sensor cassette must first be inserted into the pump cover before both parts are pushed back into the base unit together and fastened with the knurled screws!

6.2.5 Calibration and adjustment

Calibration with zero gas and test gases is used to check the display of measured values.

The adjustment with zero gas and test gas is used to set the displayed measured values. Always adjust the zero point first and the sensitivity second. It is also recommended to check the zero point again after this.

Calibration and adjustment are a part of the functional check and system check.

6.2.5.1 Zero gas and test gas

Generally, unpolluted fresh air (without any interfering gas components) or, in polluted atmospheres, synthetic air can be used as zero gas. Only electrochemical O_2 sensors and infrared CO_2 sensors use 100 vol % N_2.

Information on suitable test gases can be found in the supplied test protocol. Alternatively, you can also deduce suitable gases from the sensor specifications (► page 25 et sqq. Sensor specifications).

For calibrations, the test gas generally has to match the measured gas. The test gas concentration should, if possible, be known in advance, with an accuracy of ±5 %.

Should the measured gas be difficult to handle as a test gas, a substitute gas may be used. The substitute test gas and the associated sensitivty setting must be determined and documented in consultation with the gas detector's manufacturer. Contact GfG service in this case.

ATTENTION

Particularity of sensor units with CC sensor

Unpolluted fresh air (containing no interfering gas components) or, in polluted atmospheres, synthetic air can be used as zero gas.

ATTENTION

Particularity of sensor units with EC sensor

When selecting a zero gas, a distinction must be made between sensor units with an oxygen sensor and any other electrochemical sensors.

ATTENTION

Never operate the Pyrolyzer without an active gas flow!

The Py-ReX uses controlled heat to break down the target gas into measurable components. Two elements provide a controlled environment: the gas flow through the glass tube and over the filament element and the air flow through the fan over the glass body. Without the gas flow through the pump of the D-ReX PoS, the pyrolyzer can overheat and be damaged.

For oxygen sensors, only 100 vol % N_2 may be used. For all other electrochemical sensors, unpolluted fresh air (containing no interfering gas components) may be used as zero gas. In polluted atmospheres, you may also use synthetic air.

ATTENTION

Particularity of sensor units with IR sensor

When selecting a zero gas, a distinction must be made between sensor units with a carbon dioxide sensor and any other infrared sensors.

For carbon dioxide sensors, use only 100 vol % N_2. You may also use synthetic air, consisting of N_2 and O_2, for CO_2. For all other infrared sensors, unpolluted fresh air (containing no interfering gas compounds) may be used. In polluted atmospheres, you may also use synthetic air.

6.3 Note on the environmentally safe disposal of used parts

According to GfG's general terms and conditions, the customer assumes responsibility for the environmentally safe disposal of the device or any device components (such as replaced sensors). In Germany, this is regulated by §§11, 12 ElektroG. On request, GfG in Dortmund can also handle the proper disposal.

7. Pyrolyzer Py-Rex

The Pyrolyzer Py-ReX® expands the range of services provided by the D-ReX gas detection devices. In combination with a D-ReX PoS, which features an integrated pump, even highly toxic or chemically inactive gases can be detected in the smallest concentrations by measuring their decomposition products.

The Py-ReX is a filament pyrolyzer. It contains a filament, i.e. a thread, inside a quartz glass tube, which is heated to a certain temperature depending on the gas to be detected. When the target gas comes into contact with the filament, it decomposes into the measuring gas and possibly other components.

The measuring gas is then detected by means of an electrochemical smart sensor. The original concentration of the target gas can then be calculated from the concentration of the measuring gas.

7.1 Design Py-ReX

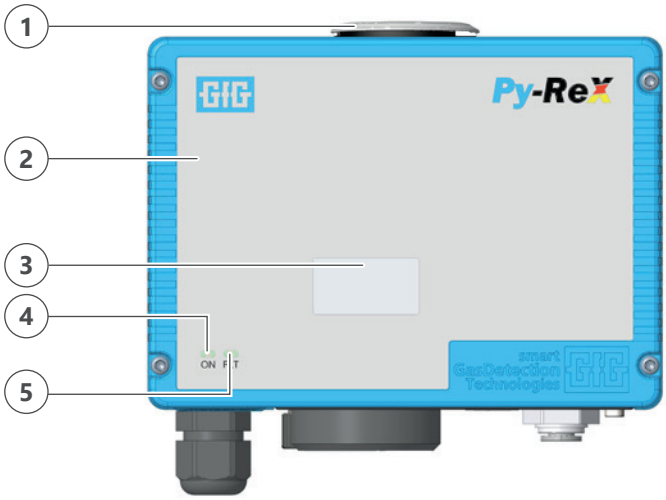
Maintenance and servicing, in accordance with DIN EN 60079-29-2 Section 11 and DIN EN 45544-4 Section 8, include testing and monitoring during operation as well as the repair of the gas detection system.

Please also observe all other applicable national and international regulations, in Germany for example the “DGUV Information 213-056 (Merkblatt T 021 Abschnitt 9)” and the “DGUV Information 213-057 (Merkblatt T 023 Abschnitt 9)”.

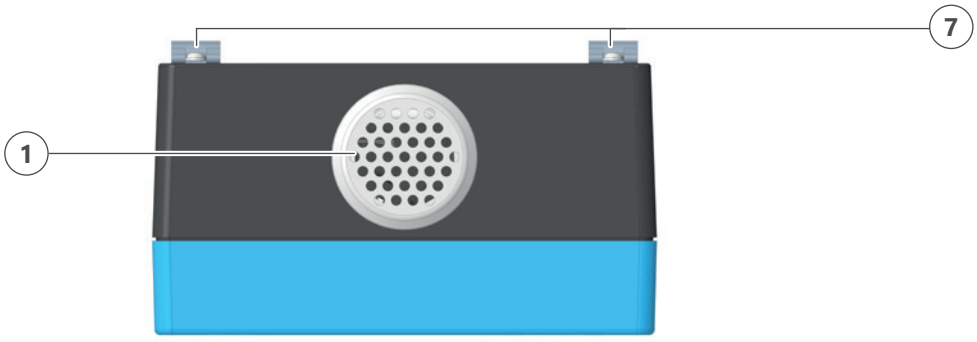
Depending on the results, it may be necessary to initiate or carry out adjustment and repair work. Any defects found must be rectified immediately!

7.1.1 Housing

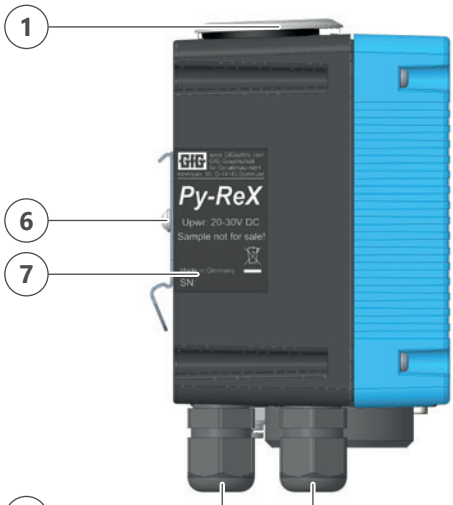
1. Fan cover
2. Housing cover
3. Inspection window gas type
4. Status LED Power ON
5. Status LED FLT (Fault)
6. DIN rail clip
8. Type plate
9. Cable gland M16 x 1.5
10. Lower housing plate
11. Ventilation opening
12. Connection for intake line
13. Connection for connection line to D-ReX PoS



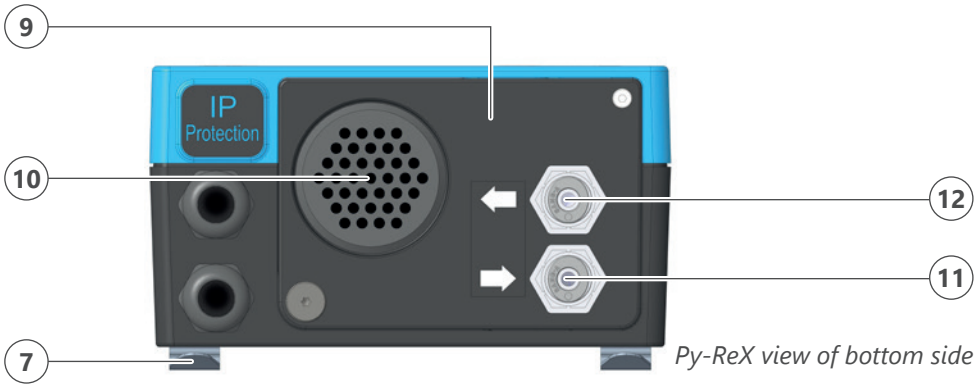
Py-ReX front view



Py-ReX view of top side



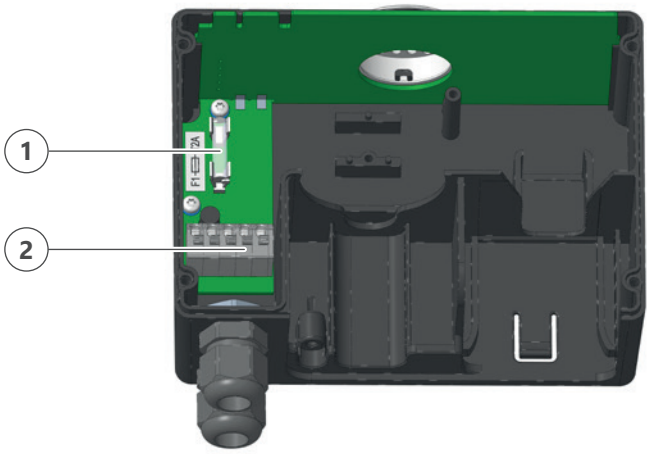
Py-ReX view left-hand side



Py-ReX view of bottom side

7.1.2 Housing interior

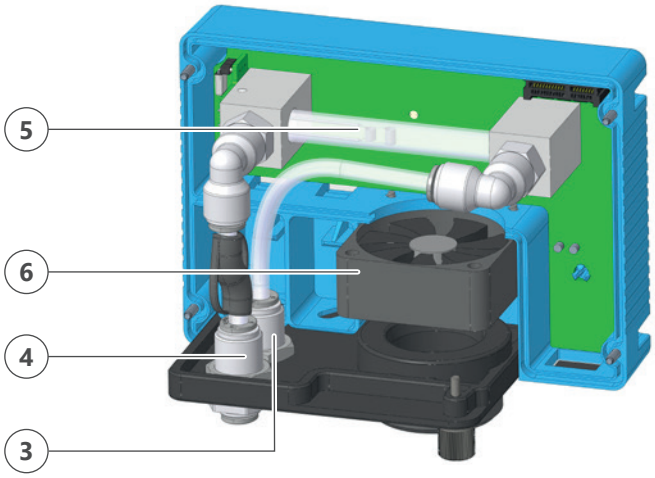
1. Fuse
2. Terminal block



Py-ReX housing interior view without Pyrolyzer

7.1.3 Housing cover (front)

3. Connection suction hose
4. Connection to the D-ReX PoS
5. Filament pyrolyzer
6. Fan



Py-ReX housing cover with Pyrolyzer and fan

7.2 Optional components

The following add-ons are available for the Py-ReX:

Accessories	Item no.
DIN rail for D-ReX or Py-ReX 35/15 500 mm Length	3605102
Angle clamps 90° for PTFE hose, PU = 2	3605100

The following spare parts are available for the Py-ReX:

Spare part	Item no.
Spare part: Heater for Py-ReX 2.5	3605201

7.3 Further applicable documents

The following table lists all further applicable documents.
If required, GfG will send you more information and additional copies of these documents.

» Configuration	Included upon delivery
» Testing protocol	Included upon delivery
» Declaration of conformity	(► Seite 109)

7.4 Mounting

7.4.1 Mounting location

The Py-ReX is designed for mounting next to a D-ReX PoS on a DIN rail (TH35 (formerly TS35) according to DIN EN 60715) up to an altitude of 2000 meters above sea level. This also includes installation in suitable wall enclosures and control cabinets. The versions with increased IP protection class (IP64) can also be installed outdoors. In this case, additional protective measures for the device may be necessary.

WARNUNG

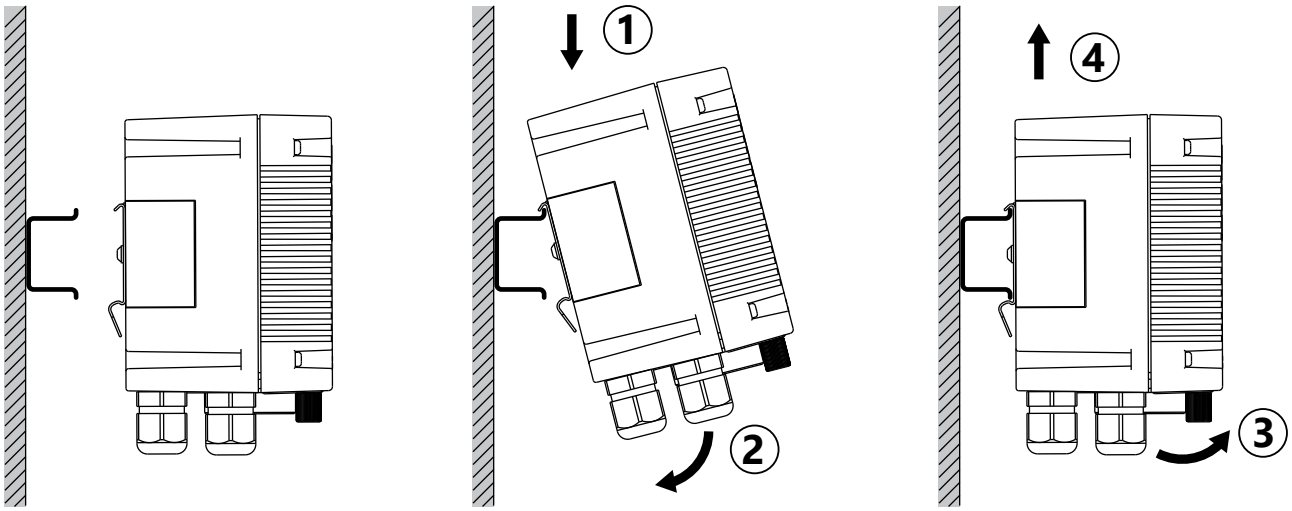
Risk of Explosion
The device must not be installed in Ex zones! It is only approved for use outside Ex zones.

ATTENTION

Shared Power Supply
When a pyrolyzer is used, the primary power supply of the D-ReX PoS is provided by the Py-ReX, as the pyrolyzer is also monitored in this way. The two devices must be mounted next to each other.

7.4.2 Mounting the housing

Mount the DIN rail the Py-ReX is attached to horizontally, so the connectors and sensor opening of the device point down when the Py-ReX is mounted.



Mounting the device:
» Hook the Py-ReX onto the DIN rail at its clip (1)
» Gently press down on its lower edge until it clicks into place (2).

Removing the device:
» Grasp the bottom of the Py-ReX and gently pull it out of the DIN rail (3).
» Then, pull it upwards to remove it (4).

7.5 Electrical connections

ATTENTION

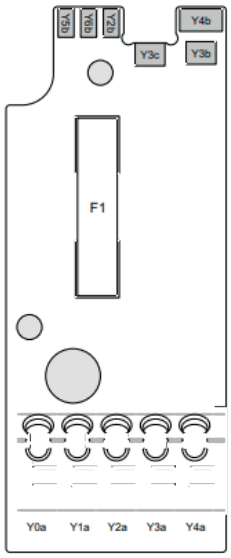
Defects caused by faulty electrical installation

Adhere to DIN VDE 0100 or the corresponding national guidelines when installing the device.

The cables used must be suitable for the intended application. Insulated wires and cables must be flame retardant.

All overcurrent protection devices (fuses, circuit breakers) of the electrical circuit must fulfill the standard requirements of installations inside buildings.

7.5.1 Current supply



The Py-ReX is supplied with power via an external 24 V DC power supply unit. This voltage is connected to the clamps 1 (0 V) and 2 (24 V). The D-ReX PoS is connected via the clamps 3 (Out), 4 (0 V) and 5 (24 V).

The 24 V DC supply must be a regulated safety extra-low voltage (SELV) or protective extra-low voltage (PELV). The power of the power supply units must be sufficient for the Py-ReX, the D-ReX and other components supplied.

Fuse F1: glass microfuse T / 2 A 5x20 mm 250 V

Information on connecting to the D-ReX PoS is available in chapter 4.3.2.

Terminal Block

No.	Abbreviation	Description	Note
Y0	GND	GND	2-core connection of a SELV or PELV power supply*
Y1	24 V	Power supply inlet with 24 V DC (15...30 V DC)	
Y2	Iout	4...20 mA signal outlet	3-core connection to the D-ReX* (Y2 to X74, Y3 to X61, Y4 to X62)
Y3	GND	GND (internally connected to Y0)	
Y4	24 V	Power supply outlet (internally connected to Y1)	

* Py-ReX and D-ReX are supplied with power from the same power supply unit via a 2- or 3-core cable.

7.6 Commissioning

After completing the installation of the Py-Rex and the D-ReX, including all extensions and any additional control modules, and after ensuring the power supply, commissioning can be carried out. They always take place together.

Gas warning devices must be checked for function by a competent person in accordance with national regulations after installation but before starting the measurement operation (initial operation).

In Germany, the "DGUV Information 213-056 (leaflet T 021 section 8.1)" and the "DGUV Information 213-057 (leaflet T 023 section 8.1)" apply. Please also observe the corresponding standards and regulations of the country in which the D-ReX is installed.

8. Technical specifications

8.1 Technical specifications D-ReX

Type designation Version	**D-ReX** Point of Use (PoS) for pump mode with internal sensor
Pump Withdrawal rate (regulated): Withdrawal rate (maximum): Suction pressure (maximum): Hose connections:	only with D-ReX PoS 0.5 slpm @ 0.0 to -2.8 kPa 1.1 slpm @ 0.0 kPa -6.2 kPa @ 0.0 slpm 2 push-in fittings, 6 mm outer diameter
Gas sensors Measuring principle: Available sensor types: Gases:	 Depending on sensor Electrochemical sensors (EC) Catalytic sensors (CC) Infrared sensors (IR) See sensor list (► page 32)
Display & control elements	 2.4″ TFT-Display (320x240 pixels) 5 control buttons 11 Status LEDs for alarms and operation statuses
Climatic conditions Temperature (storage): Temperature (operation): Pressure: Humidity: Mounting location:	 -25 to +60 °C (recommended: 0 to +30 °C) -10 to +40 °C (also take the sensor's range of application into account) 70 to 130 kPa (also take the sensor's range of application into account) 5 to 99 % RH (also take the sensor's range of application into account) Inside, or for versions with an increased IP protection class (IP64), outside up to altitudes of 2000 meters above sea level The device is mounted on a TH35 mounting rail (previously TS35) according to DIN EN 60715
Power supply Operating voltage: Power consumption:	 24 V DC (12 to 30 V DC) using stabilized SELV or PELV power supply or PoE with 48 V DC 2.4 W (base load) + 0.2 W with LonWorks + 0.3 W with 4-20mA output signal + 0.6 W with pump + 1.3 W with internal relays
Communication & Output signals Digital: Analog: Relays:	 10/100Mbit Ethernet (Modbus/TCP) RS-485 Half-Duplex, max. 115200 Baud (Modbus/RTU) Bluetooth 5.2 (optional) LonWorks Current output 4-20 mA (max. load 250 Ω) (optional) 5 internal relays with a changeover contact each (max. 3 A / 30 V DC or min. 10 mA / 5 V) (optional) 16 external relays with a changeover contact each (max. 3 A / 30 V DC or max. 3 A /250 V AC)

Cable junction	
Cable gland:	2x M16x1.5, plastic, for cable diameter of 4.5-10mm
Examples of connection cables:	5-27 x 0.25mm² LiYY or 4-24 x 0.25mm² LiY-CY 4-21 x 0.34mm² LiYY or 2-16 x 0.34mm² LiY-CY 2-16 x 0.50mm² LiYY or 2-12 x 0.50mm² LiY-CY 2-12 x 0.75mm² LiYY or 2-8 x 0.75mm² LiY-CY
Terminal connections:	for 0.2-1.5mm² / 24-16AWG (one-wire conductor) for 0.25-1.0mm² (fine stranding conductor with wire end ferrule)
RJ45 ethernet connection:	Cable at least CAT-5e shielded or, better, CAT-6, CAT-6a, CAT-7
Housing	
Dimensions:	145 x 105 x 78mm (W x H x D)
Weight:	approx. 650-850 g (depending on device version)
Housing material:	Plastic
Approvals / Examinations	
Electromagnetic compatibility:	EN 50270:2015 (Emitted interference: Type class I, Interference resistance: Type class II) EN 301489-1 V2.2.3 (2019-11) EN 301489-17 V3.2.4 (2020-04) FCC §15B
Radio signal:	EN 300 328, Bluetooth LE FCC Part 15.247, Bluetooth LE
Electrical safety:	EN 61010-1 (Degree of contamination 2) EN 60529
Housing protection class:	Base device IP30 (optionally IP64) Gas sensor IP64

8.2 Technical specifications Py-ReX

Type designation	Py-ReX
Display & control elements	2 status LEDs for indication of operation status
Climatic conditions	
Temperature (storage):	-25 to +60 °C (recommended: 0 bis +30 °C)
Temperature (operation):	-10 to +40 °C
Pressure:	70 to 130 kPa
Humidity:	5 to 95 % RH
Mounting location:	Inside up to altitudes of 2000 meters above sea level The device is mounted on a TH35 mounting rail (previously TS35) according to DINEN 60715
Power Supply	
Operating voltage:	24 V DC (15 to 30 V DC) through a stabilized SELV or PELV power supply unit
Power consumption:	25 W at highest heat output 22 W at normal heat output
Output signals	
Current output:	4-20 mA (max. load 250 Ω)
Cable junction	
Cable gland:	2x M16x1.5, plastic, for cable diameter of 4.5-10mm
Examples of connection cables:	3x 0,75mm² or 3x 1,0mm² or 3x 1,5mm² LiYY etc.
Terminal connections:	for 0,5...1,0mm² (fine stranding conductor with wire end ferrule) for 0,5...1,5mm² / 20...14AWG (one-wire conductor) for 0,75...1,5mm² / 18...16AWG (one-wire conductor)
Housing	
Dimensions:	145 x 105 x 78mm (W x H x T)
Weight:	approx. 700 g
Housing material:	Plastic
Housing protection class:	IP20

Firmwaren Versions D-ReX
Terminal MC1 V1.00.89
Mainboard MC2 V1.04.86
Sensor-Cartridge MC3 V1.07.32
Mainboard HTML V1.03.14

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8.3 Declaration of Conformity

EU Declaration of Conformity

D-ReX

Created: June 26, 2023 Edited: November 28, 2023

GfG Gesellschaft für Gerätebau mbH

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GfG Gesellschaft für Gerätebau mbH develops, produces and sells gas sensors and gas detection devices which are subject to a **quality management system** as per DIN EN ISO 9001.
This quality management system monitors the production of electric equipment of device category I and II, in categories M1, M2, 1G and 2G, for gas sensors, gas detectors and gas detection systems of protection types "flameproof enclosure", "increased safety", "encapsulated" and "intrinsic safety" and their measuring capabilities. This process is supervised by the notified body DEKRA Testing and Certification GmbH (0158).

The **D-ReX** fixed gas detector complies with directive **2014/30/EU** for electromagnetic compatibility, directive **2014/53/EU** (RED) relating to the process of making radio equipment available on the market and with directive **2011/65/EU** (RoHS) on the restriction of use of certain hazardous substances in electrical and electronic equipment.

Labelling CE

Directive 2014/30/EU is complied with according to the following standard:

- Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen — EN 50270: 2015
  Emitted interference — Type class 1
  Interference immunity — Type class 2

The electromagnetic compatibility has been tested by EMC test laboratory AMETEK CTS Germany GmbH in Kamen.

Directive 2014/53/EU is complied with according to the following standards:

- Data transmission equipment operating in the 2.4 GHz band — EN 300328 V2.2.2: 2019

Reference to directive 2014/30/EU:

- ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
  Common technical requirements — ETSI EN 301489-1 V2.2.3: 2019
  Broadband Data Transmission Systems — ETSI EN 301489-17 V3.2.4: 2020

Reference to directive 2014/35/EU:

- Safety requirements for electrical equipment for measurement, control and laboratory use
  General requirements. — EN 61010-1: 2010 + A1:2019 + A1:2019/AC2019

The compatibility has been tested and certified by test laboratories cetecom advanced GmbH, Essen and AMETEK CTS Germany GmbH, Kamen.

Directive 2011/65/EU is complied with according to the following standard:

- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances — EN 50581: 2012

Dortmund, November 28, 2023

i.V. .....
QMB B. Siebrecht

ATEX EU-Kon69-2.2/Siebrecht

EU Declaration of Conformity

Py-ReX

Created: June 27, 2023 Edited:

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GfG Gesellschaft für Gerätebau mbH develops, produces and sells gas sensors and gas detection devices which are subject to a **quality management system** as per DIN EN ISO 9001.
This quality management system monitors the production of electric equipment of device category I and II, in categories M1, M2, 1G and 2G, for gas sensors, gas detectors and gas detection systems of protection types "flameproof enclosure", "increased safety", "encapsulated" and "intrinsic safety" and their measuring capabilities. This process is supervised by the notified body DEKRA Testing and Certification GmbH (0158).

The **Py-ReX** fixed pyrolizer complies with directive **2014/30/EU** for electromagnetic compatibility and with directive **2011/65/EU** (RoHS) on the restriction of use of certain hazardous substances in electrical and electronic equipment.

Labelling CE

Directive 2014/30/EU is complied with according to the following standard:

- Electrical equipment for measurement, control and laboratory use - EMC requirements

Part 1: General requirements	IEC EN 61326-1: 2021
Emitted interference	Type class 1
Interference immunity	Type class 2

The electromagnetic compatibility has been tested by EMC test laboratory AMETEK CTS Germany GmbH in Kamen.

Directive 2011/65/EU is complied with according to the following standard:

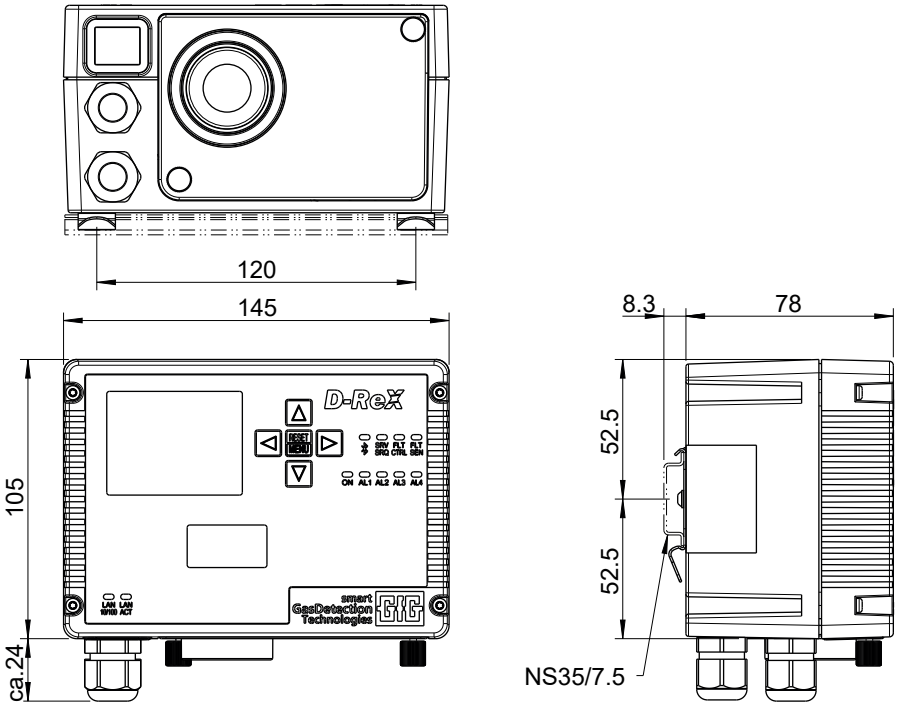
- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances EN 50581: 2012

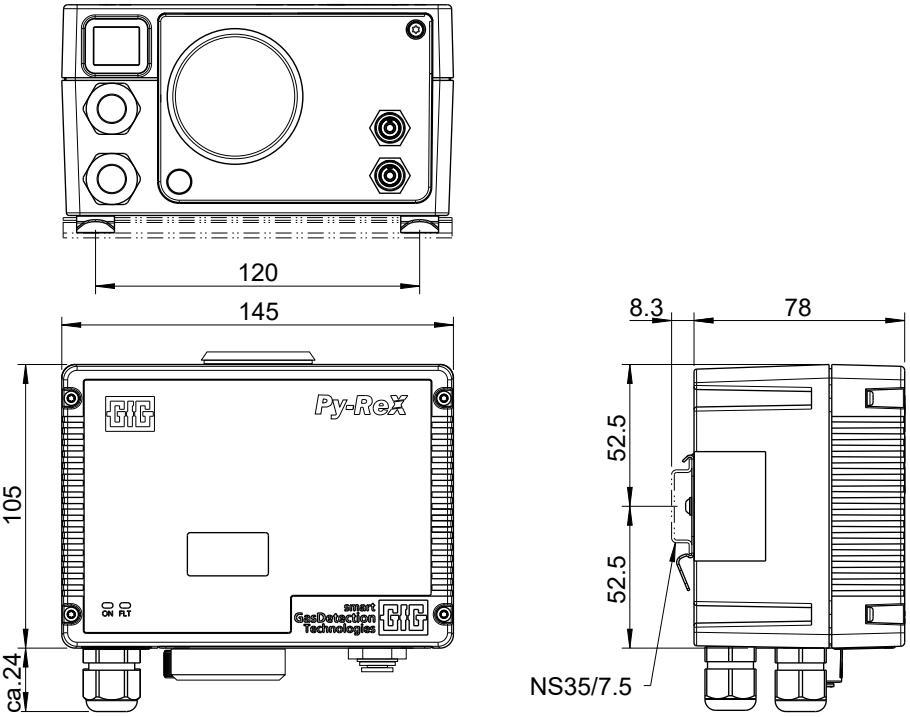
Dortmund, June 27, 2023

i.V. .....
QMB B. Siebrecht

ATEX EU-Kon70-2.2/Siebrecht

8.4 Package dimensions and Mounting template





Rev.	Changes	Date	Name	Date	Name	Verified	Title:
				2023-07-31	Leonhardt	Böttger	D-ReX with pump Package dimensions and mounting template
				Adhere to protection note ISO 16016 Schutzvermerk ISO 16016 beachten			
				GfG Gesellschaft für Gerätebau mbH Klönnestr.99, D - 44143 Dortmund			Document-No.: 245-005.06 Page 1 of 1
							Replaces: Replaced by: