Description of Device Parameters

FTL64

HART

Vibronic
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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
2 Overview of the operating menu

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### Previous diagnostics

- Timestamp
- Operating time from restart
- Operating time

### Minimum/maximum values

- Frequency min
- Frequency max
- Minimum terminal voltage
- Maximum terminal voltage
- Minimum electronics temperature
- Maximum electronics temperature
- Minimum sensor temperature
- Maximum sensor temperature

### Simulation

- Value current output
- Simulation
- Frequency simulation value
- Fork state simulation value
- Diagnostic event category
- Diagnostic event simulation

### Heartbeat Technology

#### Heartbeat Verification

- Start verification
- Date/time Heartbeat Verification
- Operating time (Verification)
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**Loop diagnostics**

- Rebuild baseline
- Tolerated deviation +/-
- Baseline status
- Loop diagnostics
- Terminal voltage 1
- Clamping voltage lower threshold
- Clamping voltage upper threshold
- 806 Alarm delay

**Process window**

- Sensor frequency
- 900 Process alert frequency too low
- 900 Alarm delay
- Low alert value
- 901 Process alert frequency too high
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Overview of the operating menu

Measurement parameters:
- Terminal voltage 1
- Terminal current
- Sensor temperature
- Electronics temperature

Measurement units:
- Temperature unit

Sensor configuration:
- Mode of operation
- Safety function
- Density setting
- Damping
- Switching delay uncovered to covered
- Customer delay to covered
- Switching delay covered to uncovered
- Customer delay to uncovered

Stored frequency:
- Stored uncovered frequency
- Stored covered frequency

Sensor calibration:
- Lower switching point at density
- Upper switching point at density
- Frequency at delivery status
- Upper warning frequency
- Upper alarm frequency
Overview of the operating menu

**Current output**

- Assign PV
- Current range output
- Lower range value output
- Upper range value output
- Failure behavior current output
- Failure current
- Output current
- Terminal current

**HART output**

**Configuration**

- HART address
- HART short tag
- Device tag
- No. of preambles
- Loop current mode

**HART output**

- Assign PV
- Primary variable (PV)
- Assign SV
- Secondary variable (SV)
- Assign TV
- Tertiary variable (TV)
- Assign QV
- Quaternary variable (QV)
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- HART date code → 69

### System

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Overview of the operating menu

Device management

- Device tag
- Locking status
- Configuration counter
- Reset device

User management

- User role

Change user role

- Enter access code

Define password

- Start
- New password
- Confirm new password

Change password

- Start
- Old password
- New password
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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) *
- العربية (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

<table>
<thead>
<tr>
<th>SI units</th>
<th>US units</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
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<tr>
<td>K</td>
<td></td>
</tr>
</tbody>
</table>

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 \( \leq \) “low saturation”, the output current is set to “low saturation”. If Measured value \( \geq \) “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.

### "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
Description of device parameters

### 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 65535

---

### 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 65535

### 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 65535
**Description of device parameters**

**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*
Description of device parameters

- 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.
Description of device parameters

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

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 65535

Code incorrect

Navigation  ➤ Guidance → Safety unlock → Code incorrect
Description  Abort SIL confirmation sequence or reenter SIL locking code.
Selection  • Reenter code
• Abort sequence
Description of device parameters

FTL64 HART

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

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

Description  Displays the timestamp for the currently active diagnostic message.

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

Previous diagnostics

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

User interface  Positive integer

Timestamp

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

**FTL64 HART**

**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
Description of device parameters

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 10000 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*  

**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
Description of device parameters

Sensor frequency 3

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 3

User interface
Signed floating-point number

Sensor frequency 4

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 4

User interface
Signed floating-point number

Sensor frequency 5

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 5

User interface
Signed floating-point number

Sensor frequency 6

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 6

User interface
Signed floating-point number

Sensor frequency 7

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 7

User interface
Signed floating-point number

Sensor frequency 8

Navigation
Diagram: Diagnostics → Heartbeat Techn. → Freq. history → Frequency 8

User interface
Signed floating-point number
<table>
<thead>
<tr>
<th>Sensor frequency</th>
<th>Navigation</th>
<th>User interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 9</td>
<td>Signed floating-point number</td>
</tr>
<tr>
<td>10</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 10</td>
<td>Signed floating-point number</td>
</tr>
<tr>
<td>11</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 11</td>
<td>Signed floating-point number</td>
</tr>
<tr>
<td>12</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 12</td>
<td>Signed floating-point number</td>
</tr>
<tr>
<td>13</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 13</td>
<td>Signed floating-point number</td>
</tr>
<tr>
<td>14</td>
<td>🟢   🟢 Diagnostics → Heartbeat Techn. → Freq. history → Frequency 14</td>
<td>Signed floating-point number</td>
</tr>
</tbody>
</table>
Description of device parameters

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**  
Diagnoses → Heartbeat Techn. → Freq. history → Date 5

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

Date 6

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

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

Date 7

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

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

Date 8

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

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

Date 9

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

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

Date 10

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

**User interface**  
Character string comprising numbers, letters and special characters
<table>
<thead>
<tr>
<th>Date</th>
<th>Navigation</th>
<th>User interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date 11</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 11</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
<tr>
<td>Date 12</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 12</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
<tr>
<td>Date 13</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 13</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
<tr>
<td>Date 14</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 14</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
<tr>
<td>Date 15</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 15</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
<tr>
<td>Date 16</td>
<td>Diagnostics → Heartbeat Techn. → Freq. history → Date 16</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
</tbody>
</table>
"Loop diagnostics" submenu

**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

**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.
'Passed'
Baseline is available.

**User interface**  
- Failed
- Success
### Loop diagnostics

**Navigation**  
Diagnosics → Heartbeat Techn. → Loop diag. → Loop diagn.

**Selection**  
- Disable  
- Enable

### Terminal voltage 1

**Navigation**  
Diagnosics → Heartbeat Techn. → Loop diag. → 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**  
Diagnosics → Heartbeat Techn. → Loop diag. → Lower threshold

**User interface**  
0.0 to 50.0 V

### Clamping voltage upper threshold

**Navigation**  
Diagnosics → Heartbeat Techn. → Loop diag. → Upper threshold

**User interface**  
0.0 to 50.0 V

### 806 Alarm delay

**Navigation**  
Diagnosics → Heartbeat Techn. → Loop diag. → 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

<table>
<thead>
<tr>
<th>Navigation</th>
<th>📅 Diagnostics → Proof test → Last proof test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>As soon as key is pressed, actual operating hours counter is saved.</td>
</tr>
<tr>
<td>User interface</td>
<td>Character string comprising numbers, letters and special characters</td>
</tr>
</tbody>
</table>

## 3.2.6 "Diagnostic settings" submenu

<table>
<thead>
<tr>
<th>Navigation</th>
<th>📅 Diagnostics → Diag. settings</th>
</tr>
</thead>
</table>

## "Properties" submenu

<table>
<thead>
<tr>
<th>Navigation</th>
<th>📅 Diagnostics → Diag. settings → Properties</th>
</tr>
</thead>
</table>

### 49 Corrosion warning

<table>
<thead>
<tr>
<th>Navigation</th>
<th>📅 Diagnostics → Diag. settings → Properties → 49 Corr. warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>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 -&gt; Diagnostics - &gt; Diagnostic settings - &gt; Configuration Diagnostic behaviour can be changed to 'Logbook entry only' in the same menu.</td>
</tr>
</tbody>
</table>
| Selection        | • Off  
• On |

### Upper warning frequency

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>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.</td>
</tr>
<tr>
<td>User interface</td>
<td>0 to 10000 Hz</td>
</tr>
</tbody>
</table>
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 → 49 Event 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 → 806 Event 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 → 900 Event 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
Description of device parameters

901 Event category

Navigation

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

![Diagram](Application → Measured values → Sensor temp.)

**User interface**

Signed floating-point number

---

### Electronics temperature

**Navigation**

![Diagram](Application → Measured values → Electronics temp)

**User interface**

Signed floating-point number

---

### 3.3.2 "Measuring Units" submenu

**Navigation**

![Diagram](Application → Measuring Units)

---

### Temperature unit

**Navigation**

![Diagram](Application → Measuring Units → Temperature unit)

**Description**

Used to display the electronics temperature.

**Selection**

- **SI units**
  - °C
  - K
- **US units**
  - °F
3.3.3 "Sensor" submenu

Navigation Application → Sensor

"Sensor configuration" submenu

Navigation Application → Sensor → Sensor conf.

Mode of operation

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>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.</td>
</tr>
<tr>
<td>Selection</td>
<td>• Level limit detection</td>
</tr>
<tr>
<td></td>
<td>• Sensor frequency</td>
</tr>
</tbody>
</table>

Safety function

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Application → Sensor → Sensor conf. → Safety function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>MIN: Use for dry run protection. MAX: Use for overfill protection.</td>
</tr>
<tr>
<td>Selection</td>
<td>• MIN</td>
</tr>
<tr>
<td></td>
<td>• MAX</td>
</tr>
</tbody>
</table>

Density setting

<table>
<thead>
<tr>
<th>Navigation</th>
<th>Application → Sensor → Sensor conf. → Density setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection</td>
<td>• &gt; 0.4 g/cm³</td>
</tr>
<tr>
<td></td>
<td>• &gt; 0.4 g/cm³</td>
</tr>
<tr>
<td></td>
<td>• &gt; 0.5 g/cm³</td>
</tr>
<tr>
<td></td>
<td>• &gt; 0.7 g/cm³</td>
</tr>
</tbody>
</table>

* Visibility depends on order options or device settings
Additional information

- > 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


User entry
1 to 60 s
Description of device parameters

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**

**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 10000 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 10000 Hz

"Sensor calibration" submenu


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 2000 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 2000 Hz

Frequency at delivery status

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

Description  Sensor frequency at delivery status.

User interface 0 to 10000 Hz

Upper warning frequency


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.
Description of device parameters

**User interface**

0 to 10 000 Hz

---

**Upper alarm frequency**

**Navigation**


**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
## Description of device parameters

### 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
**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

**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
Description of device parameters

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
Description of device parameters

- 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

* Visibility depends on order options or device settings

---

### 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

* Visibility depends on order options or device settings

---

### 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
Description of device parameters

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 65535

---

### 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 65535

---

**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**  
- **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 9999

### "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

**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

**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.
The code is delivered 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**

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

_start_

**Navigation**

System → User manag. → Logout

**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

_start_

**Navigation**

System → Bluetooth conf.

---

**Bluetooth activation**

Start

**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

**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) *
- العربية (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
Description of device parameters

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.
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

**Latitude**

-180 to 180°

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<th>System → Geolocation → Latitude</th>
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</thead>
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<td>Description</td>
<td>Use this function to enter the latitude coordinates that describe the device location.</td>
</tr>
<tr>
<td>User entry</td>
<td>-5 156.62015616066 to 5 156.62015616066°</td>
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</tr>
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</table>
| 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

**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

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<td><strong>Description</strong></td>
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<td><strong>User interface</strong></td>
</tr>
</tbody>
</table>
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 65535

---

**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 65535

---

**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
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- WHG
- Heartbeat Verification
- Heartbeat Monitoring
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