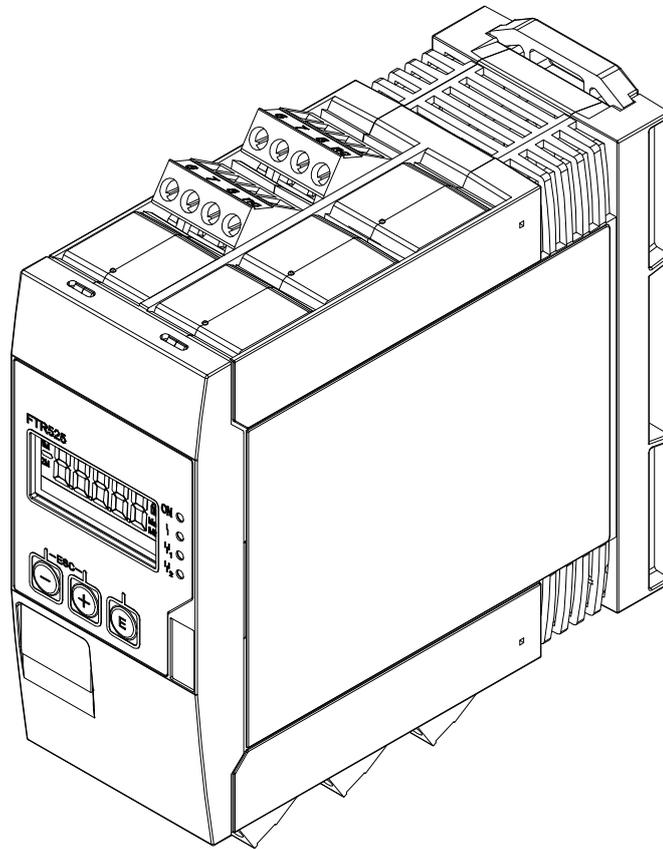


Operating Instructions

Nivotester FTR525

Process transmitter with control unit for the Soliwave microwave barrier



- Make sure the document is stored in a safe place so that it is always available when working on or with the device.
- To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.
- The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser Sales Center will supply you with information on modifications or updates to the Operating Instructions.

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1 Document information

1.1 Purpose of the document

These Operating Instructions contain all the information that is required in the various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, servicing and disposal.

1.2 Document conventions

1.2.1 Safety symbols

| Symbol | Meaning |
|--|--|
|  WARNING | WARNING! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury. |
|  NOTICE | NOTICE! This symbol contains information on procedures and other facts which do not result in personal injury. |

1.2.2 Tool symbols

| Symbol | Meaning |
|---|------------------------|
|  | Flat blade screwdriver |

1.2.3 Symbols for certain types of information

| Symbol | Meaning |
|---|--|
|  | Permitted Indicates procedures, processes or actions that are permitted. |
|  | Tip Indicates additional information. |
|  | Reference to documentation Refers to the corresponding device documentation. |
|  | Reference to page Refers to the corresponding page number. |
|  | Reference to graphic Refers to the corresponding graphic number and page number. |
|  | Visual inspection |

1.2.4 Symbols in graphics

| Symbol | Meaning |
|---|--------------------------------|
| 1, 2, 3 ... | Item numbers |
| 1., 2., 3. ... | Series of steps |
|  | Hazardous area |
|  | Safe area (non-hazardous area) |

1.2.5 Device-specific symbols

| Symbol | Meaning |
|---|--|
|  | Free path Indicates a free path (point level detection) |
|  | Covered path Indicates a covered path (point level detection) |
|  | Minimum bulk flow Indicates a minimum or absent bulk flow (bulk flow monitoring) |
|  | Maximum bulk flow Indicates a maximum bulk flow (bulk flow monitoring) |
|  | LED on Indicates an activate output with its corresponding illuminated LED |
|  | LED off Indicates an inactive output with its corresponding non-illuminated LED |
|  | Bidirectional communication Indicates a bidirectional communication between the FTR525 and the devices FQR57 and FDR57 of the Soliwave microwave barrier |

1.3 Documentation

 For an overview of the scope of the technical documentation associated with the device, see:

- The *W@M Device Viewer*: enter the serial number from the nameplate (www.endress.com/deviceviewer)
- The *Endress+Hauser Operations App*: enter the serial number from the nameplate

1.3.1 Standard documentation

| Document | Purpose and content of the document |
|--|---|
| Technical Information TI01329F/97/EN | Planning aid for your device The document contains all the technical data pertaining to the device and provides an overview of the accessories and other products that can be ordered for the device. |
| Brief Operating Instructions KA01344F/97/A2 | Guide that takes you quickly to the 1st measured value The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning. |

 The document types listed are available:

- In the Download Area of the Endress+Hauser website:
www.endress.com → Downloads

1.3.2 Supplementary device-dependent documentation

Depending on the approval, Safety Instructions (XA) are supplied with the device on delivery. These Safety Instructions (XA) are an integral part of the Operating Instructions.

| Feature 010 | Approval | Safety Instructions |
|-------------|---|---------------------|
| BA | ATEX II (1)G [Ex ia Ga] IIC / ATEX II (1)D [Ex ia Da] IIIC | XA01603F/97/A3 |
| IA | IECEX [Ex ia Ga] IIC / IECEX [Ex ia Da] IIIC | XA01604F/97/EN |

-  The document types listed are available:
- In the Download Area of the Endress+Hauser website:
www.endress.com → Downloads

2 Basic safety instructions

2.1 Requirements for personnel

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

- ▶ Trained, qualified specialists: Must be qualified for this specific function and task
- ▶ Authorized by the plant owner/operator
- ▶ Familiar with national regulations
- ▶ Before starting work: Read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application)
- ▶ Follow the instructions and relevant guidelines

Operating personnel must meet the following requirements:

- ▶ Instructed and authorized according to the requirements of the task by the facility's owner/operator
- ▶ Follow the instructions in this manual

2.2 Designated use

The process transmitter FTR525 provides the power supply for the microwave barrier Soliwave. It records simultaneously the measurements of the point level detection and optionally of the bulk flow monitoring. The devices FQR57 and FDR57 are operated and parameterised by the FTR525.

NOTICE

- The manufacturer is not liable for damage caused by improper or non-designated use. Conversion work or changes must not be carried out on the device.
- The device is designed for use in industrial environments and may only be operated when installed.
- The device can and may only be repaired by the manufacturer.

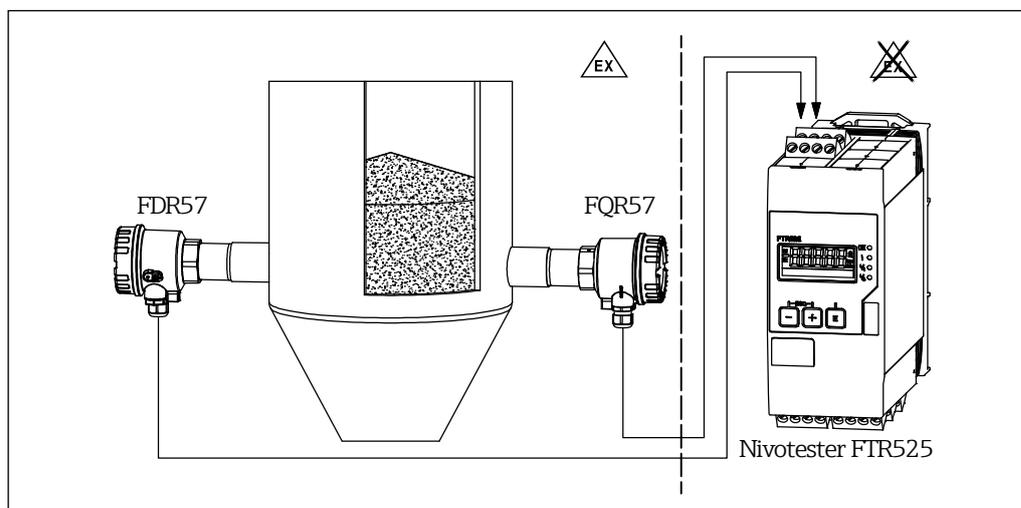
Hazardous area

The process transmitter with control unit FTR525, as an associated apparatus, is only permissible exclusively for use outside of the hazardous area.

⚠ WARNING

Observe Safety Instructions!

→ 7



1 Use in hazardous area

2.3 Occupational safety

When working on and with the device:

- ▶ Wear the required personal protective equipment in accordance with national regulations.

2.4 Operational safety

Risk of injury!

- ▶ The device may only be operated if it is in proper technical condition free from errors and faults.
- ▶ The operator is responsible for ensuring that the device is in good working order.

Hazardous area

To eliminate danger to persons or the facility when the device is used in the hazardous area (e.g. explosion protection):

- ▶ Check the nameplate to verify whether the ordered device can be used as intended in the hazardous area.
- ▶ Observe the specifications in the separate supplementary documentation, which is an integral part of these Operating Instructions.

2.5 Product safety

This device is designed to meet state-of-the-art safety requirements and good engineering practice, has been tested and left the factory in a condition in which it is safe to operate. It meets the general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

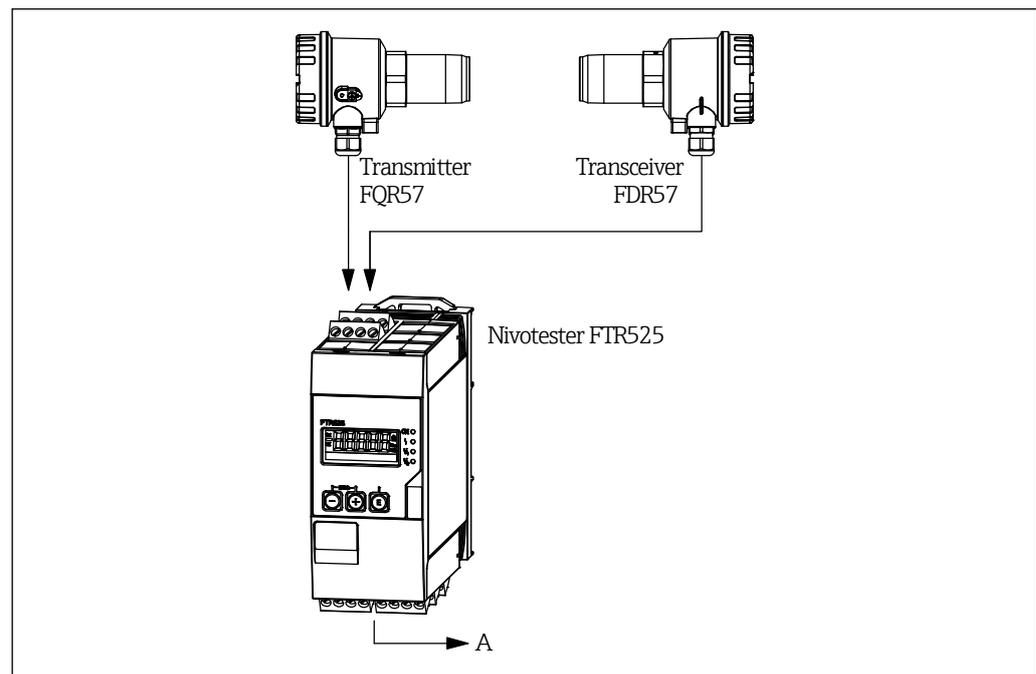
3 Product description

The Nivotester FTR525, as an associated apparatus, is used for parametrisation and evaluation of the Soliwave FQR57/FDR57 microwave barrier.

 For detailed information regarding protecting the Soliwave microwave barrier: See the Technical Information TI01330F/97/EN and the Operating Instructions BA01803F/97/A2.

3.1 Product design

All variants of the Nivotester FTR525 are mechanically identical (→  6 on page 14), they only differ regarding type and number of signal outputs and consequently the number of terminal block connectors.

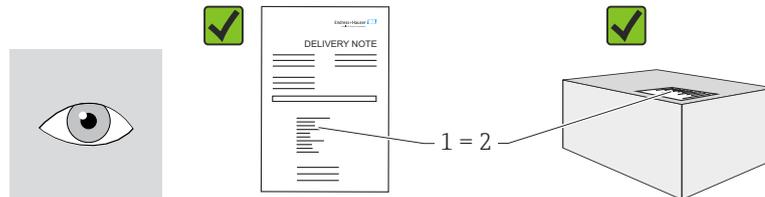


 2 Design of the measurement system

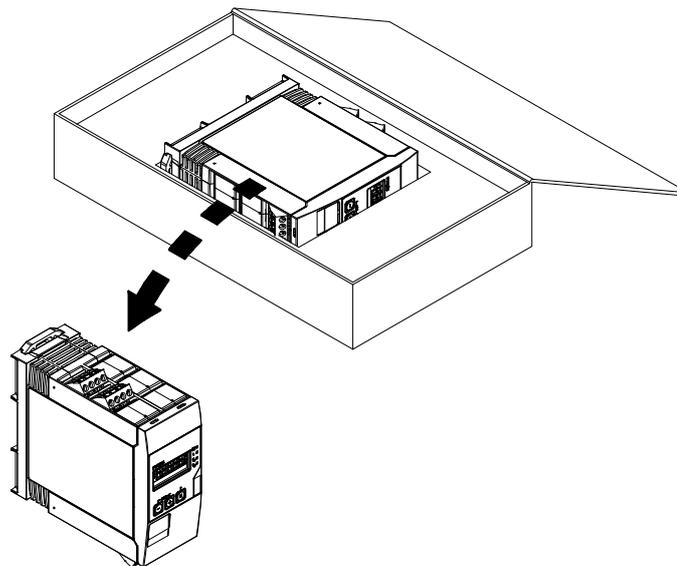
A Power supply and signal outputs

4 Incoming acceptance and product identification

4.1 Incoming acceptance



Is the order code on the delivery note (1) identical to the order code on the product sticker (2)?



Are the goods undamaged? Do the data on the nameplate correspond to the order specifications and the delivery note?

 If one of the conditions is not satisfied, contact your Endress+Hauser Sales Center.

4.2 Product identification

The following options are available for identification of the device:

- Using the nameplate specifications
- Using the order code with a breakdown of the device features on the delivery note
- Enter serial numbers from nameplates in *W@M Device Viewer* (www.endress.com/deviceviewer):
All information about the device is displayed.

For an overview of the scope of the Technical Documentation provided, refer to the following:

- The "Documentation" chapters
- The *W@M Device Viewer*: enter the serial number from the nameplate (www.endress.com/deviceviewer)

5 Installation

5.1 Installation conditions

NOTICE

Reduction in the operating life of the display due to high temperatures

- ▶ Ensure sufficient cooling of the device in order to prevent the build-up of heat.
- ▶ Do not operate the device for long periods of time in the upper marginal temperature range.

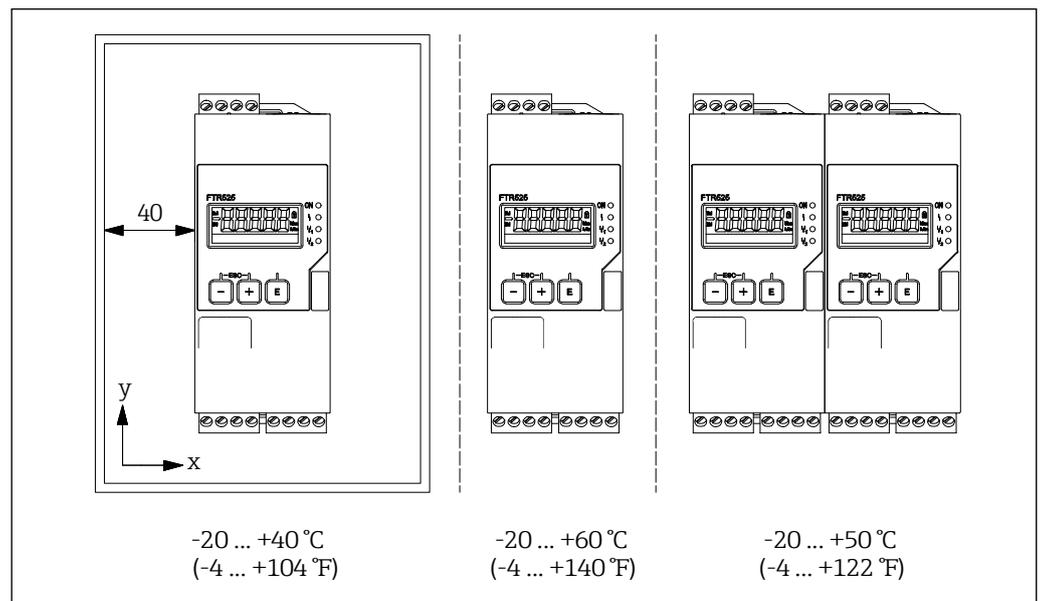
The process transmitter with control unit is designed for use on the top-hat rail (IEC 60715 TH35). Connections and outputs are fitted on the top and bottom of the device. Inputs are located on the top, while outputs and the connection for power supply are located on the bottom. Lines are connected via labeled terminals.

5.1.1 Operating temperature range

The maximum operating temperature range is -20 to 60 °C (-4 to 140 °F) when installed in the open; this range is reduced accordingly when installed in enclosed housings or in series.

NOTICE

If the orientation is not vertical (→ 5.1.2), the maximum operating temperature is reduced to +40 °C (+104 °F).



4 Operating temperature ranges depending on installation

5.1.2 Orientation

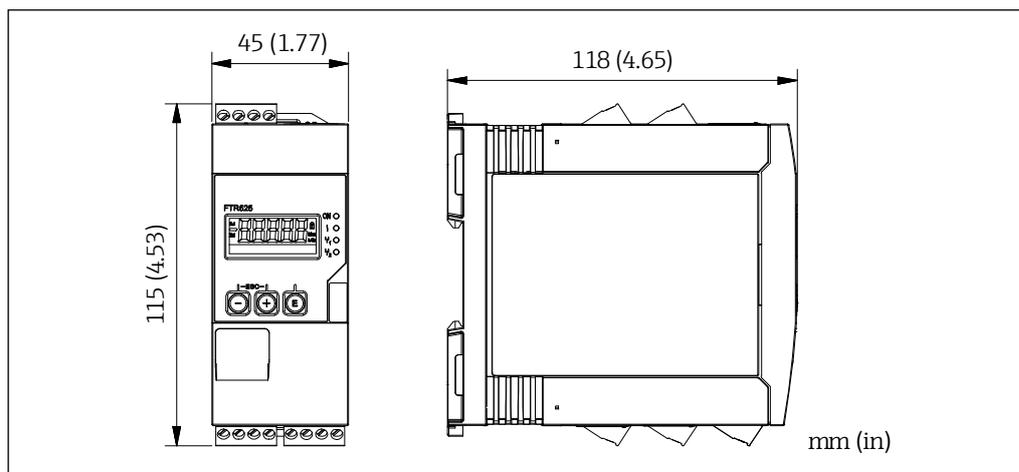
The orientation can be in any position.

NOTICE

If the orientation is not vertical, the maximum operating temperature is reduced.
→ 5.1.1

5.1.3 Installation dimensions

Observe the width to be provided for the device of 45 mm (1.77 in).



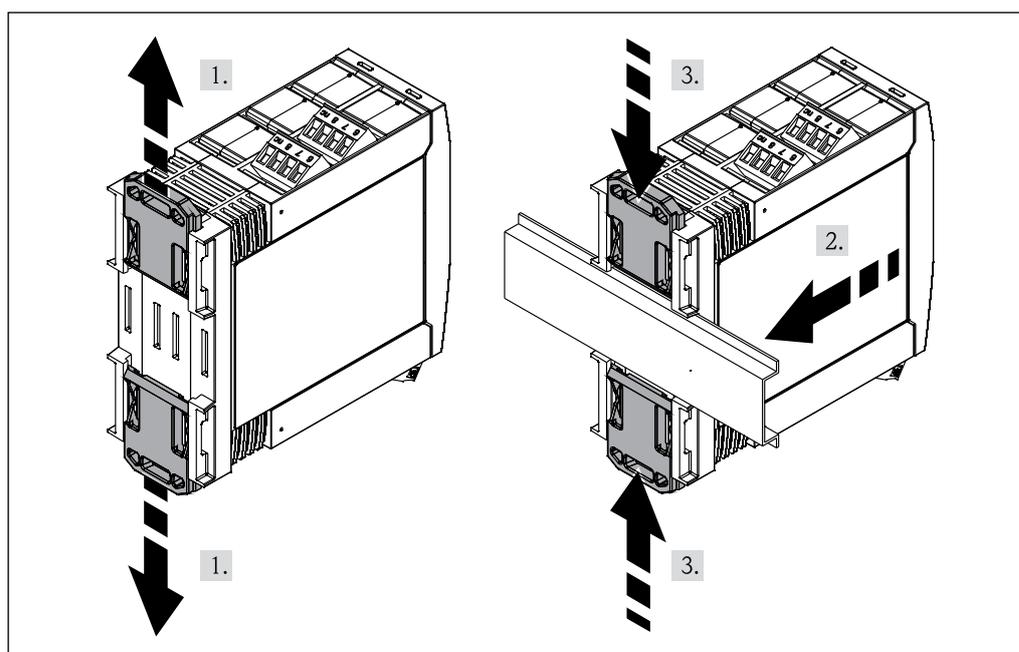
5 Installation dimensions

5.2 Installing the device

Installation procedure:

1. Slide the upper top-hat rail clip upwards and the lower clip downwards until they reach the points at which they click into place.
2. Position the device on the top-hat rail from the front.
3. Slide the two top-hat rail clips together again until they click into place.

To remove the device, slide the top-hat rail clips upwards or downwards, as applicable (see 1.), and remove the device from the top-hat rail. It is also sufficient to open one of the two top-hat rail clips and tilt the device accordingly in order to remove it from the top-hat rail.



6 Installation of the FTR525

5.3 Post-installation check

| | |
|--------------------------|--|
| <input type="checkbox"/> | Is the top-hat rail clicked into place? |
| <input type="checkbox"/> | Is the device positioned securely on the top-hat rail? |
| <input type="checkbox"/> | Are all plug-in terminals securely clicked into place? |
| <input type="checkbox"/> | Are the temperature limits complied with at the installation location? |

6 Electrical connection

WARNING

Danger due to electric voltage

- ▶ The entire process of electrical connection must be carried out while the system is de-energized.
- ▶ Before commissioning, compare the supply voltage to the specifications on the nameplate to ensure that they match.
- ▶ Provide a suitable switch or power-circuit breaker in accordance with IEC/EN61010 within the building installation. This switch must be fitted near to the device (within easy reach) and must be marked as a circuit breaker.
- ▶ An overcurrent protection device (rated current of ≤ 10 A) is required for the power cable.

NOTICE

Electrical safety is compromised by an incorrect connection!

- ▶ Have electrical connection work carried out by appropriately trained specialists only.
- ▶ Observe applicable national installation regulations.
- ▶ Comply with local workplace safety regulations.

-  Note the terminal designation on the side of the device.
- Mixed connection of safety extra low voltage and voltages that are dangerous to touch to the relay/SSR is permitted.

 In the case of a device for use in a hazardous area:
Note the information in the Ex documentation (XA).

6.1 Connection conditions

6.1.1 Required tool

For the terminals:

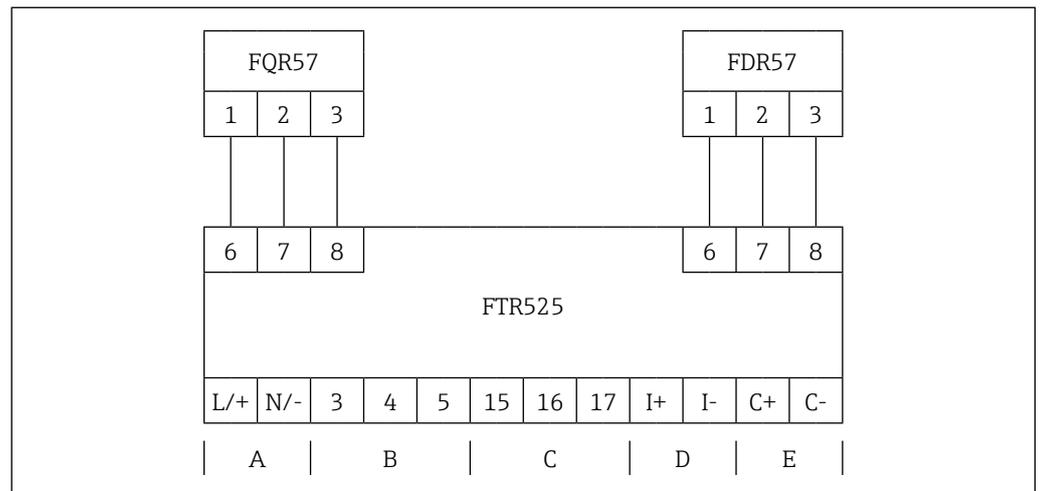
 0.6x3.5mm

6.1.2 Connecting cable requirements

The connecting cables provided by the customer (power supply and output signal) and the connection lines (FTR525 to FQR57/FDR57) must meet the following requirements:

- Electrical safety in accordance with applicable national regulations
- Permitted temperature range →  13
- Power supply and signal lines: Normal installation cable
- Connection line: Normal installation line, at least a three-wire cable
- Line cross-sections: 0.2 to 2.5 mm² (24 to 12 AWG)
- The terminals of the FTR525 are only approved for connecting fixed lines. The operator must ensure adequate strain relief.

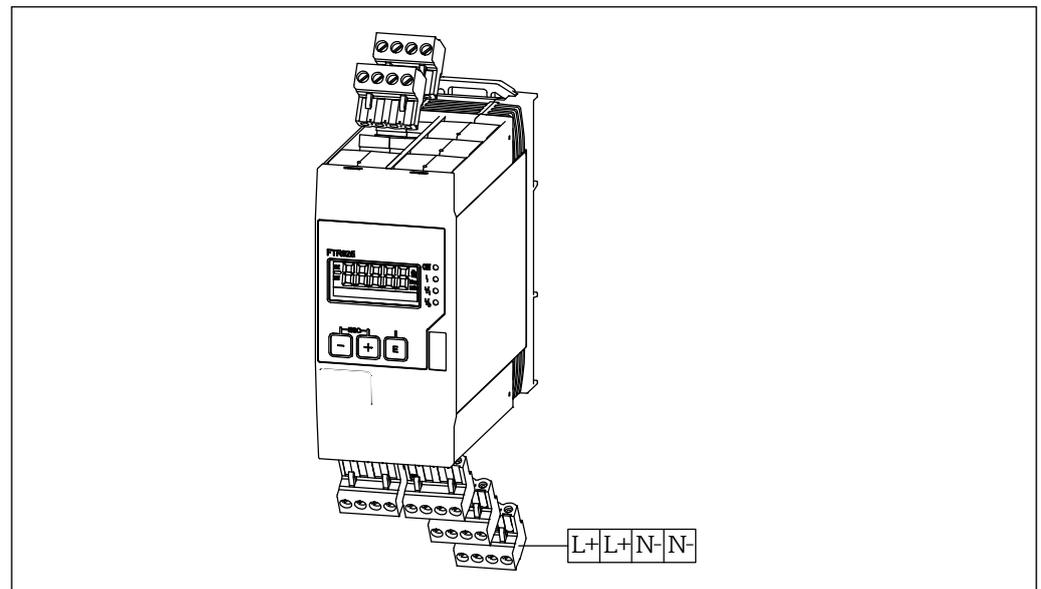
6.2 Connecting the device



7 Terminal assignment of the microwave barrier with process transmitter

- A Power supply
- B Switch output 1 (Relay or SSR)
- C Switch output 2 (Relay or SSR, optional)
- D Current output
- E Switch output (open collector)

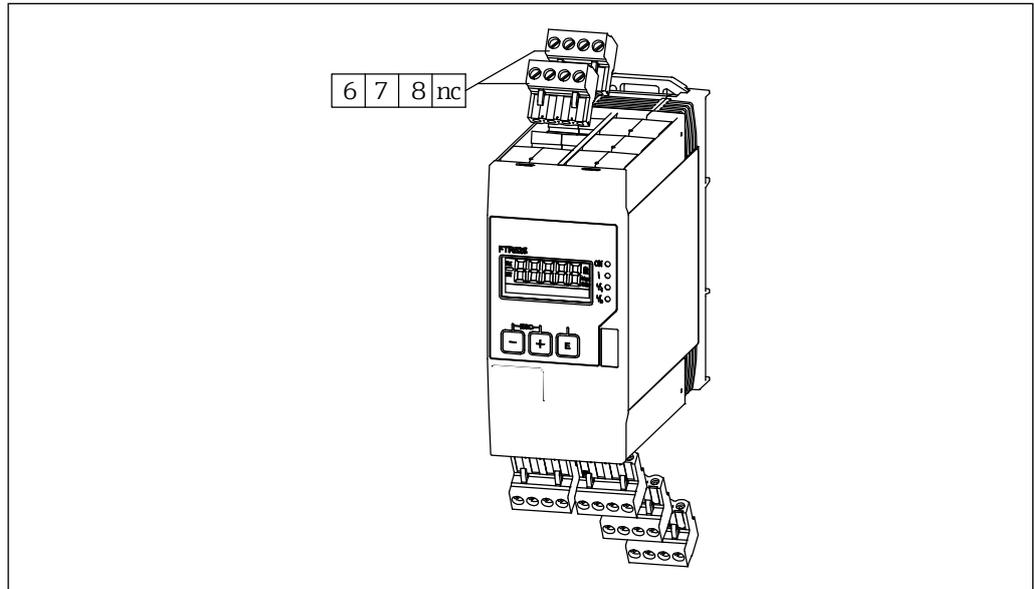
6.2.1 Connecting the power supply



8 Terminal for the power supply

| Terminal assignment | |
|---------------------|--|
| L/+ | Power supply: <ul style="list-style-type: none"> ■ 24 to 230 V DC (-15 % / +10 %) ■ 42 to 230 V AC (-15 % / +10 %), 50/60 Hz |
| L/+ | |
| N/- | |
| N/- | |

6.2.2 Connecting the microwave barrier

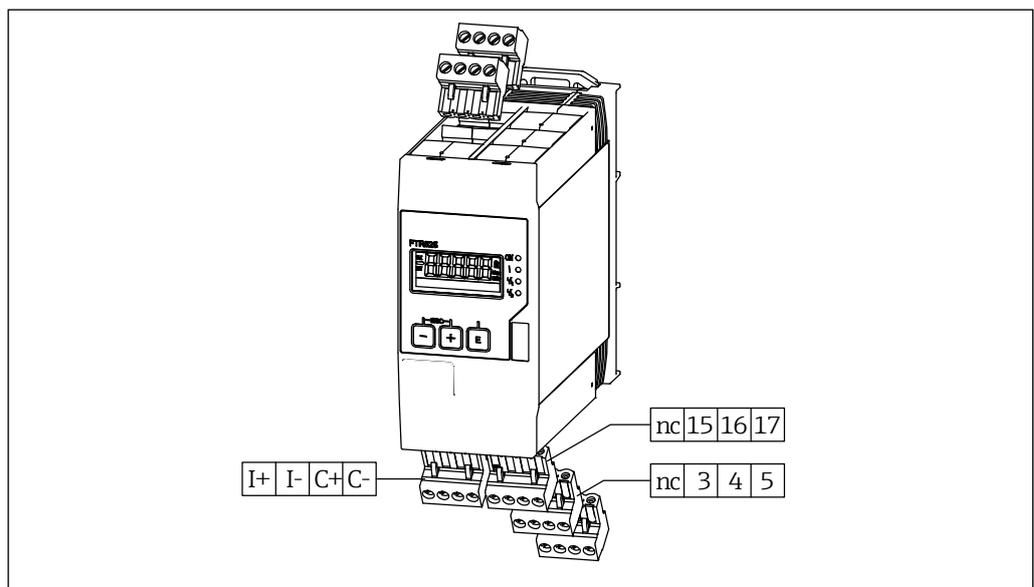


9 Terminals for the microwave barrier FQR57/FDR57

| Terminal assignment FTR525 | | Terminal assignment FQR57/FDR57 |
|----------------------------|-------------------|---------------------------------|
| 6 | (+) | 1 |
| 7 | (-) | 2 |
| 8 | \sphericalangle | 3 |

i These two plug-in terminals (connection with the FQR57 transmitter and FDR57 transceiver of the Soliwave microwave barrier) can be in any position.

6.2.3 Connecting the signal lines



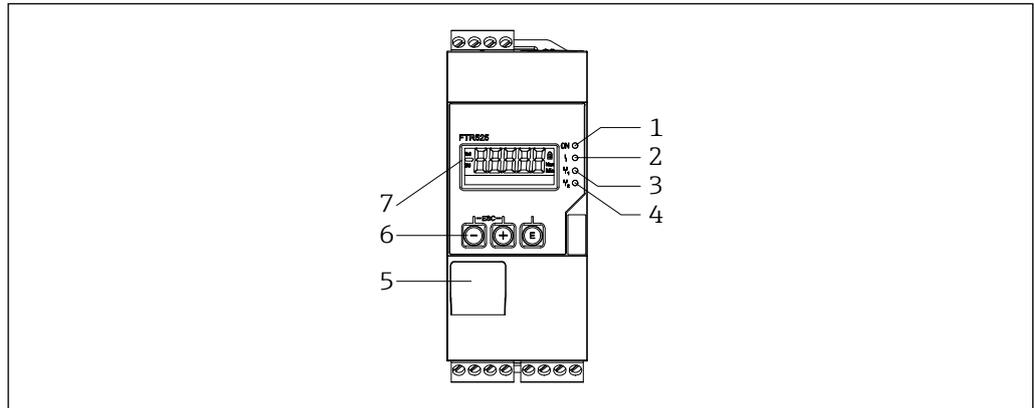
10 Terminals for the signal outputs

| Terminal assignment | | FTR525 ordering feature | | | | |
|---------------------|--|---|------|------|------|---|
| | | -*1* | -*2* | -*3* | -*4* | |
| I+ | | Current output ■ 4 ... 20 mA (passive) ■ max. 22 mA ■ max. 28 V DC | ✓ | ✓ | ✓ | ✓ |
| I- | | | | | | |
| C+ | | Open Collector ■ max. 28 V DC ■ max. 200 mA | ✓ | ✓ | ✓ | ✓ |
| C- | | | | | | |
| 3 | | Relay 1 ■ max. 250 V AC / 40 V DC ■ max. 2 A | ✓ | ✓ | ✗ | ✗ |
| 4 | | | | | | |
| 5 | | Relay 2 ■ max. 250 V AC / 40 V DC ■ max. 2 A | ✗ | ✓ | ✗ | ✗ |
| 15 | | | | | | |
| 16 | | | | | | |
| 17 | | | | | | |
| 3 | | SSR 1 ■ max. 30 V AC / 40 V DC ■ max. 400 mA | ✗ | ✗ | ✓ | ✓ |
| 4 | | | | | | |
| 15 | | SSR 2 ■ max. 30 V AC / 40 V DC ■ max. 400 mA | ✗ | ✗ | ✗ | ✓ |
| 16 | | | | | | |

6.3 Post-connection check

| | |
|--------------------------|---|
| <input type="checkbox"/> | Is the device or line damaged (visual inspection)? |
| <input type="checkbox"/> | Does the supply voltage match the specifications on the nameplate? |
| <input type="checkbox"/> | Are all terminals securely clicked into place in their correct slots? Is the coding on the individual terminals correct? |
| <input type="checkbox"/> | Are the cables installed with strain relief? |
| <input type="checkbox"/> | Are the supply voltage and signal cables connected correctly? |

7 Operating options



11 Display and operating options

- 1 Supply voltage LED (green)
- 2 Fault/alarm LED (red)
- 3 Relay/SSR output 1 LED (yellow)
- 4 Relay/SSR output 2 LED (yellow), optional
- 5 In-plant interface
- 6 Operating keys
- 7 Display

7.1 Overview of operating options

The device is operated via the three buttons integrated into the front.

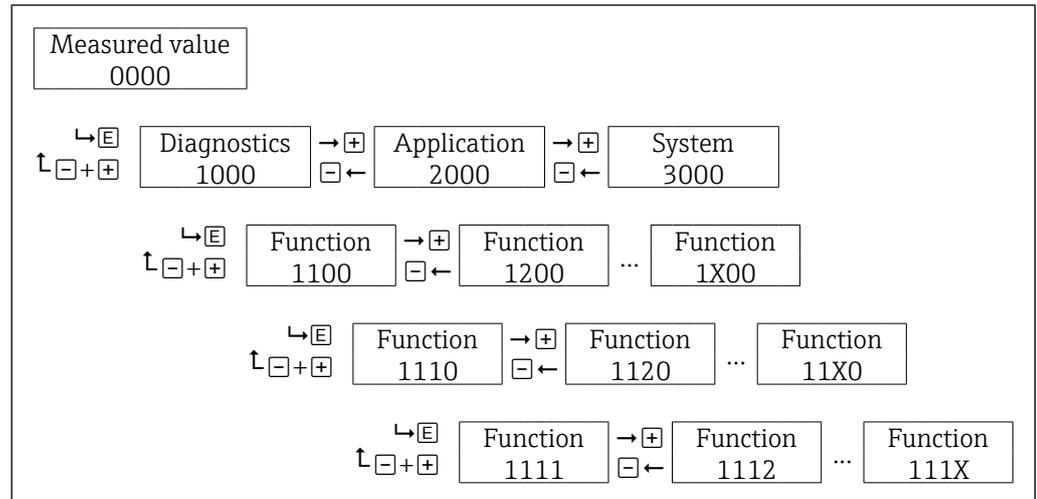
| Key | Meaning |
|-----|---|
| | <ul style="list-style-type: none"> ■ Open the configuration menu ■ In navigation mode: Open the function/function group ■ In editing mode: <ul style="list-style-type: none"> - Switch to the next character - Apply the Input |
| | <ul style="list-style-type: none"> ■ In navigation mode: Switch to the next function/function group down ■ In editing mode: Change the displayed character (9, 8, 7, etc., Z, Y, X, etc.) ■ In the measured value display: Switch to the minimum/maximum value display → |
| | <ul style="list-style-type: none"> ■ In navigation mode: Switch to the next function/function group up ■ In editing mode: Change the displayed character (0, 1, 2, etc., A, B, C, etc.) ■ In the measured value display: Switch to the minimum/maximum value display → |
| | <ul style="list-style-type: none"> ■ In navigation mode: <ul style="list-style-type: none"> - Exits a function and returns to the associated function group - Exits a function group and returns to the higher-order function group - Press and hold (min. 1 second): Returns to the measured value display regardless of the current position ■ In editing mode: Exits editing mode without saving changes |

NOTICE

Settings for protection against unauthorised access
→

7.2 Structure and function of the operating menu

7.2.1 Structure of the operating menu



12 Schematic structure of the operating menu

NOTICE

Additional functions or function groups are not available under every function (for an overview of all available functions → 61).

7.2.2 Operating philosophy

Certain parts of the operating menu are assigned to assorted users, each has specific tasks within the life cycle of the device.

| User | Scope of functions |
|-------------------|--|
| Operator | <ul style="list-style-type: none"> ▪ The Operator is generally assigned to the usage situation "operation". ▪ The Operator of the facility and therefore of the E+H device mostly checks the measured values and controls the process. ▪ Alterations to set values (especially configurations regarding the measuring path) by the Operator are not desired. Specific adjustments necessary for safe operation, like a change of language or display mode are however possible for the Operator. ▪ In case of a malfunction, the Operator usually does not take action himself, but passes the information regarding the diagnostic incident on to the Maintainer. |
| Maintainer | <ul style="list-style-type: none"> ▪ The Maintainer is generally assigned to the usage situation "configuration" (commissioning and process adjustments). ▪ Maintainers work with the devices for the whole life cycle and have a well-founded technology and process knowledge. ▪ The Maintainer is allowed to configure and change most parameters for commissioning, process adaption and optimisation. ▪ The Maintainer solves malfunctions, in more difficult cases with the help of the Expert. |
| Expert | <ul style="list-style-type: none"> ▪ Special adjustments, that exploit the full scope of functions of the device, are only performed by the Expert. ▪ Experts have profound technical knowledge (but sometimes less specific process knowledge). ▪ Among the Experts are normally the manufacturer`s service technicians, as well as service technicians of the customer that were trained by E+H for this task. |

7.2.3 Access concept

Access is possible for three users with corresponding authorisation:

- Maintainer (Default on delivery)
- Operator (is created by an entered unlock parameter by the maintainer)
- Expert (always available, fixed unlock parameter)

The following overview shows the options of the maintainer:

| User | Unlock parameter | Access right |
|------------|------------------------------|---|
| Maintainer | without | <ul style="list-style-type: none"> ▪ Write access to all standard functions ▪ Read access to all device data ▪ Service functions are not visible |
| Maintainer | Expert | Write access to all functions |
| Maintainer | ABCD (created by maintainer) | <ul style="list-style-type: none"> ▪ No change of the access ▪ Creates the user operator |
| Maintainer | ≠ ABCD | Downgrading to operator |

The following overview shows the options of the operator, if this user was created by the maintainer:

| User | Unlock parameter | Access right |
|----------|------------------|--|
| Operator | without | <ul style="list-style-type: none"> ▪ Read access to all standard functions ▪ Write access to selected functions ▪ Service functions are not visible |
| Operator | ABCD | <ul style="list-style-type: none"> ▪ Write access to all standard functions ▪ Read access to all device data ▪ Service functions are not visible |
| Operator | Expert | No change of the access, because the unlock parameter from maintainer (ABCD) must be entered first |

The following overview shows the options of the expert:

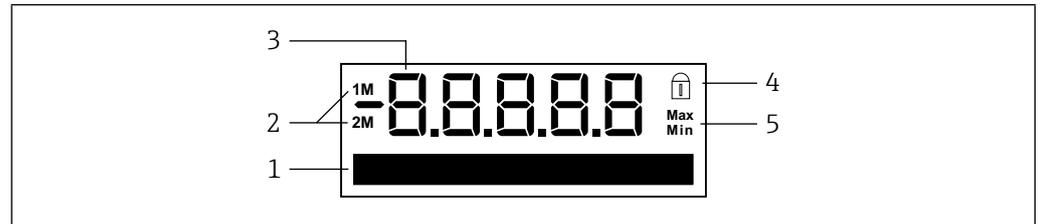
| User | Unlock parameter | Access right |
|--------|------------------|----------------------------------|
| Expert | Expert | Write access to all functions |
| Expert | ≠ Expert | Downgrading to maintainer |
| Expert | ≠ Expert & ABCD | Downgrading to operator |

NOTICE

- ABCD represents an alphanumeric unlock parameter of 4 to 16 digits.
- The access rights are shown in the appendix.
→ 61
- The lock symbol also appears without key lock, if the function chosen cannot be parameterised with the current unlock parameter and if the function chosen is just a display function.

7.3 Access to the operating menu via the local display

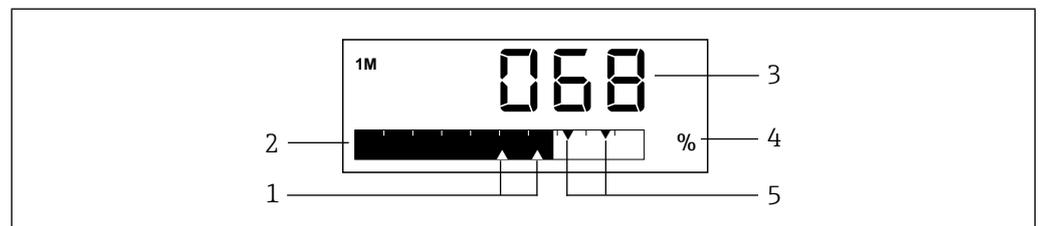
7.3.1 Operational display (initialization)



13 Initialization display

- 1 Dot matrix display for Tag, bar graph, unit, switch point, etc.
- 2 Measuring channel display: 1M = limit level detection; 2M = bulk flow detection
- 3 Measured value or function/function group number display
- 4 Operation lock display
- 5 Minimum/maximum value display

7.3.2 Measured value display

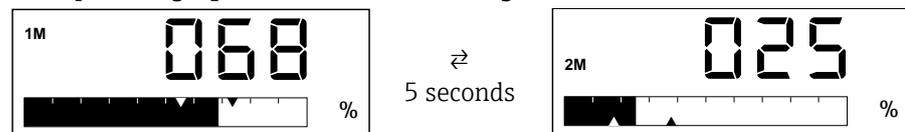


14 Measured value display

- 1 Relay/SSR 2 switch points display
- 2 Measured value bar graph display
- 3 Numerical measured value display
- 4 Measured value unit display
- 5 Relay/SSR 1 switch points display

Depending on the setting, the measured value display will display either the measured value of the first measuring channel (1M), the measured value of the second measuring channel (2M) or an alternating display of the measured values of both measuring channels (1M/2M).

Example: Bar graph of 1M/2M alternating

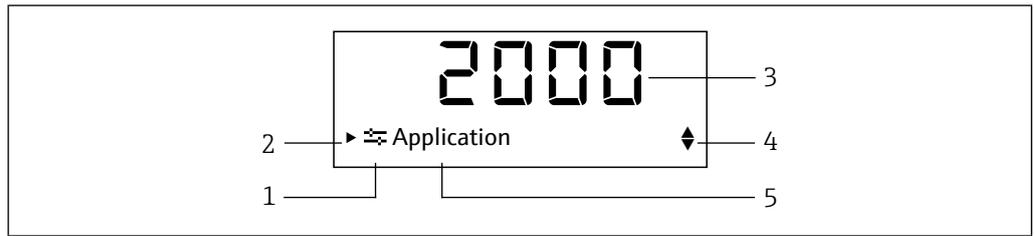


NOTICE

Overview of all available display options

→ 37

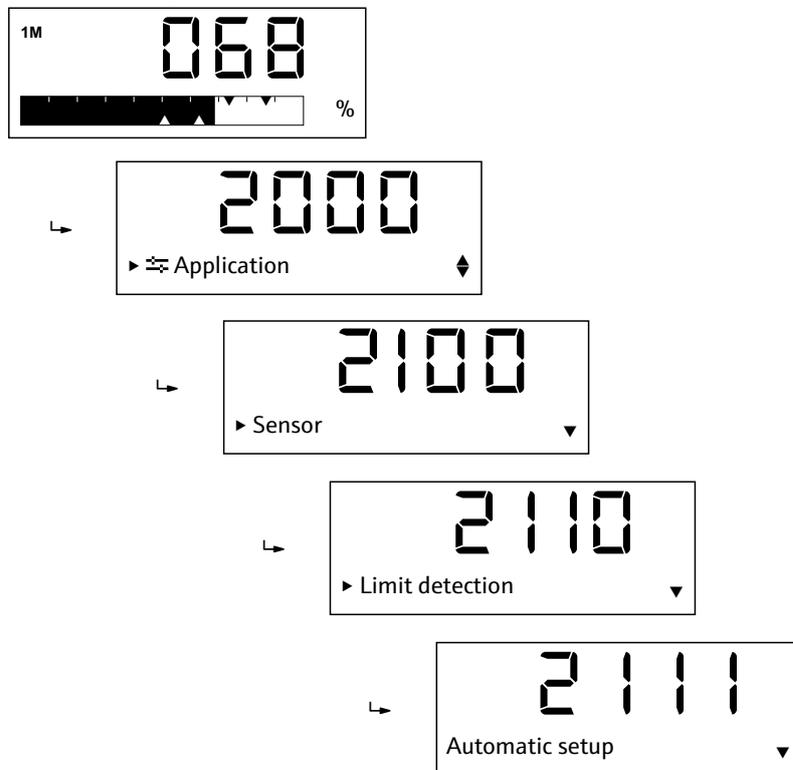
7.3.3 Function/function group display



15 Function (groups) display

- 1 Main function group symbol
- 2 Reference to lower-order functions or function groups
- 3 Function/function group number
- 4 Reference to additional functions/function groups or selection options:
 - ▲ Additional function/function group or selection option, previous
 - ▼ Additional function/function group or selection option, next
- 5 Function/function group designation

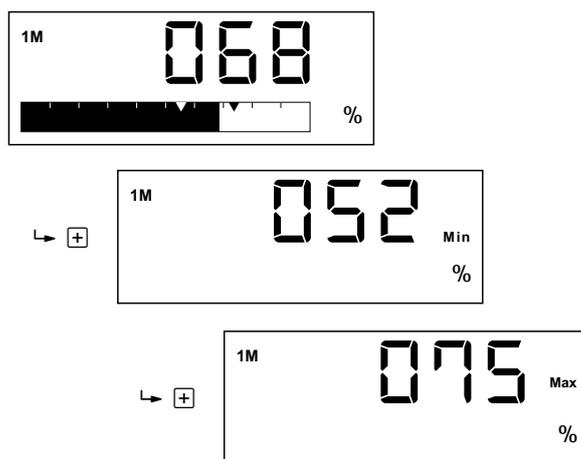
Example: **Switching from the measured value display to function 2111 "Automatic setup"**



NOTICE

Overview of all available functions
 → 61

7.3.4 Minimum/maximum value display



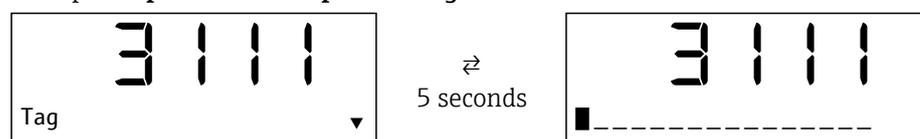
The following applies for the display of the minimum/maximum value:

- After \oplus is pressed, the measured value display switches to the display for the minimum value, and pressing this button again will switch to the display for the maximum value (in reverse order in the case of \ominus).
- In the case of an alternating display between measuring channel 1 (1M) and measuring channel 2 (2M), this display will alternate as well.
- The minimum/maximum values are determined and saved every 15 minutes, and the previous values are overwritten.

7.3.5 Dot matrix display

In addition to the display options for the dot matrix display illustrated in the previous sections, it can also be used for inputting the function parameters.

Example: **Alphanumeric input of a tag**



The input is carried out by selecting one of the following characters with \oplus or \ominus at the flashing position:

- Numbers 0-9
- Letters a-z, A-Z
- Special characters + - * / \ % ^ 2 3 μ . , ; : ! ? _ # \$ " ' () ~

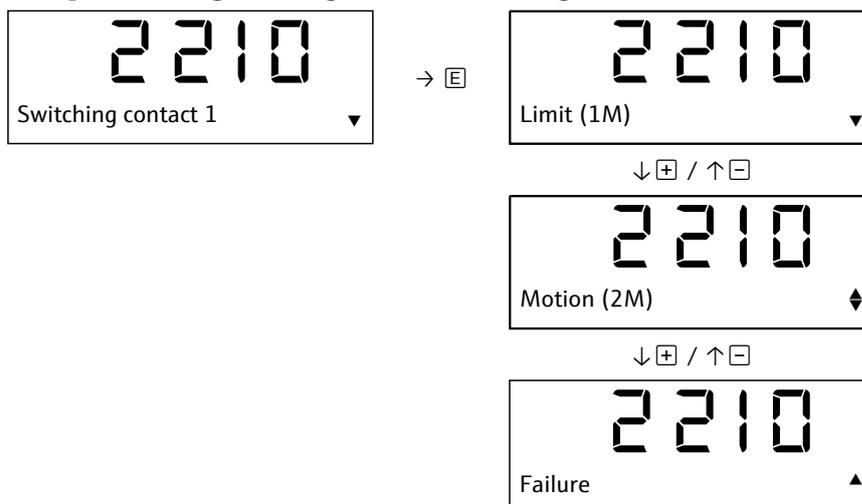
In addition, the following symbols are used in editing mode:

- \leftarrow (skip left)
- \leftarrow (skip left and delete character)
- \checkmark (Enter: Apply, end input at this point)
- \times (Cancel editing mode)

The digits 0-9 and the decimal point are available for entering numbers.

In addition to functions with free text or number input, there are also functions with multiple selection options. Pressing \oplus (scroll downwards) and \ominus (scroll upwards) selects the next or previous selection option respectively, and pressing \boxplus applies the selected option.

Example: **Selecting the assignment of switching contact 1**



NOTICE

- During input (free text, numbers or selection option), the digit or character being entered or the selected option flashes.
- After a faulty input, the note "Invalid input" appears for about 3 seconds, followed by a jump back to the input mode of the last function.

7.3.6 Error display

Details of the error display

→ 47

8 Commissioning

8.1 Function check

Make sure that the post-installation and post-connection check has been carried out before you commission your measuring point:

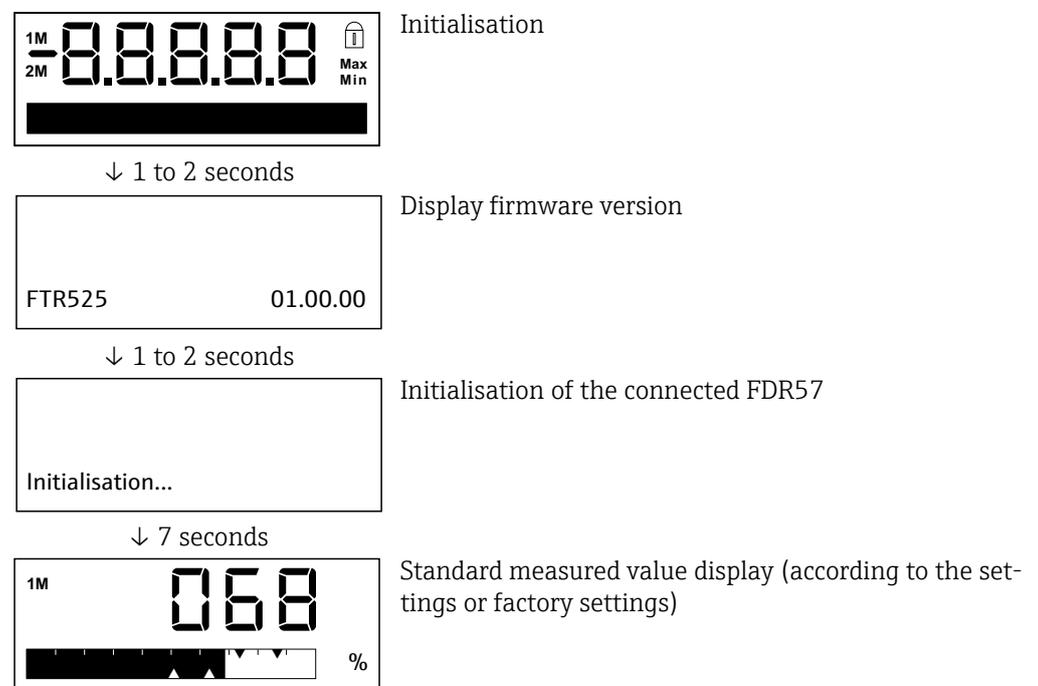
- "Post-installation check" checklist (→ 15)
- "Post-connection check" checklist (→ 19)

After the supply voltage has been applied, the green LED lights up and the display jumps to the measured value display after initialization.

The first time the device is commissioned, you can program the setup in accordance with the description of these Brief Operating Instructions available in the following sections.

8.2 Switching on the measuring device

The Nivotester FTR525 is powered up by connecting the supply voltage. The local display automatically switches from the start-up display to the measured value display after successfully starting up.



8.3 Setting the operating language

The operating language is set in function **3510**; English (factory setting) and German are available for selection as standard.

 Other operating languages as a replacement for German are available on request.

8.4 Configuring the measuring device

Configuration includes application-specific settings (such as basic adjustment), assignment and the behavior of the outputs (such as switch-on and switch-off points) as well as the behavior of the display (such as the operating language and display mode). The following sub-sections illustrate the corresponding configuration options.

NOTICE

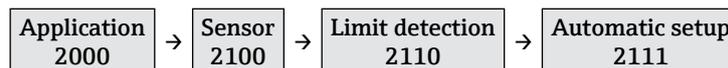
- The numbers assigned to the functions and function groups are added in brackets for easier navigation in the following sub-sections.
- Overview of all available functions and factory settings
→ 61

8.4.1 Adjustments to the application

The Soliwave FQR57/FDR57 microwave barrier must be adjusted to suit the application for commissioning; the following functions of the application main function group (2000) can be used for this.

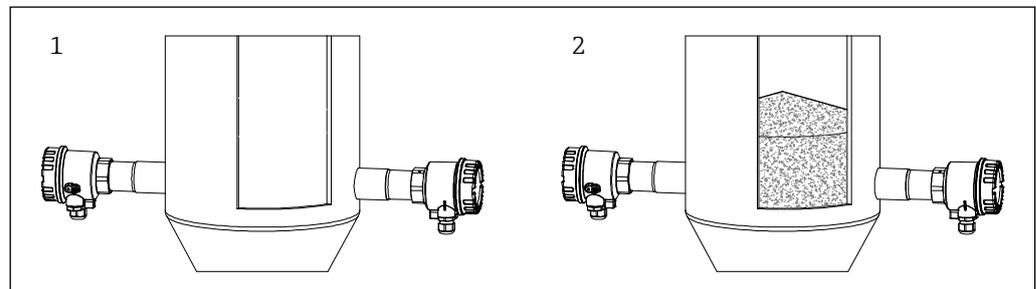
Details of the Soliwave FQR57/FDR57 microwave barrier: Technical Information TI01330F/97/EN and Operating Instructions BA01804F/97/A2

8.4.1.1 Automatic setup of level limit detection



Automatic setup is carried out with either a free (1) or a covered (2) path; the option selected for this corresponds to the state of the path.

Options: "Free path", "Covered path"



16 Setup conditions of the limit detection

NOTICE

The following manual adjustment functions can be used to carry out fine adjustment of the microwave barrier or to suit changing application conditions.

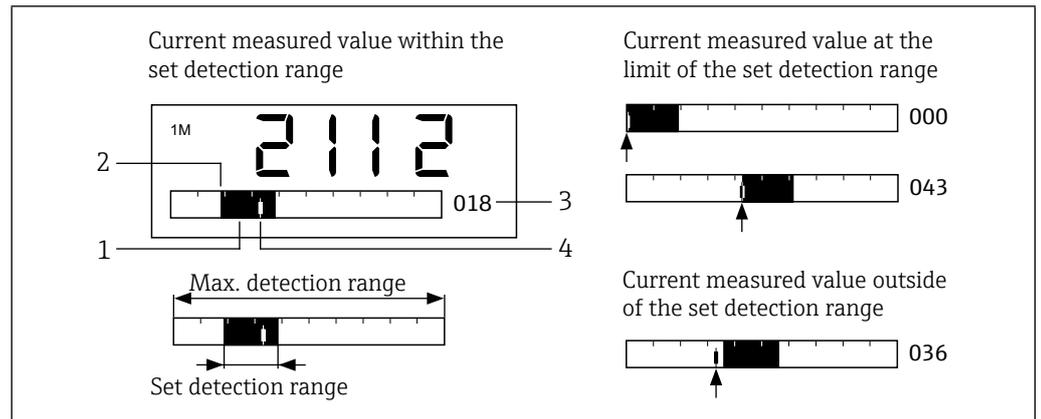
8.4.1.2 Manual adjustment lower limit (LL) level limit detection



This function can be used to change the lower limit of the set detection range using (for reducing the set detection range 0 to 100 %) or (for increasing the set detection range 0 to 100 %).

To assist with adjustment, the current measured value is shown alongside the set detection range.

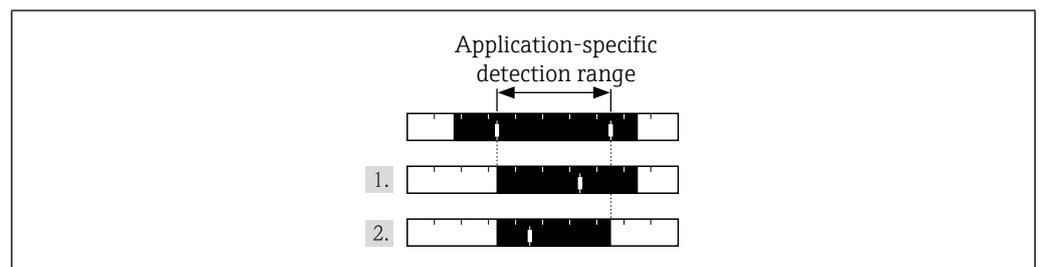
Example:



17 Manual adjustment lower limit (LL) level limit detection display with examples

- 1 Set detection range (= 0-100% of signal output)
- 2 Lower limit (adjustable using this function)
- 3 Percentage value for the lower limit relative to the maximum possible detection range
- 4 Current measured value

The microwave barrier is optimally adjusted to match the application when the lower detection limit (function 2112) corresponds to the minimum signal strength and the upper detection limit (function 2113) corresponds to the maximum signal strength.



18 Optimal adjustment

Procedure for optimal adjustment:

1. Manually adjust the lower limit to match the application-specific minimum measured value.
2. Manually adjust the upper limit (function 2113) to match the application-specific maximum measured value.

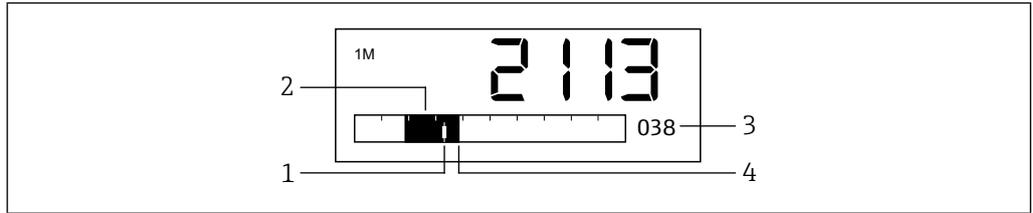
NOTICE

The detection range can also be set to be lower or higher, for example if a turndown of the signal output is desired.

8.4.1.3 Manual adjustment upper limit (UL) level limit detection



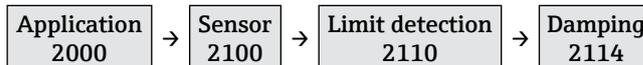
This function can be used to change the upper limit of the set detection range using \oplus (for increasing the set detection range 0 to 100 %) or \ominus (for reducing the set detection range 0 to 100 %). To assist with adjustment, the current measured value is shown alongside the set detection range (see example function 2112).



19 Manual adjustment upper limit (UL)

- 1 Current measured value
- 2 Set detection range (= 0-100% of signal output)
- 3 Percentage value for the upper limit relative to the maximum possible detection range
- 4 Upper limit (adjustable using this function)

8.4.1.4 Level limit detection damping



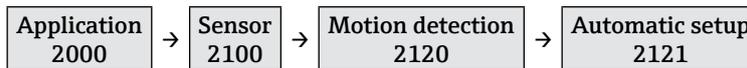
It is possible, for instance in the case of very turbulent processes, to steady the measuring signal. To do so, a time can be set over which the measured values are averaged.

Options: 100 ms to 20 s, Off

NOTICE

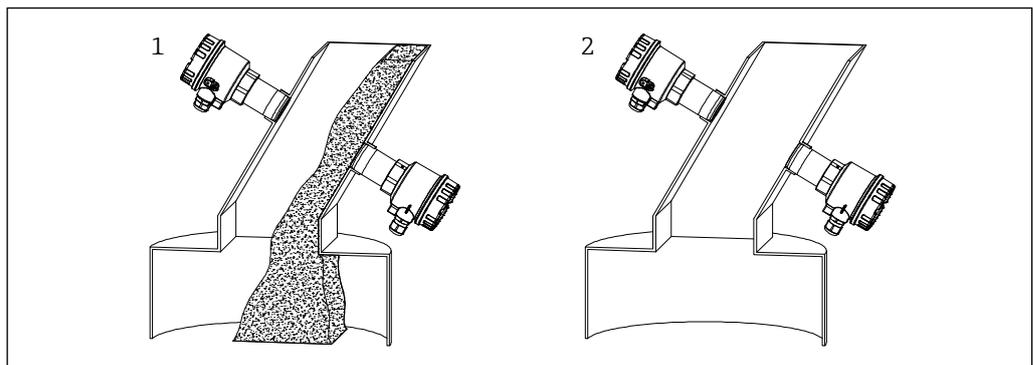
Setting the damping results in a longer reaction time.

8.4.1.5 Automatic setup of motion detection



Automatic setup is carried out with movement of bulk solids either present or not present (in front of the FDR57 transceiver); the option selected for this corresponds to the state of the bulk flow.

Options: "With movement", "Without movement"



20 Setup conditions of the motion detection

NOTICE

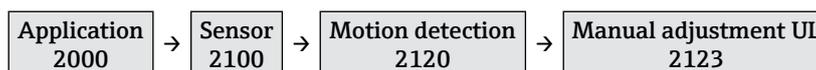
The following manual adjustment functions can be used to carry out fine adjustment of the microwave barrier or to suit changing application conditions.

8.4.1.6 Manual adjustment lower limit (LL) motion detection



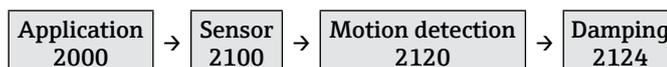
This function can be used to change the lower limit of the set detection range of the motion detection (function 2112 → 28).

8.4.1.7 Manual adjustment upper limit (UL) motion detection



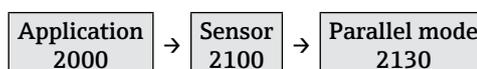
This function can be used to change the upper limit of the set detection range of the motion detection (function 2113 → 29).

8.4.1.8 Movement detection damping



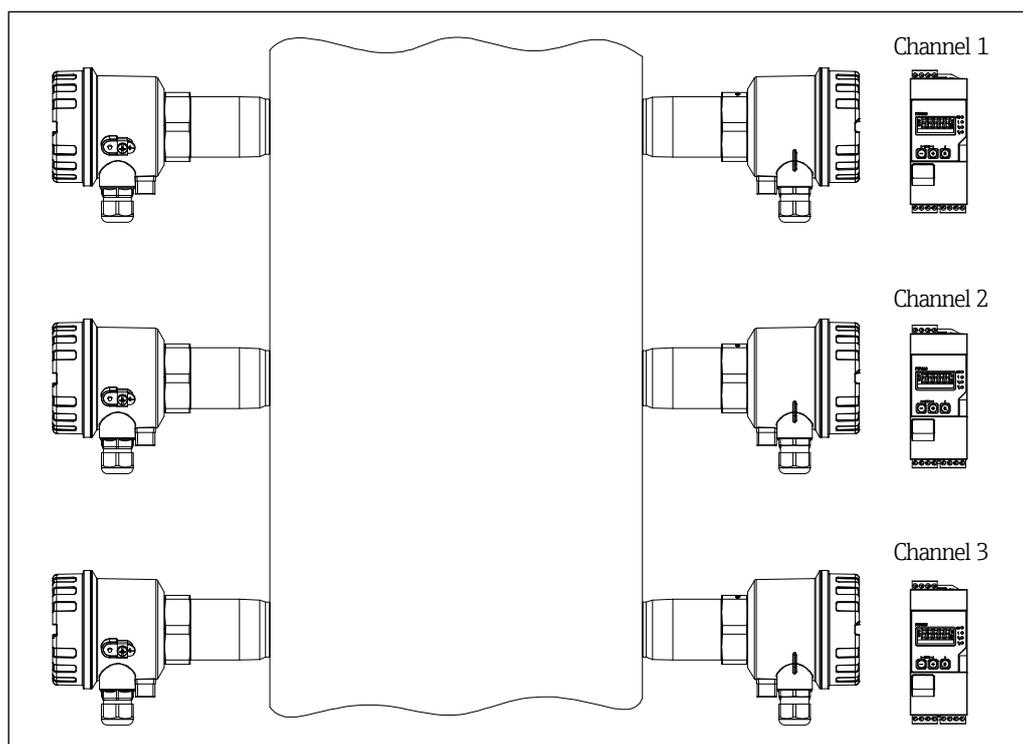
This function can be used to enter a damping of the movement detection (function 2114 → 30).

8.4.1.9 Parallel mode



In order to prevent mutual interference from multiple microwave barriers operated in parallel, up to five different channels can be set.

Options: "Channel 1" to "Channel 5"



21 Parallel mode of Soliwave FQR57/FDR57

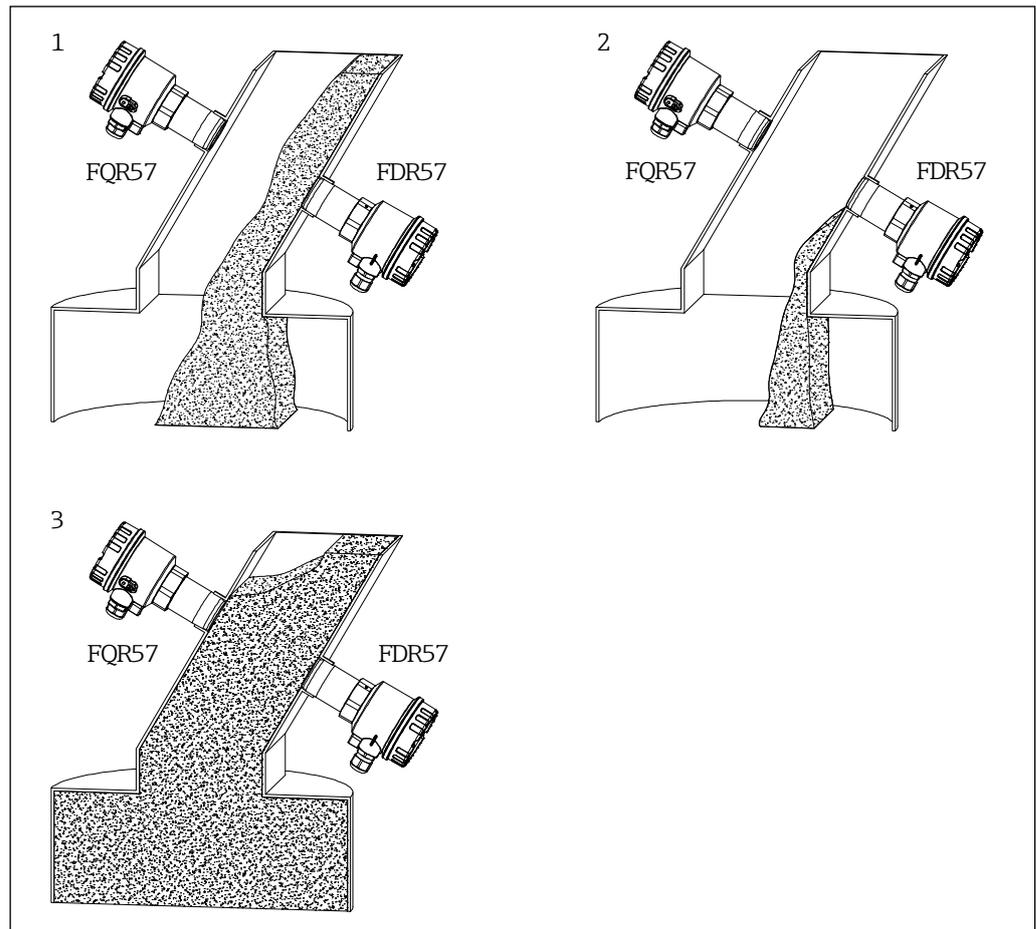
- i For details regarding the Soliwave microwave barriers, please see the associated Technical Information TI01330F/97/EN and Operating Instructions BA01804F/97/A2.
- It is not necessary to carry out the channel setting again after changing the FQR57/FDR57 devices, as the selected channel is automatically transmitted from the FTR525 to the FQR57 transmitter and the FDR57 transceiver.

8.4.2 Output adjustments

The following functions are used to adjust the signal outputs, among others the assignment and the behavior of the relay/SSR and current outputs.

Example: **Backlog monitoring**

A typical application for microwave barriers with integrated bulk flow detection is the monitoring of shafts, chutes or similar regarding material flow and backlog. Continuous material transport is detected by the transceiver FDR57. In combination with the signal of the microwave barrier, it is possible to detect a disruption in material flow or backlog.



☒ 22 Example of combined limit and motion detection

In this example featuring relay outputs, switching contact 1 (2210) is assigned to the limit level detection (1M) and switching contact 2 (2220) is assigned to the bulk flow detection (2M), minimum safety was chosen for both switching functions (2411+2421).

This leads to the following conditions at the signal outputs:

| Pos. | Condition | Limit | Switch. outp. 1 (3 NO - 4 CC) | Bulk flow | Switch. outp. 2 (15 NO - 16 CC) |
|------|----------------------|-------|----------------------------------|-----------|------------------------------------|
| 1 | Continuous bulk flow | | <input type="checkbox"/> | | <input type="checkbox"/> |
| 2 | Bulk flow torn-off | | <input type="checkbox"/> | | <input type="checkbox"/> |
| 3 | Backlog | | <input type="checkbox"/> | | <input type="checkbox"/> |

8.4.2.1 Switching contact 1 assignment



This function is used to assign switching contact 1 (relay or SSR) to measuring channel 1 (limit, 1M), measuring channel 2 (motion, 2M) or the fault state.

Options: "Limit (1M)", "Motion (2M)", "Fault"

NOTICE

The option for the second measuring channel (bulk flow detection, 2M) is only available for the corresponding device versions.

8.4.2.2 Switching contact 2 assignment



This function is used to assign switching contact 2 (relay or SSR) to measuring channel 1 (limit, 1M), measuring channel 2 (motion, 2M) or the fault state.

Options: "Limit (1M)", "Motion (2M)", "Fault"

NOTICE

- The switching output 2 is only available for the corresponding device versions.
- The option for the second measuring channel (bulk flow detection, 2M) is only available for the corresponding device versions.

8.4.2.3 Current output assignment



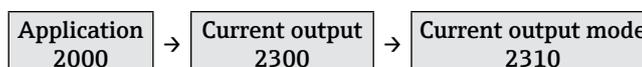
This function is used to assign the current output to measuring channel 1 (limit, 1M) or measuring channel 2 (motion, 2M).

Options: "Limit (1M)", "Motion (2M)"

NOTICE

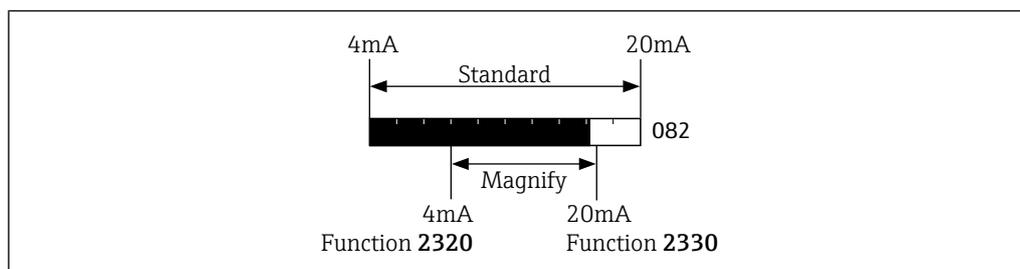
The option for the second measuring channel (bulk flow detection, 2M) is only available for the corresponding device versions.

8.4.2.4 Current output mode



This function can be used to switch on output magnify. For this function, a small segment of the 0-100 % detection range is shown on the current output of 4-20 mA.

Options: "Standard", "Magnify"



23 Current output mode

8.4.2.5 4 mA value of the magnify



This function is used to enter the percentage value for the lower limit (4 mA) while the magnify is enabled (function 2310).

Options: 0 to 100 %

8.4.2.6 20 mA value of the magnify



This function is used to enter the percentage value for the upper limit (20 mA) while the magnify is enabled (function 2310).

Options: 0 to 100 %

NOTICE

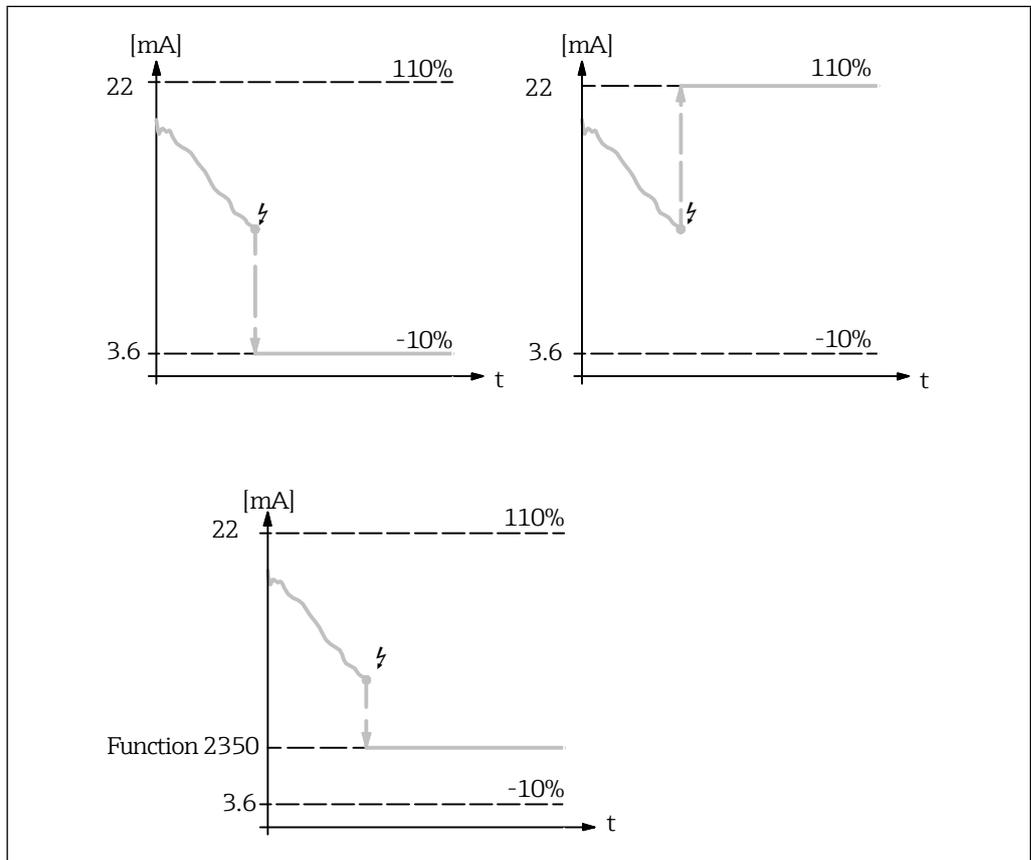
The 4 mA value (function 2310) must always be lower than the 20 mA value; if it is not, an error message is displayed.

8.4.2.7 Current output in failure mode



This function is used to define the failure mode of the current output.

Options: "MIN (<4mA)", "MAX (>20mA)", "Fixed value"



24 Behavior of the current output in failure mode

8.4.2.8 Fixed value for the current output in the event of an error



This function is used to enter the current value to be put out in the event of an error while "Fixed value" is selected in function 2310.

Options: 3.6 to 22.0 mA

8.4.2.9 Switching function switching output 1



This function is used to define the switching function of signal output 1 (relay or SSR).

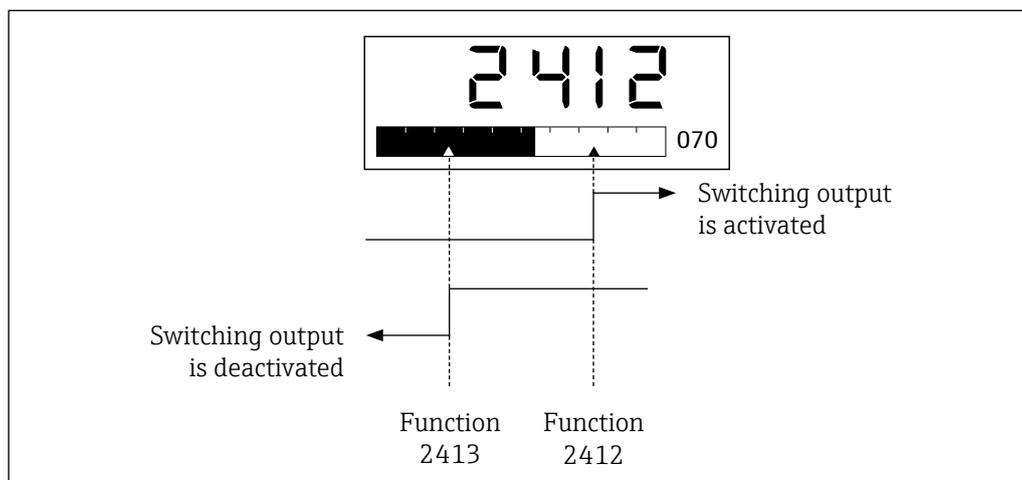
Options: "Min.safety", "Max.safety"

8.4.2.10 Switch-on point switching output 1



In this function the switching point of signal output 1, above which the switching output is activated, is defined. The right switching point flashes and can be moved by \ominus (lower) and \oplus (higher) accordingly.

Options: 0 to 100 %



25 Switch points of output 1

8.4.2.11 Switch-off point switching output 1



In this function the switching point of signal output 1, below which the switching output is deactivated, is defined. The left switching point flashes and can be moved by \ominus (lower) and \oplus (higher) accordingly.

Options: 0 to 100 %

NOTICE

The maximum switch-off point is limited to the value of the switch-on point (function 2412), the switching hysteresis is therefor zero.

8.4.2.12 Switch-on delay switching output 1



This function can be used to define a switch-on delay for switching output 1. While this delay is enabled, the measured value must be above the switch-on point (function 2412) for at least the set time before the switching output is activated.

Options: 100 ms to 20 s, Off

Example: Switch delays of limit detection

The following diagram shows the behavior of the switching output with activated switch-on and switch-off delay (function 2415), depending on additional adjustments (assignment outputs in function group 2200, switching outputs in function group 2400).

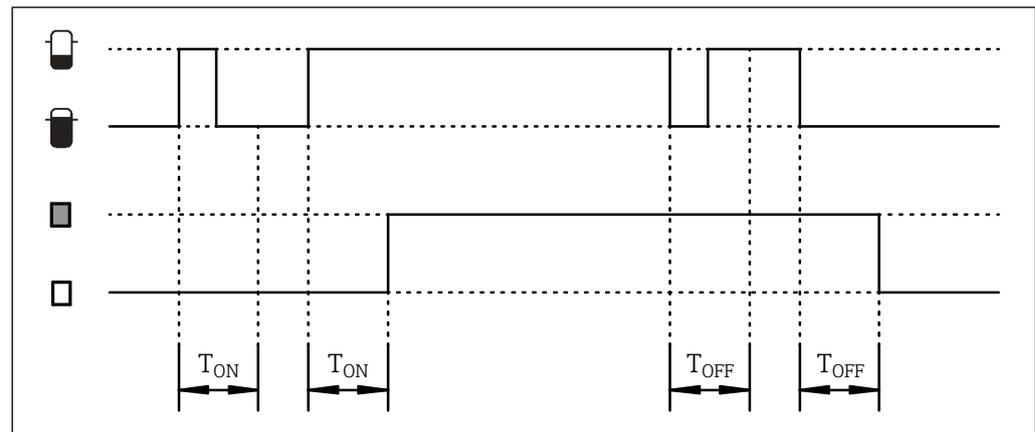


Fig. 26 Switch-on and switch-off delays

8.4.2.13 Switch-off delay switching output 1



This function can be used to define a switch-off delay T_{OFF} for switching output 1. While this delay is enabled, the measured value must be below the switch-off point (function 2413) for at least the set time before the switching output is deactivated (see example function 2414).

Options: 100 ms to 20 s, Off

8.4.2.14 Switching function switching output 2



This function is used to define the switching function of signal output 2 (relay or SSR, function 2411 → 35).

NOTICE

Function group 2420 for switching output 2 is only available for device versions with two switching outputs.

8.4.2.15 Switch-on point switching output 2



In this function the switching point of switching output 2, below which the switching output is activated, is defined (function 2412 → 35).

8.4.2.16 Switch-off point switching output 2



In this function the switching point of switching output 2, below which the switching output is deactivated, is defined (function 2413 → 35).

8.4.2.17 Switch-on delay switching output 2



This function can be used to define a switch-on delay T_{ON} for switching output 1 (function 2414 → 36).

8.4.2.18 Switch-off delay switching output 2



This function can be used to define a switch-off delay T_{OFF} for switching output 1 (function 2415 → 36).

8.4.3 Adjustments to the display

The following functions can be used to configure settings for the display such as the display mode and the language.

8.4.3.1 Tag



This function can be used to enter the name for the measuring point (Tag). This name is displayed in the measured value display depending on the selected display mode.

Options: 16-character free text input (→ 25).

8.4.3.2 Language



This function is used to select the language for the FTR525.

Options: "English", "German"

NOTICE

Other languages are available on request; these will replace the "German" language option.

8.4.3.3 Display mode



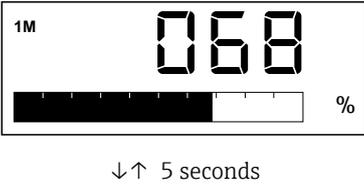
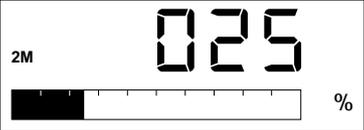
This function is used to select the display mode that defines how the measured values of the maximum of two measuring channels are displayed.

Options: "% limit (1M)", "Bargraph limit (1M)", "Tag limit (1M)", "% motion (2M)" *, "Bargraph motion (2M)" *, "Tag motion (2M)" *, "Bargraph alternat. (1M/2M)" *, "Tag alternating (1M/2M)" *

NOTICE

The selection options marked with a * are only available for the FTR525 with optional bulk flow detection.

| Option | Description |
|--|--|
| <p>% limit (1M)</p>  | <p>The percentage value of the level limit detection (measuring channel 1, 1M) is displayed.</p> |
| <p>Bargraph limit (1M)</p>   | <p>The percentage value and associated bargraph (0-100 %) of the level limit detection (measuring channel 1, 1M) are displayed.</p> <p>If one or two switching outputs are assigned to measuring channel 1, the corresponding switch points are also displayed (switching output 1: Upper switch points; switching output 2: Lower switch points).</p> |
| <p>Tag limit (1M)</p>  | <p>The tag and the percentage value of the level limit detection (measuring channel 1, 1M) are displayed.</p> <p> Enter Tag →  37</p> |
| <p>% motion (2M)*</p>  | <p>The percentage value of the bulk flow detection (measuring channel 2, 2M) is displayed.</p> |
| <p>Bargraph motion (2M)*</p>   | <p>The percentage value and associated bargraph (0-100 %) of the bulk flow detection (measuring channel 2, 2M) are displayed.</p> <p>If one or two switching outputs are assigned to measuring channel 2, the corresponding switch points are also displayed (switching output 1: Upper switch points; switching output 2: Lower switch points).</p> |
| <p>Tag motion (2M)*</p>  | <p>The tag and the percentage value of the bulk flow detection (measuring channel 2, 2M) are displayed.</p> |

| Option | Description |
|---|--|
| <p>Bargraph alternating (1M/2M)*</p>   | <p>The percentage values and associated bargraph for measuring channel 1 (1M) and measuring channel 2 (2M) are displayed in an alternating display (display duration approx. 5 seconds each time).</p> |
| <p>Tag alternating (1M/2M)*</p>   | <p>The tag is displayed together with an alternating display (display duration approx. 5 seconds each time) showing the percentage value of the level limit detection (measuring channel 1, 1M) and the bulk flow detection (measuring channel 2, 2M).</p> |

8.4.3.4 Back to home



This function is used to set the length of time the system will wait following the last time a button is pressed before the display switches automatically back to the measured value display.

Options: 3 to 9999 seconds

8.4.3.5 Format display



This function is used to check the display, all segments are activated for around 2 seconds.

Options: "On", "Abort"

8.4.3.6 Contrast setting



This function is used to set the display contrast.

Options: 1 (low contrast) to 7 (high contrast)

8.4.3.7 Brightness setting



This function is used to set the display brightness.
Options: 1 (low brightness) to 7 (high brightness)

8.5 Configuration management

Following commissioning of the microwave barrier, it is possible to save the current device configuration of the FTR525 or restore an existing device configuration, using the following functions. In total three configurations can be saved and restored independently of each other.

8.5.1 Save user settings



This function can be used to save up to three separate sets of user settings.
Options: "User settings 1" to "User settings 3"

i We recommend that users also separately make a note of their device settings (for example, in order to restore them following a technical failure). The "User-specific settings" form (→ 60) can be used for this.

8.5.2 Device reset



This function can be used to restore the saved user settings or perform a factory reset.
Options: "Factory reset", "User reset 1" to "User reset 3"

NOTICE

- After a successful reset, a corresponding note is displayed for about 5 seconds.
- An overview of all factory settings that will be loaded following a factory reset can be found in the appendix (→ 61).
- Saved user settings are not deleted following a factory reset.

8.6 Simulation

The simulation allows to simulate various measured values in the process as well as the device alarm behavior, without any real level limit or movement detection, and to check subsequent signalling chains (for example the switching-off of a screw conveyor upon reaching minimum fill level).

NOTICE

- An active simulation is stopped by deactivation as well as by a reset or by cutting off the power supply.
- With active simulation and a return to operation display, the error "Simulation" is shown (see Diagnostics and troubleshooting → 47).

8.6.1 Simulation mode



This function is used to activate or deactivate the different simulation modes (measured values and signal outputs).

Options: "Off", "Measurement limit 0-100%", "Measurement motion 0-100%", "Current output", "Switching contact 1", "Switching contact 2", "Failure contact"

8.6.2 Simulation value



This function is used to enter corresponding simulation values for the selected simulation mode (→ 41).

Options: Measurement limit 0 to 100 %, measurement motion 0 to 100 %, current output 3.6 to 22.0 mA, contact 3-4 opened, contact 3-4 closed, contact 15-16 opened, contact 15-16 closed, failure, no failure

| Simulation | Simulation value | Beschreibung |
|---------------------------|---|---|
| Measurement limit 0-100% | Measurement limit 0 to 100 % | <ul style="list-style-type: none"> ▪ A corresponding measurement is simulated by pressing ⊕ (higher) and ⊖ (lower). ▪ All signal outputs follow the simulated value according to the settings. |
| Measurement motion 0-100% | Measurement motion 0 to 100 % | |
| Current output | Current output 3.6 to 22.0 mA | <ul style="list-style-type: none"> ▪ A corresponding current output value is simulated by pressing ⊕ (higher) and ⊖ (lower). ▪ All other outputs follow the original settings. |
| Switching contact 1 | <ul style="list-style-type: none"> ▪ Contact 3-4 opened ▪ Contact 3-4 closed | <ul style="list-style-type: none"> ▪ Contact 3-4 of switching contact 1 is alternately opened or closed by pressing ⊕ or ⊖. ▪ All other outputs follow the original settings. |
| Switching contact 2 | <ul style="list-style-type: none"> ▪ Contactt 15-16 opened ▪ Contact 15-16 closed | <ul style="list-style-type: none"> ▪ Contact 15-16 of switching contact 2 is alternately opened or closed by pressing ⊕ or ⊖. ▪ All other outputs follow the original settings. ▪ This simulation is only available on FTR525 with two switching outputs (relay or SSR). |
| Failure contact | <ul style="list-style-type: none"> ▪ No failure ▪ Failure | <ul style="list-style-type: none"> ▪ The failure contact (C+/C-) is alternately opened or closed by pressing ⊕ or ⊖. ▪ All other outputs follow the original settings. |
| Off | X | <ul style="list-style-type: none"> ▪ The simulation is deactivated. ▪ All other outputs follow the original settings. |

8.7 Protecting settings from unauthorised access

The following means guard against unauthorised access of the device configuration after commissioning:

- Write protection by key lock
- Write protection by change of user

8.7.1 Key lock

By pressing the key  for a minimum of 3 seconds, the key lock is activated, and the note "Key lock on" appears for about one second.

Now the FTR525 can no longer be operated by the keys, any attempt is followed by the note "Key locked".

Only after pressing the key  again for at least 3 seconds, the lock is deactivated, followed by the note "Key lock off".

8.7.2 User change

Upon delivery of the FTR525 or after a factory reset, the users **Maintainer** and **Expert** are defined, the additional **Operator** with reduced access rights must be actively established by the user.

The following functions explain the write protection by user change.

NOTICE

- Details about this access concept
→  22
- Overview of all functions and their access rights
→  61

8.7.2.1 Access rights



In this function, the current access rights can be displayed. The rights depend on the unlock parameter which is entered in the following function.

8.7.2.2 Enter unlock parameter



Enter an unlock parameter in this function, to make further adjustments to the FTR525.

Option: A ... Z, 0 ... 9 (max. 16 digits)

NOTICE

- A **Maintainer** can upgrade his status to **Expert** using the appropriate unlock parameter.
- An **Operator** can upgrade his status to **Maintainer** using the appropriate unlock parameter, the unlock parameter for the **Expert** cannot be used here.

8.7.2.3 Define unlock parameter



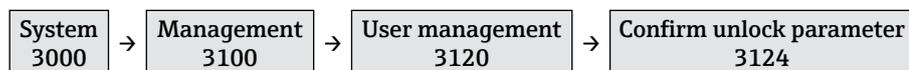
This function is used to define an unlock parameter to establish the new user **Operator** with limited access rights.

Options: A ... Z, 0 ... 9 (max. 16 digits)

NOTICE

- Only after confirmation of the unlock parameter in function **3124**, the user **Operator** is established.
- An existing **Operator** can be deleted by the maintainer by entering and confirming the unlock parameter **0000**.

8.7.2.4 Confirm unlock parameter



This function is used to confirm the entered unlock parameter in function **3123**, the **Operator** is now established as an additional user.

Options: A ... Z, 0 ... 9 (max. 16 digits)

NOTICE

After differing input (**3123** ≠ **3124**), the note "Invalid input" appears, followed by a jump back to the input mode of the function.

9 Operation

9.1 Reading off the device locking status

The locking status of the device can be read as follows:

- Write protection via key lock (→ 42)
 - The locking symbol  lights permanently on the display.
 - The note "**Key locked**" occurs if pressing a key.
- Write protection by changing the user (→ 42)
 - In the function **3121** the current user status is displayed.
 - The locking symbol  occurs when selecting a function without access right.

9.2 Reading off measured values

The measured values can be read from the display depending on the display mode (→ 37).

 In the functions **2510 "Min/Max limit (1M)"** and **2520 "Min/Max motion (2M)"**, the last minimum and maximum values can be read off as well.

9.3 Analysis

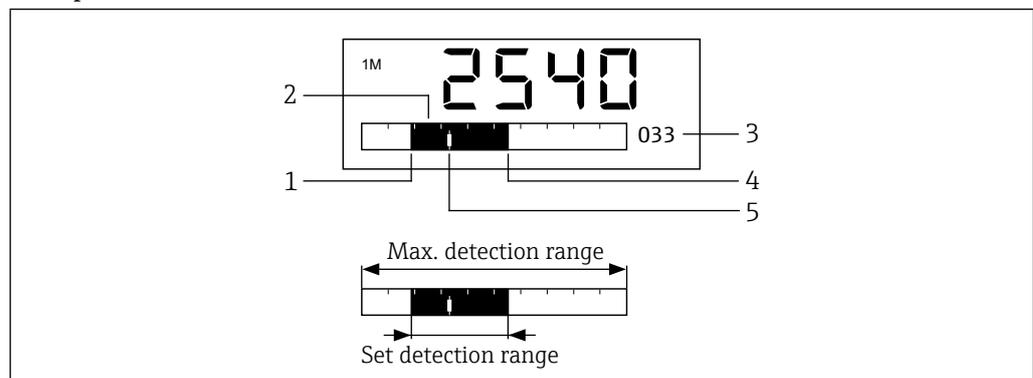
The following functions can be used to analyse the settings of the measuring system, consisting of the Soliwave microwave barrier and the Nivotester FTR525.

9.3.1 Signal strength limit (1M)



This function is used to display the current signal strength of the limit detection (1M) depending on the performed setup.

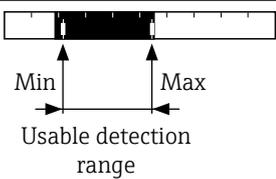
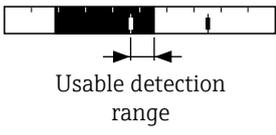
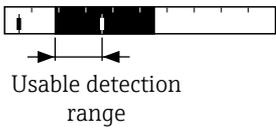
Example:



 27 Display signal strength of limit detection (1M)

- 1 Set lower limit of adjustment (LL) in function 2112 → 28
- 2 Set detection range (= 0-100% of signal output)
- 3 Percentage value of the current signal strength
- 4 Set upper limit of adjustment (UL) in function 2113 → 29
- 5 Current signal strength

Through analysis of the signal strength over a longer period of time (also in conjunction with minimum and maximum values in function 2510), the following conclusions may be drawn:

| Display | Analysis |
|---|--|
|  | <p>The limit level detection is adjusted reasonably well:</p> <ul style="list-style-type: none"> In this case, the usable detection range generally equals the preset detection range. The current output can put out almost the whole possible range (in this case about 5.7 to 19.5 mA). |
|  | <p>The limit level detection is overdriven:</p> <ul style="list-style-type: none"> In this case, the usable detection range equals only a small portion of the preset upper detection range. The current output can put out only a narrow upper range (in this case about 17.2 to 20.0 mA) of the total possible range. |
|  | <p>The limit level detection is underdriven:</p> <ul style="list-style-type: none"> In this case, the usable detection range equals only about half of the preset lower detection range. The current output can put out only half of the lower range (in this case about 4.0 to 12.3 mA) of the total possible range. |

In case of a substantial over- or underdrive, the boundaries of the detection range should be moved accordingly.

- Manual adjustment LL in function 2112 → 28
- Manual adjustment UL in function 2113 → 29

i If there is no opportunity for analysis of the signal strength over an extended period of time, minimum and maximum values can be used (→ 46).

9.3.2 Signal strength motion (2M)

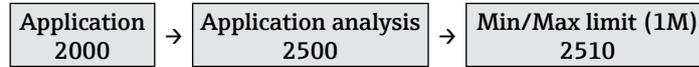


This function is used to display the current signal strength of the motion detection (2M) depending on the performed setup (function 2122 → 30 and function 2123 → 31).

9.4 Show data logging

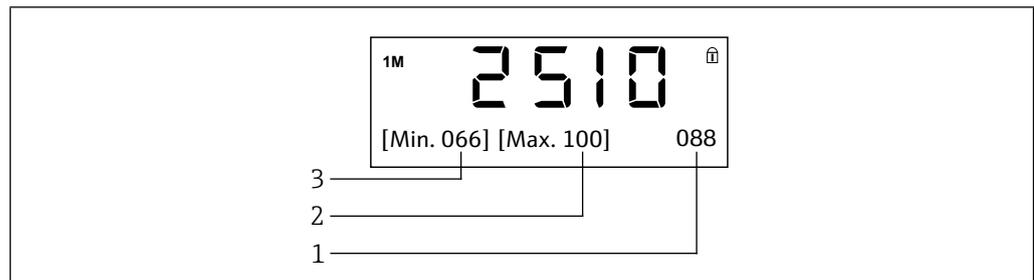
Using the following functions, the minimum and maximum measured values since the last switching-on of the FTR525 can be displayed and even deleted, if so desired.

9.4.1 Min/Max limit (1M)



This function is used to display the logged minimum and maximum values of the limit detection (1M).

Example:



28 Display Min/Max values of the limit detection (1M)

- 1 Percentage value of the current signal strength
- 2 Maximum percentage value of the signal strength
- 3 Minimum percentage value of the signal strength

9.4.2 Min/Max limit (2M)



This function is used to display the logged minimum and maximum values of the motion detection (2M) (see function 2520).

9.4.3 Reset Min/Max



This function is used to reset (clear) the logged minimum and maximum measurement values of the limit (1M, function 2510) and motion detection (2M, function 2520).

Options: "Reset Min/Max", "Abort"

10 Diagnostics and troubleshooting

10.1 General troubleshooting

For local display

| Fault | Possible causes | Remedial action |
|--|--|---|
| Local display dark and no output signals | No contact between connecting cables and terminals | Check the connection of the cables and correct if necessary |
| | Power supply missing | Check power supply of the FTR525 |
| | Electronics is defective | Contact service |
| Local display is dark, but signal output is within the valid range | Display is set too bright or too dark | Set contrast → 39 and/or brightness → 40 |
| | Display module is defective | Contact service |
| Text on local display looks unusual | Individual segments of the display are defective | Format display → 39, contact service if necessary |
| Text on local display appears in a foreign language and cannot be understood | Incorrect operating language is configured | Change operating language → 37 |

For output signals

| Fault | Possible causes | Remedial action |
|--|--------------------------|---|
| Signal output outside the valid range | Electronics is defective | Contact service |
| Device shows correct value on local display, but signal output is incorrect, though in the valid range | Configuration error | Check and correct parameter configuration: - Current output → 33 - Relay/SSR 1 → 35 - Relay/SSR 2 → 36 |
| Device measures incorrectly | | |

For access

| Fault | Possible causes | Remedial action |
|---|--------------------------------------|-----------------------------------|
| No write access to certain parameters | Wrong or no unlock parameter entered | Enter valid unlock parameter → 42 |
| No access to all functions (lock symbol  lights permanently) | Key lock activated | Deactivate key lock → 42 |

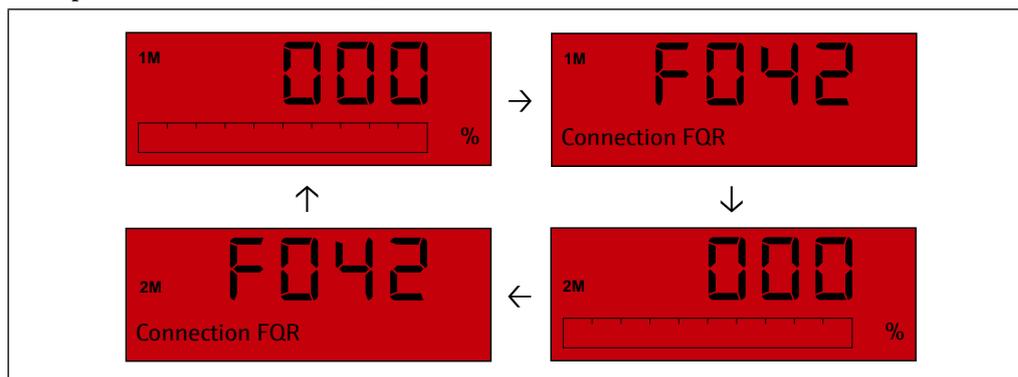
10.2 Diagnostic information via LEDs

The red fault/alert LED (→  11 on page 20) lights up if the device detects an error, the failure contact (C+/C-) is activated. In combination with the error message (see 10.3), the specific fault can be determined.

10.3 Diagnostic information on the local display

Upon recognition of a failure, the background illumination of the local display turns from white to red. The current failure code and the chosen operating display of the respective measuring channel are shown, alternating every 2 seconds.

Example: **F042 - Connection FQR**



 29 Example diagnostic information on the FTR525 with optional motion detection

NOTICE

- In this case the display shows 0 %, because the detection is not possible without both devices of the Soliwave microwave barrier.
- The error message cannot be acknowledged, it disappears only after solving the fault.
- Upon moving to the configuration menu, the background illumination changes back to white, the fault/alert LED stays lit.
- Overview of diagnostic information →  49

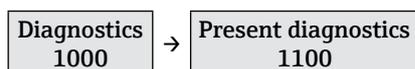
NOTICE

Special case simulation

- The colour of the display switches as described.
- The fault LED does not switch (except simulation of the failure contact).
- Depending on the simulation mode, the signal outputs don't match the measured values and have to be regarded as invalid.

10.4 Diagnostic functions

10.4.1 Present diagnostics



This function is used to display the present error (code with short message).

NOTICE

The error with the highest priority (lowest error code) is displayed if more than one error is present.

10.4.2 Previous diagnostics



This function is used to display the previous error (code with short message).

10.4.3 Erase previous diagnostics



This function is used to erase the previous logged error (code with short message).
Options: "Keep", "Erase"

10.5 Overview of diagnostic information

| Code | Help text | Remedial action |
|------|------------------------|---|
| 0000 | No error | – |
| F041 | Connection FDR | <ul style="list-style-type: none"> Check electrical connection to the FDR57 Check function of the FDR57, if necessary In case of defect: contact service |
| F042 | Connection FQR | <ul style="list-style-type: none"> Check electrical connection to the FQR57 Check function of the FQR57, if necessary In case of defect: contact service |
| F043 | Communication FDR | <ul style="list-style-type: none"> Check function of the FDR57 Reset device, if necessary In case of defect: contact service |
| F044 | Communication FQR | <ul style="list-style-type: none"> Check function of the FQR57 Reset device, if necessary In case of defect: contact service |
| F261 | Flash FTR | <ul style="list-style-type: none"> Perform reset of the FTR525 If the defect occurs repetitively: contact service |
| F262 | EEPROM FTR | |
| F263 | EEPROM FQR | <ul style="list-style-type: none"> Perform reset of the FQR57 If the defect occurs repetitively: contact service |
| F264 | EEPROM FDR | <ul style="list-style-type: none"> Perform reset of the FDR57 If the defect occurs repetitively: contact service |
| F401 | FTR: T < Min / T > Max | <ul style="list-style-type: none"> Minimum temperature on the device undercut or maximum temperature exceeded (Technical Data → 57) Ensure operating temperature range (Installation conditions → 13) |
| F402 | FDR: T < Min / T > Max | |
| F403 | FQR: T < Min / T > Max | |
| C482 | Simulation | <ul style="list-style-type: none"> Only for information, no error Deactivate simulation (→ 41) |

10.6 Reset device

Reset functions of the FTR525
→ 40

10.7 Device information

The following functions can be used to display information about device and current status.

10.7.1 Device identification

Nameplate of the Nivotester FTR525

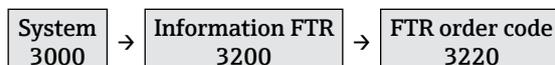
→  3 on page 12

10.7.1.1 FTR serial number



This function displays the serial number of the FTR525.

10.7.1.2 FTR order code



This function displays the order code of the FTR525.

10.7.1.3 FTR order identifier



This function displays the order identifier of the FTR525.

10.7.1.4 FTR firmware version



This function displays the firmware version of the FTR525.

10.7.1.5 FDR serial number



This function displays the serial number of the connected FDR57.

10.7.1.6 FDR order code



This function displays the order code of the connected FDR57.

10.7.1.7 FDR order identifier



This function displays the order identifier of the connected FDR57.

10.7.1.8 FDR firmware version



This function displays the firmware version of the connected FDR57.

10.7.1.9 FDR hardware version



This function displays the hardware version of the connected FDR57.

10.7.1.10 FQR serial number



This function displays the serial number of the connected FQR57.

10.7.1.11 FQR order code



This function displays the order code of the connected FQR57.

10.7.1.12 FQR order identifier



This function displays the order identifier of the connected FQR57.

10.7.1.13 FQR firmware version



This function displays the firmware version of the connected FQR57.

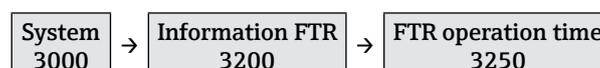
10.7.1.14 FQR hardware version



This function displays the hardware version of the connected FQR57.

10.7.2 Device status

10.7.2.1 Operation time



This function displays the operation time (in hours) of the FTR525 since first power-on.

10.7.2.2 Current temperature of the FTR525



This function displays the current temperature at the FTR525.

-  This and the following functions can be used to analyse temperatures on the devices of the measuring system with current error codes F401 to F403 (→ 49).
- The minimum and maximum values displayed in the following functions are saved since first power-on. They only change if the existing values are undercut or exceeded.

10.7.2.3 Minimum temperature of the FTR525



This function displays the minimum temperature at the FTR525.

10.7.2.4 Maximum temperature of the FTR525



This function displays the maximum temperature at the FTR525.

10.7.2.5 Current temperature of the FDR57



This function displays the current temperature at the FDR57.

10.7.2.6 Minimum temperature of the FDR57



This function displays the minimum temperature at the FDR57.

10.7.2.7 Maximum temperature of the FDR57



This function displays the maximum temperature at the FDR57.

10.7.2.8 Current temperature of the FQR57



This function displays the current temperature at the FQR57.

10.7.2.9 Minimum temperature of the FQR57



This function displays the minimum temperature at the FQR57.

10.7.2.10 Maximum temperature of the FQR57



This function displays the maximum temperature at the FQR57.

10.8 Firmware history

| Release date | Firmware version | Firmware changes | Documentation |
|--------------|------------------|--|----------------------|
| 10.2017 | 01.00.00 | Original | BA01683F/97/EN/01.17 |
| 06.2018 | 01.00.01 | Software revised: - After a factory reset of a FTR525 without bulk flow detection and with two switching outputs the setting in function 2220 (Assignment of switching contact 2) is adjusted from "Fault" to "Limit (1M)". | BA01683F/97/EN/01.17 |
| 11.2018 | 01.00.02 | Software extension: - Enhanced functionality (internal) | BA01683F/97/EN/01.17 |
| 05.2020 | 01.00.03 | Software revised: Assignment of Min./Max.safety in functions 2411+2421 corrected | BA01683F/97/EN/03.20 |

11 Maintenance

No special maintenance work is required on the device.

12 Repairs

12.1 General notes

Repairs and modifications are carried out only by Endress+Hauser service, repairs on-site are not intended.

12.2 Endress+Hauser services

 Contact your Endress+Hauser Sales Center for information on services, repairs and spare parts.

12.3 Return

The measuring device must be returned if it is in need of repair or a factory calibration, or if the wrong measuring device has been delivered or ordered.

To ensure safe, swift and professional device returns, please refer to the procedure and conditions for returning devices provided on the Endress+Hauser website at <http://www.endress.com/support/return-material>

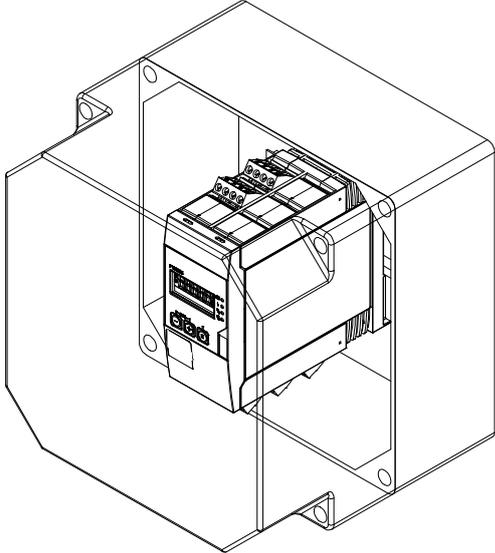
12.4 Disposal



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), our products are marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Such products may not be disposed of as unsorted municipal waste and can be returned to Endress+Hauser for disposal at conditions stipulated in our General Terms and Conditions or as individually agreed.

13 Accessories

Various accessories are available for the device, and can be ordered with the device or at a later stage from Endress+Hauser. Detailed information on the order code in question is available from your local Endress+Hauser Sales Center or on the product page of the Endress+Hauser website: www.endress.com.

| Accessory | Description |
|--------------------|--|
| Protective housing | <p>To install top-hat rail devices like the FTR525 on-site, the following protective housing is available.</p> <ul style="list-style-type: none"> ▪ Order No: 52010132 ▪ Ingress protection: IP66 ▪ Material: <ul style="list-style-type: none"> - Lower housing section: fibreglass reinforced polycarbonate, grey - Upper housing section: polycarbonate, transparent ▪ Cover screws: PA, 4 pieces, 2 of which are sealing ▪ Seal: PU seal ▪ Top-hat rail (EN 50022): galvanized ▪ Cable entries: 5 pieces M20x1.5 ▪ Dimensions (width x depth x height): 180 x 165 x 182 mm (7.09 x 6.50 x 7.17 in) <div style="text-align: center;">  </div> <p> The housing has room for several top-hat rail devices to a maximum installation width of 145 mm.</p> |

14 Technical data

14.1 Input

14.1.1 Measured variable

Acquisition of measurements of the limit and optionally the motion detection of the Soliwave microwave barrier

14.1.2 Measurement cycle

250 ms

14.1.3 Galvanic isolation

Galvanic isolation among each output and the power supply

14.2 Output

14.2.1 Current output

- 4-20 mA (passive)
- max. 22 mA
- Supply voltage max. 28 V DC

14.2.2 Relay (SPDT, standard)

- Number: 1 (optional 2)
- Contact rating: 250 V AC / 40 V DC, max. 2 A
- Service life: min. 60×10^3 (mechanical) / min. 10×10^6 (electrical)

14.2.3 Solid-state relay (SSR, optional)

- Number: 1 (optional 2)
- Load: 30 V AC / 40 V DC, max. 400 mA

14.2.4 Switching output (open collector, only Alarm)

- Number: 1
- Load: 28 V DC, max. 200 mA

14.3 Power supply

14.3.1 Supply voltage

Wide-range power supply unit

- 24 to 230 V DC (-15 % / +10 %)
- 42 to 230 V AC (-15 % / +10 %), 50/60 Hz

NOTICE

- ▶ When using the public power supply, install an easily accessible power switch in the proximity of the instrument. Mark the power switch as a disconnecter for the instrument (EN/IEC 61010).
- ▶ An overcurrent protection device (rated current of ≤ 10 A) is required for the power cable.

14.3.2 Power consumption

Max. 15 VA / 7 W

14.4 Installation

14.4.1 Installation position

Installation on top-hat rail acc. to IEC 60715

14.4.2 Installation orientation

→  13

14.5 Environment

14.5.1 Ambient temperature

NOTICE

The life-time of the display is shortened when operated in the upper temperature range

► To avoid heat accumulation, always make sure the device is sufficiently cooled.

-20 to +60 °C (-4 to +140 °F)

14.5.2 Storage temperature

-40 to +85 °C (-40 to +185 °F)

14.5.3 Operation height

< 2000 m (6560 ft) above MSL

14.5.4 Degree of protection

IP20

14.5.5 Electrical safety

- Protection class II
- Overvoltage category II
- Pollution degree 2

14.5.6 Condensation

Not permitted

14.5.7 Electromagnetic compatibility (EMC)

- Interference Emission to IEC 61326, Electrical Equipment Class B
- Interference Immunity to IEC 61326, Appendix A (Industrial)

15.6 Mechanical construction

15.6.1 Design, dimensions

→  5 on page 14

15.6.2 Weight

max. 350 g (12.4 oz)

15.6.3 Material

Housing: plastic PC-GF10

15.6.4 Terminals

- Screw terminals, plug-in
- 2,5 mm² (14 AWG)
- 0.14 to 2.5 mm² (26 to 14 AWG)
- Torque 0.5 to 0.6 Nm (0.37 to 0.44 ft-lbs)

15.7 Certificates and approvals

15.7.1 CE mark

The device meets the legal requirements of the applicable EC guidelines. These are listed in the corresponding EC Declaration of Conformity together with the standards applied. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

15.7.2 Ex approval

The process transmitter with control unit FTR525, as an associated apparatus, is only permissible exclusively for use outside of the hazardous area. The FTR525 controls the devices FQR57/FDR57 of the Soliwave microwave barrier, which are installed inside of the hazardous area. Please observe the safety notes of the separate "Safety Instructions" (XA), reference is made to this document on the nameplate.

 The separate Safety Instructions (XA) with all information regarding explosion protection is available from the Endress+Hauser Sales Center or in the download area of the internet site www.endress.com.

15.7.3 Other standards and guidelines

- EN 60529
Degree of protection provided by enclosures (IP code)
- EN 61010-1
Safety requirements for electrical equipment for measurement, control and laboratory use
- EN/IEC 60079-0
Explosive atmospheres - Part 0: Equipment - General requirements
- EN/IEC 60079-11
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
- EN/IEC 60079-26
Explosive atmospheres - Part 26: Equipment with Equipment Protection Level (EPL) Ga

15.8 Supplementary documentation

- Technical Information Nivotester FTR525
TI01329F/97/EN
- Technical Information Soliwave FQR57/FDR57
TI01330F/97/EN
- Safety Instructions Nivotester FTR525 with Soliwave FQR57/FDR57
 - ATEX: XA01603F/97/A3
 - IECEx: XA01604F/97/EN

16 Appendix

16.1 User-specific settings

| User-specific settings | | Endress+Hauser  | |
|---|---|--|--|
| People for Process Automation | | | |
| <p>The order option for Nivotester FTR525 with user-specific settings requires that all necessary parameters and options are mentioned. Wherever informations are missing, default values will be used. This completed form must be supplied with every order.</p> | | | |
| <p>Order code: FTR525 - <input type="text"/> <input type="text"/> <input type="text"/></p> | | | |
| 2112 Manual adjustment LL (Point level detektion) _____ % (0 ... 100 %; 30 %) | 2113 Manual adjustment UL (Point level detektion) _____ % (0 ... 100 %; 80 %) | 2114 Damping (Point level detektion) <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | |
| 2122 Manual adjustment LL (Bulk flow detection) _____ % (0 ... 100 %; 30 %) | 2123 Manual adjustment UL (Bulk flow detection) _____ % (0 ... 100 %; 80 %) | 2124 Damping (Bulk flow detection) <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | |
| 2130 Parallel mode <input type="checkbox"/> Channel 1 <input type="checkbox"/> Channel 2 <input type="checkbox"/> Channel 3 <input type="checkbox"/> Channel 4 <input type="checkbox"/> Channel 5 | 2210 Assignment switching contact 1 <input type="checkbox"/> Limit (1M) <input type="checkbox"/> Failure <input type="checkbox"/> Motion (2M) * ¹ | 2220 Assignment switching contact 2 * ¹ <input type="checkbox"/> Limit (1M) * ² <input type="checkbox"/> Motion (2M) * ³ <input type="checkbox"/> Failure | |
| 2230 Assignment current output <input type="checkbox"/> Limit (1M) <input type="checkbox"/> Motion (2M) * ¹ | 2310 Current output mode <input type="checkbox"/> Standard <input type="checkbox"/> Magnify | 2320 4mA value (if 2310 = Magnify) _____ % (0 ... 100 %; 10 %) | |
| 2330 20mA value (if 2310 = Magnify) _____ % (0 ... 100 %; 90 %) | 2340 Failure mode <input type="checkbox"/> MIN (<4mA) <input type="checkbox"/> MAX (>20mA) <input type="checkbox"/> Fixed value | 2350 Fixed value (if 2340 = Fixed value) _____ mA (3.6 ... 22.0 mA; 12.0 mA) | |
| 2411 Switching function output 1 <input type="checkbox"/> Min.safety <input type="checkbox"/> Max.safety | 2412 Switch-on point output 1 _____ % (0 ... 100 %; 50 %) | 2413 Switch-off point output 1 _____ % (0 ... 100 %; 40 %) | |
| 2414 Switch-on delay output 1 <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | 2415 Switch-off delay output 1 <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | 2421 Switching function output 2 * ¹ <input type="checkbox"/> Min.safety <input type="checkbox"/> Max.safety | |
| 2422 Switch-on point output 2 * ¹ _____ % (0 ... 100 %; 50 %) | 2423 Switch-off point output 2 * ¹ _____ % (0 ... 100 %; 40 %) | 2424 Switch-on delay output 2 * ¹ <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | |
| 2425 Switch-off delay output 2 * ¹ <input type="checkbox"/> 100 ms <input type="checkbox"/> 200 ms <input type="checkbox"/> 300 ms <input type="checkbox"/> 500 ms <input type="checkbox"/> 1 s <input type="checkbox"/> 2 s <input type="checkbox"/> 3 s <input type="checkbox"/> 5 s <input type="checkbox"/> 10 s <input type="checkbox"/> 20 s <input type="checkbox"/> Off | 3111 TAG _____ (max. 16 digits) | 3123 Define unlock parameter _____ (4 to 16 digit, 0000) Notice: 0000 = no unlock parameter | |
| 3510 Language <input type="checkbox"/> English <input type="checkbox"/> Deutsch | 3520 Display mode <input type="checkbox"/> % limit (1M) <input type="checkbox"/> Bargraph limit (1M) * ² <input type="checkbox"/> TAG limit (1M) <input type="checkbox"/> % motion (2M) * ¹ <input type="checkbox"/> Bargraph motion (2M) * ¹ <input type="checkbox"/> TAG motion (2M) * ¹ <input type="checkbox"/> % alternating (1M/2M) * ¹ <input type="checkbox"/> Bargraph alternating (1M/2M) * ¹ * ³ <input type="checkbox"/> TAG alternating (1M/2M) * ¹ | 3530 Back to home _____ s (3 ... 9999; 120) | |
| | | 3550 Contrast <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 | |
| | | 3560 Brightness <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 | |
| <p>Notice: The bold marked options are the default values. *¹ Available with appropriate type of device *² Default on FTR525-*¹ *³ Default on FTR525-*²</p> | | | |

ad064000en/11.20

16.2 Operating menu

The following table gives an overview of all functions of the operating menu and their relevant access rights.

-  User: E - Expert, M - Maintainer, O - Operator
- Access concept →  22

| Function/function group - designation | Factory setting | Access rights | | |
|---------------------------------------|--|---------------|-------------|---|
| | | Visible | Read access | Write access |
| 0000 Measured value display | | | | |
| 1000 Diagnostics | | | | |
| ↳ 1100 Present diagnostics | – | E M O | E M O |  |
| ↳ 1200 Previous diagnostics | – | E M O | E M O |  |
| ↳ 1300 Erase previous diagnostics | – | E M O | E M O | E M |
| ↳ 1400 Temperature FTR | | | | |
| ↳ 1410 Current temperature | – | E M O | E M O |  |
| ↳ 1420 Minimum temperature | – | E M O | E M O |  |
| ↳ 1430 Maximum temperature | – | E M O | E M O |  |
| ↳ 1500 Temperature FDR | | | | |
| ↳ 1510 Current temperature | – | E M O | E M O |  |
| ↳ 1520 Minimum temperature | – | E M O | E M O |  |
| ↳ 1530 Maximum temperature | – | E M O | E M O |  |
| ↳ 1600 Temperature FQR | | | | |
| ↳ 1610 Current temperature | – | E M O | E M O |  |
| ↳ 1620 Minimum temperature | – | E M O | E M O |  |
| ↳ 1630 Maximum temperature | – | E M O | E M O |  |
| ↳ 1700 Simulation | | | | |
| ↳ 1710 Simulation mode | Off | E M O | E M O | E M |
| ↳ 1720 Simulation value | →  41 | E M O | E M O | E M |

| Function/function group - designation | Factory setting | Access rights | | |
|---------------------------------------|---|---------------|-------------|--------------|
| | | Visible | Read access | Write access |
| 2000 Application | | | | |
| ↳ 2100 Sensor | | | | |
| ↳ 2110 Limit detection | | | | |
| ↳ 2111 Automatic setup | – | E M O | E M O | E M M |
| ↳ 2112 Manual adjustment LL | 30 % | E M O | E M O | E M M |
| ↳ 2113 Manual adjustment UL | 80 % | E M O | E M O | E M M |
| ↳ 2114 Damping | Off | E M O | E M O | E M M |
| ↳ 2120 Motion detection | | | | |
| ↳ 2121 Automatic setup | – | E M O | E M O | E M M |
| ↳ 2122 Manual adjustment LL | 30 % | E M O | E M O | E M M |
| ↳ 2123 Manual adjustment UL | 80 % | E M O | E M O | E M M |
| ↳ 2124 Damping | Off | E M O | E M O | E M M |
| ↳ 2130 Parallel mode | Channel 1 | E M O | E M O | E M M |
| ↳ 2200 Assignment outputs | | | | |
| ↳ 2210 Switching contact 1 | Limit (1M) | E M O | E M O | E M M |
| ↳ 2220 Switching contact 2 | <ul style="list-style-type: none"> ■ Limit (1M) for FTR525-**1 ■ Motion (2M) for FTR525-**2 | E M O | E M O | E M M |
| ↳ 2230 Current output | Limit (1M) | E M O | E M O | E M M |
| ↳ 2300 Current output | | | | |
| ↳ 2310 Current output mode | Standard | E M O | E M O | E M M |
| ↳ 2320 4mA value | 10 % | E M O | E M O | E M M |
| ↳ 2330 20mA value | 90 % | E M O | E M O | E M M |
| ↳ 2340 Failure mode | MIN(<4mA) | E M O | E M O | E M M |
| ↳ 2350 Fixed value | 12.0 mA | E M O | E M O | E M M |

| Function/function group - designation | Factory setting | Access rights | | |
|---------------------------------------|-----------------|---------------|-------------|---|
| | | Visible | Read access | Write access |
| ↳ 2400 Switching outputs | | | | |
| ↳ 2410 Switching output 1 | | | | |
| ↳ 2411 Switching function output 1 | Max.safety | E M O | E M O | E M |
| ↳ 2412 Switch-on point output 1 | 50 % | E M O | E M O | E M |
| ↳ 2413 Switch-off point output 1 | 40 % | E M O | E M O | E M |
| ↳ 2414 Switch-on delay output 1 | Off | E M O | E M O | E M |
| ↳ 2415 Switch-off delay output 1 | Off | E M O | E M O | E M |
| ↳ 2420 Switching output 2 | | | | |
| ↳ 2421 Switching function output 2 | Max.safety | E M O | E M O | E M |
| ↳ 2422 Switch-on point output 2 | 50 % | E M O | E M O | E M |
| ↳ 2423 Switch-off point output 2 | 40 % | E M O | E M O | E M |
| ↳ 2424 Switch-on delay output 2 | Off | E M O | E M O | E M |
| ↳ 2425 Switch-off delay output 2 | Off | E M O | E M O | E M |
| ↳ 2500 Application analysis | | | | |
| ↳ 2510 Min/Max limit (1M) | - | E M O | E M O |  |
| ↳ 2520 Min/Max motion (2M) | - | E M O | E M O |  |
| ↳ 2530 Reset Min/Max | - | E M O | E M O | E M |
| ↳ 2540 Signal strength limit (1M) | - | E M O | E M O |  |
| ↳ 2550 Signal strength motion (2M) | - | E M O | E M O |  |

| Function/function group - designation | Factory setting | Access rights | | |
|---------------------------------------|-----------------|---------------|-------------|--------------|
| | | Visible | Read access | Write access |
| 3000 System | | | | |
| ↳ 3100 Management | | | | |
| ↳ 3110 Device management | | | | |
| ↳ 3111 Tag | - | E M O | E M O | E M |
| ↳ 3112 Save user settings | - | E M | E M | E M |
| ↳ 3113 Device reset | - | E M | E M | E M |
| ↳ 3120 User management | | | | |
| ↳ 3121 Access rights | - | E M O | E M O | X |
| ↳ 3122 Enter unlock parameter | - | E M O | E M O | E M O |
| ↳ 3123 Define unlock parameter | - | E M | E M | E M |
| ↳ 3124 Confirm unlock parameter | - | E M | E M | E M |
| ↳ 3200 Information FTR525 | | | | |
| ↳ 3210 FTR525 serial number | - | E M O | E M O | X |
| ↳ 3220 FTR525 order code | - | E M O | E M O | X |
| ↳ 3230 FTR525 order identifier | - | E M O | E M O | X |
| ↳ 3240 FTR525 firmware version | - | E M O | E M O | X |
| ↳ 3250 Operation time | - | E M O | E M O | X |
| ↳ 3300 Information FDR | | | | |
| ↳ 3310 FDR serial number | - | E M O | E M O | X |
| ↳ 3320 FDR order code | - | E M O | E M O | X |
| ↳ 3330 FDR order identifier | - | E M O | E M O | X |
| ↳ 3340 FDR firmware version | - | E M O | E M O | X |
| ↳ 3350 FDR hardware version | - | E M O | E M O | X |

| Function/function group - designation | Factory setting | Access rights | | |
|---------------------------------------|---|---------------|-------------|-------------------------------------|
| | | Visible | Read access | Write access |
| ↳ 3400 Information FQR | | | | |
| ↳ 3410 FQR serial number | | E M O | E M O | <input checked="" type="checkbox"/> |
| ↳ 3420 FQR order code | | E M O | E M O | <input checked="" type="checkbox"/> |
| ↳ 3430 FQR order identifier | | E M O | E M O | <input checked="" type="checkbox"/> |
| ↳ 3440 FQR firmware version | | E M O | E M O | <input checked="" type="checkbox"/> |
| ↳ 3450 FQR hardware version | | E M O | E M O | <input checked="" type="checkbox"/> |
| ↳ 3500 Display | | | | |
| ↳ 3510 Language | English | E M O | E M O | E M |
| ↳ 3520 Display mode | <ul style="list-style-type: none"> ■ Bargraph limit (1M) for FTR525-**1 ■ Bargraph alternating 1M/2M for FTR525-**2 | E M O | E M O | E M |
| ↳ 3530 Back to home | 120 s | E M O | E M O | E M O |
| ↳ 3540 Format display | Off | E M O | E M O | E M O |
| ↳ 3550 Contrast | 4 | E M O | E M O | E M O |
| ↳ 3560 Brightness | 4 | E M O | E M O | E M O |

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