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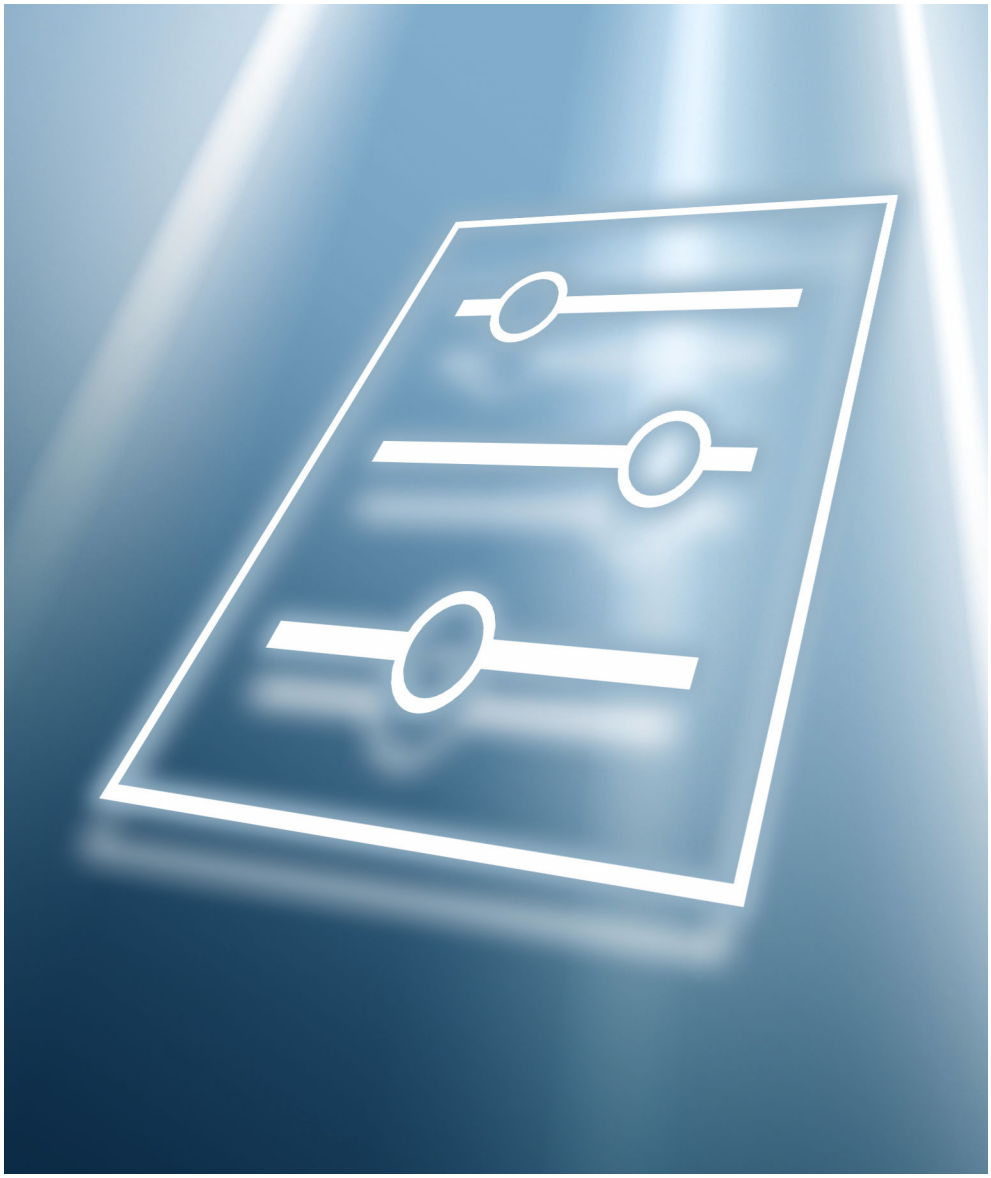
01.00.zz (Device firmware)



# Description of Device Parameters
# FTL51B
# HART

Vibronic



Endress+Hauser
People for Process Automation

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# 1 About this document

## 1.1 Document function

The document is part of the Operating Instructions and serves as a reference for parameters. The document provides a detailed explanation of each individual parameter.

Performance of tasks that require detailed knowledge of the functioning of the device:
- Commissioning measurements under difficult conditions
- Optimal adaptation of the measurement to difficult conditions
- Detailed configuration of the communication interface
- Error diagnostics in difficult cases

## 1.2 Target group

The document is aimed at specialists who work with the device over the entire life cycle and perform specific configurations.

## 1.3 Using this document

### 1.3.1 Information on the document structure

This document lists the submenus and parameters that are available when the **"Maintenance" option** user role is enabled.

For the operating concept of the operating menus, see the Operating Instructions.

### 1.3.2 Structure of a parameter description

The individual parts of a parameter description are described in the following section:

- Navigation: Navigation path to the parameter via the local display
- Prerequisite: The parameter is only available under these specific conditions
- Description: Description of the parameter function
- Selection: List of the individual options for the parameter
- User entry: Input range for the parameter
- User interface: Display value/data of the parameter
- Factory setting: Default setting on leaving the factory
- Additional information:
  - On individual options
  - On display values/data
  - On the input range
  - On the factory setting
  - On the parameter function

## 1.4 Symbols

### 1.4.1 Symbols for certain types of information

**Additional information:**

**Reference to documentation:**

**Operation via local display:**

**Operation via operating tool:**

**Write-protected parameter:**

## 1.5 Documentation

### 1.5.1 Standard documentation

**Operating Instructions**

The Operating Instructions are available via the Internet: www.endress.com → Download

### 1.5.2 Supplementary device-dependent documentation

**Special Documentation**

The Special Documentation is available via the Internet: www.endress.com → Download

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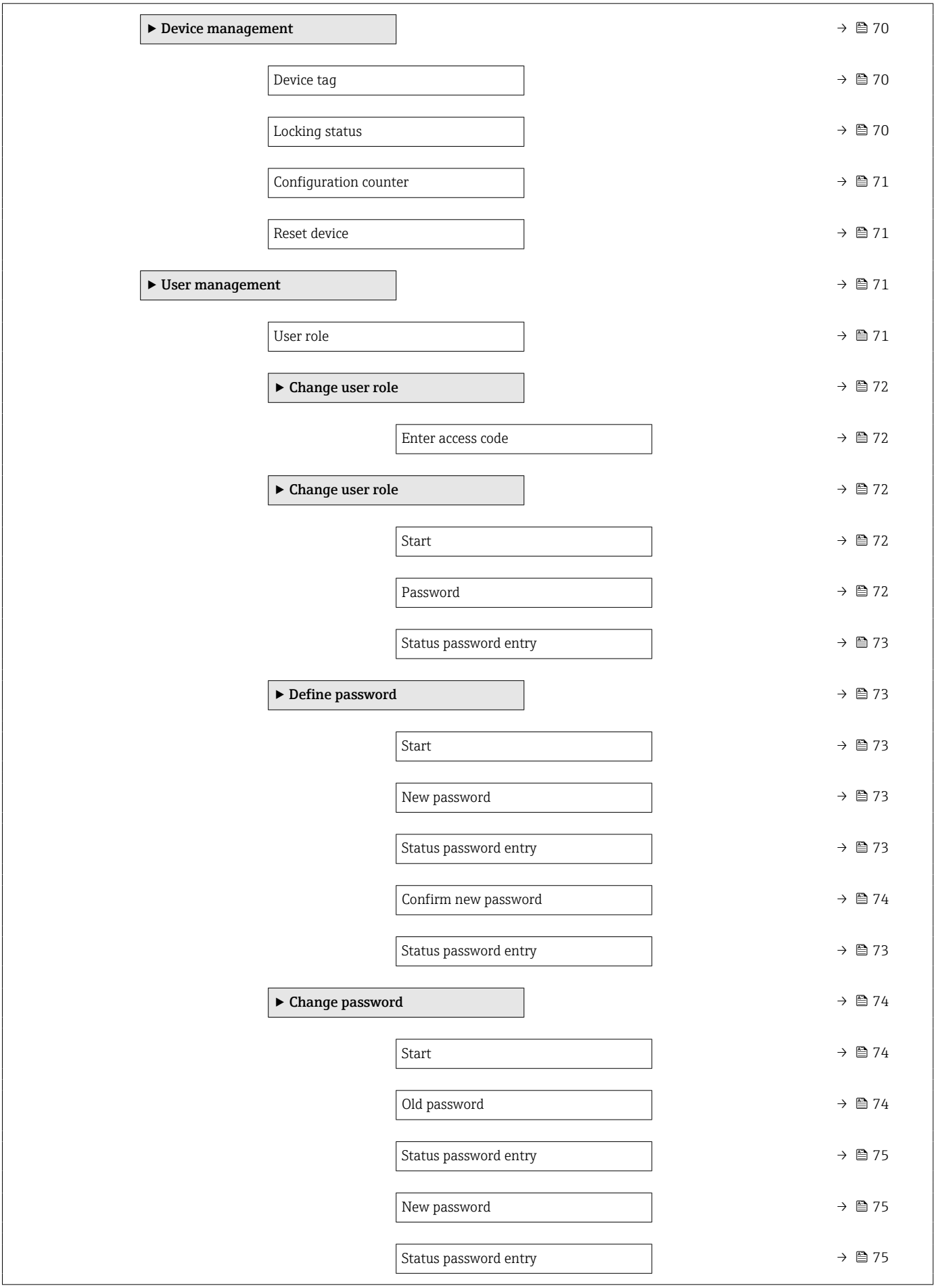
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# 3 Description of device parameters

In the following section, the parameters are listed according to the menu structure of the local display.

The operating menu is dynamic and adapts the choice of parameters to the selected options.

The parameter description of the operating tool is contained in the operating tool.

*Navigation* System → Display

*Navigation* System → User manag. → User role

## Language

**Navigation** System → Display → Language

**Description** Set display language

**Selection**
- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *
- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- العَرَبيّة (Arabic) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- tiếng Việt (Vietnamese) *
- čeština (Czech) *

## User role

**Navigation** System → User manag. → User role

**Description** Shows the access authorization to the parameters via the operating tool

* Visibility depends on order options or device settings

**User interface**

- Operator
- Maintenance
- Expert
- Production
- Development

## 3.1 "Guidance" menu

*Navigation* Guidance

### 3.1.1 "Commissioning" wizard

*Navigation* Guidance → Commissioning

**Temperature unit**

**Navigation** Guidance → Commissioning → Temperature unit

**Description** Used to display the electronics temperature.

**Selection**

| *SI units* | *US units* |
|---|---|
| ▪ °C | °F |
| ▪ K | |

**Mode of operation**

**Navigation** Guidance → Commissioning → Mode of operat.

**Description** Level limit detection: Switching mode, output is either 8 mA (demand) or 16 mA (good).

Sensor frequency : Continuous mode, output between 4 mA and 20 mA proportional to sensor frequency.

**Selection**
- Level limit detection
- Sensor frequency

**Safety function**

**Navigation** Guidance → Commissioning → Safety function

**Description** MIN: Use for dry run protection.

MAX: Use for overfill protection.

**Selection**
- MIN
- MAX

## Density setting

**Navigation** Guidance → Commissioning → Density setting

**Selection**
- > 0.4 g/cm³ *
- > 0.4 g/cm³ *
- > 0.5 g/cm³
- > 0.7 g/cm³

**Additional information** *Selection*
- **> 0.4 g/cm³** option
  For liquids with a density of 0.4...0.6 g/cm³
- **> 0.4 g/cm³** option
  For liquids with a density of 0.4...0.6 g/cm³
- **> 0.5 g/cm³** option
  For liquids with a density 0.5...0.8 g/cm³
- **> 0.7 g/cm³** option
  Standard setting for liquids with a density > 0.7 g/cm³

## Lower range value output

**Navigation** Guidance → Commissioning → Low.range outp

**Description** Depending of which variable has been selected as PV, define the related lower and upper range values.
Assignment PV value to 4 mA and 20 mA.

**User entry** 4 to 23 mA

## Upper range value output

**Navigation** Guidance → Commissioning → Upp.range outp

**Description** Depending of which variable has been selected as PV, define the related lower and upper range values.
Assignment PV value to 4 mA and 20 mA.

**User entry** 4 to 23 mA

* Visibility depends on order options or device settings

**Current range output**

**Navigation** Guidance → Commissioning → Cur.range outp

**Description** Defines the current range used to transmit the measured or calculated value.
In brackets are indicated the “low saturation value” and the “high saturation value”.
If Measured value ≤ “low saturation”, the output current is set to “low saturation”.
If Measured value ≥ “high saturation”, the output current is set to ”high saturation”.

Note:
Currents below 3.6 mA or above 21.5 mA can be used to signal an alarm.

**Selection**
- 4...20 mA (4... 20.5 mA)
- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)

**Failure behavior current output**

**Navigation** Guidance → Commissioning → Fail.behav.out

**Description** Defines which current the output assumes in the case of an error.
Min: < 3.6 mA
Max: >21.5 mA

**Selection**
- Min.
- Max.

### 3.1.2 "Safety lock" wizard

*Navigation* Guidance → Safety lock

**Proof test via Bluetooth allowed?**

**Navigation** Guidance → Safety lock → Bluetooth

**Description** After completion of the Safety mode wizard, the device will be write protected via software lock.

To use the proof test wizard (optional), the device does not have to be unlocked.

It must be defined, if the proof test wizard via Bluetooth is allowed.

**Selection**
- No
- Yes

### Enter safety locking code

**Navigation** Guidance → Safety lock → Safety code

**Description** The Safety locking/unlocking code can be found in the corresponding safety manual or the WHG documentation.

**User entry** 0 to 65 535

### SIL status

**Navigation** Guidance → Safety lock → SIL status

**User interface**
- Not active
- SIL sequence active
- Active
- Failed
- Finished

### Character test string

**Navigation** Guidance → Safety lock → Char.test string

**Description** The following character string is displayed:
0123456789+-,.

Set the 'Confirm' parameter to 'Yes' if this string is rendered correctly.
Set the 'Confirm' parameter to 'No' if this string is not rendered correctly. Safety locking is not possible in this case.

**User interface** Character string comprising numbers, letters and special characters

### Device tag

**Navigation** Guidance → Safety lock → Device tag

**Description** Enter the name for the measuring point.

**User interface** Character string comprising numbers, letters and special characters

### Device name

**Navigation** Guidance → Safety lock → Device name

**Description** Use this function to display the device name. It can also be found on the nameplate.

**User interface** Character string comprising numbers, letters and special characters

### Serial number

**Navigation** Guidance → Safety lock → Serial number

**Description** The serial number is a unique alphanumerical code identifying the device.
It is printed on the nameplate.
In combination with the Operations app it allows to access all device related documentation.

**User interface** Character string comprising numbers, letters and special characters

### CRC device configuration

**Navigation** Guidance → Safety lock → CRC device conf.

**Description** CRC device configuration based on current settings of safety relevant parameters.
The CRC device configuration is unique and can be used to detect changes in safety relevant parameter settings.

**User interface** 0 to 65 535

### Stored CRC device configuration

**Navigation** Guidance → Safety lock → Stored CRC conf.

**Description** Stored CRC after the last safety lock. Factory delivery is 65535 means that the device has not yet been safety locked.

**User interface** 0 to 65 535

### Timestamp stored CRC device config.

**Navigation** Guidance → Safety lock → TS stored CRC

**Description** Gives the time stamp when the CRC was last stored following completion of the safety lock wizard.

**User interface** Character string comprising numbers, letters and special characters

### Operating time

**Navigation** Guidance → Safety lock → Operating time

**Description** Indicates how long the device has been in operation.

**User interface** Days (d), hours (h), minutes (m), seconds (s)

### Density setting

**Navigation** Guidance → Safety lock → Density setting

**User interface**
- > 0.4 g/cm³ *
- > 0.4 g/cm³ *
- > 0.5 g/cm³
- > 0.7 g/cm³

### Safety function

**Navigation** Guidance → Safety lock → Safety function

**User interface**
- MIN
- MAX

### Switching delay uncovered to covered

**Navigation** Guidance → Safety lock → Time delay cover

**User interface**
- 0.25 s
- 0.50 s
- 1.00 s

* Visibility depends on order options or device settings

- 1.50 s
- 5.00 s
- Customer specific

### Switching delay uncovered to covered

**Navigation** Guidance → Safety lock → Time delay cover

**User interface** Character string comprising numbers, letters and special characters

### Switching delay covered to uncovered

**Navigation** Guidance → Safety lock → Time delay free

**User interface**
- 0.25 s
- 0.50 s
- 1.00 s
- 1.50 s
- 5.00 s
- Customer specific

### Switching delay covered to uncovered

**Navigation** Guidance → Safety lock → Time delay free

**User interface** Character string comprising numbers, letters and special characters

### Failure behavior current output

**Navigation** Guidance → Safety lock → Fail.behav.out

**Description** Assigned value of current output in case of an error.

**User interface**
- Min.
- Max.

### Current range output

**Navigation** Guidance → Safety lock → Cur.range outp

**Description** Assigned current range used to transmit the measured value.

**User interface**
- 4...20 mA (4... 20.5 mA)
- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)
- Customer specific

### Lower range value output

**Navigation** Guidance → Safety lock → Low.range outp

**Description** Assigned value 4 mA.

**User interface** Character string comprising numbers, letters and special characters

### Upper range value output

**Navigation** Guidance → Safety lock → Upp.range outp

**Description** Assigned value 20 mA.

**User interface** Character string comprising numbers, letters and special characters

### Locking status

**Navigation** Guidance → Safety lock → Locking status

**Description** Indicates the type of locking.

'Hardware locked' (HW)
The device is locked by the 'WP' switch on the main electronics module. To unlock, set the switch into the OFF position.

'Safety locked' (SW)
Unlock the device by entering the appropriate access code in 'Enter safety unlocking code'.

'Temporarily locked' (SW)
The device is temporarily locked by processes in the device (e.g. data upload/download, reset). The device will automatically be unlocked after completion of these processes.

**User interface**
- Hardware locked
- Safety locked
- Temporarily locked

**Code incorrect**

**Navigation** Guidance → Safety lock → Code incorrect

**Description** Abort SIL confirmation sequence or reenter SIL locking code.

**Selection**
- Reenter code
- Abort sequence

### 3.1.3 "Safety unlock" wizard

*Navigation* Guidance → Safety unlock

**Enter safety unlocking code**

**Navigation** Guidance → Safety unlock → Safe.unlock code

**Description** The Safety locking/unlocking code can be found in the corresponding safety manual or the WHG documentation.

**User entry** 0 to 65 535

**Code incorrect**

**Navigation** Guidance → Safety unlock → Code incorrect

**Description** Abort SIL confirmation sequence or reenter SIL locking code.

**Selection**
- Reenter code
- Abort sequence

## Locking status

**Navigation** Guidance → Safety unlock → Locking status

**Description** Indicates the type of locking.

'Hardware locked' (HW)
The device is locked by the 'WP' switch on the main electronics module. To unlock, set the switch into the OFF position.

'Safety locked' (SW)
Unlock the device by entering the appropriate access code in 'Enter safety unlocking code'.

'Temporarily locked' (SW)
The device is temporarily locked by processes in the device (e.g. data upload/download, reset). The device will automatically be unlocked after completion of these processes.

**User interface**
- Hardware locked
- Safety locked
- Temporarily locked

## 3.2 "Diagnostics" menu

*Navigation* Diagnostics

### 3.2.1 "Active diagnostics" submenu

*Navigation* Diagnostics → Active diagnos.

**Active diagnostics**

**Navigation** Diagnostics → Active diagnos. → Active diagnos.

**Description** Displays the currently active diagnostic message.

If there is more than one pending diagnostic event, the message for the diagnostic event with the highest priority is displayed.

**User interface** Positive integer

**Timestamp**

**Navigation** Diagnostics → Active diagnos. → Timestamp

**Description** Displays the timestamp for the currently active diagnostic message.

**User interface** Days (d), hours (h), minutes (m), seconds (s)

**Previous diagnostics**

**Navigation** Diagnostics → Active diagnos. → Prev.diagnostics

**Description** Displays the diagnostic message for the last diagnostic event that has ended.

**User interface** Positive integer

**Timestamp**

**Navigation** Diagnostics → Active diagnos. → Timestamp

**Description** Displays the timestamp of the diagnostic message generated for the last diagnostic event that has ended.

**User interface** Days (d), hours (h), minutes (m), seconds (s)

**Operating time from restart**

**Navigation** Diagnostics → Active diagnos. → Time fr. restart

**Description** Indicates how long the device has been in operation since the last time the device was restarted.

**User interface** Days (d), hours (h), minutes (m), seconds (s)

**Operating time**

**Navigation** Diagnostics → Active diagnos. → Operating time

**Description** Indicates how long the device has been in operation.

**User interface** Days (d), hours (h), minutes (m), seconds (s)

### 3.2.2 "Minimum/maximum values" submenu

*Navigation* Diagnostics → Min/max val.

**Frequency min**

**Navigation** Diagnostics → Min/max val. → Frequency min

**Description** Minimum or maximum measured sensor frequency.

**User interface** Signed floating-point number

**Frequency max**

**Navigation** Diagnostics → Min/max val. → Frequency max

**Description** Minimum or maximum measured sensor frequency.

**User interface** Signed floating-point number

### Minimum terminal voltage

**Navigation** Diagnostics → Min/max val. → Min.term.volt.

**Description** Minimum or maximum measured terminal (supply) voltage.

**User interface** 0.0 to 50.0 V

### Maximum terminal voltage

**Navigation** Diagnostics → Min/max val. → Max.term.voltage

**Description** Minimum or maximum measured terminal (supply) voltage.

**User interface** 0.0 to 50.0 V

### Minimum electronics temperature

**Navigation** Diagnostics → Min/max val. → Min.electr.temp.

**Description** Minimum or maximum measured main electronics temperature.

**User interface** Signed floating-point number

### Maximum electronics temperature

**Navigation** Diagnostics → Min/max val. → Max.electr.temp.

**Description** Minimum or maximum measured main electronics temperature.

**User interface** Signed floating-point number

### Minimum sensor temperature

**Navigation** Diagnostics → Min/max val. → Min. sensor temp

**Description** Minimum or maximum measured sensor (sensor electronics) temperature.

**User interface** Signed floating-point number

**Maximum sensor temperature**

**Navigation** Diagnostics → Min/max val. → Max. Sensor temp

**Description** Minimum or maximum measured sensor (sensor electronics) temperature.

**User interface** Signed floating-point number

### 3.2.3 "Simulation" submenu

*Navigation* Diagnostics → Simulation

**Value current output**

**Navigation** Diagnostics → Simulation → Val. curr.outp

**Description** Defines the value of the simulated output current.

**User entry** 3.59 to 23 mA

**Simulation**

**Navigation** Diagnostics → Simulation → Simulation

**Description** By activating the simulation, the following can be simulated:
- Fork state
- Sensor frequency
- Current output
- Diagnostic event simulation

The simulation can affect the output current.

**Selection**
- Off
- Fork state
- Sensor frequency
- Current output
- Diagnostic event simulation

### Frequency simulation value

**Navigation** Diagnostics → Simulation → Freq. simulation

**Description** In level limit detection mode, output current and fork state are independent of frequency simulation value.

**User entry** 0 to 10 000 Hz

### Fork state simulation value

**Navigation** Diagnostics → Simulation → Fork. simul.val.

**Description** In sensor frequency mode, output current is independent of fork state simulation value. In level limit detection mode, sensor frequency is independent of fork state simulation value.

**Selection**
- Fork covered
- Fork uncovered

### Diagnostic event category

**Navigation** Diagnostics → Simulation → Event category

**Description** Select which diagnostic events can be simulated.

**Selection**
- Sensor
- Electronics
- Configuration
- Process

### Diagnostic event simulation

**Navigation** Diagnostics → Simulation → Diag. event sim.

**Description** Select the diagnostic event to be simulated.

Note:
To terminate the simulation, select "Off".

**Selection** Off

### 3.2.4 "Heartbeat Technology" submenu

*Navigation* Diagnostics → Heartbeat Techn.

**"Heartbeat Verification" submenu**

*Navigation* Diagnostics → Heartbeat Techn. → Heartbeat Verif.

**Date/time Heartbeat Verification**

**Navigation** Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Date/time Heartbeat Verification

**Description** Date and time of last Hearbeat Verification.

This value is updated with every Heartbeat verification.

Note:
If time information is not available, e.g. Heartbeat verification is started from display, '--------' is shown.

**User interface** Character string comprising numbers, letters and special characters

**Start verification**

**Navigation** Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Start verificat.

**Description** Start verification.

**Selection**
- Cancel
- Start

**Operating time (Verification)**

**Navigation** Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Operating time

**User interface** Days (d), hours (h), minutes (m), seconds (s)

### Overall result

**Navigation** Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Overall result

**User interface**
- Not done
- Passed
- Not done
- Failed

### Status

**Navigation** Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Status

**Description** Shows the actual status.

**User interface**
- Done
- Busy
- Failed
- Not done

## "Frequency history" submenu

*Navigation* Diagnostics → Heartbeat Techn. → Freq. history

### Sensor frequency 1

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 1

**User interface** Signed floating-point number

### Sensor frequency 2

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 2

**User interface** Signed floating-point number

### Sensor frequency 3

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 3

**User interface** Signed floating-point number

### Sensor frequency 4

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 4

**User interface** Signed floating-point number

### Sensor frequency 5

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 5

**User interface** Signed floating-point number

### Sensor frequency 6

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 6

**User interface** Signed floating-point number

### Sensor frequency 7

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 7

**User interface** Signed floating-point number

### Sensor frequency 8

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 8

**User interface** Signed floating-point number

### Sensor frequency 9

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 9

**User interface** Signed floating-point number

### Sensor frequency 10

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 10

**User interface** Signed floating-point number

### Sensor frequency 11

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 11

**User interface** Signed floating-point number

### Sensor frequency 12

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 12

**User interface** Signed floating-point number

### Sensor frequency 13

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 13

**User interface** Signed floating-point number

### Sensor frequency 14

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 14

**User interface** Signed floating-point number

### Sensor frequency 15

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 15

**User interface** Signed floating-point number

### Sensor frequency 16

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Frequency 16

**User interface** Signed floating-point number

### Date 1

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 1

**User interface** Character string comprising numbers, letters and special characters

### Date 2

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 2

**User interface** Character string comprising numbers, letters and special characters

### Date 3

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 3

**User interface** Character string comprising numbers, letters and special characters

### Date 4

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 4

**User interface** Character string comprising numbers, letters and special characters

### Date 5

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 5

**User interface** Character string comprising numbers, letters and special characters

### Date 6

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 6

**User interface** Character string comprising numbers, letters and special characters

### Date 7

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 7

**User interface** Character string comprising numbers, letters and special characters

### Date 8

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 8

**User interface** Character string comprising numbers, letters and special characters

### Date 9

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 9

**User interface** Character string comprising numbers, letters and special characters

### Date 10

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 10

**User interface** Character string comprising numbers, letters and special characters

**Date 11**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 11

**User interface** Character string comprising numbers, letters and special characters

**Date 12**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 12

**User interface** Character string comprising numbers, letters and special characters

**Date 13**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 13

**User interface** Character string comprising numbers, letters and special characters

**Date 14**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 14

**User interface** Character string comprising numbers, letters and special characters

**Date 15**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 15

**User interface** Character string comprising numbers, letters and special characters

**Date 16**

**Navigation** Diagnostics → Heartbeat Techn. → Freq. history → Date 16

**User interface** Character string comprising numbers, letters and special characters

### "Loop diagnostics" submenu

*Navigation* Diagnostics → Heartbeat Techn. → Loop diagn.

| Rebuild baseline | |
|---|---|
| **Navigation** | Diagnostics → Heartbeat Techn. → Loop diagn. → Reb. baseline |
| **Description** | Notice<br>The current output is simulated.<br>Bridge the PLC or take other appropriate measures to prevent an erroneous triggering of alarm messages or changes in the control loop behavior.<br>The baseline should be rebuilt if planned changes have been made in the loop. |
| **Selection** | ▪ No<br>▪ Yes |

| Tolerated deviation +/- | |
|---|---|
| **Navigation** | Diagnostics → Heartbeat Techn. → Loop diagn. → Toler. deviation |
| **Description** | A value should be chosen to ensure that normal voltage deviations do not lead to unwanted messages.<br>Default<br>1.5 V DC |
| **User entry** | 0.5 to 3.0 V |

| Baseline status | |
|---|---|
| **Navigation** | Diagnostics → Heartbeat Techn. → Loop diagn. → Baseline status |
| **Description** | 'Failed'<br>Means, baseline is not available or creation not possible.<br>'Passed'<br>Baseline is available. |
| **User interface** | ▪ Failed<br>▪ Success |

## Loop diagnostics

**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → Loop diagn.

**Selection**
- Disable
- Enable

## Terminal voltage 1

**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → Terminal volt. 1

**Description** Shows the current terminal voltage that is applied at the output

**User interface** 0.0 to 50.0 V

## Clamping voltage lower threshold

**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → Lower threshold

**User interface** 0.0 to 50.0 V

## Clamping voltage upper threshold

**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → Upper threshold

**User interface** 0.0 to 50.0 V

## 806 Alarm delay

**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → 806 Alarm delay

**User entry** 0 to 60 s

**"Process window" submenu**

*Navigation* Diagnostics → Heartbeat Techn. → Process window

### Sensor frequency

**Navigation** Diagnostics → Heartbeat Techn. → Process window → Frequency

**Description** Actual fork frequency.

**User interface** 0 to 10 000 Hz

### 900 Process alert frequency too low

**Navigation** Diagnostics → Heartbeat Techn. → Process window → 900 Freq. too low

**Description** Note: With the MAX safety function, no event for 'Process alert frequency too low' is triggered if the fork is covered.

**Selection**
- Disable
- Enable

### 900 Alarm delay

**Navigation** Diagnostics → Heartbeat Techn. → Process window → 900 Alarm delay

**User entry** 0 to 300 s

### Low alert value

**Navigation** Diagnostics → Heartbeat Techn. → Process window → Low alert value

**Description** If this limit value is undercut, an event is generated. There is no hysteresis. A typical value is 1% below the actual frequency.

**User entry** 0 to 2 000 Hz

**901 Process alert frequency too high**

**Navigation** Diagnostics → Heartbeat Techn. → Process window → 901 Freq. high

**Description** Note: With the MIN safety function, no event for 'Process alert frequency too high' is triggered if the fork is uncovered.

**Selection**
- Disable
- Enable

**901 Alarm delay**

**Navigation** Diagnostics → Heartbeat Techn. → Process window → 901 Alarm delay

**User entry** 0 to 300 s

**High alert value**

**Navigation** Diagnostics → Heartbeat Techn. → Process window → High alert value

**Description** If this limit value is exceeded an event is generated. There is no hysteresis. With stable environmental conditions a typical value is 1% above the actual frequency.

**User entry** 0 to 2 000 Hz

### 3.2.5 "Proof test" submenu

*Navigation* Diagnostics → Proof test

**Date/time proof test**

**Navigation** Diagnostics → Proof test → Date/time

**Description** This value is updated with every proof test and with inspector decision „Passed“.

**User interface** Character string comprising numbers, letters and special characters

**Time stamp of last proof test**

**Navigation** Diagnostics → Proof test → Last proof test

**Description** As soon as key is pressed, actual operating hours counter is saved.

**User interface** Character string comprising numbers, letters and special characters

### 3.2.6 "Diagnostic settings" submenu

*Navigation* Diagnostics → Diag. settings

**"Properties" submenu**

*Navigation* Diagnostics → Diag. settings → Properties

**49 Corrosion warning**

**Navigation** Diagnostics → Diag. settings → Properties → 49 Corr. warning

**Description** Enables or disable the corrosion warning. The corrosion warning is set if sensor frequency exceeds frequency at delivery status by 5%.
If turned on event category can be set in menu -> Diagnostics -> Diagnostic settings -> Configuration
Diagnostic behaviour can be changed to 'Logbook entry only' in the same menu.

**Selection**
- Off
- On

**Upper warning frequency**

**Navigation** Diagnostics → Diag. settings → Properties → U. warning freq.

**Description** If the sensor frequency is currently greater than the upper warning frequency, then a warning is generated. The switching output remains in the current state. It is recommended to remove the sensor and check it for corrosion.

**User interface** 0 to 10 000 Hz

### 825 Electronics temperature

**Navigation** Diagnostics → Diag. settings → Properties → 825 Electr. temp

**Description** Activates the monitoring of the electronics temperature. The limit values are fixed and depend on the order code of the device (+85°C and -40/-50/-60°C or 185°F and -40/-58/-76°F).

**Selection**
- Off
- On

### 826 Sensor temperature

**Navigation** Diagnostics → Diag. settings → Properties → 826 Sensor temp.

**Description** Activates the monitoring of the sensor (electronics) temperature. The limit values are fixed and depend on the order code of the device (+85°C and -40/-50/-60°C or 185°F and -40/-58/-76°F).

**Selection**
- Off
- On

**"Sensor" submenu**

*Navigation* Diagnostics → Diag. settings → Sensor

### 49 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Sensor → 49 Diag. behav.

**Description** Select event behavior

'Logbook entry only': no digital or analog transmission of the message.

'Warning': Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

**Selection**
- Warning
- Logbook entry only

### 49 Event category

**Navigation** Diagnostics → Diag. settings → Sensor → 49Event category

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

**"Process" submenu**

*Navigation* Diagnostics → Diag. settings → Process

### 806 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Process → 806 Diag. behav.

**Description** Select event behavior

'Logbook entry only': no digital or analog transmission of the message.

'Warning': Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

**Selection**
- Warning
- Logbook entry only

### 806 Event category

**Navigation** Diagnostics → Diag. settings → Process → 806Event category

**Description** Select category for diagnostic message.

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

## 900 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Process → 900 Diag. behav.

**Description**

Select event behavior

'Logbook entry only': no digital or analog transmission of the message.

'Warning': Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

**Selection**

- Warning
- Logbook entry only

## 900 Event category

**Navigation** Diagnostics → Diag. settings → Process → 900Event category

**Selection**

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

## 901 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Process → 901 Diag. behav.

**Description**

Select event behavior

'Logbook entry only': no digital or analog transmission of the message.

'Warning': Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

**Selection**

- Warning
- Logbook entry only

## 901 Event category

**Navigation** Diagnostics → Diag. settings → Process → 901Event category

**Selection**
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

## 3.3 "Application" menu

*Navigation* Application

### 3.3.1 "Measured values" submenu

*Navigation* Application → Measured values

**Sensor frequency**

**Navigation** Application → Measured values → Frequency

**Description** Actual fork frequency.

**User interface** 0 to 10 000 Hz

**Fork state**

**Navigation** Application → Measured values → Fork state

**Description** The condition of the fork is displayed.

**User interface**
- Fork covered
- Fork uncovered

**Terminal voltage 1**

**Navigation** Application → Measured values → Terminal volt. 1

**Description** Shows the current terminal voltage that is applied at the output

**User interface** 0.0 to 50.0 V

**Terminal current**

**Navigation** Application → Measured values → Terminal curr.

**Description** Shows the current value of the current output which is currently measured

**User interface** 0 to 30 mA

**Sensor temperature**

**Navigation** Application → Measured values → Sensor temp.

**User interface** Signed floating-point number

**Electronics temperature**

**Navigation** Application → Measured values → Electronics temp

**User interface** Signed floating-point number

### 3.3.2 "Measuring Units" submenu

*Navigation* Application → Measuring Units

**Temperature unit**

**Navigation** Application → Measuring Units → Temperature unit

**Description** Used to display the electronics temperature.

**Selection**

| *SI units* | *US units* |
| --- | --- |
| ▪ ℃<br>▪ K | ℉ |

### 3.3.3 "Sensor" submenu

*Navigation* Application → Sensor

**"Sensor configuration" submenu**

*Navigation* Application → Sensor → Sensor conf.

**Mode of operation**

**Navigation** Application → Sensor → Sensor conf. → Mode of operat.

**Description** Level limit detection: Switching mode, output is either 8 mA (demand) or 16 mA (good).

Sensor frequency : Continuous mode, output between 4 mA and 20 mA proportional to sensor frequency.

**Selection**
- Level limit detection
- Sensor frequency

**Safety function**

**Navigation** Application → Sensor → Sensor conf. → Safety function

**Description** MIN: Use for dry run protection.

MAX: Use for overfill protection.

**Selection**
- MIN
- MAX

**Density setting**

**Navigation** Application → Sensor → Sensor conf. → Density setting

**Selection**
- > 0.4 g/cm³ *
- > 0.4 g/cm³ *
- > 0.5 g/cm³
- > 0.7 g/cm³

* Visibility depends on order options or device settings

**Additional information** *Selection*

- **> 0.4 g/cm³** option
  For liquids with a density of 0.4…0.6 g/cm³
- **> 0.4 g/cm³** option
  For liquids with a density of 0.4…0.6 g/cm³
- **> 0.5 g/cm³** option
  For liquids with a density 0.5…0.8 g/cm³
- **> 0.7 g/cm³** option
  Standard setting for liquids with a density > 0.7 g/cm³

## Damping

**Navigation** Application → Sensor → Sensor conf. → Damping

**Description** Damping, used for Sensor frequency only. Does not affect Level limit detection and Fork state.

**User entry** 0 to 999 s

## Switching delay uncovered to covered

**Navigation** Application → Sensor → Sensor conf. → Delay to covered

**Description** Choose between predefined values or select 'Customer specific' to enter a value between 1.00 s and 60.00 s.

**Selection**

- 0.25 s
- 0.50 s
- 1.00 s
- 1.50 s
- 5.00 s
- Customer specific

## Customer delay to covered

**Navigation** Application → Sensor → Sensor conf. → Cust. delay cov.

**User entry** 1 to 60 s

### Switching delay covered to uncovered

**Navigation** Application → Sensor → Sensor conf. → Delay to uncov.

**Description** Choose between predefined values or select 'Customer specific' to enter a value between 1.00 s and 60.00 s.

**Selection**
- 0.25 s
- 0.50 s
- 1.00 s
- 1.50 s
- 5.00 s
- Customer specific

### Customer delay to uncovered

**Navigation** Application → Sensor → Sensor conf. → Cust. delay unc.

**User entry** 1 to 60 s

#### "Stored frequency" submenu

*Navigation* Application → Sensor → Stored frequency

### Stored uncovered frequency

**Navigation** Application → Sensor → Stored frequency → St. uncov. freq

**Description** In this parameter the actual sensor frequency can be stored, which is only possible if the fork is uncovered. The value is displayed on the Heartbeat Technology verification report and can be used as a reference for further/future analyses.

**User interface** 0 to 10 000 Hz

### Stored covered frequency

**Navigation** Application → Sensor → Stored frequency → Stor. cov. freq

**Description** In this parameter the actual sensor frequency can be stored, which is only possible if the fork is covered. The value is displayed on the Heartbeat Technology verification report and can be used as a reference for further/future analyses.

**User interface** 0 to 10 000 Hz

### "Sensor calibration" submenu

*Navigation* Application → Sensor → Sensor cal.

### Lower switching point at density

**Navigation** Application → Sensor → Sensor cal. → Lower sw. point

**Description** This is the sensor frequency at which the fork status changes to covered (depending on the density selected).

**User interface** 0 to 2 000 Hz

### Upper switching point at density

**Navigation** Application → Sensor → Sensor cal. → Upper sw. point

**Description** This is the sensor frequency at which the fork status changes to uncovered (depending on the density selected).

**User interface** 0 to 2 000 Hz

### Frequency at delivery status

**Navigation** Application → Sensor → Sensor cal. → Freq. delivery

**Description** Sensor frequency at delivery status.

**User interface** 0 to 10 000 Hz

### Upper warning frequency

**Navigation** Application → Sensor → Sensor cal. → U. warning freq.

**Description** If the sensor frequency is currently greater than the upper warning frequency, then a warning is generated. The switching output remains in the current state. It is recommended to remove the sensor and check it for corrosion.

**User interface** 0 to 10 000 Hz

**Upper alarm frequency**

**Navigation** Application → Sensor → Sensor cal. → Upper alarm f.

**Description** If the sensor frequency is currently greater than the upper alarm frequency, then an alarm is generated and the switching output switches to the safety related state.

**User interface** 0 to 10 000 Hz

### 3.3.4 "Current output" submenu

*Navigation* Application → Curr.output

**Assign PV**

**Navigation** Application → Curr.output → Assign PV

**Description** Assign a measured variable to the primary dynamic variable (PV).

Additional information:
The assigned measured variable is also used by the current output.

**User interface**
- Level limit detection
- Sensor frequency

**Current range output**

**Navigation** Application → Curr.output → Cur.range outp

**Description** Defines the current range used to transmit the measured or calculated value.
In brackets are indicated the “low saturation value” and the “high saturation value”.
If Measured value ≤ “low saturation”, the output current is set to “low saturation”.
If Measured value ≥ “high saturation”, the output current is set to ”high saturation”.

Note:
Currents below 3.6 mA or above 21.5 mA can be used to signal an alarm.

**Selection**
- 4...20 mA (4... 20.5 mA)
- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)

### Lower range value output

**Navigation** Application → Curr.output → Low.range outp

**Description** Depending of which variable has been selected as PV, define the related lower and upper range values.
Assignment PV value to 4 mA and 20 mA.

**User entry** 4 to 23 mA

### Upper range value output

**Navigation** Application → Curr.output → Upp.range outp

**Description** Depending of which variable has been selected as PV, define the related lower and upper range values.
Assignment PV value to 4 mA and 20 mA.

**User entry** 4 to 23 mA

### Failure behavior current output

**Navigation** Application → Curr.output → Fail.behav.out

**Description** Defines which current the output assumes in the case of an error.
Min: < 3.6 mA
Max: >21.5 mA

**Selection**
- Min.
- Max.

### Failure current

**Navigation** Application → Curr.output → Failure current

**Description** Enter current output value in alarm condition

**User entry** 21.5 to 23 mA

**Output current**

**Navigation** Application → Curr.output → Output curr.

**Description** Shows the value currently calculated for the current output

**User interface** 3.59 to 23 mA

**Terminal current**

**Navigation** Application → Curr.output → Terminal curr.

**Description** Shows the current value of the current output which is currently measured

**User interface** 0 to 30 mA

### 3.3.5 "HART output" submenu

*Navigation* Application → HART output

**"Configuration" submenu**

*Navigation* Application → HART output → Configuration

**HART address**

**Navigation** Application → HART output → Configuration → HART address

**Description** Enter the address to exchange data via the HART protocol.

**User entry** 0 to 63

**HART short tag**

**Navigation** Application → HART output → Configuration → HART short tag

**Description** Defines the short tag for the measuring point.

Maximum length: 8 characters
Allowed characters: A-Z, 0-9, certain special characters

**User entry** Character string comprising numbers, letters and special characters (8)

## Device tag

**Navigation** Application → HART output → Configuration → Device tag

**Description** Enter a unique name for the measuring point to identify the device quickly within the plant.

**User entry** Character string comprising numbers, letters and special characters (32)

## No. of preambles

**Navigation** Application → HART output → Configuration → No. of preambles

**Description** Defines the number of preambles in the HART telegram

**User entry** 5 to 20

## Loop current mode

**Navigation** Application → HART output → Configuration → Loop curr mode

**Description** If Loop current mode is disabled, Multi-drop communication mode is activated. Multi-drop is a HART digital communication mode where multiple devices may share the same pair of wires for power and communications.
In this mode the output current is fixed.

**Selection**
- Disable
- Enable

### "HART output" submenu

*Navigation* Application → HART output → HART output

## Assign PV

**Navigation** Application → HART output → HART output → Assign PV

**Description** Assign a measured variable to the primary dynamic variable (PV).

Additional information:
The assigned measured variable is also used by the current output.

**User interface**
- Level limit detection
- Sensor frequency

## Primary variable (PV)

**Navigation** Application → HART output → HART output → Primary var (PV)

**Description** Shows the current measured value of the primary dynamic variable (PV)

**User interface** 4 to 23 mA

## Assign SV

**Navigation** Application → HART output → HART output → Assign SV

**Description** Assign a measured variable to the second dynamic variable (SV).

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Additional information** *Selection*
- **Fork state** option
  Indicates fork state 'Fork covered ' (1) or 'Fork uncovered ' (0).
- **Sensor temperature** option
  Temperature of sensor electronics in the housing.

* Visibility depends on order options or device settings

### Secondary variable (SV)

**Navigation** Application → HART output → HART output → Second.var(SV)

**Description** Shows the current measured value of the secondary dynamic variable (SV)

**User interface** 0 to 10 000 Hertz

### Assign TV

**Navigation** Application → HART output → HART output → Assign TV

**Description** Assign a measured variable to the tertiary dynamic variable (TV).

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Additional information** *Selection*
- **Fork state** option
  Indicates fork state 'Fork covered ' (1) or 'Fork uncovered ' (0).
- **Sensor temperature** option
  Temperature of sensor electronics in the housing.

### Tertiary variable (TV)

**Navigation** Application → HART output → HART output → Tertiary var(TV)

**Description** Shows the current measured value of the tertiary (third) dynamic variable (TV)

**User interface** 0 to 1.0 ManufacturerNoUnit

### Assign QV

**Navigation** Application → HART output → HART output → Assign QV

**Description** Assign a measured variable to the quaternary dynamic variable (QV).

* Visibility depends on order options or device settings

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Additional information** *Selection*
- **Fork state** option
  Indicates fork state 'Fork covered ' (1) or 'Fork uncovered ' (0).
- **Sensor temperature** option
  Temperature of sensor electronics in the housing.

### Quaternary variable (QV)

**Navigation** Application → HART output → HART output → Quaterna.var(QV)

**Description** Shows the current measured value of the quaternary (fourth) dynamic variable (QV)

**User interface** Signed floating-point number

#### "Burst configuration 1" submenu

*Navigation* Application → HART output → Burst config. 1

### Burst mode

**Navigation** Application → HART output → Burst config. 1 → Burst mode 1

**Description** Switch HART burst mode for burst message on

**Selection**
- Off
- On

### Burst command

**Navigation** Application → HART output → Burst config. 1 → Burst command 1

**Description** Select the HART command that is sent to the HART master

* Visibility depends on order options or device settings

**Selection**
- Primary variable (PV)
- Loop Current and Percent of Range
- Dynamic Variables
- Device variables with status
- Device variables
- Additional device status

## Burst variable 0

**Navigation** Application → HART output → Burst config. 1 → Burst variable 0

**Description** For HART command 9 and 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 1

**Navigation** Application → HART output → Burst config. 1 → Burst variable 1

**Description** For HART command 9 and 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)

* Visibility depends on order options or device settings

- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 2

**Navigation** Application → HART output → Burst config. 1 → Burst variable 2

**Description** For HART command 9 and 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 3

**Navigation** Application → HART output → Burst config. 1 → Burst variable 3

**Description** For HART command 9 and 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

* Visibility depends on order options or device settings

## Burst variable 4

**Navigation** Application → HART output → Burst config. 1 → Burst variable 4

**Description** For HART command 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 5

**Navigation** Application → HART output → Burst config. 1 → Burst variable 5

**Description** For HART command 33, assign a HART device variable or process variable to burst variable

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 6

**Navigation** Application → HART output → Burst config. 1 → Burst variable 6

**Description** For HART command 33, assign a HART device variable or process variable to burst variable

* Visibility depends on order options or device settings

**Selection**

- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst variable 7

**Navigation** Application → HART output → Burst config. 1 → Burst variable 7

**Description** For HART command 33, assign a HART device variable or process variable to burst variable

**Selection**

- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

## Burst trigger mode

**Navigation** Application → HART output → Burst config. 1 → Trigger mode

**Description** Select the event that triggers the burst message

**Selection**

- Continuous
- Window *
- Rising *
- Falling *
- On change

* Visibility depends on order options or device settings

**Burst trigger level**

**Navigation** Application → HART output → Burst config. 1 → Trigger level

**Description** Enter the burst trigger value that determines together with the option selected in 'Burst trigger mode' parameter the time of burst message

**User entry** Signed floating-point number

**Min. update period**

**Navigation** Application → HART output → Burst config. 1 → Min. upd. per.

**Description** Enter the minimum time span between two burst responses of one burst message

**User entry** Positive integer

**Max. update period**

**Navigation** Application → HART output → Burst config. 1 → Max. upd. per.

**Description** Enter the maximum time span between two burst responses of one burst message

**User entry** Positive integer

### "Information" submenu

*Navigation* Application → HART output → Information

**Device ID**

**Navigation** Application → HART output → Information → Device ID

**Description** Shows the device ID for identifying the device in a HART network

**User interface** Positive integer

### Device type

**Navigation** Application → HART output → Information → Device type

**Description** Shows the device type with which the measuring device is registered with the HART Communication Foundation

**User interface** 0 to 65 535

### Device revision

**Navigation** Application → HART output → Information → Device revision

**Description** Shows the device revision with which the device is registered with the HART Communication Foundation

**User interface** 0 to 255

### HART short tag

**Navigation** Application → HART output → Information → HART short tag

**Description** Defines the short tag for the measuring point.

Maximum length: 8 characters
Allowed characters: A-Z, 0-9, certain special characters

**User entry** Character string comprising numbers, letters and special characters (8)

### HART revision

**Navigation** Application → HART output → Information → HART revision

**User interface** 5 to 7

### HART descriptor

**Navigation** Application → HART output → Information → HART descriptor

**Description** Use this function to define a description for the measuring point.

Maximum length: 16 characters
Allowed characters: A-Z, 0-9, certain special characters

**User entry** Character string comprising numbers, letters and special characters (16)

## HART message

**Navigation** Application → HART output → Information → HART message

**Description** Use this function to define a HART message which is sent via the HART protocol when requested by the master.

Maximum length: 32 characters
Allowed characters: A-Z, 0-9, certain special characters

**User entry** Character string comprising numbers, letters and special characters (32)

## HART date code

**Navigation** Application → HART output → Information → HART date code

**Description** Enter date of the last configuration change. Use this format yyyy-mm-dd

**User entry** Character string comprising numbers, letters and special characters (10)

## 3.4 "System" menu

*Navigation* System

### 3.4.1 "Device management" submenu

*Navigation* System → Device manag.

**Device tag**

**Navigation** System → Device manag. → Device tag

**Description** Enter a unique name for the measuring point to identify the device quickly within the plant.

**User entry** Character string comprising numbers, letters and special characters (32)

**Locking status**

**Navigation** System → Device manag. → Locking status

**Description** Indicates the type of locking.

'Hardware locked' (HW)
The device is locked by the 'WP' switch on the main electronics module. To unlock, set the switch into the OFF position.

'Safety locked' (SW)
Unlock the device by entering the appropriate access code in 'Enter safety unlocking code'.

'Temporarily locked' (SW)
The device is temporarily locked by processes in the device (e.g. data upload/download, reset). The device will automatically be unlocked after completion of these processes.

**User interface**
- Hardware locked
- Safety locked
- Temporarily locked

**Configuration counter**

**Navigation** System → Device manag. → Config. counter

**Description** Displays the counter for changes to the device parameters.

Additional information:
- If the value for a static parameter is changed when optimizing or configuring the parameter, the counter is incremented by 1. This is to enable tracking different parameter versions.
- When multiple parameters are changed simultaneously, e.g. when loading parameters into the device from an external source such as FieldCare, the counter may display a higher value. The counter cannot be reset, nor is it reset to a default value on performing a device reset.
- Once the counter has reached the value 65535, it restarts at 0.

**User interface** 0 to 65 535

**Reset device**

**Navigation** System → Device manag. → Reset device

**Description** Reset the device configuration - either entirely or in part - to a defined state

**Selection**
- Cancel
- To fieldbus defaults **
- To factory defaults *
- To delivery settings *
- Restart device

## 3.4.2 "User management" submenu

*Navigation* System → User manag.

**User role**

**Navigation** System → User manag. → User role

**Description** Shows the access authorization to the parameters via the operating tool

** Visibility depends on communication
* Visibility depends on order options or device settings

**User interface**
- Operator
- Maintenance
- Expert
- Production
- Development

**"Change user role" wizard**

*Navigation* System → User manag. → Change user role

## Enter access code

**Navigation** System → User manag. → Change user role → Ent. access code

**Description** For authorized service personnel only.

**User entry** 0 to 9 999

**"Change user role" wizard**

*Navigation* System → User manag. → Change user role

## Start

**Navigation** System → User manag. → Change user role → Start

**User interface** Character string comprising numbers, letters and special characters

## Password

**Navigation** System → User manag. → Change user role → Password

**Description** Enter the password for the 'Maintenance' user role to get access to the functionality of this role.

**User entry** Character string comprising numbers, letters and special characters (16)

### Status password entry

**Navigation** System → User manag. → Change user role → Status pw entry

**Description** Use this function to display the status of the password verification.

**User interface**
- --------
- Wrong password
- Password rule violated
- Password accepted
- Permission denied
- Confirm PW mismatch
- Reset password accepted
- Invalid user role
- Wrong sequence of entry

#### "Define password" wizard

*Navigation* System → User manag. → Define password

### Start

**Navigation** System → User manag. → Define password → Start

**User interface** Character string comprising numbers, letters and special characters

### New password

**Navigation** System → User manag. → Define password → New password

**Description** Define the new 'Maintenance' password.
A new password is valid after it has been confirmed within the 'Confirm new password' parameter.
Any valid password consists of 4 to 16 characters and can contain letters and numbers.

**User entry** Character string comprising numbers, letters and special characters (16)

### Status password entry

**Navigation** System → User manag. → Define password → Status pw entry

**Description** Use this function to display the status of the password verification.

**User interface**

- --------
- Wrong password
- Password rule violated
- Password accepted
- Permission denied
- Confirm PW mismatch
- Reset password accepted
- Invalid user role
- Wrong sequence of entry

## Confirm new password

**Navigation** System → User manag. → Define password → Conf. new passw.

**Description** Enter the new password again to confirm.

**User entry** Character string comprising numbers, letters and special characters (16)

### "Change password" wizard

*Navigation* System → User manag. → Change password

## Start

**Navigation** System → User manag. → Change password → Start

**User interface** Character string comprising numbers, letters and special characters

## Old password

**Navigation** System → User manag. → Change password → Old password

**Description** Enter the current password, to subsequently change the existing password.

**User entry** Character string comprising numbers, letters and special characters (16)

## Status password entry

**Navigation** System → User manag. → Change password → Status pw entry

**Description** Use this function to display the status of the password verification.

**User interface**
- --------
- Wrong password
- Password rule violated
- Password accepted
- Permission denied
- Confirm PW mismatch
- Reset password accepted
- Invalid user role
- Wrong sequence of entry

## New password

**Navigation** System → User manag. → Change password → New password

**Description** Define the new 'Maintenance' password.
A new password is valid after it has been confirmed within the 'Confirm new password' parameter.
Any valid password consists of 4 to 16 characters and can contain letters and numbers.

**User entry** Character string comprising numbers, letters and special characters (16)

## Confirm new password

**Navigation** System → User manag. → Change password → Conf. new passw.

**Description** Enter the new password again to confirm.

**User entry** Character string comprising numbers, letters and special characters (16)

### "Delete password" wizard

*Navigation* System → User manag. → Delete password

### Start

**Navigation** System → User manag. → Delete password → Start

**User interface** Character string comprising numbers, letters and special characters

### Old password

**Navigation** System → User manag. → Delete password → Old password

**Description** Enter the current password, to subsequently change the existing password.

**User entry** Character string comprising numbers, letters and special characters (16)

### Status password entry

**Navigation** System → User manag. → Delete password → Status pw entry

**Description** Use this function to display the status of the password verification.

**User interface**
- --------
- Wrong password
- Password rule violated
- Password accepted
- Permission denied
- Confirm PW mismatch
- Reset password accepted
- Invalid user role
- Wrong sequence of entry

### "Reset password" wizard

*Navigation* System → User manag. → Reset password

| Start | |
|---|---|
| **Navigation** | System → User manag. → Reset password → Start |
| **User interface** | Character string comprising numbers, letters and special characters |

| Reset password | |
|---|---|
| **Navigation** | System → User manag. → Reset password → Reset password |
| **Description** | Enter a code to reset the current 'Maintenance' password.<br>The code is deliverd by your local support. |
| **User entry** | Character string comprising numbers, letters and special characters (16) |

| Status password entry | |
|---|---|
| **Navigation** | System → User manag. → Reset password → Status pw entry |
| **Description** | Use this function to display the status of the password verification. |
| **User interface** | ▪ --------<br>▪ Wrong password<br>▪ Password rule violated<br>▪ Password accepted<br>▪ Permission denied<br>▪ Confirm PW mismatch<br>▪ Reset password accepted<br>▪ Invalid user role<br>▪ Wrong sequence of entry |

**"Logout" wizard**

*Navigation* System → User manag. → Logout

**Start**

**Navigation** System → User manag. → Logout → Start

**User interface** Character string comprising numbers, letters and special characters

**User role**

**Navigation** System → User manag. → Logout → User role

**Description** Shows the access authorization to the parameters via the operating tool

**User interface**
- Operator
- Maintenance
- Expert
- Production
- Development

### 3.4.3 "Bluetooth configuration" submenu

*Navigation* System → Bluetooth conf.

**Bluetooth activation**

**Navigation** System → Bluetooth conf. → Bluetooth active

**Description** If Bluetooth is deactivated, it can only be reactivated via the display or the operating tool. Reactivating via the SmartBlue app is not possible.

**Selection**
- Disable
- Enable

### 3.4.4 "Display" submenu

*Navigation* System → Display

**Language**

**Navigation** System → Display → Language

**Description** Set display language

**Selection**
- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *
- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- العَرَبيّة (Arabic) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- tiếng Việt (Vietnamese) *
- čeština (Czech) *

**Format display**

**Navigation** System → Display → Format display

**Description** Select how measured values are shown on the display

**Selection**
- 1 value, max. size
- 1 bargraph + 1 value
- 2 values

**Value 1 display**

**Navigation** System → Display → Value 1 display

**Description** Select the measured value that is shown on the local display

* Visibility depends on order options or device settings

**Selection**
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Current output
- Terminal voltage

## Decimal places 1

**Navigation** System → Display → Decimal places 1

**Description** This selection does not affect the measurement and calculation accuracy of the device.

**Selection**
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

## Value 2 display

**Navigation** System → Display → Value 2 display

**Description** Select the measured value that is shown on the local display

**Selection**
- None
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Current output
- Terminal voltage

## Decimal places 2

**Navigation** System → Display → Decimal places 2

**Description** This selection does not affect the measurement and calculation accuracy of the device.

**Selection**
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

### Value 3 display

**Navigation** System → Display → Value 3 display

**Description** Select the measured value that is shown on the local display

**Selection**
- None
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Current output
- Terminal voltage

### Decimal places 3

**Navigation** System → Display → Decimal places 3

**Description** This selection does not affect the measurement and calculation accuracy of the device.

**Selection**
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

### Value 4 display

**Navigation** System → Display → Value 4 display

**Description** Select the measured value that is shown on the local display

**Selection**
- None
- Level limit detection
- Sensor frequency
- Fork state
- Sensor temperature
- Current output
- Terminal voltage

### Decimal places 4

**Navigation** System → Display → Decimal places 4

**Description** This selection does not affect the measurement and calculation accuracy of the device.

**Selection**
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

**Contrast display**

**Navigation** System → Display → Contrast display

**Description** Adjust local display contrast setting to ambient conditions (e.g. lighting or reading angle)

**User entry** 20 to 80 %

### 3.4.5 "Geolocation" submenu

*Navigation* System → Geolocation

**Process Unit Tag**

**Navigation** System → Geolocation → Process Unit Tag

**Description** Enter the process unit in which the device is installed.

**User entry** Character string comprising numbers, letters and special characters (32)

**Location Description**

**Navigation** System → Geolocation → Location Descr.

**Description** Use this function to enter a description of the location so that the device can be located in the plant.

**User entry** Character string comprising numbers, letters and special characters (32)

**Longitude**

**Navigation** System → Geolocation → Longitude

**Description** Use this function to enter the longitude coordinates that describe the device location.

**User entry** −180 to 180 °

## Latitude

**Navigation** System → Geolocation → Latitude

**Description** Use this function to enter the latitude coordinates that describe the device location.

**User entry** −5 156.62015616066 to 5 156.62015616066 °

## Altitude

**Navigation** System → Geolocation → Altitude

**Description** Use this function to enter the altitude data that describe the device location.

**User entry** Signed floating-point number

## Location method

**Navigation** System → Geolocation → Location method

**Description** Use this function to select the data format for specifying the geographic location. The codes for specifying the location are based on the US National Marine Electronics Association (NMEA) Standard NMEA 0183.

**Selection**
- No fix
- GPS or Standard Positioning Service fix
- Differential GPS fix
- Precise positioning service (PPS) fix
- Real Time Kinetic (RTK) fixed solution
- Real Time Kinetic (RTK) float solution
- Estimated dead reckoning
- Manual input mode
- Simulation Mode

### 3.4.6 "Information" submenu

*Navigation* System → Information

**Device name**

**Navigation** System → Information → Device name

**Description** Use this function to display the device name. It can also be found on the nameplate.

**User interface** Character string comprising numbers, letters and special characters

**Manufacturer**

**Navigation** System → Information → Manufacturer

**User interface** Character string comprising numbers, letters and special characters

**Serial number**

**Navigation** System → Information → Serial number

**Description** The serial number is a unique alphanumerical code identifying the device.
It is printed on the nameplate.
In combination with the Operations app it allows to access all device related documentation.

**User interface** Character string comprising numbers, letters and special characters

**Order code**

**Navigation** System → Information → Order code

**Description** Shows the device order code.

**User interface** Character string comprising numbers, letters and special characters

### Firmware version

**Navigation** System → Information → Firmware version

**Description** Displays the device firmware version installed.

**User interface** Character string comprising numbers, letters and special characters

### Hardware version

**Navigation** System → Information → Hardware version

**User interface** Character string comprising numbers, letters and special characters

### Extended order code 1

**Navigation** System → Information → Ext. order cd. 1

**Description** The extended order code is an alphanumeric code containing all information to identify the device and its options.

**User interface** Character string comprising numbers, letters and special characters

### Extended order code 2

**Navigation** System → Information → Ext. order cd. 2

**Description** The extended order code is an alphanumeric code containing all information to identify the device and its options.

**User interface** Character string comprising numbers, letters and special characters

### Extended order code 3

**Navigation** System → Information → Ext. order cd. 3

**Description** The extended order code is an alphanumeric code containing all information to identify the device and its options.

**User interface** Character string comprising numbers, letters and special characters

### 3.4.7 "Software configuration" submenu

*Navigation* System → Softw. config.

**CRC device configuration**

**Navigation** System → Softw. config. → CRC device conf.

**Description** CRC device configuration based on current settings of safety relevant parameters. The CRC device configuration is unique and can be used to detect changes in safety relevant parameter settings.

**User interface** 0 to 65 535

**Stored CRC device configuration**

**Navigation** System → Softw. config. → Stored CRC conf.

**Description** Stored CRC after the last safety lock. Factory delivery is 65535 means that the device has not yet been safety locked.

**User interface** 0 to 65 535

**Timestamp stored CRC device config.**

**Navigation** System → Softw. config. → TS stored CRC

**Description** Gives the time stamp when the CRC was last stored following completion of the safety lock wizard.

**User interface** Character string comprising numbers, letters and special characters

**Activate SW option**

**Navigation** System → Softw. config. → Activate SW opt.

**Description** Enter the application package code or code of another re-ordered functionality to enable it

**User entry** Positive integer

## Software option overview

**Navigation** System → Softw. config. → SW option overv.

**Description** Shows all enabled software options

**User interface**
- SIL
- WHG
- Heartbeat Verification
- Heartbeat Monitoring

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## T



## U



## V



## W


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