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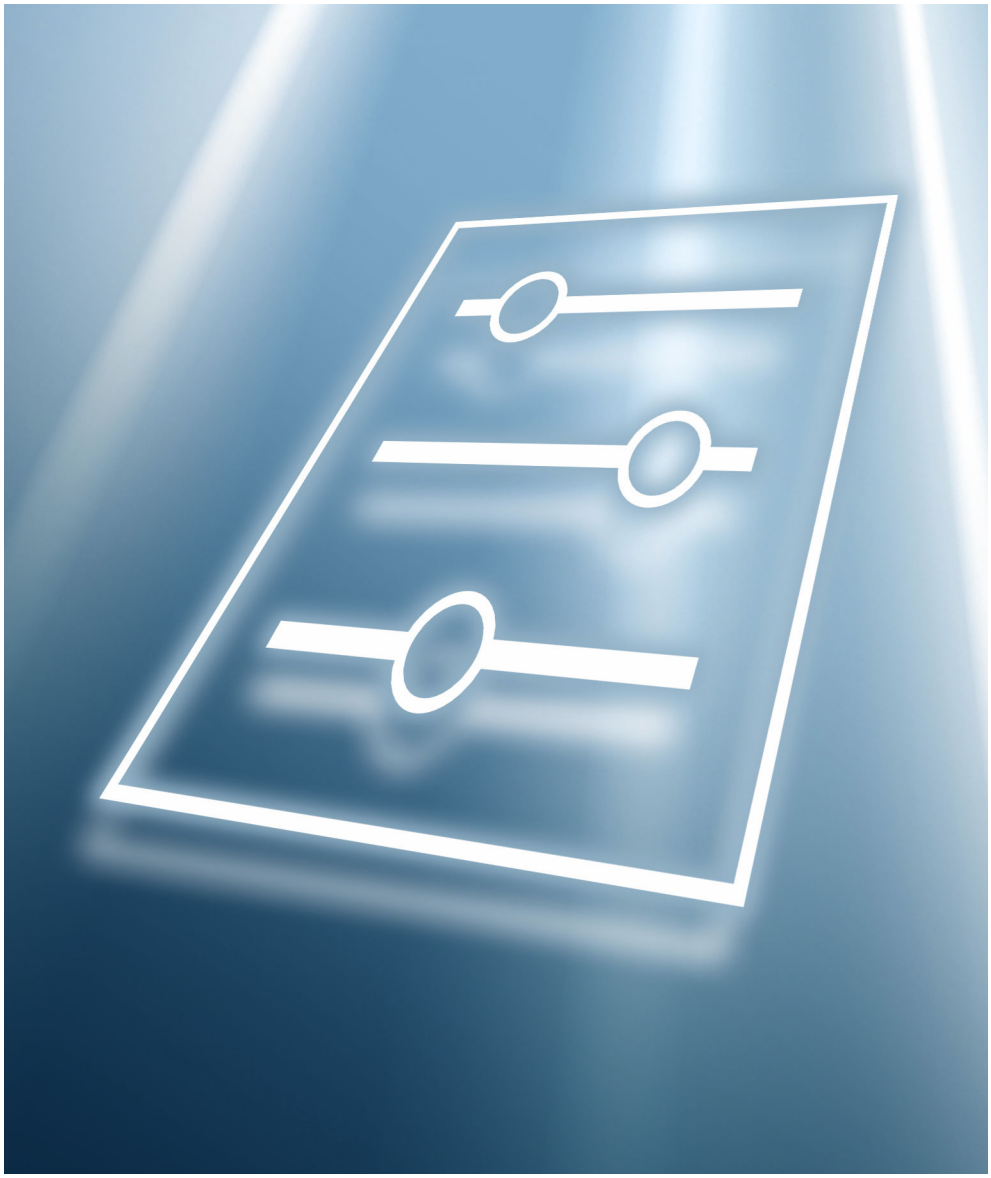
01.00.zz (Device firmware)



# Description of Device Parameters
# **Liquiphant FTL43**

Vibronic
HART



Endress+Hauser
People for Process Automation

# 1 About this document

## 1.1 Document function

The document is part of the Operating Instructions and serves as a reference for parameters.

Tasks that require detailed knowledge of the function of the device:
- Starting up measurements under difficult conditions
- Optimal adjustment of measurements to difficult conditions
- Detailed configuration of communication interface
- Fault diagnosis in difficult cases

## 1.2 Target group

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

## 1.3 Document structure

The document consists of a general part and a specific part.

The structure of the document and its components are explained in the general part (section 1).

The specific part starts with an overview of the device operating menu, which is the focus of this manual.

The description of the device parameters follows the overview of the operating menu. The description is divided into 4 main menus and their submenus.

The 4 main menus:
- Guidance
- Diagnostics
- Application
- System

In the "Description of device parameters" section, the menus, submenus and parameters are displayed in the same way as they are laid out in the menu structure for the **operating tool**.

An operating tool is software, such as FieldCare, which can be used to display and edit the data and parameters stored in the device on a PC or laptop. Compared to operation via the local display, an operating tool offers more options. It provides additional information, such as graphics and help texts, which explain the properties of the parameters.

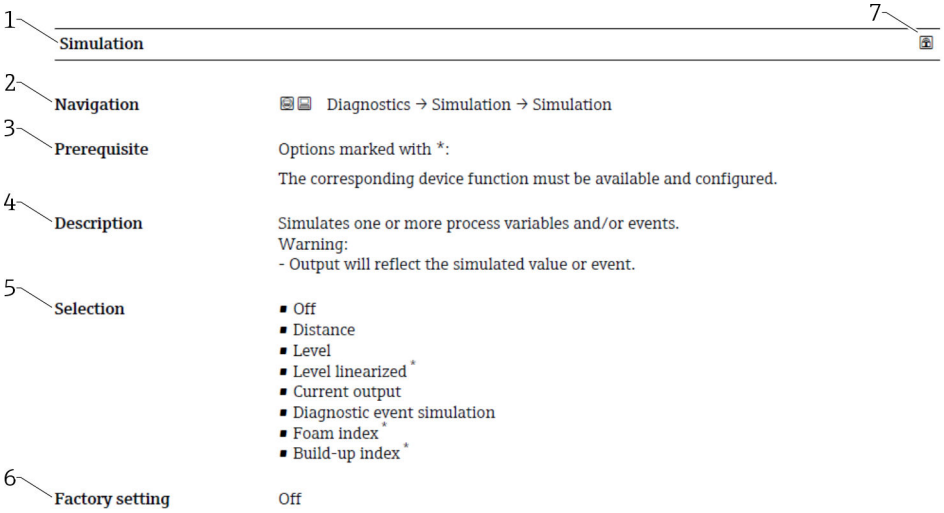
The submenus visible to a user depend on the **User role (→ 60)** they are logged in with. This document lists the submenus and their parameters that are available to the User role **Maintenance**.

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

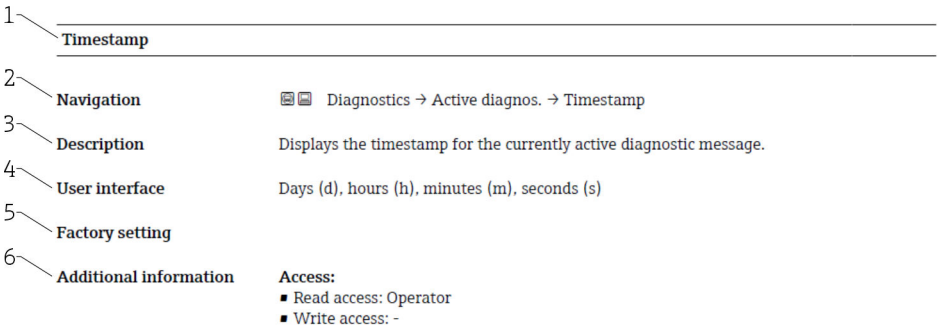
For information on operating options, see the Operating Instructions.

## 1.4 Elements of parameter descriptions

Parameter descriptions are structured and made up of a number of elements. Depending on the parameter, more or fewer elements may be available. Below are 2 examples of different parameters:




1 *Name: Parameter designation (Label)*
2 *Navigation: Navigation path to the parameter. The graphics indicate whether the path applies to the onsite display, the operating tool or both.*
3 *Prerequisite: The marked options can only be selected under the condition specified in each case*
4 *Description: Description of the parameter function*
5 *Selection: List of the individual options for the parameter*
6 *Factory setting: Default setting on leaving the factory*
7 *The lock symbol indicates that the parameter is write-protected*




1 *Name: Parameter designation (Label)*
2 *Navigation: Navigation path to the parameter. The graphics indicate whether the path applies to the onsite display, the operating tool or both.*
3 *Description: Description of the parameter function*
4 *User interface: Display value/data of the parameter*
5 *Factory setting: Default setting on leaving the factory*
6 *Additional information:*
*Read and write access: Information on access rights that users with certain roles have to the parameter*

Additional information at the end of the parameter description can refer to all elements of the parameter description and expand them.

## 1.5 Symbols

### 1.5.1 Safety symbols

**⚠ DANGER**
This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

⚠ WARNING
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

⚠ CAUTION
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE
This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

### 1.5.2 Symbols for certain types of Information

- Indicates additional information
- Reference to documentation
- Operation via local display
- Operation via operating tool
- Write-protected parameter

## 1.6 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

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

# 2 Overview of the operating menu

*Navigation* Operating tool

- Minimum temp. of sensor electronics → 20
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# 3 Description of device parameters

## 3.1 Guidance

In the **Guidance** menu, the user can quickly perform basic tasks, such as commissioning. These primarily consist of guided wizards and cross-thematic special functions.

*Navigation* Guidance

### 3.1.1 Overview

The **Guidance** menu contains the following submenus and wizards:
- Commissioning
- Heartbeat Technology
  - Heartbeat Verification
  - Loop diagnostics
  - Process window
- Safety mode
- Proof test
- Import / Export
- Compare

### 3.1.2 Commissioning

Run the **Commissioning** wizard to commission the device. Enter the appropriate value in each parameter or select the appropriate option.

**⚠ WARNING**

**If the wizard is canceled before all the necessary parameters have been configured, any settings already set are saved.**
The device may be in an undefined state!
► Reset the device to factory settings.

*Navigation* Guidance → Commissioning

**Parameters for the "Commissioning" wizard**

**The following parameters are configured in this wizard:**
- **Device identification**
  - Device tag
  - Device name
  - Serial number
  - Extended order code 1 ... 3
  - Locking status
  - HART short tag
  - HART date code
  - HART descriptor
  - HART message
  - HART address
- **Measurement adjustments**
  - Temperature unit
  - Mode of medium detection
  - 946 Advanced sensor monitoring
  - Mode of operation
  - Safety function
  - Density setting
  - Switching delay covered to uncovered
  - Customer delay to uncovered
  - Switching delay uncovered to covered
  - Customer delay to covered
  - 49 Corrosion warning
  - Frequency of vibrating fork
  - Stored covered frequency
  - Frequency at delivery status
  - Stored uncovered frequency
- **Output settings**
  - Process variable output current
  - Current range output
  - Lower range value output
  - Upper range value output
  - Failure behavior current output
  - Failure current
  - Loop current mode
  - Assign HART variables?
  - Assign PV
  - Assign SV
  - Assign TV
  - Assign QV

### 3.1.3 Heartbeat Technology

Heartbeat Technology offers the following functions:
- Diagnostics through continuous self-monitoring
- Additional measured variables output to an external condition monitoring system
- In situ verification of measuring instruments in the application

Special Documentation on Heartbeat Technology is available via the Internet: www.endress.com → Download

*Navigation* Guidance → Heartbeat Techn.

**Heartbeat Verification**

This wizard is used to start an automatic verification of the device functionality.
The results can be documented as a verification report.

*Navigation* Guidance → Heartbeat Techn. → Heartbeat Verif.

**Loop diagnostics**

Using this wizard, changes in the current-voltage loop characteristics (baseline) can be used to detect unwanted installation anomalies such as creep currents caused by terminal corrosion or a deteriorating power supply that can lead to an incorrect 4-20 mA measured value.

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

**Process window**

This wizard can be used to monitor the sensor frequency for frequencies that are too low or too high. This can be used for early detection of buildup or corrosion.

*Navigation* Guidance → Heartbeat Techn. → Process window

### 3.1.4 Safety mode

The write protection guards the device settings against overwriting. In addition, it is recommended for safety applications to confirm the safety relevant device settings. This ensures that the correct values have been entered and downloaded to device.

This input can be used as the confirmation sequence instead of manual checklists.
After the safety relevant device settings have been confirmed, the device is marked with the property Safety-locked. This indicates that the safety relevant parameter settings have been checked and evaluated as correct.

To unlock the safety locking the sequence needs to be restarted. The safety locking is deactivated when the safety unlocking code (= safety locking code) is entered.

*Navigation* Guidance → Safety mode

### 3.1.5 Proof test

The proof test will simulate the current output.
The safety function is not guaranteed during proof test. Alternative process control in manual must be taken to ensure process safety.

Note: It is only possible to perform a proof test when the device has no alarm and the hardware write protection switch is off.

Note: Only available in "Mode of operation" "Level limit detection".

*Navigation* Guidance → Proof test

### 3.1.6 Import / Export

**Save / Restore**
- The device settings can be saved in a .deh file.
- The device settings saved in a .deh file can be written to the device.

**Create documentation**
Device documentation can be saved in PDF format under **Create documentation**. This device documentation contains the following general device information:
- Information on device parameters
- Event list
- Diagnostic list

*Navigation* Guidance → Import / Export

### 3.1.7 Compare

**Compare datasets**
This function can be used to compare the following datasets:
- Data records in the .deh file format from the function Import / Export
- Datasets with the configuration currently in the device

*Navigation* Guidance → Compare

## 3.2 Diagnostics

*Navigation* Diagnostics

### 3.2.1 Active diagnostics

*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**
- Operating time of the device until the event occurs
- Symbol for diagnostic behavior
- Code for diagnostic behavior
- Event text
- Corrective measure

**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**
- Operating time of the device until the event occurs
- Symbol for diagnostic behavior
- Code for diagnostic behavior
- Event text
- Corrective measure

**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 Diagnostic list

*Navigation* Diagnostics → Diagnostic list

### 3.2.3 Event logbook

*Navigation* Diagnostics → Event logbook

**Clear event list**

**Navigation** Diagnostics → Event logbook → Clear event list

**Description** Delete all entries of the event list.

**Selection**
- Cancel
- Clear data

**Factory setting** Cancel

**Additional information** **Access:**
- Read access: Expert
- Write access: Expert

### 3.2.4 Minimum/maximum values

*Navigation* Diagnostics → Min/max val.

**Minimum fork frequency**

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

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

**User interface** Signed floating-point number

**Maximum fork frequency**

**Navigation** Diagnostics → Min/max val. → Max. frequency

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

**User interface** Signed floating-point number

**Minimum temp. of sensor electronics**

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

**Description** Minimum or maximum measured temperature of sensor electronics.

**User interface** Signed floating-point number

### Maximum temp. of sensor electronics

**Navigation** Diagnostics → Min/max val. → Max.TSensElectr.

**Description** Minimum or maximum measured temperature of sensor electronics.

**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

### 3.2.5 Simulation

*Navigation* Diagnostics → Simulation

**Simulation**

**Navigation** Diagnostics → Simulation → Simulation

**Description** By activating the simulation, the following can be simulated:
- State of vibrating fork
- Sensor frequency
- Current output
- Diagnostic event simulation

The simulation can affect the output current.

**Selection**
- Off
- State of vibrating fork
- Sensor frequency
- Current output
- Diagnostic event simulation

**Factory setting** Off

**Frequency simulation value**

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

**Description** Enter the frequency value to be simulated.

Note:
Prerequisite for the simulation to have an effect on the output:
Select "Sensor frequency " in the "Mode of operation" parameter in the Application > Sensor > Basic settings menu.
The simulated frequency value has no affect on the displayed state of the vibrating fork ("Fork uncovered ", "Fork covered ").

**User entry** 0 to 10 000 Hz

**Factory setting** 0 Hz

### Fork state simulation value

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

**Description** Select the state of the vibrating fork to be simulated.

Note:
Prerequisite for the simulation to have an effect on the output:
Select "Level limit detection" in the "Mode of operation" parameter in the Application > Sensor > Basic settings menu.
The simulated state of the vibrating fork has no affect on the displayed sensor frequency.

**Selection**
- Fork covered
- Fork uncovered

**Factory setting** Fork uncovered

### Diagnostic event simulation

**Navigation** Diagnostics → Simulation → Diagnostic event

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

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

**Selection**
- Off
- Drop-down list of diagnostic events

**Factory setting** Off

### Value current output

**Navigation** Diagnostics → Simulation → Current output

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

**User entry** 3.59 to 23 mA

**Factory setting** 3.59 mA

### 3.2.6 Heartbeat Technology

*Navigation* Diagnostics → Heartbeat Techn.

**Heartbeat Verification**

*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 Heartbeat 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

**Factory setting** 01.01.1970 00:00:00

**Operating time (Verification)**

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

**Description** Value of the operating hours counter at the time of verification.

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

**Verification result**

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

**Description** Result of Heartbeat Verification.

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

**Factory setting** Not done

### Status

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

**Description** Shows the actual status.

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

**Factory setting** Not done

**Frequency history**

List of the last 16 sensor frequencies saved in the previous Heartbeat Verification.

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

### Date 1 ... 16

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

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

**Factory setting** 1970-01-01 00:00:00

### Sensor frequency 1 ... 16

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

**User interface** Signed floating-point number

**Factory setting** 0 Hz

### Loop diagnostics

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

### Rebuild baseline

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

**Description**

Notice
The current output is simulated.
Bridge the PLC or take other appropriate measures to prevent an erroneous triggering of alarm messages or changes in the control loop behavior.

The baseline should be rebuilt if planned changes have been made in the loop.

**Selection**

- No
- Yes

**Factory setting** No

### 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.

Default
1.5 V DC

**User entry** 0.5 to 3.0 V

### Baseline status

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

**Description**

"Failed"
Means, baseline is not available or creation not possible.

"Success"
Baseline is available.

**User interface**

- Failed
- Success

**Factory setting** Failed

### Loop diagnostics

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

**Description** Enable/disable loop diagnostics.

Note:
If the function is disabled, there is no analysis and no event message.

**Selection**
- Disable
- Enable

**Factory setting** Disable

**Additional information** The parameter is visible if the baseline has been created.

### 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 Event delay

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

**Description** Displays how long the triggering status must be present until an event message is issued. Used to filter out short-term signal interference.

**User entry** 0 to 60 s

**Factory setting** 1 s

**Process window**

*Navigation* Diagnostics → Heartbeat Techn. → Process window

**Frequency of vibrating fork**

**Navigation** Diagnostics → Heartbeat Techn. → Process window → Fork frequency

**Description** Displays the actual frequency of the vibrating fork.

**User interface** 0 to 10 000 Hz

**High alert value**

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

**Description** Enter the upper limit value.
If this limit value is exceeded, an event is generated. There is no hysteresis.

**User entry** 0 to 2 000 Hz

**Factory setting** 0 Hz

**901 Alarm delay**

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

**Description** Enter the duration (integer) that the triggering status must be active before the alarm is generated.
A warning is generated.

**User entry** 0 to 300 s

**Factory setting** 60 s

### 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

**Factory setting** Disable

### Low alert value

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

**Description** Enter the lower limit value.
If this limit value is undercut, an event is generated. There is no hysteresis.

**User entry** 0 to 2 000 Hz

**Factory setting** 0 Hz

### 900 Alarm delay

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

**Description** Enter the duration (integer) that the triggering status must be active before the alarm is generated.
A warning is generated.

**User entry** 0 to 300 s

**Factory setting** 60 s

### 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

**Factory setting** Disable

### 3.2.7 Proof test

*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

**Factory setting** 01.01.1970 00:00:00

**Operating time of proof test on device**

**Navigation** Diagnostics → Proof test → Op.TimeProofTest

**Description** Displays operating time when the proof test was activated on site at the device.
Value is not displayed in the proof test protocol.

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

**Factory setting**

### 3.2.8 Diagnostic settings

*Navigation* Diagnostics → Diag. settings

**Properties**

*Navigation* Diagnostics → Diag. settings → Properties

**49 Corrosion warning**

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

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

**Selection**
- Off
- On

**Factory setting** On

**Upper warning frequency**

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

**Description** If the sensor frequency is currently higher than the upper warning frequency, a warning is generated. The switch output remains in the current state. It is recommended to remove the sensor and check for corrosion or abrasion.

**User interface** 0 to 10 000 Hz

**Factory setting** Device-specific

**825 Electronics temperature**

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

**Description** Activates the monitoring of the temperature of the main electronics.
The limit values are fixed.

**Selection**
- Off
- On

**Factory setting** On

## 826 Temperature of sensor electronics

**Navigation** Diagnostics → Diag. settings → Properties → 826TSensElectr.

**Description** Displays the actual temperature of the main electronics.

**Selection**
- Off
- On

**Factory setting** On

## 946 Advanced sensor monitoring

**Navigation** Diagnostics → Diag. settings → Properties → 946Adv.Sens.Mon.

**Description** Enable/disable advanced sensor monitoring to detect high external vibrations and other sensor errors (e.g. caused by pumps, agitators, turbulent flows, high flow rates, etc.).

**Selection**
- Enable
- Disable

**Factory setting** Enable

## 806 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Properties → 806Diag. 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

**Factory setting** Warning

### 806 Event category

**Navigation** Diagnostics → Diag. settings → Properties → 806Event categ.

**Description** Select category for diagnostic message.

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

**Factory setting** Maintenance required (M)

### 806 Event delay

**Navigation** Diagnostics → Diag. settings → Properties → 806 Event delay

**Description** Displays how long the triggering status must be present until an event message is issued. Used to filter out short-term signal interference.

**User entry** 0 to 60 s

**Factory setting** 1 s

#### Configuration

*Navigation* Diagnostics → Diag. settings → Configuration

*Sensor*

*Navigation* Diagnostics → Diag. settings → Configuration → Sensor

### 49 Diagnostic behavior

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

**Factory setting** Warning

## 49 Event category

**Navigation** Diagnostics → Diag. settings → Configuration → Sensor → 49Event categ.

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

**Factory setting** Maintenance required (M)

*Process*

*Navigation* Diagnostics → Diag. settings → Configuration → Process

## 806 Diagnostic behavior

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

**Factory setting** Warning

## 806 Event category

**Navigation** Diagnostics → Diag. settings → Configuration → Process → 806Event categ.

**Description** Select category for diagnostic message.

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

**Factory setting** Maintenance required (M)

### 826 Diagnostic behavior

**Navigation** Diagnostics → Diag. settings → Configuration → Process → 826Diag. 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

**Factory setting** Warning

### 826 Event category

**Navigation** Diagnostics → Diag. settings → Configuration → Process → 826Event categ.

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

**Factory setting** Out of specification (S)

### 900 Diagnostic behavior

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

**Factory setting** Warning

## 900 Event category

**Navigation** Diagnostics → Diag. settings → Configuration → Process → 900Event categ.

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

**Factory setting** Maintenance required (M)

## 901 Diagnostic behavior

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

**Factory setting** Warning

## 901 Event category

**Navigation** Diagnostics → Diag. settings → Configuration → Process → 901Event categ.

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

**Factory setting** Maintenance required (M)

## 3.3 Application

*Navigation* Application

### 3.3.1 Measuring units

*Navigation* Application → Measuring units

**Temperature unit**

**Navigation** Application → Measuring units → Temperature unit

**Description** Select the temperature unit.

**Selection**

| *SI units* | *US units* |
|---|---|
| ▪ ℃ | ℉ |
| ▪ K | |

**Factory setting** ℃

### 3.3.2 Measured values

*Navigation* Application → Measured values

**Frequency of vibrating fork**

**Navigation** Application → Measured values → Fork frequency

**Description** Displays the actual frequency of the vibrating fork.

**User interface** 0 to 10 000 Hz

**State of vibrating fork**

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

**Description** Displays the actual status of the vibrating fork.

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

### Receiving signal strength of fork

**Navigation** Application → Measured values → Sign.Str.Fork

**Description** Displays the receiving signal strength of the vibrating fork to the sensor electronics in percent.
The value indicates how much oscillation energy comes back from the vibrating fork. Energy loss occurs due to e.g. viscous medium, external vibrations or mechanical tensioning of the sensor.

**User interface** −200 to 1 000 %

### Temperature of sensor electronics

**Navigation** Application → Measured values → T sens.electr.

**Description** Displays the actual temperature of the main electronics.

**User interface** Signed floating-point number

### 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

### Electronics temperature

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

**Description** Displays the current temperature of the main electronics.

**User interface** Signed floating-point number

**Output current**

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

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

**User interface** 3.59 to 23 mA

### 3.3.3 Sensor

*Navigation* Application → Sensor

**Basic settings**

*Navigation* Application → Sensor → Basic settings

**Mode of medium detection**

**Navigation** Application → Sensor → Basic settings → Medium detection

**Description** Select the mode of medium dection.

**Selection**
- Standard
- Detect foam
  (only visible with order option Heartbeat Verification + Monitoring)
- Ignore foam
  (only visible with order option Heartbeat Verification + Monitoring)

**Factory setting** Standard

**Mode of operation**

**Navigation** Application → Sensor → Basic settings → Mode of operat.

**Description** Select mode of operation.

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 frequency of vibrating fork.

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

**Factory setting** Level limit detection

## Safety function

**Navigation** Application → Sensor → Basic settings → Safety function

**Description** Select "MIN" or "MAX" as safety function.
- Select "MIN" for dry-run protection.
- Select "MAX" for overfill protection.

**Selection**
- MIN
- MAX

**Factory setting** MAX

## Density setting

**Navigation** Application → Sensor → Basic settings → Density setting

**Description** Select the density of the medium.
- > 0.4 g/cm³ (> 25.0 lb/ft³)
  For liquids with a density of 0.4 … 0.6 g/cm³ (25.0 … 37.5 lb/ft³).
- > 0.5 g/cm³ (> 31.2 lb/ft³)
  For liquids with a density of 0.5 … 0.8 g/cm³ (31.2 … 49.9 lb/ft³).
- > 0.7 g/cm³ (> 43.7 lb/ft³)
  Standardsetting for liquids with a density > 0.7 g/cm³ (> 43.7 lb/ft³).

**Selection**
- > 0.4 g/cm³ (> 25.0 lb/ft³)
- > 0.5 g/cm³ (> 31.2 lb/ft³)
- > 0.7 g/cm³ (> 43.7 lb/ft³)

**Factory setting** Depends on the order option

## Damping

**Navigation** Application → Sensor → Basic settings → Damping

**Description** Enter a value between 0 s and 999 s.
Damping reduces the effect of fluctuations in the measured value on the output signal.
Damping has an effect only on mode of operation "Sensor frequency ".
It does not affect the mode of operation "Level limit detection" and "State of vibrating fork" ("Fork uncovered " or "Fork covered ").

**User entry** 0 to 999 s

**Factory setting** 1 s

## Switching delay uncovered to covered

**Navigation** Application → Sensor → Basic settings → Delay to covered

**Description** Select the delay time for switching from "Fork uncovered " to "Fork covered ".
The value determines the delay time until the switching output switches after a change of state is detected.

Choose between predefined values or select "Customer specific" to enter an integer between 1 s and 60 s.

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

**Factory setting** Depends on the order option

## Customer delay to covered

**Navigation** Application → Sensor → Basic settings → Cust. delay cov.

**Description** Enter the delay time for switching from "Fork uncovered " to "Fork covered ".
The value determines the delay time until the switching output switches after a change of state is detected.
Enter an integer between 1 s and 60 s.

**User entry** 1 to 60 s

**Factory setting** 1 s

## Switching delay covered to uncovered

**Navigation** Application → Sensor → Basic settings → Delay to uncov.

**Description** Select the delay time for switching from "Fork covered " to "Fork uncovered ".
The value determines the delay time until the switching output switches after a change of state is detected.

Choose between predefined values or select "Customer specific" to enter an integer between 1 s and 60 s.

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

**Factory setting** Depends on the order option

### Customer delay to uncovered

**Navigation** Application → Sensor → Basic settings → Cust. delay unc.

**Description** Enter the delay time for switching from "Fork covered " to "Fork uncovered ".
The value determines the delay time until the switching output switches after a change of state is detected.
Enter an integer between 1 s and 60 s.

**User entry** 1 to 60 s

**Factory setting** 1 s

## Sensor calibration

*Navigation* Application → Sensor → Sensor cal.

### Lower switching point at density

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

**Description** Displays the sensor frequency at which the status of the vibrating fork changes to "Fork covered " (depending on the density selected).

**User interface** 0 to 2 000 Hz

**Factory setting** Depends on density setting

### Upper switching point at density

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

**Description** Displays the sensor frequency at which the status of the vibrating fork changes to "Fork uncovered " (depending on the density selected).

**User interface** 0 to 2 000 Hz

**Factory setting** Depends on density setting

### Frequency at delivery status

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

**Description** Sensor frequency at delivery status. The individually determined oscillation frequency in air is in the range of 900 to 1 200 Hz.

**User interface** 0 to 10 000 Hz

**Factory setting** Device-specific

### Upper warning frequency

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

**Description** If the sensor frequency is currently higher than the upper warning frequency, a warning is generated. The switch output remains in the current state. It is recommended to remove the sensor and check for corrosion or abrasion.

**User interface** 0 to 10 000 Hz

**Factory setting** Device-specific

### Upper alarm frequency

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

**Description** If the actual sensor frequency is higher than the upper alarm frequency, then an alarm is generated.
The switching output switches to the fail-safe state.

**User interface** 0 to 10 000 Hz

**Factory setting** Device-specific

**Stored frequency**

*Navigation* Application → Sensor → Stored frequency

**Stored uncovered frequency**

**Navigation** Application → Sensor → Stored frequency → Stored uncov. f.

**Description** The actual sensor frequency can be saved in this parameter.
This is only possible when the fork is uncovered.
The value is displayed in the Heartbeat Technology verification report.

Note:
Save the frequency in a reproducible state in order to use it as a reference for further/ future analyses.

**User interface** 0 to 10 000 Hz

**Stored covered frequency**

**Navigation** Application → Sensor → Stored frequency → Stored cov. f.

**Description** The actual sensor frequency can be saved in this parameter.
This is only possible when the fork is covered.
The value is displayed in the Heartbeat Technology verification report.

Note:
Save the frequency in a reproducible state in order to use it as a reference for further/ future analyses.

**User interface** 0 to 10 000 Hz

### 3.3.4 Current output

*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

**Factory setting** Level limit detection

## Current range output

**Navigation** Application → Curr.output → Current range

**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)

**Factory setting** 4...20 mA NE (3.8...20.5 mA)

**Additional information** Only visible if Sensor frequency is selected as the Mode of operation.

## Lower range value output

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

**Description** Depending on which variable has been selected as Process variable output current, specify the relevant start of the measuring range (4 mA).

**User entry** Signed floating-point number

**Factory setting** Depends on the device setting

## Upper range value output

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

**Description** Depending on which variable has been selected as Process variable output current, specify the relevant end of the measuring range (20 mA).

**User entry** Signed floating-point number

**Factory setting** Depends on the device setting

### Failure behavior current output

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

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

Note: The hardware DIP Switch for alarm current (if available) has priority over software setting.

**Selection**
- Min.
- Max.

**Factory setting** Min.

### Failure current

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

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

**User entry** 21.5 to 23 mA

**Factory setting** 22.5 mA

### Output current

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

**Description** Displays 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

*Navigation* Application → HART output

#### Configuration

*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

**Factory setting** 0

**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)

**Factory setting** Customized

**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)

**Factory setting** Customized

### 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

**Factory setting** 5

### 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

**Factory setting** Enable

## HART output

*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

**Factory setting** Level limit detection

### 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
- State of vibrating fork
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Factory setting** Sensor frequency

### 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
- State of vibrating fork
- Sensor temperature

* Visibility depends on order options or device settings

- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Factory setting** State of vibrating fork

## 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

**Factory setting** 0 ManufacturerNoUnit

## Assign QV

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

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

**Selection**
- Level limit detection
- Sensor frequency
- State of vibrating fork
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage *
- Not used

**Factory setting** Sensor temperature

## 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

* Visibility depends on order options or device settings

### Burst configuration 1

*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<br>▪ On |
| **Factory setting** | Depends on the order option |

| Burst command | |
|---|---|
| **Navigation** | Application → HART output → Burst config. 1 → Burst command 1 |
| **Description** | Select the HART command that is sent to the HART master |
| **Selection** | ▪ Primary variable (PV)<br>▪ Loop Current and Percent of Range<br>▪ Dynamic Variables<br>▪ Device variables with status<br>▪ Device variables<br>▪ Additional device status |
| **Factory setting** | Loop Current and Percent of Range |

| 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<br>▪ Sensor frequency<br>▪ State of vibrating fork<br>▪ Sensor temperature<br>▪ Electronics temperature<br>▪ Measured current *<br>▪ Terminal voltage 1 *<br>▪ Percent of range |

* Visibility depends on order options or device settings

- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

**Factory setting** 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
- State of vibrating fork
- 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

**Factory setting** 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
- State of vibrating fork
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range

* Visibility depends on order options or device settings

- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

**Factory setting** 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
- State of vibrating fork
- 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

**Factory setting** Not used

## 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
- State of vibrating fork
- Sensor temperature
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Percent of range
- Measured current

* Visibility depends on order options or device settings

- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

**Factory setting** 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
- State of vibrating fork
- 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

**Factory setting** 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

**Selection**
- Level limit detection
- Sensor frequency
- State of vibrating fork
- 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

**Factory setting** 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
- State of vibrating fork
- 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

**Factory setting** 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

**Factory setting** Continuous

* 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

**Factory setting** 1 000 ms

### 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

**Factory setting** 2 000 ms

## Information

*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

**Factory setting** Device-specific

### Device type

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

**Description** Displays the device type with which the device is registered with the HART FieldComm Group.

**Factory setting** 0x91DF01

### Device revision

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

**Description** Displays the device revision with which the device is registered with the HART FieldComm Group.

**User interface** 0 to 255

**Factory setting** 1

### 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)

**Factory setting** Customized

### HART revision

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

**Description** Displays the revision of the HART protocol for the device.

**User interface** 5 to 7

**Factory setting** 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)

**Factory setting** 43/60

### 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)

**Factory setting** 43/60

### 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

*Navigation* System

### 3.4.1 Device management

*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)

**Factory setting** 43/60

**Locking status**

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

**Description** Indicates the type of locking.

"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**
- 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

**Factory setting** 0

**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 factory defaults *
- To delivery settings *
- Restart device

**Factory setting** Cancel

## 3.4.2 User management

*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 order options or device settings

**User interface**
- Operator
- Maintenance
- Expert

**Factory setting** Maintenance

## Change user role

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

**Description** It is possible to change the user role.
If the actual role is 'Maintenance', the 'Enter access code' will be prompted.
If the actual role is 'Operator', a 'Maintenance' password will be required.

**User entry** Character string comprising numbers, letters and special characters (1)

## Password

**Navigation** System → User manag. → 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)

## Enter access code

**Navigation** System → User manag. → Ent. access code

**Description** For authorized service personnel only.

**User entry** 0 to 9 999

**Factory setting** 0

## Status password entry

**Navigation** System → User manag. → 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

**Factory setting** --------

### Define password

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

**User entry** Character string comprising numbers, letters and special characters (1)

### New password

**Navigation** System → User manag. → 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. → Confirm password

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

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

### Change password

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

**Description** Changes the 'Maintenance' password.

**User entry** Character string comprising numbers, letters and special characters (1)

### Old password

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

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

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

### Delete password

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

**Description** Deletes the 'Maintenance' password.
After deleting, the 'Operator' role will be no more available.
All users have read/write access rights.

**User entry** Character string comprising numbers, letters and special characters (1)

### Forgot password?

**Navigation** System → User manag. → Forgot password?

**User entry** Character string comprising numbers, letters and special characters (1)

### Reset password

**Navigation** System → User manag. → Reset password

**Description** Enter a code to reset the current "Maintenance" password.
The code is delivered by your local support.

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

### 3.4.3 Bluetooth configuration

*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

**Factory setting** Depends on the order option

### 3.4.4 Geolocation

*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)

**Factory setting** Process Unit Tag

**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)

**Factory setting** somewhere

### Longitude

**Navigation** System → Geolocation → Longitude

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

**User entry** −180 to 180 °

**Factory setting** 0 °

### Latitude

**Navigation** System → Geolocation → Latitude

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

**User entry** −90 to 90 °

**Factory setting** 0 °

### 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

**Factory setting** 0 m

### 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

**Factory setting** No fix

### 3.4.5 Information

*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

**Factory setting** 43/60

**Manufacturer**

**Navigation** System → Information → Manufacturer

**Description** Displays the manufacturer.

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

**Factory setting** Endress+Hauser

**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

**Factory setting** - none -

**Additional information** **Access:**
- Read access: Operator
- Write access: Expert

### 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 ... 3

**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

**Additional information** **Access:**
- Read access: Operator
- Write access: Expert

**XML build number**

**Navigation** System → Information → XML build no.

**User interface** Positive integer

**Additional information** **Access:**
- Read access: Expert
- Write access: -

**Checksum**

**Navigation** System → Information → Checksum

**Description** Checksum for Firmware version.

**User interface** Positive integer

### 3.4.6 Additional information

*Navigation* System → Additional info

**Sensor**

*Navigation* System → Additional info → Sensor

**Serial number**

**Navigation** System → Additional info → Sensor → Serial number

**Description** Shows the serial number of the module

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

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Firmware version

**Navigation** System → Additional info → Sensor → Firmware version

**Description** Displays the firmware version of the module.

**User interface** Positive integer

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Build no. software

**Navigation** System → Additional info → Sensor → Build no. softw.

**Description** Shows the build number of the module firmware

**User interface** 0 to 65 535

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Hardware version

**Navigation** System → Additional info → Sensor → Hardware version

**Description** Displays the hardware version of the module.

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

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Checksum

**Navigation** System → Additional info → Sensor → Checksum

**Description** Checksum for Firmware version.

**User interface** Positive integer

**Factory setting** 0

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Electronics

*Navigation* System → Additional info → Electronics

### Serial number

**Navigation** System → Additional info → Electronics → Serial number

**Description** Shows the serial number of the module

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

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Firmware version

**Navigation** System → Additional info → Electronics → Firmware version

**Description** Displays the firmware version of the module.

**User interface** Positive integer

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Build no. software

**Navigation** System → Additional info → Electronics → Build no. softw.

**Description** Shows the build number of the module firmware

**User interface** 0 to 65 535

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### Hardware version

**Navigation** System → Additional info → Electronics → Hardware version

**Description** Displays the hardware version of the module.

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

**Additional information**

**Access:**
- Read access: Expert
- Write access: -

#### Display/Bluetooth

*Navigation* System → Additional info → Displ./Bluetooth

### Serial number

**Navigation** System → Additional info → Displ./Bluetooth → Serial number

**Description** Shows the serial number of the module

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

**Additional information**

**Access:**
- Read access: Expert
- Write access: -

### Firmware version

**Navigation** System → Additional info → Displ./Bluetooth → Firmware version

**Description** Displays the firmware version of the module.

**User interface** Positive integer

**Additional information**

**Access:**
- Read access: Expert
- Write access: -

**Build no. software**

**Navigation** System → Additional info → Displ./Bluetooth → Build no. softw.

**Description** Shows the build number of the module firmware

**User interface** 0 to 65 535

**Additional information** **Access:**
- Read access: Expert
- Write access: -

**Hardware version**

**Navigation** System → Additional info → Displ./Bluetooth → Hardware version

**Description** Displays the hardware version of the module.

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

**Additional information** **Access:**
- Read access: Expert
- Write access: -

### 3.4.7 Software configuration

*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

**Factory setting** 65 535

**Additional information** A CRC code (Cyclic Redundancy Check) for measuring instruments is an error detection method that is used to ensure the integrity of data.

### 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

**Factory setting** 65 535

### Timestamp stored CRC device config.

**Navigation** System → Softw. config. → Time 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**
- WHG
- Heartbeat Verification
- Heartbeat Monitoring
- Bluetooth


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