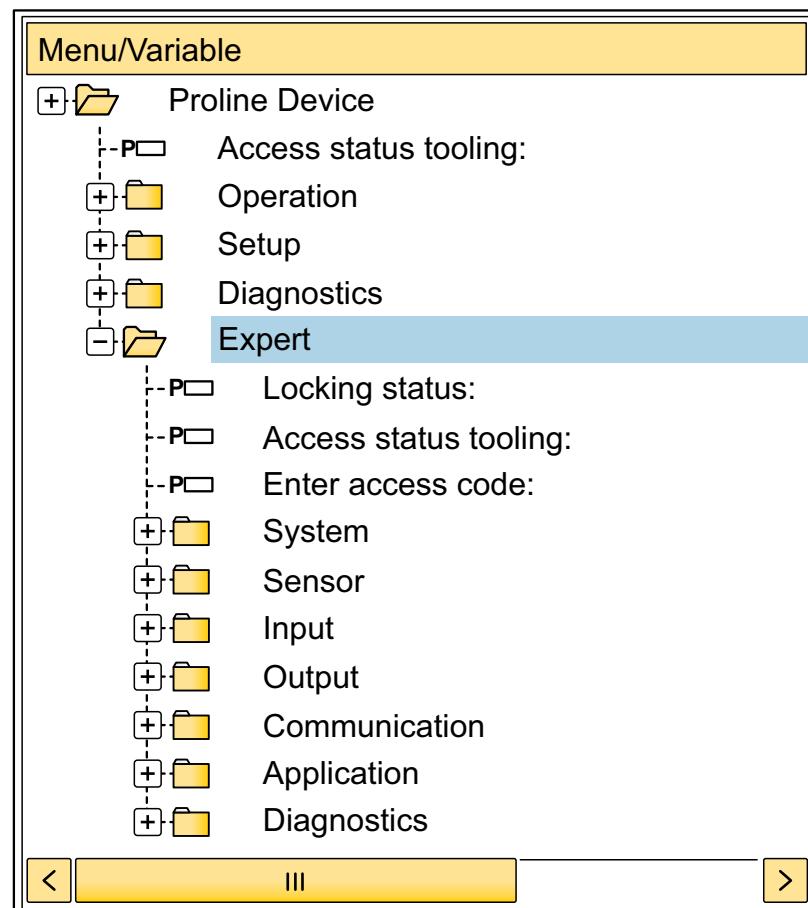


# Description of Device Parameters

## Proline Prosonic Flow 300

## HART

Ultrasonic time-of-flight flowmeter





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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, providing a detailed explanation of each individual parameter of the Expert operating menu.

It is used to perform tasks that require detailed knowledge of the function 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

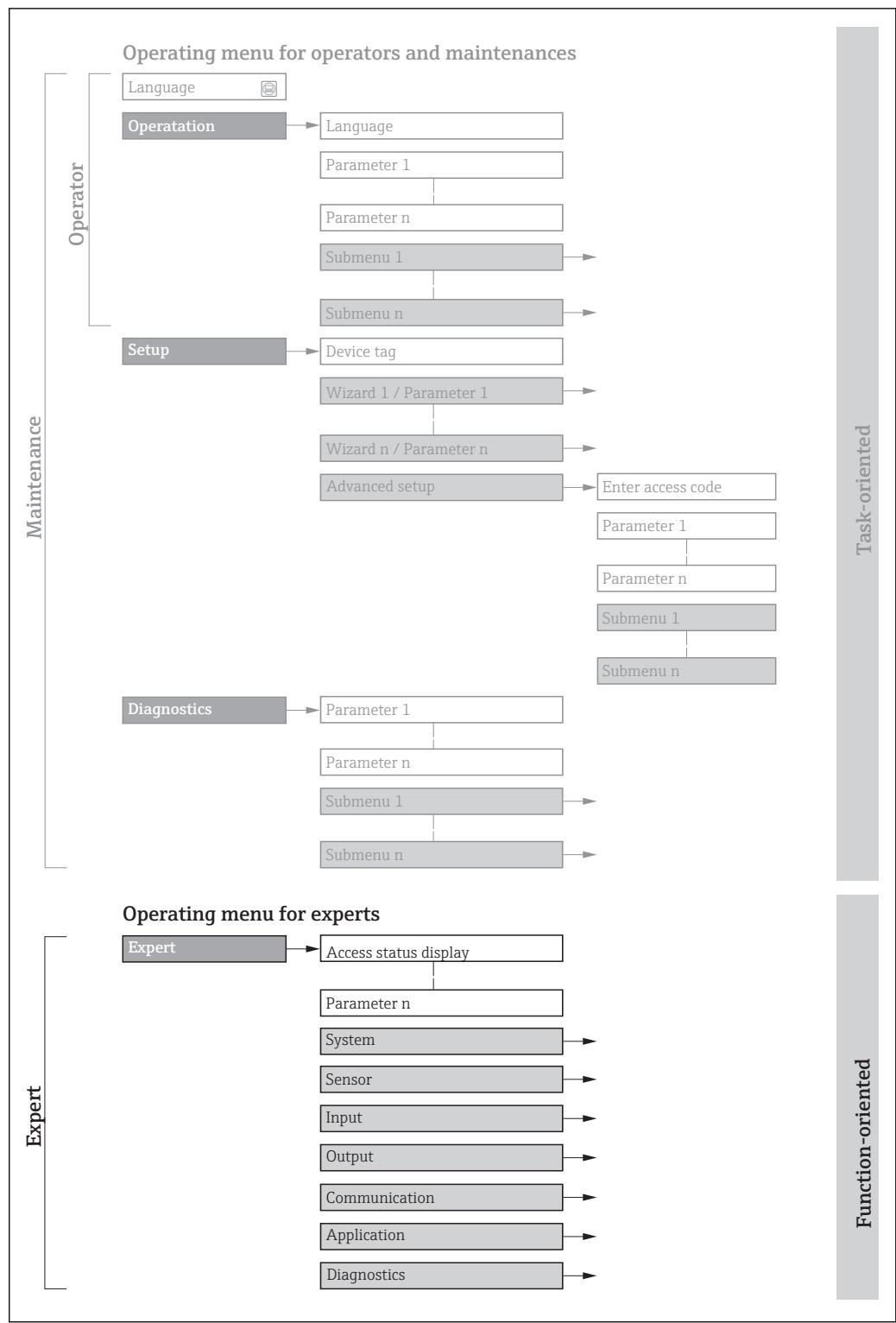
## 1.2    Target group

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

The document lists the submenus and their parameters according to the structure from the **Expert** menu (→ 8), which is displayed when the "**Maintenance**" user role is enabled.



1 Sample graphic for the schematic layout of the operating menu



Additional information regarding:

- The arrangement of the parameters according to the menu structure of the **Operation** menu, **Setup** menu, **Diagnostics** menu with a brief description: Operating Instructions
- Operating concept of the operating menus: Operating Instructions

### 1.3.2 Structure of a parameter description

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

Complete parameter name

Write-protected parameter = 

**Navigation**



Navigation path to the parameter via the local display (direct access code) or web browser  
Navigation path to the parameter via the operating tool  
The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.

**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

- Option 1
- Option 2

**User entry**

Input range for the parameter

**User interface**

Display value/data for the parameter

**Factory setting**

Default setting ex works

**Additional information**

Additional explanations (e.g. in examples):

- On individual options
- On display values/data
- On the input range
- On the factory setting
- On the parameter function

## 1.4 Symbols used

### 1.4.1 Symbols for certain types of information

Symbol	Meaning
	<b>Tip</b> Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
	Operation via local display
	Operation via operating tool
	Write-protected parameter

### 1.4.2 Symbols in graphics

Symbol	Meaning	Symbol	Meaning
1, 2, 3 ...	Item numbers	A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections		

## 1.5 Documentation

### 1.5.1 Standard documentation

#### Operating Instructions

Measuring device	Documentation code
Prosonic Flow G 300	BA01834D

### 1.5.2 Supplementary device-dependent documentation

#### Special documentation

Content	Documentation code
Information on the Pressure Equipment Directive	SD01614D
Remote display and operating module DKX001	SD01763D
Radio approvals for WLAN interface for A309/A310 display module	SD01793D
Advanced gas analysis	SD02349D
Functional Safety Manual	SD02307D
Heartbeat Technology	SD02302D
Web server	SD02309D

## 2 Overview of the Expert operating menu

The following table provides an overview of the menu structure of the expert operating menu and its parameters. The page reference indicates where the associated description of the submenu or parameter can be found.

<b>Expert</b>	
Direct access (0106)	→ <a href="#">11</a>
Locking status (0004)	→ <a href="#">12</a>
Access status (0005)	→ <a href="#">13</a>
Ent. access code (0003)	→ <a href="#">13</a>
<b>▶ System</b>	→ <a href="#">13</a>
▶ Display	→ <a href="#">14</a>
▶ Config. backup	→ <a href="#">27</a>
▶ Diagn. handling	→ <a href="#">30</a>
▶ Administration	→ <a href="#">41</a>
<b>▶ Sensor</b>	→ <a href="#">46</a>
▶ Measured val.	→ <a href="#">46</a>
▶ System units	→ <a href="#">62</a>
▶ Process param.	→ <a href="#">74</a>
▶ Measurement mode	→ <a href="#">78</a>
▶ External comp.	→ <a href="#">85</a>
▶ Sensor adjustm.	→ <a href="#">87</a>
▶ Calibration	→ <a href="#">97</a>
<b>▶ I/O config.</b>	→ <a href="#">99</a>
I/O 1 to n terminals (3902–1 to n)	→ <a href="#">99</a>
I/O 1 to n info (3906–1 to n)	→ <a href="#">99</a>
I/O 1 to n type (3901–1 to n)	→ <a href="#">100</a>

Apply I/O config (3907)	→  100
Alteration code (2762)	→  101
▶ Input	→  101
▶ Current input 1 to n	→  101
▶ Status input 1 to n	→  104
▶ Output	→  106
▶ Curr.output 1 to n	→  106
▶ PFS output 1 to n	→  119
▶ Relay output 1 to n	→  138
▶ Double pulse out	→  145
▶ Communication	→  149
▶ HART input	→  150
▶ HART output	→  156
▶ Web server	→  173
▶ Diag. config.	→  176
▶ WLAN settings	→  186
▶ Application	→  192
Reset all tot. (2806)	→  193
▶ Totalizer 1 to n	→  193
▶ Diagnostics	→  199
Actual diagnos. (0691)	→  199
Prev.diagnostics (0690)	→  200
Time fr. restart (0653)	→  201
Operating time (0652)	→  201
▶ Diagnostic list	→  202

▶ Event logbook	→ 206
▶ Device info	→ 208
▶ Main elec.+I/O1	→ 212
▶ Sens. electronic	→ 213
▶ I/O module 2	→ 215
▶ I/O module 3	→ 216
▶ Display module	→ 218
▶ Data logging	→ 219
▶ Heartbeat	→ 226
▶ Simulation	→ 227

### 3 Description of Device Parameters

In the following section, the parameters are listed according to the menu structure of the local display. Specific parameters for the operating tools are included at the appropriate points in the menu structure.

Expert	
Locking status (0004)	→ 12
Access status (0005)	→ 13
Ent. access code (0003)	→ 13
Direct access (0106)	→ 11
▶ System	→ 13
▶ Sensor	→ 46
▶ I/O config.	→ 99
▶ Input	→ 101
▶ Output	→ 106
▶ Communication	→ 149
▶ Application	→ 192
▶ Diagnostics	→ 199

#### Direct access



##### Navigation

Expert → Direct access (0106)

##### Description

Use this function to enter the access code to enable direct access to the desired parameter via the local display. A parameter number is assigned to each parameter for this purpose.

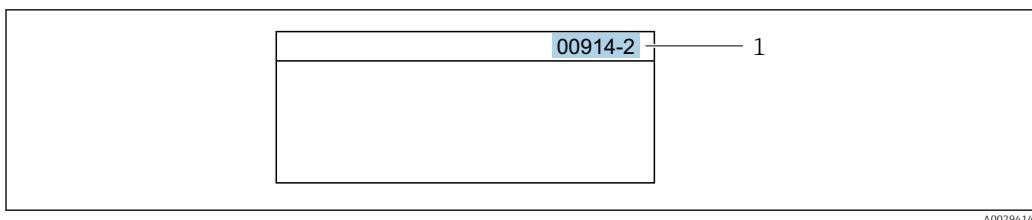
##### User entry

0 to 65 535

##### Additional information

*User entry*

The direct access code consists of a 5-digit number (at maximum) and the channel number, which identifies the channel of a process variable: e.g. 00914-2. In the navigation view, this appears on the right-hand side in the header of the selected parameter.



1 Direct access code

Note the following when entering the direct access code:

- The leading zeros in the direct access code do not have to be entered.  
Example: Enter "914" instead of "00914"
- If no channel number is entered, channel 1 is accessed automatically.  
Example: Enter 00914 → **Assign variable** parameter
- If a different channel is accessed: Enter the direct access code with the corresponding channel number.  
Example: Enter 00914-2 → **Assign variable** parameter

## Locking status

### Navigation

 Expert → Locking status (0004)

### Description

Displays the active write protection.

### User interface

- Hardware locked
- SIL locked
- CT act.-def.par.
- CT act.-all par.
- Temp. locked

### Additional information

#### Display

If two or more types of write protection are active, the write protection with the highest priority is shown on the local display. In the operating tool all active types of write protection are displayed.

 Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device

#### Selection

Options	Description
None	The access status displayed in the <b>Access status</b> parameter (→ 13) applies . Only appears on local display.
Hardware locked (priority 1)	The DIP switch for hardware locking is activated on the PCB board. This locks write access to the parameters (e.g. via local display or operating tool) .
SIL locked (priority 2)	The SIL mode is enabled. This locks write access to the parameters (e.g. via local display or operating tool).
Temp. locked	Write access to the parameters is temporarily locked on account of internal processes running in the device (e.g. data upload/download, reset etc.). Once the internal processing has been completed, the parameters can be changed once again.

---

**Access status**

---

<b>Navigation</b>	  Expert → Access status (0005)
<b>Description</b>	Displays the access authorization to the parameters via the local display, Web browser or operating tool.
<b>User interface</b>	<ul style="list-style-type: none"> <li>▪ Operator</li> <li>▪ Maintenance</li> </ul>
<b>Factory setting</b>	Maintenance
<b>Additional information</b>	<p><i>Description</i></p> <p> Access authorization can be modified via the <b>Ent. access code</b> parameter (→  13).</p> <p> If additional write protection is active, this restricts the current access authorization even further.</p> <p><i>Display</i></p> <p> Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device</p>

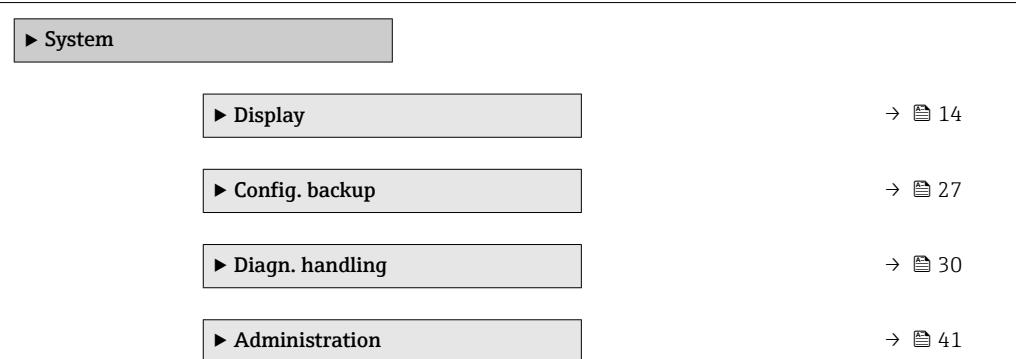
---

**Ent. access code**

---

<b>Navigation</b>	  Expert → Ent. access code (0003)
<b>Description</b>	Use this function to enter the user-specific release code to remove parameter write protection.
<b>User entry</b>	Max. 16-digit character string comprising numbers, letters and special characters

### 3.1 "System" submenu

<i>Navigation</i>	  Expert → System
	
▶ System	
▶ Display	→  14
▶ Config. backup	→  27
▶ Diagn. handling	→  30
▶ Administration	→  41

### 3.1.1 "Display" submenu

Navigation

Expert → System → Display

► Display	
Display language (0104)	→  15
Format display (0098)	→  15
Value 1 display (0107)	→  18
0% bargraph 1 (0123)	→  19
100% bargraph 1 (0125)	→  19
Decimal places 1 (0095)	→  19
Value 2 display (0108)	→  20
Decimal places 2 (0117)	→  21
Value 3 display (0110)	→  21
0% bargraph 3 (0124)	→  22
100% bargraph 3 (0126)	→  22
Decimal places 3 (0118)	→  23
Value 4 display (0109)	→  23
Decimal places 4 (0119)	→  24
Display interval (0096)	→  24
Display damping (0094)	→  25
Header (0097)	→  25
Header text (0112)	→  26
Separator (0101)	→  26
Contrast display (0105)	→  27
Backlight (0111)	→  27

---

## Display language

---

**Navigation**  Expert → System → Display → Display language (0104)

**Prerequisite** A local display is provided.

**Description** Use this function to select the configured language on the local display.

**Selection**

- English
- Deutsch
- Français
- Español
- Italiano
- Nederlands
- Portuguesa
- Polski
- русский язык(Ru)
- Svenska
- Türkçe
- 中文 (Chinese)
- 日本語 (Japanese)
- 한국어 (Korean)
- العربية(Ara)
- Bahasa Indonesia
- ภาษาไทย (Thai)
- tiếng Việt (Viet)
- čeština (Czech)

**Factory setting** English (alternatively, the ordered language is preset in the device)

---

## Format display

---

**Navigation**  Expert → System → Display → Format display (0098)

**Prerequisite** A local display is provided.

**Description** Use this function to select how the measured value is shown on the local display.

**Selection**

- 1 value, max.
- Bagr. + 1 value
- 2 values
- Val. large+2val.
- 4 values

**Factory setting** 1 value, max.

**Additional information***Description*

The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.



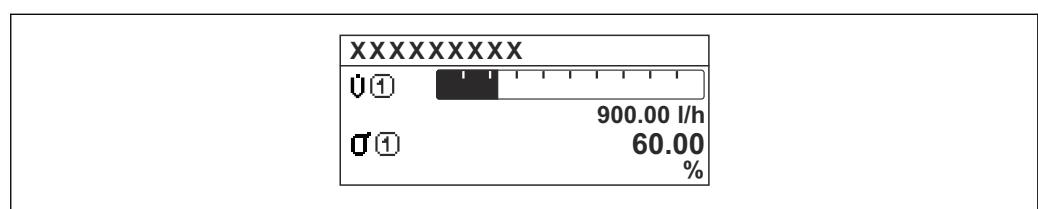
- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured via the **Display interval** parameter (→ 24).

Possible measured values shown on the local display:

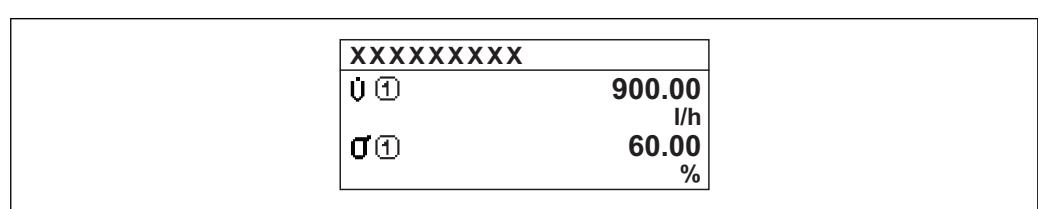
"1 value, max." option



"Bagr. + 1 value" option

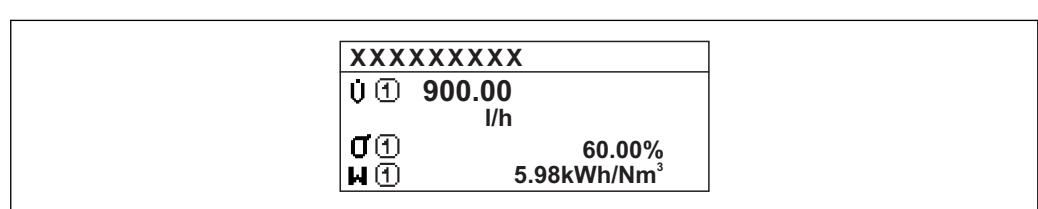


"2 values" option

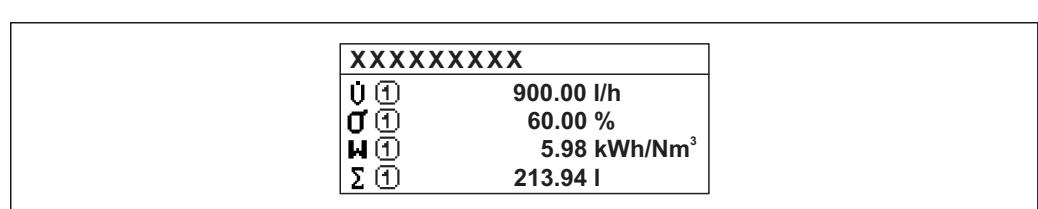


2

"Val. large+2val." option



"4 values" option



**Value 1 display****Navigation**

Expert → System → Display → Value 1 display (0107)

**Prerequisite**

A local display is provided.

**Description**

Use this function to select one of the measured values shown on the local display.

**Selection**

- Volume flow \*
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1 \*
- Curr.output 2 \*
- Curr.output 3 \*
- Curr.output 4 \*

**Factory setting**

Volume flow

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the first value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Dependency*

The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

\* Visibility depends on order options or device settings

---

**0% bargraph 1**

<b>Navigation</b>	Expert → System → Display → 0% bargraph 1 (0123)
<b>Prerequisite</b>	A local display is provided.
<b>Description</b>	Use this function to enter the 0% bar graph value to be shown on the display for the measured value 1.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Country-dependent
<b>Additional information</b>	<i>Description</i> The <b>Format display</b> parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i> The unit of the displayed measured value is taken from the <b>System units</b> submenu (→  62).

---

**100% bargraph 1**

<b>Navigation</b>	Expert → System → Display → 100% bargraph 1 (0125)
<b>Prerequisite</b>	A local display is provided.
<b>Description</b>	Use this function to enter the 100% bar graph value to be shown on the display for the measured value 1.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Depends on country and nominal diameter →  237
<b>Additional information</b>	<i>Description</i> The <b>Format display</b> parameter (→  15) is used to specify that the measured value is to be displayed as a bar graph. <i>User entry</i> The unit of the displayed measured value is taken from the <b>System units</b> submenu (→  62).

---

**Decimal places 1**

<b>Navigation</b>	Expert → System → Display → Decimal places 1 (0095)
<b>Prerequisite</b>	A measured value is specified in the <b>Value 1 display</b> parameter (→  18).

**Description** Use this function to select the number of decimal places for measured value 1.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting** X.XX

**Additional information** *Description*

 This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

---

## Value 2 display



**Navigation**  Expert → System → Display → Value 2 display (0108)

**Prerequisite** A local display is provided.

**Description** Use this function to select one of the measured values shown on the local display.

**Selection**

- None
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Curr.output 1 \*
- Curr.output 2 \*
- Curr.output 3 \*
- Curr.output 4 \*

---

\* Visibility depends on order options or device settings

<b>Factory setting</b>	None
<b>Additional information</b>	<p><i>Description</i></p> <p>If several measured values are displayed at once, the measured value selected here will be the second value to be displayed. The value is only displayed during normal operation.</p> <p> The <b>Format display</b> parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Dependency</i></p> <p> The unit of the displayed measured value is taken from the <b>System units</b> submenu (→ 62).</p>

## Decimal places 2

<b>Navigation</b>	  Expert → System → Display → Decimal places 2 (0117)
<b>Prerequisite</b>	A measured value is specified in the <b>Value 2 display</b> parameter (→ 20).
<b>Description</b>	Use this function to select the number of decimal places for measured value 2.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ X</li><li>■ X.X</li><li>■ X.XX</li><li>■ X.XXX</li><li>■ X.XXXX</li></ul>
<b>Factory setting</b>	X.XX
<b>Additional information</b>	<p><i>Description</i></p> <p> This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.</p>

## Value 3 display

<b>Navigation</b>	  Expert → System → Display → Value 3 display (0110)
<b>Prerequisite</b>	A local display is provided.
<b>Description</b>	Use this function to select one of the measured values shown on the local display.
<b>Selection</b>	For the picklist, see the <b>Value 2 display</b> parameter (→ 20)
<b>Factory setting</b>	None

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the third value to be displayed. The value is only displayed during normal operation.

 The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Selection*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

**0% bargraph 3****Navigation**

  Expert → System → Display → 0% bargraph 3 (0124)

**Prerequisite**

A selection was made in the **Value 3 display** parameter (→ 21).

**Description**

Use this function to enter the 0% bar graph value to be shown on the display for the measured value 3.

**User entry**

Signed floating-point number

**Factory setting**

Country-dependent

**Additional information***Description*

 The **Format display** parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

*User entry*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

**100% bargraph 3****Navigation**

  Expert → System → Display → 100% bargraph 3 (0126)

**Prerequisite**

A selection was made in the **Value 3 display** parameter (→ 21).

**Description**

Use this function to enter the 100% bar graph value to be shown on the display for the measured value 3.

**User entry**

Signed floating-point number

**Factory setting**

0

**Additional information***Description*

The **Format display** parameter (→ 15) is used to specify that the measured value is to be displayed as a bar graph.

*User entry*

The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

**Decimal places 3****Navigation**

Expert → System → Display → Decimal places 3 (0118)

**Prerequisite**

A measured value is specified in the **Value 3 display** parameter (→ 21).

**Description**

Use this function to select the number of decimal places for measured value 3.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting**

X.XX

**Additional information***Description*

This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

**Value 4 display****Navigation**

Expert → System → Display → Value 4 display (0109)

**Prerequisite**

A local display is provided.

**Description**

Use this function to select one of the measured values shown on the local display.

**Selection**

For the picklist, see the **Value 2 display** parameter (→ 20)

**Factory setting**

None

**Additional information***Description*

If several measured values are displayed at once, the measured value selected here will be the fourth value to be displayed. The value is only displayed during normal operation.

 The **Format display** parameter (→ 15) is used to specify how many measured values are displayed simultaneously and how.

*Selection*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

---

**Decimal places 4****Navigation**

 Expert → System → Display → Decimal places 4 (0119)

**Prerequisite**

A measured value is specified in the **Value 4 display** parameter (→ 23).

**Description**

Use this function to select the number of decimal places for measured value 4.

**Selection**

- X
- X.X
- X.XX
- X.XXX
- X.XXXX

**Factory setting**

X.XX

**Additional information***Description*

 This setting does not affect the measuring or computational accuracy of the device. The arrow displayed between the measured value and the unit indicates that the device computes with more digits than are shown on the local display.

---

**Display interval****Navigation**

 Expert → System → Display → Display interval (0096)

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter the length of time the measured values are displayed if the values alternate on the display.

**User entry**

1 to 10 s

**Factory setting**

5 s

**Additional information***Description*

This type of alternating display only occurs automatically if the number of measured values defined exceeds the number of values the selected display format can display simultaneously.



- The **Value 1 display** parameter (→ 18) to **Value 4 display** parameter (→ 23) are used to specify which measured values are shown on the local display.
- The display format of the displayed measured values is specified using the **Format display** parameter (→ 15).

**Display damping****Navigation**

Expert → System → Display → Display damping (0094)

**Prerequisite**

A local display is provided.

**Description**

Use this function to enter a time constant for the reaction time of the local display to fluctuations in the measured value caused by process conditions.

**User entry**

0.0 to 999.9 s

**Factory setting**

0.0 s

**Additional information***User entry*

Use this function to enter a time constant (PT1 element<sup>1)</sup>) for display damping:

- If a low time constant is entered, the display reacts particularly quickly to fluctuating measured variables.
- On the other hand, the display reacts more slowly if a high time constant is entered.



Damping is switched off if **0** is entered (factory setting).

**Header****Navigation**

Expert → System → Display → Header (0097)

**Prerequisite**

A local display is provided.

**Description**

Use this function to select the contents of the header of the local display.

**Selection**

- Device tag
- Free text

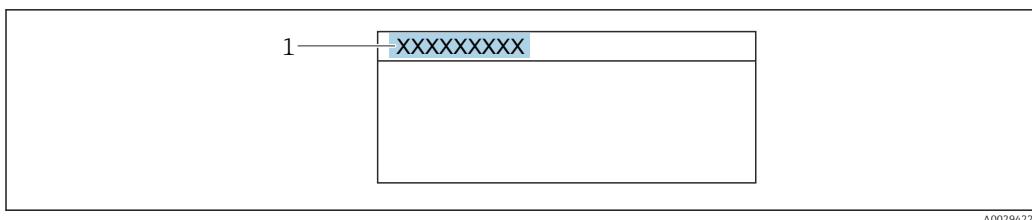
**Factory setting**

Device tag

**Additional information***Description*

The header text only appears during normal operation.

1) proportional transmission behavior with first order delay



1 Position of the header text on the display

#### *Selection*

- Device tag  
Is defined in the **Device tag** parameter (→ 209).
- Free text  
Is defined in the **Header text** parameter (→ 26).

## Header text



### Navigation

Expert → System → Display → Header text (0112)

### Prerequisite

In the **Header** parameter (→ 25), the **Free text** option is selected.

### Description

Use this function to enter a customer-specific text for the header of the local display.

### User entry

Max. 12 characters such as letters, numbers or special characters (e.g. @, %, /)

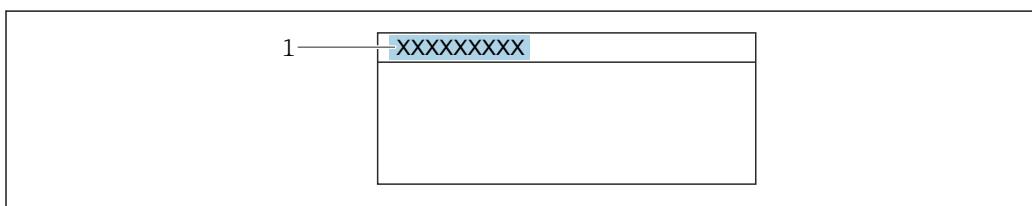
### Factory setting

-----

### Additional information

#### *Description*

The header text only appears during normal operation.



1 Position of the header text on the display

#### *User entry*

The number of characters displayed depends on the characters used.

## Separator



### Navigation

Expert → System → Display → Separator (0101)

### Prerequisite

A local display is provided.

**Description** Use this function to select the decimal separator.

**Selection**

- . (point)
- , (comma)

**Factory setting** . (point)

## Contrast display

**Navigation**  Expert → System → Display → Contrast display (0105)

**Prerequisite** A local display is provided.

**Description** Use this function to enter a value to adapt the display contrast to the ambient conditions (e.g. the lighting or viewing angle).

**User entry** 20 to 80 %

**Factory setting** Depends on the display

## Backlight

**Navigation**  Expert → System → Display → Backlight (0111)

**Prerequisite** One of the following conditions is met:

- Order code for "Display; operation", option **F** "4-line, illum.; touch control"
- Order code for "Display; operation", option **G** "4-line, illum.; touch control +WLAN"
- Order code for "Display; operation", option **O** "Separate 4-line display, illum.; 10m/30ft cable; touch control"

**Description** Use this function to switch the backlight of the local display on and off.

**Selection**

- Disable
- Enable

**Factory setting** Enable

### 3.1.2 "Configuration backup" submenu

*Navigation*  Expert → System → Config. backup

► Config. backup

Operating time (0652)

→  28

Last backup (2757)	→  28
Config. managem. (2758)	→  28
Backup state (2759)	→  29
Compar. result (2760)	→  29

## Operating time

**Navigation** Expert → System → Config. backup → Operating time (0652)

**Description** Use this function to display the length of time the device has been in operation.

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

**Additional information** *User interface*

The maximum number of days is 9999, which is equivalent to 27 years.

## Last backup

**Navigation** Expert → System → Config. backup → Last backup (2757)

**Description** Displays the time since a backup copy of the data was last saved to the device memory.

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

## Config. managem.



**Navigation** Expert → System → Config. backup → Config. managem. (2758)

**Description** Use this function to select an action to save the data to the device memory.

**Selection**

- Cancel
- Execute backup
- Restore \*
- Compare \*
- Clear backup

**Factory setting** Cancel

\* Visibility depends on order options or device settings

**Additional information***Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
Execute backup	A backup copy of the current device configuration is saved from the HistoROM backup to the memory of the device. The backup copy includes the transmitter data of the device. The following message appears on local display: Backup active, please wait!
Restore	The last backup copy of the device configuration is restored from the device memory to the device's HistoROM backup. The backup copy includes the transmitter data of the device. The following message appears on local display: Restore active! Do not interrupt power supply!
Compare	The device configuration saved in the device memory is compared with the current device configuration of the HistoROM backup. The following message appears on local display: Comparing files The result can be viewed in <b>Compar. result</b> parameter.
Clear backup	The backup copy of the device configuration is deleted from the memory of the device. The following message appears on local display: Deleting file

*HistoROM*

A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

**Backup state****Navigation**
 Expert → System → Config. backup → Backup state (2759)
**Description**

Displays the status of the data backup process.

**User interface**

- None
- Backup in progr.
- Restore in progr
- Delete in progr.
- Comp. in progr.
- Restoring failed
- Backup failed

**Factory setting**

None

**Compar. result****Navigation**
 Expert → System → Config. backup → Compar. result (2760)
**Description**

Displays the last result of the comparison of the data records in the device memory and in the HistoROM.

**User interface**

- Set. identical
- Set. not ident.
- No backup

- Backup corrupt
- Check not done
- Dataset incomp.

**Factory setting** Check not done

**Additional information** *Description*

**i** The comparison is started via the **Compare** option in the **Config. managem.** parameter (→ 28).

*Selection*

Options	Description
Set. identical	The current device configuration of the HistoROM is identical to the backup copy in the device memory. If the transmitter configuration of another device has been transmitted to the device via HistoROM in the <b>Config. managem.</b> parameter, the current device configuration of the HistoROM is only partially identical to the backup copy in the device memory: The settings for the transmitter are not identical.
Set. not ident.	The current device configuration of the HistoROM is not identical to the backup copy in the device memory.
No backup	There is no backup copy of the device configuration of the HistoROM in the device memory.
Backup corrupt	The current device configuration of the HistoROM is corrupt or not compatible with the backup copy in the device memory.
Check not done	The device configuration of the HistoROM has not yet been compared to the backup copy in the device memory.
Dataset incomp.	The backup copy in the device memory is not compatible with the device.

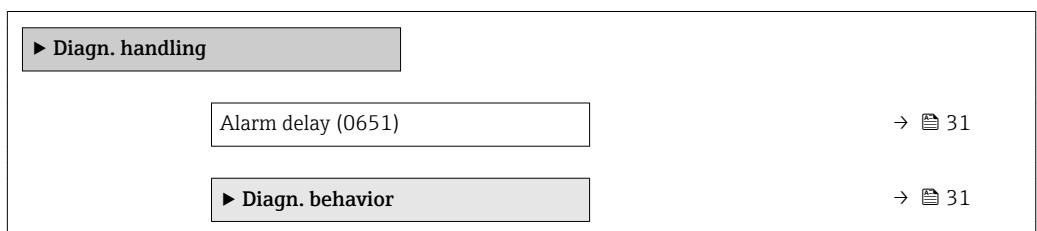
#### *HistoROM*

A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

### 3.1.3 "Diagn. handling" submenu

*Navigation*

Expert → System → Diagn. handling



**Alarm delay****Navigation**

Expert → System → Diagn. handling → Alarm delay (0651)

**Description**

Use this function to enter the time interval until the device generates a diagnostic message.



The diagnostic message is reset without a time delay.

**User entry**

0 to 60 s

**Factory setting**

0 s

**Additional information***Result*

This setting affects the following diagnostic messages:

- △S452 Calc. error
- 832 Electronic temp.
- 833 Electronic temp.
- 834 Process temp.
- 835 Process temp.
- △S836 Process pressure
- △S837 Process pressure
- △S840 Sensor range
- △S870 Meas. inaccuracy
- △S930 Process fluid
- △S931 Process fluid

**"Diagn. behavior" submenu**

Each item of diagnostic information is assigned a specific diagnostic behavior at the factory. The user can change this assignment for specific diagnostic information in the **Diagn. behavior** submenu (→ 31).

The following options are available in the **Assign behavior of diagnostic no. xxx** parameters:

Options	Description
Alarm	The device stops measurement. The signal outputs and totalizers assume the defined alarm condition. A diagnostic message is generated. The background lighting changes to red.
Warning	The device continues to measure. The signal outputs and totalizers are not affected. A diagnostic message is generated.
Logbook only	The device continues to measure. The diagnostic message is displayed only in the <b>Event logbook</b> submenu (→  206) ( <b>Event list</b> submenu (→  207)) and is not displayed in alternation with the operational display.
Off	The diagnostic event is ignored, and no diagnostic message is generated or entered.



For a list of all the diagnostic events, see the Operating Instructions for the device  
→ 7

*Navigation* Expert → System → Diagn. handling → Diagn. behavior

► Diagn. behavior	
Diagnostic no. 124 (0774)	→  33
Diagnostic no. 125 (0775)	→  33
Diagnostic no. 160 (0776)	→  33
Diagnostic no. 302 (0742)	→  34
Diagnostic no. 441 (0657)	→  34
Diagnostic no. 442 (0658)	→  34
Diagnostic no. 443 (0659)	→  35
Diagnostic no. 444 (0740)	→  35
Diagnostic no. 452 (0713)	→  35
Diagnostic no. 543 (0643)	→  36
Diagnostic no. 832 (0675)	→  36
Diagnostic no. 833 (0676)	→  37
Diagnostic no. 834 (0677)	→  37
Diagnostic no. 835 (0678)	→  37
Diagnostic no. 837 (0714)	→  38
Diagnostic no. 840 (0680)	→  38
Diagnostic no. 842 (0638)	→  38
Diagnostic no. 870 (0726)	→  39
Diagnostic no. 881 (0724)	→  39
Diagnostic no. 930 (0639)	→  40
Diagnostic no. 931 (0640)	→  40
Diagnostic no. 953 (0636)	→  40
Diagnostic no. 954 (0637)	→  41

---

**Diagnostic no. 124 (Rel.sig.strength)**

---



<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 124 (0774)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>124 Rel.sig.strength.</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 125 (Rel. sound vel.)**

---



<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 125 (0775)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>125 Rel. sound vel..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 160 (Signal path off)**

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<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 160 (0776)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>160 Signal path off.</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 302 (Verific. active)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 302 (0742)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>302 Verific. active</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 441 (Curr.output 1 to n)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 441 (0657)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>441 Curr.output 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	<i>Selection</i> Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 442 (Freq. output 1 to n)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 442 (0658)
<b>Prerequisite</b>	The measuring device has a pulse/frequency/switch output.
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>442 Freq. output 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
<b>Factory setting</b>	Warning

**Additional information**

Detailed description of the options available for selection: → 31

---

**Diagnostic no. 443 (Pulse output)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 443 (0659)

**Prerequisite**

The measuring device has a pulse/frequency/switch output.

**Description**

Option for changing the diagnostic behavior of the diagnostic message **443 Pulse output**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

*Selection*



Detailed description of the options available for selection: → 31

---

**Diagnostic no. 444 (Current input 1 to n)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 444 (0740)

**Prerequisite**

The device has one current input.

**Description**

Option for changing the diagnostic behavior of the diagnostic message **444 Current input 1 to n**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection: → 31

---

**Diagnostic no. 452 (Calc. error)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 452 (0713)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **452 Calc. error**.

<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 543 (Double pulse out)**

---



<b>Navigation</b>	  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 543 (0643)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>543 Double pulse out</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 832 (Electronic temp.)**

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<b>Navigation</b>	  Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 832 (0675)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>832 Electronic temp.</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 833 (Electronic temp.)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 833 (0676)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>833 Electronic temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	<i>Selection</i> Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 834 (Process temp.)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 834 (0677)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>834 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	<i>Selection</i> Detailed description of the options available for selection: → <a href="#">31</a>

---

**Diagnostic no. 835 (Process temp.)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 835 (0678)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>835 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ Alarm</li><li>▪ Warning</li><li>▪ Logbook only</li></ul>
<b>Factory setting</b>	Warning

**Additional information***Selection*

Detailed description of the options available for selection: → [31](#)

---

**Diagnostic no. 837 (Process pressure)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 837 (0714)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **837 Process pressure**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection: → [31](#)

---

**Diagnostic no. 841 (Sensor range)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 840 (0680)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **841 Sensor range**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

Detailed description of the options available for selection: → [31](#)

---

**Diagnostic no. 842 (Process limit)**

---

**Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 842 (0638)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **△S842 Process limit**.

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
------------------	--

<b>Factory setting</b>	Off
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<b>Additional information</b>	 Detailed description of the options available for selection: → <a href="#">31</a>
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## Diagnostic no. 870 (Meas. inaccuracy)



<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 870 (0726)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>870 Meas. inaccuracy</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	<i>Selection</i>  Detailed description of the options available for selection: → <a href="#">31</a>

---

## Diagnostic no. 881 (Sen.sig. path 1 to n)



<b>Navigation</b>	 Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 881 (0724)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>881 Sen.sig. path 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Alarm</li><li>■ Warning</li><li>■ Logbook only</li></ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	 Detailed description of the options available for selection: → <a href="#">31</a>

**Diagnostic no. 930 (Process fluid)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 930 (0639)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **△S930 Process fluid**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Alarm

**Additional information**

Detailed description of the options available for selection: → 31

**Diagnostic no. 931 (Process fluid)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 931 (0640)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **△S931 Process fluid**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Alarm

**Additional information**

Detailed description of the options available for selection: → 31

**Diagnostic no. 953 (Asy.noise path 1 to n)****Navigation**

Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 953 (0636)

**Description**

Option for changing the diagnostic behavior of the diagnostic message **△M953 Asy.noise path 1 to n**.

**Selection**

- Off
- Alarm
- Warning
- Logbook only

**Factory setting**

Warning

**Additional information**

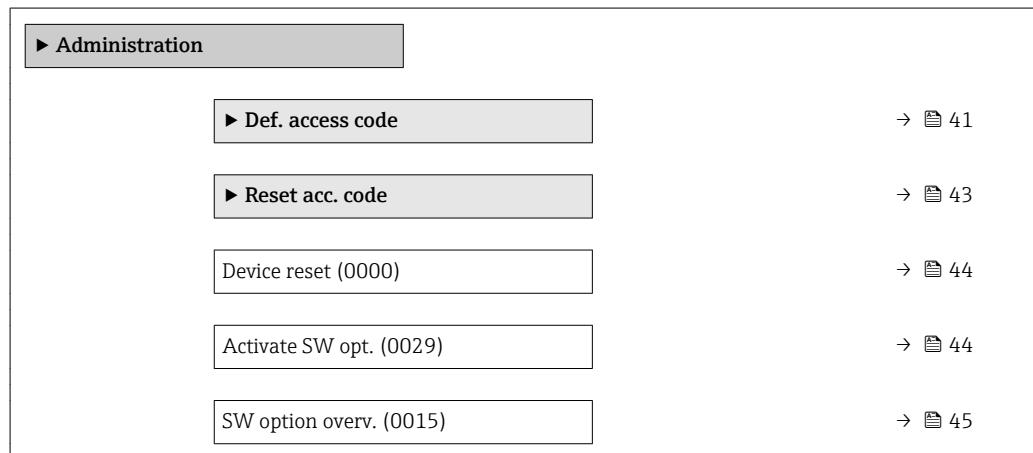
Detailed description of the options available for selection: → 31

**Diagnostic no. 954 (Sound v. dev. hi)**

<b>Navigation</b>	Expert → System → Diagn. handling → Diagn. behavior → Diagnostic no. 954 (0637)
<b>Description</b>	Option for changing the diagnostic behavior of the diagnostic message <b>△S954 Sound v. dev. hi.</b>
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Logbook only</li> </ul>
<b>Factory setting</b>	Warning
<b>Additional information</b>	Detailed description of the options available for selection: → <a href="#">31</a>

**3.1.4 "Administration" submenu***Navigation*

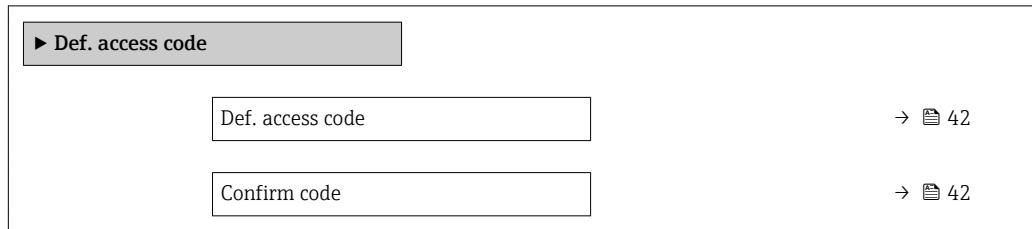
Expert → System → Administration

**"Def. access code" wizard**

The **Def. access code** wizard (→ [41](#)) is only available when operating via the local display or Web browser.

If operating via the operating tool, the **Def. access code** parameter can be found directly in the **Administration** submenu. There is no **Confirm code** parameter if the device is operated via the operating tool.

Navigation      Expert → System → Administration → Def. access code



## Def. access code



Navigation      Expert → System → Administration → Def. access code → Def. access code

### Description

Use this function to enter a user-specific release code to restrict write-access to the parameters. This protects the device configuration against any inadvertent modifications via the local display, Web browser, FieldCare or DeviceCare (via CDI-RJ45 service interface).

### User entry

Max. 16-digit character string comprising numbers, letters and special characters

### Additional information

#### Description

The write protection affects all parameters in the document marked with the symbol. On the local display, the symbol in front of a parameter indicates that the parameter is write-protected.

The parameters that cannot be write-accessed are grayed out in the Web browser.

Once the access code has been defined, write-protected parameters can only be modified if the access code is entered in the **Ent. access code** parameter (→ 13).

If you lose the access code, please contact your Endress+Hauser sales organization.

#### User entry

A message is displayed if the access code is not in the input range.

#### Factory setting

If the factory setting is not changed or **0** is defined as the access code, the parameters are not write-protected and the device configuration data can be modified. The user is logged on in the "**Maintenance**" role.

## Confirm code



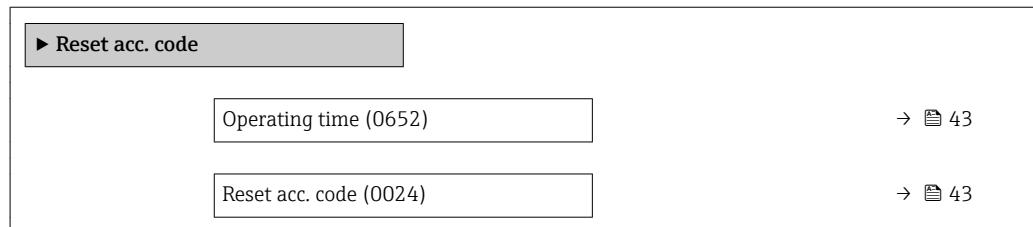
Navigation      Expert → System → Administration → Def. access code → Confirm code

### Description

Enter the defined release code a second time to confirm the release code.

### User entry

Max. 16-digit character string comprising numbers, letters and special characters

**"Reset access code" submenu****Navigation** Expert → System → Administration → Reset acc. code

---

**Operating time**

---

**Navigation** Expert → System → Administration → Reset acc. code → Operating time (0652)**Description**

Use this function to display the length of time the device has been in operation.

**User interface**

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***User interface*

The maximum number of days is 9999, which is equivalent to 27 years.

---

**Reset acc. code**

---

**Navigation** Expert → System → Administration → Reset acc. code → Reset acc. code (0024)**Description**

Use this function to enter a reset code to reset the user-specific release code to the factory setting.

**User entry**

Character string comprising numbers, letters and special characters

**Factory setting**

0x00

**Additional information***Description*

 For a reset code, contact your Endress+Hauser service organization.

*User entry*

The reset code can only be entered via:

- Web browser
- DeviceCare, FieldCare (via interface CDI RJ45)
- Fieldbus

### Additional parameters in the "Administration" submenu

**Device reset****Navigation**

Expert → System → Administration → Device reset (0000)

**Description**

Use this function to choose whether to reset the device configuration - either entirely or in part - to a defined state.

**Selection**

- Cancel
- To delivery set.
- Restart device

**Factory setting**

Cancel

**Additional information**

*Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
To delivery set.	Every parameter for which a customer-specific default setting was ordered is reset to this customer-specific value. All other parameters are reset to the factory setting.
Restart device	The restart resets every parameter whose data are in the volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.
Rest.S-DATBackup	Restore the data that are saved on the S-DAT. The data record is restored from the electronics memory to the S-DAT.  This option is displayed only in an alarm condition.

**Activate SW opt.****Navigation**

Expert → System → Administration → Activate SW opt. (0029)

**Description**

Use this function to enter an activation code to enable an additional, ordered software option.

**User entry**

Max. 10-digit string consisting of numbers.

**Factory setting**

Depends on the software option ordered

**Additional information**

*Description*

If a measuring device was ordered with an additional software option, the activation code is programmed in the device at the factory.

*User entry*

To activate a software option subsequently, please contact your Endress+Hauser sales organization.

**NOTE!**

**The activation code is linked to the serial number of the measuring device and varies according to the device and software option.**

If an incorrect or invalid code is entered, this results in the loss of software options that have already been activated.

- ▶ Before you enter a new activation code, make a note of the current activation code .
- ▶ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.
- ▶ Once the activation code has been entered, check if the new software option is displayed in the **SW option overv.** parameter (→  45).
  - ↳ The new software option is active if it is displayed.
  - ↳ If the new software option is not displayed or all software options have been deleted, the code entered was either incorrect or invalid.
  - ▶ If the code entered is incorrect or invalid, enter the old activation code .
  - ▶ Have your Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

*Example for a software option*

Order code for "Application package", option **EA** "Extended HistoROM"

-  The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

*Web browser*

-  Once a software option has been activated, the page must be loaded again in the Web browser.

---

## SW option overv.

---

**Navigation**

 Expert → System → Administration → SW option overv. (0015)

**Description**

Displays all the software options that are enabled in the device.

**User interface**

- Extend. HistoROM
- SIL
- HBT Monitoring
- HBT Verification
- Ad. gas analysis

**Additional information****Description**

Displays all the options that are available if ordered by the customer.

*"Extend. HistoROM" option*

Order code for "Application package", option EA "Extended HistoROM"

*"SIL" option*

Order code for "Additional approval", option LA "SIL"

*"HBT Verification" option and "HBT Monitoring" option*

Order code for "Application package", option EB "Heartbeat Verification + Monitoring"

*"Ad. gas analysis" option*

Order code for "Application package", option EF "Advanced gas analysis"

## 3.2 "Sensor" submenu

## Navigation

Expert → Sensor

<b>► Sensor</b>	
<b>► Measured val.</b>	→  46
<b>► System units</b>	→  62
<b>► Process param.</b>	→  74
<b>► Measurement mode</b>	→  78
<b>► External comp.</b>	→  85
<b>► Sensor adjustm.</b>	→  87
<b>► Calibration</b>	→  97

### 3.2.1 "Measured val." submenu

## Navigation

Expert → Sensor → Measured val.

<b>► Measured val.</b>	
<b>► Process variab.</b>	→  47
<b>► System values</b>	→  52

▶ Totalizer	→  54
▶ Input values	→  56
▶ Output values	→  58

### "Process variables" submenu

*Navigation*

Expert → Sensor → Measured val. → Process variab.

▶ Process variab.	
Volume flow (1838)	→  47
Correct.vol.flow (1857)	→  50
Mass flow (1847)	→  48
Flow velocity (1852)	→  49
Sound velocity (1850)	→  48
Temperature (1853)	→  49
Pressure (1872)	→  48
Dry CH <sub>4</sub> in % (1863)	→  50
Molar mass (1864)	→  51
Density (1865)	→  51
Dynam. viscosity (1887)	→  52
Calorific value (1893)	→  52
Wobbe index (1854)	→  50
Energy flow (1851)	→  49

---

### Volume flow

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Volume flow (1838)

**Description**

Displays the volume flow that is currently measured.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Volume flow unit** parameter (→ [63](#))

---

## Mass flow

---

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Mass flow (1847)

**Description** Displays the mass flow currently calculated.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Mass flow unit** parameter (→ [67](#))

---

## Sound velocity

---

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Sound velocity (1850)

**Description** Displays the sound velocity that is currently measured.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Velocity unit** parameter (→ [68](#))

---

## Pressure

---

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Pressure (1872)

**Prerequisite** For the following order code:

"Measuring tube; Transducer; Sensor version", option AC "316L; Titanium Gr. 2; pressure + temperature measurement integrated"

 The software options currently enabled are displayed in the **SW option overv.** parameter (→ [45](#)).

**Description** Displays the pressure that is currently measured.

**User interface** Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Pressure unit** parameter (→ [69](#))

---

**Energy flow**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Energy flow (1851)

**Description**

Displays the energy flow that is currently calculated.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Energy flow unit** parameter (→ [72](#))

---

**Flow velocity**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Flow velocity (1852)

**Description**

Displays the flow velocity that is currently measured.

**User interface**

Signed floating-point number

---

**Temperature**

---

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Temperature (1853)

**Prerequisite**

For the following order codes:

- "Measuring tube; Transducer; Sensor version", option AB "316L; Titanium Gr. 2; temperature measurement integrated"
- "Measuring tube; Transducer; Sensor version", option AC "316L; Titanium Gr. 2; pressure + temperature measurement integrated"



The software options currently enabled are displayed in the **SW option overv.** parameter (→ [45](#)).

**Description**

Displays the medium temperature that is currently measured.

**User interface**

Signed floating-point number

**Additional information***Dependency*

The unit is taken from the **Temperature unit** parameter (→ [69](#))

## Wobbe index

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Wobbe index (1854)

**Prerequisite** For the following order code:  
"Application package", option EF "Advanced gas analysis"

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

**Description** Displays the Wobbe index that is currently calculated.

**User interface** Signed floating-point number

**Additional information** *Description*

The Wobbe index compares the combustion energy output of different composition fuel gases in an appliance. If two fuels have identical Wobbe indices then for given pressure and valve settings the energy output will also be identical.

The Wobbe index is the ratio of the calorific value (heating value) and the square root of the gases' relative density (often called specific gravity). The relative density is the ratio of the density of the gas and the density of dry air under the same pressure and temperature conditions. This index refers to the gross calorific value (sometimes called gross energy or upper heating value or higher calorific value) or net calorific value (sometimes called net energy or lower heating value or lower calorific value).

*Dependency*

 The unit is taken from the **Cal. value unit** parameter (→  71)

## Correct.vol.flow

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Correct.vol.flow (1857)

**Description** Displays the corrected volume flow that is currently measured.

**User interface** Signed floating-point number

**Additional information** *Dependency*

 The unit is taken from the **Cor.volflow unit** parameter (→  66)

## Dry CH<sub>4</sub> in %

**Navigation**  Expert → Sensor → Measured val. → Process variab. → Dry CH<sub>4</sub> in % (1863)

**Prerequisite** For the following order code:  
"Application package", option EF "Advanced gas analysis"

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

**Description** Displays the methane content in Mol% that is currently calculated.

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Velocity unit** parameter (→ 68)

---

## Molar mass

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Molar mass (1864)

**Prerequisite** For the following order code:  
"Application package", option EF "Advanced gas analysis"



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 45).

**Description** Displays the molar mass in g/mol that is currently calculated.

**User interface** Signed floating-point number

---

## Density

---

**Navigation** Expert → Sensor → Measured val. → Process variab. → Density (1865)

**Prerequisite** For the following order code:  
"Application package", option EF "Advanced gas analysis"



The software options currently enabled are displayed in the **SW option overv.** parameter (→ 45).

**Description** Displays the density that is currently calculated.

*Dependency*

The unit is taken from the **Density unit** parameter (→ 70).

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Density unit** parameter (→ 70)

## Dynam. viscosity

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Dynam. viscosity (1887)

**Prerequisite**

For the following order code:  
"Application package", option EF "Advanced gas analysis"

 The software options currently enabled are displayed in the **SW option overv.** parameter (→ [45](#)).

**Description**

Displays the dynamic viscosity that is currently calculated.

**User interface**

Signed floating-point number

**Additional information**

*Dependency*

 The unit is taken from the **Dyn. visc. unit** parameter (→ [71](#)).

## Calorific value

**Navigation**

Expert → Sensor → Measured val. → Process variab. → Calorific value (1893)

**Prerequisite**

For the following order code:  
"Application package", option EF "Advanced gas analysis"

 The software options currently enabled are displayed in the **SW option overv.** parameter (→ [45](#)).

**Description**

Displays the calorific value that is currently calculated.

**User interface**

Signed floating-point number

**Additional information**

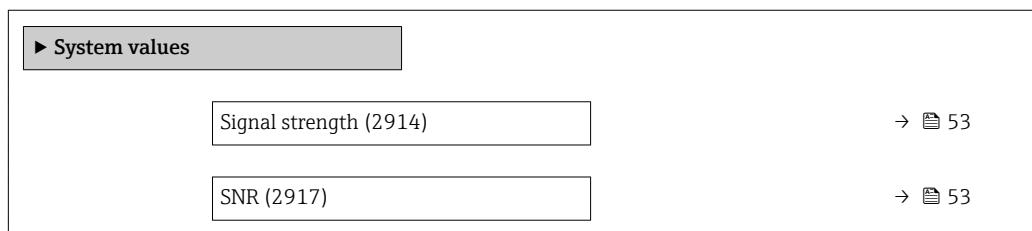
*Dependency*

 The unit is taken from the **Cal. value unit** parameter (→ [71](#))

## "System values" submenu

**Navigation**

Expert → Sensor → Measured val. → System values



[Turbulence \(2907\)](#)→ [54](#)[Flow asymmetry \(2913\)](#)→ [54](#)

## Signal strength

<b>Navigation</b>	  Expert → Sensor → Measured val. → System values → Signal strength (2914)
<b>Description</b>	Displays the current signal strength.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Description</i> A drop in the signal strength over time can be an indicator of deposit buildup on the converter or high ultrasonic damping in the gas.

## SNR

<b>Navigation</b>	  Expert → Sensor → Measured val. → System values → SNR (2917)
<b>Description</b>	Displays the current signal-to-noise ratio.
<b>User interface</b>	Signed floating-point number
<b>Additional information</b>	<i>Description</i> A low value or a drop in the signal to noise ratio over time is an indicator of poor signal quality.

## Acceptance rate

<b>Navigation</b>	  Expert → Sensor → Measured val. → System values → Acceptance rate (2912)
<b>Description</b>	Displays the ratio of the number of ultrasonic signals accepted for flow calculation and the total number of ultrasonic signals emitted.  Multipath measuring devices only: Displays the minimum of all acceptance rates measured.
<b>User interface</b>	0 to 100 %

## Turbulence

**Navigation**  Expert → Sensor → Measured val. → System values → Turbulence (2907)

**Description** Displays the current turbulence.

**User interface** Signed floating-point number

**Additional information** *Description*

A high turbulence value indicates a disturbance in the flow profile.

## Flow asymmetry

**Navigation**  Expert → Sensor → Measured val. → System values → Flow asymmetry (2913)

**Prerequisite**  Only available from nominal diameter DN 50 (2").

**Description** Displays the asymmetry of the flow velocity between signal path 1 and signal path 2.

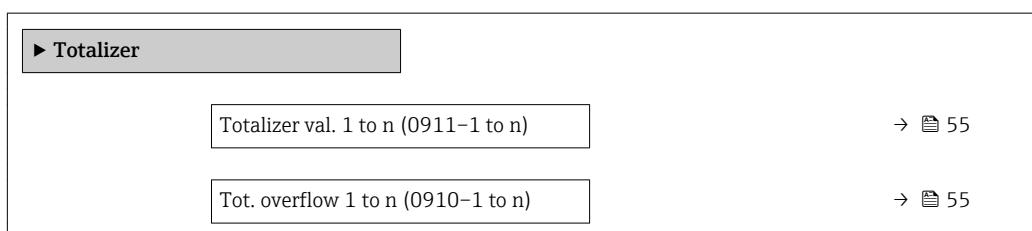
**User interface** Signed floating-point number

**Additional information** *Limit values*

If the value 0 is displayed, both flow velocities are the same. The higher the displayed value, the greater the difference between the two measured values of the signal paths.

## "Totalizer" submenu

*Navigation*  Expert → Sensor → Measured val. → Totalizer



**Totalizer val. 1 to n****Navigation**

Expert → Sensor → Measured val. → Totalizer → Totalizer val. 1 to n (0911–1 to n)

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ [194](#)) of the **Totalizer 1 to n** submenu:

- Volume flow
- Correct.vol.flow
- Mass flow
- Energy flow

**Description**

Displays the current totalizer reading.

**User interface**

Signed floating-point number

**Additional information***Description*

As it is only possible to display a maximum of 7 digits in the operating tool, the current counter value is the sum of the totalizer value and the overflow value from the **Tot. overflow 1 to n** parameter if the display range is exceeded.

In the event of an error, the totalizer adopts the mode defined in the **Failure mode** parameter (→ [197](#)).

*User interface*

The value of the process variable totalized since measuring began can be positive or negative. This depends on the settings in the **Operation mode** parameter (→ [196](#)).

The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [194](#)).

*Example*

Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

- Value in the **Totalizer val. 1** parameter: 1 968 457 m<sup>3</sup>
- Value in the **Tot. overflow 1** parameter: 1 · 10<sup>7</sup> (1 overflow) = 10 000 000 [m<sup>3</sup>]
- Current totalizer reading: 11 968 457 m<sup>3</sup>

**Tot. overflow 1 to n****Navigation**

Expert → Sensor → Measured val. → Totalizer → Tot. overflow 1 to n (0910–1 to n)

**Prerequisite**

One of the following options is selected in the **Assign variable** parameter (→ [194](#)) of the **Totalizer 1 to n** submenu:

- Volume flow
- Correct.vol.flow
- Mass flow
- Energy flow

**Description**

Displays the current totalizer overflow.

**User interface**

Integer with sign

**Additional information****Description**

If the current totalizer reading exceeds 7 digits, which is the maximum value range that can be displayed by the operating tool, the value above this range is output as an overflow. The current totalizer value is therefore the sum of the overflow value and the totalizer value from the **Totalizer val. 1 to n** parameter.

*User interface*

**i** The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ [194](#)).

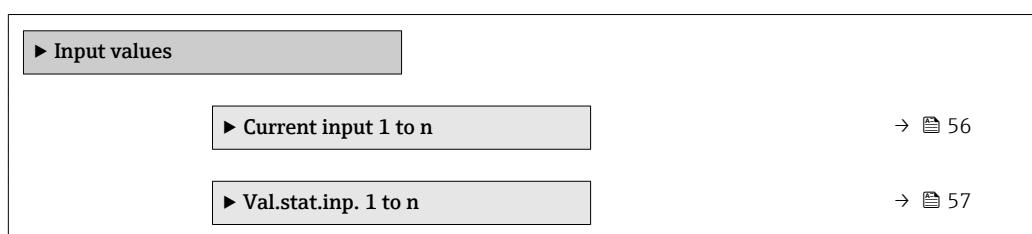
*Example*

Calculation of the current totalizer reading when the value exceeds the 7-digit display range of the operating tool:

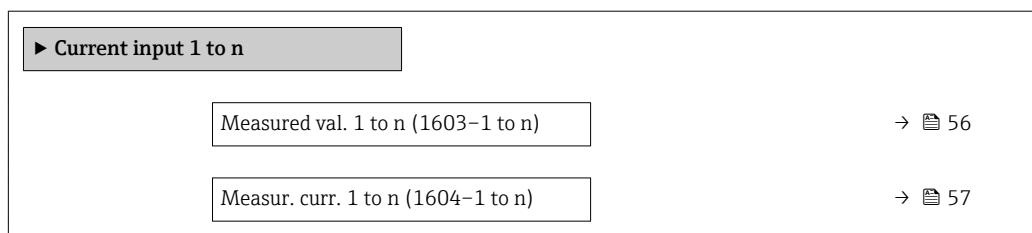
- Value in the **Totalizer val. 1** parameter: 1968457 m<sup>3</sup>
- Value in the **Tot. overflow 1** parameter:  $2 \cdot 10^7$  (2 overflows) = 20 000 000 [m<sup>3</sup>]
- Current totalizer reading: 21 968 457 m<sup>3</sup>

**"Input values" submenu***Navigation*

Expert → Sensor → Measured val. → Input values

**"Current input 1 to n" submenu***Navigation*

Expert → Sensor → Measured val. → Input values → Current input 1 to n

**Measured val. 1 to n****Navigation**

Expert → Sensor → Measured val. → Input values → Current input 1 to n  
→ Measured val. 1 to n (1603-1 to n)

**Description**

Displays the current input value.

**User interface** Signed floating-point number

**Additional information** *Dependency*



The unit is taken from the **Pressure unit** parameter (→ 69)

### Measur. curr. 1 to n

**Navigation** Expert → Sensor → Measured val. → Input values → Current input 1 to n → Measur. curr. 1 to n (1604–1 to n)

**Description** Displays the current value of the current input.

**User interface** 0 to 22.5 mA

"Value status input 1 to n" submenu

*Navigation*

Expert → Sensor → Measured val. → Input values → Val.stat.inp. 1 to n

► Val.stat.inp. 1 to n

Val.stat.inp. (1353–1 to n)

→ 57

### Val.stat.inp.

**Navigation** Expert → Sensor → Measured val. → Input values → Val.stat.inp. 1 to n → Val.stat.inp. (1353–1 to n)

**Description** Displays the current input signal level.

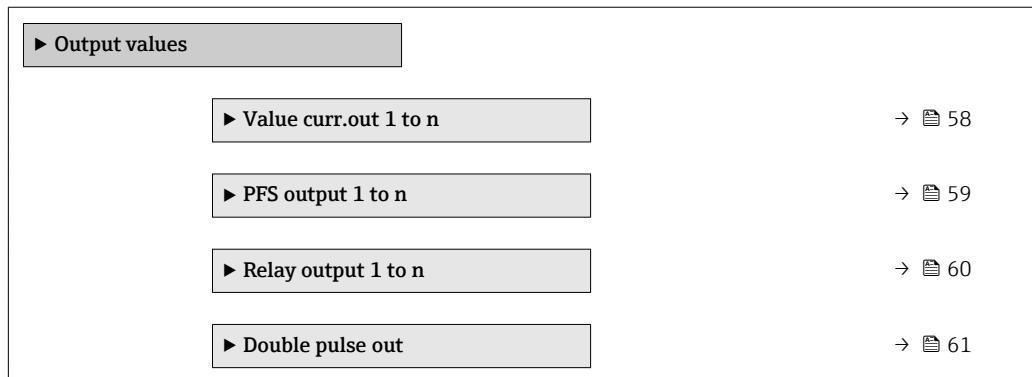
**User interface**

- High
- Low

**"Output values" submenu**

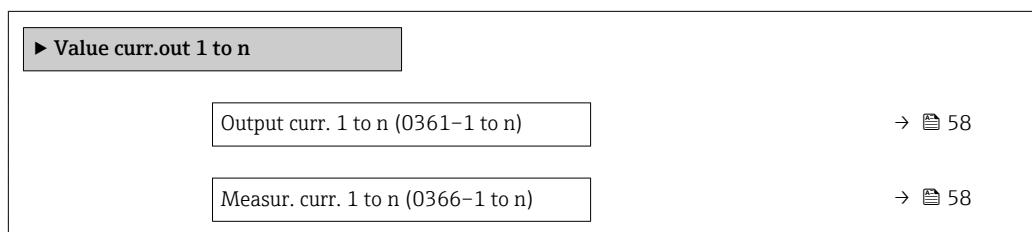
Navigation

Expert → Sensor → Measured val. → Output values

**"Value current output 1 to n" submenu**

Navigation

Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n

**Output curr. 1 to n****Navigation**

Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Output curr. 1 to n (0361-1 to n)

**Description**

Displays the current value currently calculated for the current output.

**User interface**

0 to 22.5 mA

**Measur. curr. 1 to n****Navigation**

Expert → Sensor → Measured val. → Output values → Value curr.out 1 to n → Measur. curr. 1 to n (0366-1 to n)

**Description**

Use this function to display the actual measured value of the output current.

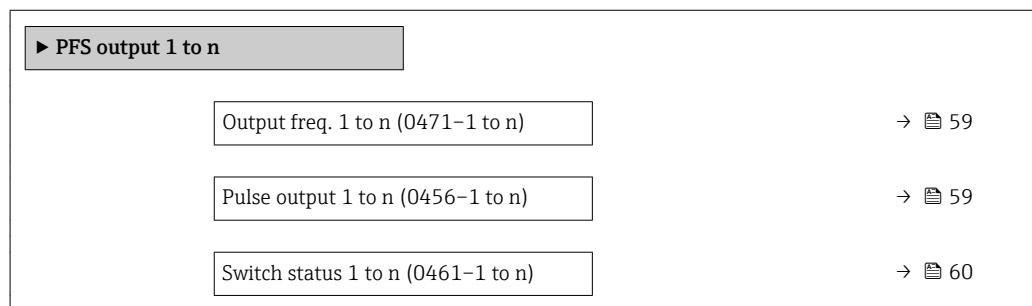
**User interface**

0 to 30 mA

*"Pulse/frequency/switch output 1 to n" submenu*

*Navigation*

Expert → Sensor → Measured val. → Output values → PFS output 1 to n



## Output freq. 1 to n

**Navigation**

Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Output freq. 1 to n (0471-1 to n)

**Prerequisite**

In the **Operating mode** parameter (→ 121), the **Frequency** option is selected.

**Description**

Displays the actual value of the output frequency which is currently measured.

**User interface**

0.0 to 12 500.0 Hz

## Pulse output 1 to n

**Navigation**

Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Pulse output 1 to n (0456-1 to n)

**Prerequisite**

The **Pulse** option is selected in the **Operating mode** parameter (→ 121) parameter.

**Description**

Displays the pulse frequency currently output.

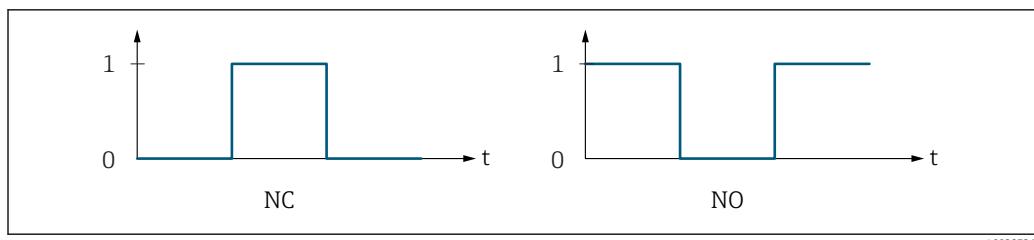
**User interface**

Positive floating-point number

**Additional information**

*Description*

- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.



- 0 Non-conductive
- 1 Conductive
- NC NC contact (normally closed)
- NO NO contact (normally open)

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ 138) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ 125)) can be configured.

## Switch status 1 to n

**Navigation**      Expert → Sensor → Measured val. → Output values → PFS output 1 to n → Switch status 1 to n (0461-1 to n)

**Prerequisite**      The **Switch** option is selected in the **Operating mode** parameter (→ 121).

**Description**      Displays the current switch status of the status output.

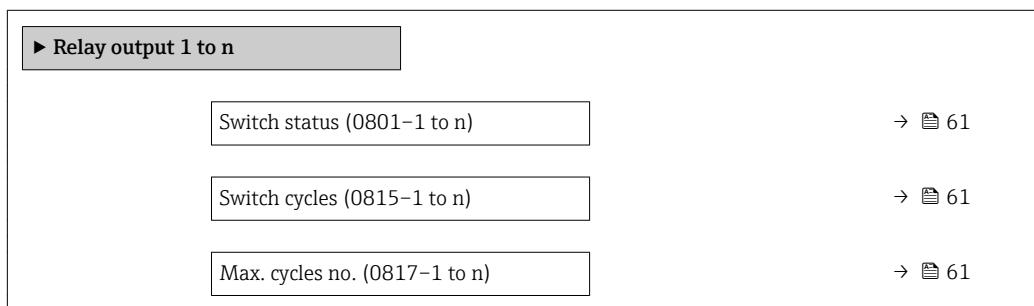
- Open
- Closed

**Additional information**      *User interface*

- Open  
The switch output is not conductive.
- Closed  
The switch output is conductive.

### "Relay output 1 to n" submenu

**Navigation**      Expert → Sensor → Measured val. → Output values → Relay output 1 to n



---

**Switch status**

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch status (0801-1 to n)
<b>Description</b>	Displays the current status of the relay output.
<b>User interface</b>	<ul style="list-style-type: none"> <li>▪ Open</li> <li>▪ Closed</li> </ul>
<b>Additional information</b>	<p><i>User interface</i></p> <ul style="list-style-type: none"> <li>▪ Open The relay output is not conductive.</li> <li>▪ Closed The relay output is conductive.</li> </ul>

---

**Switch cycles**

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Switch cycles (0815-1 to n)
<b>Description</b>	Displays all the switch cycles performed.
<b>User interface</b>	Positive integer

---

**Max. cycles no.**

---

<b>Navigation</b>	 Expert → Sensor → Measured val. → Output values → Relay output 1 to n → Max. cycles no. (0817-1 to n)
<b>Description</b>	Displays the maximum number of guaranteed switch cycles.
<b>User interface</b>	Positive integer

*"Double pulse output" submenu*

*Navigation*       Expert → Sensor → Measured val. → Output values → Double pulse out

► Double pulse out

Pulse output (0987)

→  62

## Pulse output

### Navigation

Expert → Sensor → Measured val. → Output values → Double pulse out → Pulse output (0987)

### Description

Displays the pulse frequency of the double pulse output which is currently output.

### User interface

Positive floating-point number

### Additional information

 For a detailed description and example: **Pulse output** parameter (→ 59)

## 3.2.2 "System units" submenu

### Navigation

Expert → Sensor → System units

► System units	
Volume flow unit (0553)	→ 63
Volume unit (0563)	→ 65
Cor.volflow unit (0558)	→ 66
Corr. vol. unit (0575)	→ 66
Mass flow unit (0554)	→ 67
Mass unit (0574)	→ 68
Velocity unit (0566)	→ 68
Temperature unit (0557)	→ 69
Pressure unit (0564)	→ 69
Density unit (0555)	→ 70
Energy unit (0559)	→ 70
Dyn. visc. unit (0577)	→ 71
Cal. value unit (0552)	→ 71
Energy flow unit (0565)	→ 72
Length unit (0551)	→ 72

SpecHeatCapaUnit (0604)

→ 73

Date/time format (2812)

→ 73

## Volume flow unit



### Navigation

Expert → Sensor → System units → Volume flow unit (0553)

### Description

Use this function to select the unit for the volume flow.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ cm <sup>3</sup> /s	■ af/s	■ gal/s (imp)	
■ cm <sup>3</sup> /min	■ af/min	■ gal/min (imp)	
■ cm <sup>3</sup> /h	■ af/h	■ gal/h (imp)	
■ cm <sup>3</sup> /d	■ af/d	■ gal/d (imp)	
■ dm <sup>3</sup> /s	■ ft <sup>3</sup> /s	■ Mgal/s (imp)	
■ dm <sup>3</sup> /min	■ ft <sup>3</sup> /min	■ Mgal/min (imp)	
■ dm <sup>3</sup> /h	■ ft <sup>3</sup> /h	■ Mgal/h (imp)	
■ dm <sup>3</sup> /d	■ ft <sup>3</sup> /d	■ Mgal/d (imp)	
■ m <sup>3</sup> /s	■ MMft <sup>3</sup> /s	■ bbl/s (imp;beer)	
■ m <sup>3</sup> /min	■ MMft <sup>3</sup> /min	■ bbl/min (imp;beer)	
■ m <sup>3</sup> /h	■ MMft <sup>3</sup> /h	■ bbl/h (imp;beer)	
■ m <sup>3</sup> /d	■ Mft <sup>3</sup> /d	■ bbl/d (imp;beer)	
■ ml/s	■ fl oz/s (us)	■ bbl/s (imp;oil)	
■ ml/min	■ fl oz/min (us)	■ bbl/min (imp;oil)	
■ ml/h	■ fl oz/h (us)	■ bbl/h (imp;oil)	
■ ml/d	■ fl oz/d (us)	■ bbl/d (imp;oil)	
■ l/s	■ gal/s (us)		
■ l/min	■ gal/min (us)		
■ l/h	■ gal/h (us)		
■ l/d	■ gal/d (us)		
■ hl/s	■ Mgal/s (us)		
■ hl/min	■ Mgal/min (us)		
■ hl/h	■ Mgal/h (us)		
■ hl/d	■ Mgal/d (us)		
■ Ml/s	■ bbl/s (us;liq.)		
■ Ml/min	■ bbl/min (us;liq.)		
■ Ml/h	■ bbl/h (us;liq.)		
■ Ml/d	■ bbl/d (us;liq.)		
	■ bbl/s (us;beer)		
	■ bbl/min (us;beer)		
	■ bbl/h (us;beer)		
	■ bbl/d (us;beer)		
	■ bbl/s (us;oil)		
	■ bbl/min (us;oil)		
	■ bbl/h (us;oil)		
	■ bbl/d (us;oil)		
	■ bbl/s (us;tank)		
	■ bbl/min (us;tank)		
	■ bbl/h (us;tank)		
	■ bbl/d (us;tank)		
	■ kgal/s (us)		
	■ kgal/min (us)		
	■ kgal/h (us)		
	■ kgal/d (us)		
Factory setting	Country-specific:		
	■ m <sup>3</sup> /h		
	■ ft <sup>3</sup> /h		

**Additional information***Result*

The selected unit applies for:  
**Volume flow** parameter (→ 47)

*Selection*

For an explanation of the abbreviated units: → 241

*Customer-specific units*

The unit for the customer-specific volume is specified in the **Volume text** parameter.

**Volume unit****Navigation**

Expert → Sensor → System units → Volume unit (0563)

**Description**

Use this function to select the unit for the volume.

**Selection***SI units*

- cm<sup>3</sup>
- /cm<sup>3</sup>
- dm<sup>3</sup>
- /dm<sup>3</sup>
- m<sup>3</sup>
- /m<sup>3</sup>
- ml
- /ml
- l
- /l
- hl
- /hl
- Ml Mega
- /Ml

*US units*

- af
- /af
- ft<sup>3</sup>
- /ft<sup>3</sup>
- Mft<sup>3</sup>
- /MMft<sup>3</sup>
- fl oz (us)
- /fl oz (us)
- gal (us)
- /gal (us)
- kgal (us)
- /kgal (us)
- Mgal (us)
- /Mgal (us)
- bbl (us;oil)
- /bbl (us;oil)
- bbl (us;liq.)
- /bbl (us;liq.)
- bbl (us;beer)
- /bbl (us;beer)
- bbl (us;tank)
- /bbl (us;tank)

*Imperial units*

- gal (imp)
- /gal (imp)
- Mgal (imp)
- /Mgal (imp)
- bbl (imp;beer)
- /bbl (imp;beer)
- bbl (imp;oil)
- /bbl (imp;oil)

**Factory setting**

## Country-specific:

- m<sup>3</sup>
- ft<sup>3</sup>

**Additional information***Selection*

For an explanation of the abbreviated units: → 241

**Cor.volflow unit****Navigation**

Expert → Sensor → System units → Cor.volflow unit (0558)

**Description**

Use this function to select the unit for the corrected volume flow.

**Selection***SI units*

- NI/s
- NI/min
- NI/h
- NI/d
- Nhl/s
- Nhl/min
- Nhl/h
- Nhl/d
- Nm<sup>3</sup>/s
- Nm<sup>3</sup>/min
- Nm<sup>3</sup>/h
- Nm<sup>3</sup>/d
- Sl/s
- Sl/min
- Sl/h
- Sl/d
- Sm<sup>3</sup>/s
- Sm<sup>3</sup>/min
- Sm<sup>3</sup>/h
- Sm<sup>3</sup>/d
- MSft<sup>3</sup>/d

*US units*

- Sft<sup>3</sup>/s
- Sft<sup>3</sup>/min
- Sft<sup>3</sup>/h
- Sft<sup>3</sup>/d
- Sgal/s (us)
- Sgal/min (us)
- Sgal/h (us)
- Sgal/d (us)
- Sbbl/s (us;liq.)
- Sbbl/min (us;liq.)
- Sbbl/h (us;liq.)
- Sbbl/d (us;liq.)
- MMSft<sup>3</sup>/s
- MMSft<sup>3</sup>/min
- MMSft<sup>3</sup>/h
- Sbbl/s (us;oil)
- Sbbl/min (us;oil)
- Sbbl/h (us;oil)
- Sbbl/d (us;oil)

*Imperial units*

- Sgal/s (imp)
- Sgal/min (imp)
- Sgal/h (imp)
- Sgal/d (imp)

**Factory setting**

Country-specific:

- Nm<sup>3</sup>/h
- Sft<sup>3</sup>/h

**Additional information***Result*

The selected unit applies for:  
Correct.vol.flow (→ 50)

*Selection*

For an explanation of the abbreviated units: → 241

**Corr. vol. unit****Navigation**

Expert → Sensor → System units → Corr. vol. unit (0575)

**Description**

Use this function to select the unit for the corrected volume.

Selection	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ Nl	■ Sft <sup>3</sup>	■ Sgal (imp)
	■ /Nl	■ /Sft <sup>3</sup>	■ /Sgal (imp)
	■ Nhl	■ MMSft <sup>3</sup>	
	■ /Nhl	■ /MMSft <sup>3</sup>	
	■ Nm <sup>3</sup>	■ Sgal (us)	
	■ /Nm <sup>3</sup>	■ /Sgal (us)	
	■ SI	■ Sbbl (us;liq.)	
	■ /SI	■ /Sbbl (us;liq.)	
	■ Sm <sup>3</sup>	■ Sbbl (us;oil)	
	■ /Sm <sup>3</sup>	■ /Sbbl (us;oil)	
Factory setting	Country-specific:		
	■ Nm <sup>3</sup>		
	■ Sft <sup>3</sup>		
Additional information	<i>Selection</i>		
	 For an explanation of the abbreviated units: → <a href="#">241</a>		

**Mass flow unit**

**Navigation**  Expert → Sensor → System units → Mass flow unit (0554)

**Description** Use this function to select the unit for the mass flow.

Selection	<i>SI units</i>	<i>US units</i>
	■ g/s	■ oz/s
	■ g/min	■ oz/min
	■ kg/s	■ lb/s
	■ kg/min	■ lb/min
	■ kg/h	■ lb/h
	■ kg/d	■ lb/d
	■ t/h	■ STon/h
	■ t/d	■ STon/d

**Factory setting** Country-specific:

- kg/h
- lb/h

**Additional information** *Result*

The selected unit applies for:

**Mass flow** parameter (→ [48](#))

*Selection*

 For an explanation of the abbreviated units: → [241](#)

**Mass unit****Navigation**

Expert → Sensor → System units → Mass unit (0574)

**Description**

Use this function to select the unit for the mass.

**Selection***SI units*

- g
- /g
- kg
- /kg
- t
- /t

*US units*

- oz
- /oz
- lb
- /lb
- STon
- /STon

**Factory setting**

Country-specific:

- kg
- lb

**Additional information***Selection*

For an explanation of the abbreviated units: → [241](#)

**Velocity unit****Navigation**

Expert → Sensor → System units → Velocity unit (0566)

**Description**

Use this function to select the unit for the flow velocity.

**Selection***SI units*

m/s

*US units*

ft/s

**Factory setting**

Country-specific:

- m/s
- ft/s

**Additional information***Result*

The selected unit applies for:

- Flow velocity (→ [49](#))
- Sound velocity (→ [48](#))
- Maximum value
- Minimum value

*Selection*

For an explanation of the abbreviated units: → [241](#)

---

**Temperature unit**

**Navigation** Expert → Sensor → System units → Temperature unit (0557)

**Description** Use this function to select the unit for the temperature.

Selection	<i>SI units</i>	<i>US units</i>
	▪ °C	▪ °F
	▪ K	▪ °R

<b>Factory setting</b>	Country-specific: ▪ °C ▪ °F
------------------------	-----------------------------------

<b>Additional information</b>	<i>Result</i> The selected unit applies for: Temperature (→  49)
-------------------------------	--

*Selection*

For an explanation of the abbreviated units: → 241

---

**Pressure unit**

**Navigation** Expert → Sensor → System units → Pressure unit (0564)

**Description** Use this function to select the unit for the pipe pressure.

Selection	<i>SI units</i>	<i>US units</i>
	▪ MPa	psi
	▪ kPa	
	▪ Pa	
	▪ bar	

<b>Factory setting</b>	Country-specific: ▪ bar a ▪ psi a
------------------------	---

<b>Additional information</b>	<i>Result</i> The unit is taken from: <b>Process pressure</b> parameter (5640)
-------------------------------	--

*Selection*

For an explanation of the abbreviated units: → 241

**Density unit****Navigation**

Expert → Sensor → System units → Density unit (0555)

**Description**

Use this function to select the unit for the density.

**Selection***SI units*

- g/cm<sup>3</sup>
- g/m<sup>3</sup>
- kg/l
- kg/dm<sup>3</sup>
- kg/m<sup>3</sup>
- SD4°C
- SD15°C
- SD20°C
- SG4°C
- SG15°C
- SG20°C

*US units*

- lb/ft<sup>3</sup>
- lb/gal (us)
- lb/bbl (us;liq.)
- lb/bbl (us;beer)
- lb/bbl (us;oil)
- lb/bbl (us;tank)

*Imperial units*

- lb/gal (imp)
- lb/bbl (imp;beer)
- lb/bbl (imp;oil)

**Factory setting**

Country-specific:

- kg/m<sup>3</sup>
- lb/ft<sup>3</sup>

**Additional information**

*Selection*

For an explanation of the abbreviated units: → [241](#)

**Energy unit****Navigation**

Expert → Sensor → System units → Energy unit (0559)

**Description**

Use this function to select the unit for energy.

**Selection***SI units*

- kWh
- MWh
- GWh
- kJ
- MJ
- GJ
- kcal
- Mcal

*Imperial units*

- Btu
- MBtu
- MMBtu

**Factory setting**

Country-specific:

- kWh
- Btu

**Additional information**

*Selection*

For an explanation of the abbreviated units: → [241](#)

**Dyn. visc. unit**

**Navigation** Expert → Sensor → System units → Dyn. visc. unit (0577)

**Description** Use this function to select the unit for dynamic viscosity.

**Selection** *SI units*

- cP
- mPa s
- Pa s
- P

**Factory setting** Pa s

**Additional information** *Result*

The selected unit applies for:

**Dynam. viscosity** parameter (gases)

**Additional information** *Selection*

For an explanation of the abbreviated units: → 241

**Cal. value unit**

**Navigation** Expert → Sensor → System units → Cal. value unit (0552)

**Description** Use this function to select the unit for the calorific value.

**Selection**

*SI units*

- kJ/Nm<sup>3</sup>
- MJ/Nm<sup>3</sup>
- kWh/Nm<sup>3</sup>
- kWh/Sm<sup>3</sup>
- kJ/Sm<sup>3</sup>

*Imperial units*

- Btu/Sm<sup>3</sup>
- MBtu/Sm<sup>3</sup>
- Btu/Sft<sup>3</sup>
- MBtu/Sft<sup>3</sup>

**Factory setting** Country-specific:

- kWh/Nm<sup>3</sup>
- Btu/Sft<sup>3</sup>

**Additional information** *Result*

The selected unit applies for:

- **Calorific value** parameter (→ 49)
- **Wobbe index** parameter (→ 50)

*Selection*

For an explanation of the abbreviated units: → 241

**Energy flow unit****Navigation**

Expert → Sensor → System units → Energy flow unit (0565)

**Description**

Use this function to select the unit for the energy flow.

**Selection***SI units*

- kW
- MW
- kJ/s
- kJ/min
- kJ/h
- kJ/d
- MJ/h
- MJ/d
- kcal/s
- kcal/min
- kcal/h
- kcal/d

*Imperial units*

- Btu/s
- Btu/min
- Btu/h
- Btu/day
- MBtu/min
- MBtu/h
- MBtu/d
- MMBtu/h
- MMBtu/d

**Factory setting**

Country-specific:

- kW
- Btu/h

**Additional information***Selection*

For an explanation of the abbreviated units: → [241](#)

**Length unit****Navigation**

Expert → Sensor → System units → Length unit (0551)

**Description**

Use this function to select the unit of length for the nominal diameter.

**Selection***SI units*

- m
- mm
- μm

*US units*

- ft
- in

**Factory setting**

Country-specific:

- mm
- in

**Additional information***Selection*

For an explanation of the abbreviated units: → [241](#)

**SpecHeatCapaUnit****Navigation**

Expert → Sensor → System units → SpecHeatCapaUnit (0604)

**Prerequisite**

The following conditions are met:

Selected medium:

The **User-spec. gas** option is selected in the **Select gas type** parameter parameter.

**Description**

Use this function to select the unit for the specific heat capacity.

**Selection***SI units*

- J/(kgK)
- kJ/(kgK)
- MJ/(kgK)
- kWh/(kgK)
- kcal/(kgK)

*Imperial units*

Btu/(lb°R)

**Factory setting**

J/(kgK)

**Additional information***Result*

The selected unit applies for:

**Spec. heat cap.** parameter

*Selection*

For an explanation of the abbreviated units: → [241](#)

**Date/time format**

Expert → Sensor → System units → Date/time format (2812)

**Description**

Use this function to select the desired time format for calibration history.

**Selection**

- dd.mm.yy hh:mm
- dd.mm.yy am/pm
- mm/dd/yy hh:mm
- mm/dd/yy am/pm

**Factory setting**

dd.mm.yy hh:mm

**Additional information***Selection*

For an explanation of the abbreviated units: → [241](#)

### 3.2.3 "Process param." submenu

**Navigation**

Expert → Sensor → Process param.

▶ Process param.	
Flow override (1839)	→ 74
Flow damping (1802)	→ 74
Gas prop. damp. (1888)	→ 75
Temp. damping (1803)	→ 76
Pressure damping (1889)	→ 76
▶ Low flow cut off	→ 76

#### Flow override



**Navigation**

Expert → Sensor → Process param. → Flow override (1839)

**Description**

Use this function to select whether to interrupt the evaluation of measured values. This is useful for the cleaning processes of a pipeline, for example.

**Selection**

- Off
- On

**Factory setting**

Off

**Additional information**

*Description*

**Flow override is active**

- The diagnostic message **△C453 Flow override** is output.
- Output values
  - Temperature: continues to be output
  - Pressure: continues to be output
  - Sound velocity: continues to be output
  - Totalizers 1-3: stop being totalized

**i** The **Flow override** option can also be activated in the **Status input** submenu: **Assign stat.inp.** parameter (→ 105).

#### Flow damping



**Navigation**

Expert → Sensor → Process param. → Flow damping (1802)

**Description**

Use this function to enter a time constant for flow damping (PT1 element). Reduction of the variability of the flow measured value (in relation to interference). For this purpose,

the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.

**User entry** 0 to 999.9 s

**Factory setting** 1 s

**Additional information** *Description*

 The damping is performed by a PT1 element<sup>2)</sup>.

*User entry*

- Value = 0: no damping
- Value > 0: damping is increased

 Damping is switched off if **0** is entered (factory setting).

*Result*

 The damping affects the following variables of the device:

- Outputs → [106](#)
- Low flow cut off → [76](#)
- Totalizers → [193](#)

## Gas prop. damp.



**Navigation**  Expert → Sensor → Process param. → Gas prop. damp. (1888)

**Description** Use this function to enter the time constant for gas properties damping. Reduction of the variability of the flow measured value (in relation to interference). For this purpose, the depth of the flow filter is adjusted: when the filter setting increases, the reaction time of the device also increases.

**User entry** 0 to 999.9 s

**Factory setting** 1 s

**Additional information** *Result*

 The damping has an effect on the following outputs:

- Correct.vol.flow (→ [50](#))
- Density (→ [51](#))
- Dry CH<sub>4</sub> in % (→ [50](#))
- Dynam. viscosity (→ [52](#))
- Calorific value (→ [52](#))
- Wobbe index (→ [50](#))
- Energy flow (→ [49](#))

2) Proportional behavior with first-order lag

**Temp. damping**

**Navigation** Expert → Sensor → Process param. → Temp. damping (1803)

**Description** Enter the value for damping the temperature value and the sound velocity.

**User entry** 0 to 999.9 s

**Factory setting** 10 s

**Additional information** *Description*

The damping is performed by a PT1 element<sup>3)</sup>.

*User entry*

- Value = 0: no damping
- Value > 0: damping is increased

Damping is switched off if **0** is entered (factory setting).

**Pressure damping**

**Navigation** Expert → Sensor → Process param. → Pressure damping (1889)

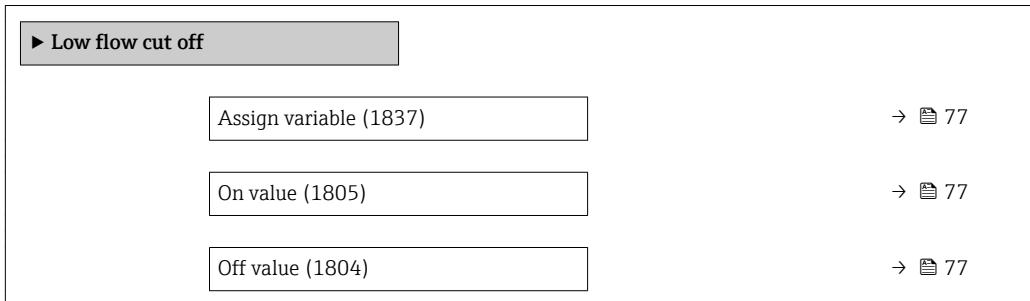
**Description** Enter value for damping the pressure.

**User entry** 0 to 999.9 s

**Factory setting** 0 s

**"Low flow cut off" submenu**

*Navigation* Expert → Sensor → Process param. → Low flow cut off



3) Proportional behavior with first-order lag

**Assign variable**

**Navigation** Expert → Sensor → Process param. → Low flow cut off → Assign variable (1837)

**Description** Use this function to select the process variable for low flow cutoff detection.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity \*
- Energy flow \*

**Factory setting** Volume flow

**On value**

**Navigation** Expert → Sensor → Process param. → Low flow cut off → On value (1805)

**Prerequisite** A process variable is selected in the **Assign variable** parameter (→ [77](#)).

**Description** Use this function to enter a switch-on value for low flow cut off. Low flow cut off is activated if the value entered is not equal to 0 → [77](#).

**User entry** Positive floating-point number

**Factory setting** Depends on country and nominal diameter → [238](#)

**Additional information**

*Dependency*

The unit depends on the process variable selected in the **Assign variable** parameter (→ [77](#)).

**Off value**

**Navigation** Expert → Sensor → Process param. → Low flow cut off → Off value (1804)

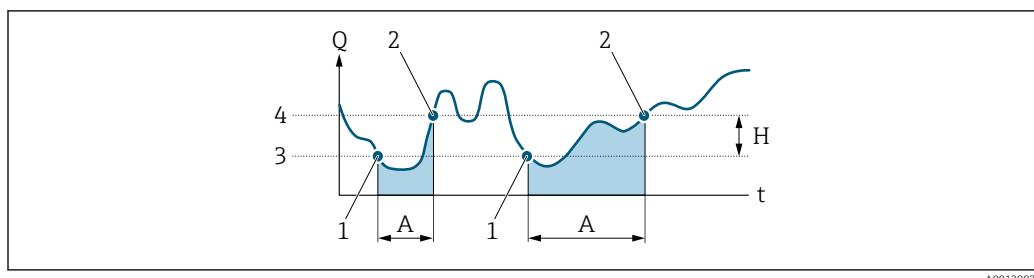
**Prerequisite** A process variable is selected in the **Assign variable** parameter (→ [77](#)).

**Description** Use this function to enter a switch-off value for low flow cut off. The off value is entered as a positive hysteresis from the on value → [77](#).

**User entry** 0 to 100.0 %

**Factory setting** 50 %

\* Visibility depends on order options or device settings

**Additional information***Example*

- Q* Flow
- t* Time
- H* Hysteresis
- A* Low flow cut off active
- 1 Low flow cut off is activated
- 2 Low flow cut off is deactivated
- 3 On value entered
- 4 Off value entered

**3.2.4 "Measurement mode" submenu**

Navigation

Expert → Sensor → Measurement mode

<b>► Measurement mode</b>	
Select gas type (3109)	→ <a href="#">78</a>
Density calc. (3102)	→ <a href="#">79</a>
Enthalpy calc. (3103)	→ <a href="#">79</a>
Ref. conditions (3155)	→ <a href="#">79</a>
Ref. pressure (3146)	→ <a href="#">80</a>
Ref. temperature (3147)	→ <a href="#">80</a>
Ref. comb. temp. (3165)	→ <a href="#">80</a>
<b>► Medium property</b>	
→ <a href="#">81</a>	

**Select gas type**

Navigation

Expert → Sensor → Measurement mode → Select gas type (3109)

Description

Select measured gas type.

---

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Single gas *</li> <li>■ Gas mixture *</li> <li>■ Coal gas/bio gas *</li> <li>■ Natur.gas (std) *</li> <li>■ Nat.gas (s.vel.) *</li> <li>■ User-spec. gas</li> </ul>
------------------	--

<b>Factory setting</b>	User-spec. gas
------------------------	----------------

---

**Density calc.**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Density calc. (3102)
<b>Description</b>	Select the norm the density calculation is based on.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ AGA Nx19</li> <li>■ ISO 12213- 2</li> <li>■ ISO 12213- 3</li> </ul>
<b>Factory setting</b>	ISO 12213- 3

---

**Cal.value calc.**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Cal.value calc. (3103)
<b>Description</b>	Select the standard used for calculating the calorific value.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ AGA5</li> <li>■ ISO 6976</li> </ul>
<b>Factory setting</b>	ISO 6976

---

**Ref. conditions**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Ref. conditions (3155)
<b>Description</b>	Select reference conditions for calculation of the corrected volume flow.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ 1013.25hPa, 0°C</li> <li>■ 1013.25hPa, 15°C</li> <li>■ 1013.25hPa, 20°C</li> <li>■ 1013.25hPa, 25°C</li> <li>■ 1000.00hPa, 0°C</li> <li>■ 1000.00hPa, 15°C</li> </ul>

\* Visibility depends on order options or device settings

- 1000.00hPa, 20°C
- 1000.00hPa, 25°C
- 14.696Psi, 59°F
- 14.696Psi, 60°F
- 14.730Psi, 60°F
- Others

**Factory setting** 1013.25hPa, 0°C

---

#### Ref. pressure



**Navigation** Expert → Sensor → Measurement mode → Ref. pressure (3146)

**Prerequisite** The **Others** option is selected in the **Ref. conditions** parameter (→ 79).

**Description** Select reference conditions for the corrected volume flow.

**User entry** 0 to 250 bar

**Factory setting** 1.01325 bar

---

#### Ref. temperature



**Navigation** Expert → Sensor → Measurement mode → Ref. temperature (3147)

**Prerequisite** The **Others** option is selected in the **Ref. conditions** parameter (→ 79).

**Description** Select reference conditions for the corrected volume flow.

**User entry** -200 to 450 °C

**Factory setting** 0 °C

---

#### Ref. comb. temp.



**Navigation** Expert → Sensor → Measurement mode → Ref. comb. temp. (3165)

**Description** Select ref. temp. (reference combustion temperature) for calculating the gas energy value.

**Selection**

- 0 °C
- 15 °C
- 20 °C
- 25 °C
- 60 °F

**Factory setting**

25 °C

**"Medium properties" submenu***Navigation*

Expert → Sensor → Measurement mode → Medium property

► Medium property	
Calorif.val.type (3101)	→ 81
Humidity type (3156)	→ 82
Ref.density (3144)	→ 82
Ref. GrossCalVal (3145)	→ 82
Ref. Z-factor (3148)	→ 82
Relative density (3149)	→ 83
Spec. heat cap. (3162)	→ 83
Calorific value (3105)	→ 83
Z-factor (3108)	→ 83
Dynam. viscosity (3106)	→ 84
Add. gas compon. (3154)	→ 84
St.vol.fl. cal. (3164)	→ 84

**Calorif.val.type****Navigation**

Expert → Sensor → Measurement mode → Medium property → Calorif.val.type (3101)

**Description**

Select calculation based on gross calorific value or net calorific value.

**Selection**

- GrossCalorValVol
- NetCalorValVol

**Factory setting**

GrossCalorValVol

**Humidity type**

**Navigation**      Expert → Sensor → Measurement mode → Medium property → Humidity type (3156)

**Description**      Select the input value for the gas humidity.

**Selection**

- Rel. humidity
- Water fraction
- Dew point

**Factory setting**      Depends on the selected gas type.

**Ref.density**

**Navigation**      Expert → Sensor → Measurement mode → Medium property → Ref.density (3144)

**Description**      Enter fixed value for reference density.

**User entry**      0.01 to 100 kg/m<sup>3</sup>

**Factory setting**      1 kg/m<sup>3</sup>

**Ref. GrossCalVal**

**Navigation**      Expert → Sensor → Measurement mode → Medium property → Ref. GrossCalVal (3145)

**Description**      Enter the reference gross calorific value of the gas.

**User entry**      0 to 1 000 MJ/Nm<sup>3</sup>

**Factory setting**      40 MJ/Nm<sup>3</sup>

**Ref. Z-factor**

**Navigation**      Expert → Sensor → Measurement mode → Medium property → Ref. Z-factor (3148)

**Description**      Enter real gas constant Z for gas under reference conditions.

**User entry**      0.1 to 2

**Factory setting**      1

---

**Relative density**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Relative density (3149)
<b>Description</b>	Enter the relative density of the gas.
<b>User entry</b>	0.5 to 1.0
<b>Factory setting</b>	0.58

---

**Spec. heat cap.**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Spec. heat cap. (3162)
<b>Description</b>	Enter the specific heat capacity of the medium.
<b>User entry</b>	0 to 50 000 J/(kgK)
<b>Factory setting</b>	Depends on the selected gas type.

---

**Calorific value**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Calorific value (3105)
<b>Description</b>	Enter gross calorific value to calculate the energy flow.
<b>User entry</b>	0 to 1000 MJ/Nm <sup>3</sup>
<b>Factory setting</b>	40 MJ/Nm <sup>3</sup>

---

**Z-factor**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Z-factor (3108)
<b>Description</b>	Enter real gas constant Z for gas under operation conditions.
<b>User entry</b>	0.1 to 2.0
<b>Factory setting</b>	1

**Dynam. viscosity**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Dynam. viscosity (3106)
<b>Description</b>	Value of the dynamic viscosity for user-specific gas.
<b>User entry</b>	0 to 0.001 Pa s
<b>Factory setting</b>	0.000015 Pa s

**Add. gas compon.**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → Add. gas compon. (3154)
<b>Prerequisite</b>	The <b>Coal gas/bio gas</b> option is selected in the <b>Select gas type</b> parameter (→ 78).
<b>Description</b>	Specify the additional gas component of the gas.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ None</li><li>▪ Hydrogen H<sub>2</sub></li><li>▪ Hydrot.sulf. H<sub>2</sub>S</li></ul>
<b>Factory setting</b>	None

**St.vol.fl. cal.**

<b>Navigation</b>	Expert → Sensor → Measurement mode → Medium property → St.vol.fl. cal. (3164)
<b>Prerequisite</b>	The <b>Coal gas/bio gas</b> option is selected in the <b>Select gas type</b> parameter (→ 78).
<b>Description</b>	Setting specifying how the corrected volume flow is calculated for wet coal gas/biogas.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Wet gas</li><li>▪ Dry gas</li></ul>
<b>Factory setting</b>	Dry gas

### 3.2.5 "External comp." submenu

*Navigation*

Expert → Sensor → External comp.

► External comp.	
Pressure compen. (3023)	→ 85
Pressure (3022)	→ 85
Ext. press.meas. (3033)	→ 86
Atmosph. press. (3024)	→ 86
Temp. compensat. (3025)	→ 86
Medium temp. (2925)	→ 87

#### Pressure compen.



**Navigation**

Expert → Sensor → External comp. → Pressure compen. (3023)

**Description**

Select pressure compensation type.

**Selection**

- Fixed value
- Internal value \*
- External value \*
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*

**Factory setting**

Fixed value

#### Pressure

**Navigation**

Expert → Sensor → External comp. → Pressure (3022)

**Description**

Enter fixed value for the process pressure.

**User entry**

0 to 250 bar

**Factory setting**

5 bar

\* Visibility depends on order options or device settings

---

**Ext. press.meas.**

---

**Navigation**  Expert → Sensor → External comp. → Ext. press.meas. (3033)

**Description** Select pressure type for external pressure measurement.

**Selection**

- Abs. pressure
- Gauge pressure

**Factory setting** Abs. pressure

---

**Atmosph. press.**

---



**Navigation**  Expert → Sensor → External comp. → Atmosph. press. (3024)

**Prerequisite** The **External value** option or **Current input 1...3** option is selected in the **Pressure compen.** parameter (→  85).

The **Gauge pressure** option is selected in the **Ext. press.meas.** parameter (→  86).

**Description** Enter atmospheric pressure value to be used for pressure correction.

**User entry** 0.7 to 1.1 bar

**Factory setting** 1.01325 bar

---

**Temp. compensat.**

---



**Navigation**  Expert → Sensor → External comp. → Temp. compensat. (3025)

**Description** Select temperature mode for temperature compensation.

**Selection**

- Fixed value
- Internal value \*
- External value \*
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*

**Factory setting** Fixed value

---

\* Visibility depends on order options or device settings

**Medium temp.**

**Navigation**      Expert → Sensor → External comp. → Medium temp. (2925)

**Description**      Enter a fixed value for process temperature.

**User entry**      -50 to 150 °C

**Factory setting**      20 °C

### 3.2.6 "Sensor adjustm." submenu

*Navigation*      Expert → Sensor → Sensor adjustm.

► Sensor adjustm.	
Install. direct. (1809)	→  87
Ref. pressure (5670)	→  88
Press. cell adj. (5669)	→  88
p cell offs.val (5671)	→  88
► Variable adjust	→  88

**Install. direct.**

**Navigation**      Expert → Sensor → Sensor adjustm. → Install. direct. (1809)

**Description**      Use this function to change the sign of the medium flow direction.

**Selection**

- In arrow direct.
- Against arrow

**Factory setting**      In arrow direct.

**Additional information**      *Description*

Before changing the sign: ascertain the actual direction of fluid flow with reference to the direction indicated by the arrow on the sensor nameplate.

**Ref. pressure****Navigation**

Expert → Sensor → Sensor adjustm. → Ref. pressure (5670)

**Description**

Enter the reference pressure for calculating the offset for the internal pressure measuring cell.

**User entry**

Positive floating-point number

**Factory setting**

1.01325 bar

**Press. cell adj.****Navigation**

Expert → Sensor → Sensor adjustm. → Press. cell adj. (5669)

**Description**

Select process for the offset adjustment for the integrated pressure measurement.

**Selection**

- Yes
- Discard offset
- Cancel

**Factory setting**

Cancel

**p cell offs.val****Navigation**

Expert → Sensor → Sensor adjustm. → p cell offs.val (5671)

**Description**

Displays the offset value currently used by the device to correct the pressure measured value that is measured internally.

**User interface**

Signed floating-point number

**Factory setting**

0 bar

**"Process variable adjustment" submenu****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust

<b>► Variable adjust</b>	
Vol. flow offset (1831)	→  90
Vol. flow factor (1832)	→  90

Corr. vol offset (1855)	→  90
Corr. vol factor (1856)	→  91
Mass flow offset (1841)	→  91
Mass flow factor (1846)	→  91
S. veloc. offset (1848)	→  92
S. veloc. factor (1849)	→  92
Temp. offset (1870)	→  92
Temp. factor (1871)	→  93
Pressure offset (1881)	→  93
Pressure factor (1882)	→  93
Methane offset (1873)	→  94
Methane factor (1874)	→  94
Molar mass offs. (1875)	→  94
Mol mass factor (1876)	→  94
Density offset (1877)	→  95
Density factor (1878)	→  95
Dyn.visc. offset (1898)	→  95
Dyn.visc. factor (1897)	→  95
Cal. val. offs. (1899)	→  96
Cal. val. fact. (1900)	→  96
Wobbe index offs (1879)	→  96
Wobbe index fact (1880)	→  96
En. flow offset (1866)	→  97
En. flow factor (1867)	→  97

**Vol. flow offset****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow offset (1831)

**Description**

Use this function to enter the zero point shift for the volume flow trim. The volume flow unit on which the shift is based is m<sup>3</sup>/s.

**User entry**

Signed floating-point number

**Factory setting**

0 m<sup>3</sup>/h

**Additional information***Description*

Corrected value = (factor × value) + offset

**Vol. flow factor****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Vol. flow factor (1832)

**Description**

Use this function to enter a quantity factor (without time) for the volume flow. This multiplication factor is applied over the volume flow range.

**User entry**

Positive floating-point number

**Factory setting**

1

**Additional information***Description*

Corrected value = (factor × value) + offset

**Corr. vol offset****Navigation**

Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol offset (1855)

**Description**

Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is 1 K.

**User entry**

Signed floating-point number

**Factory setting**

0 Sm<sup>3</sup>/h

**Additional information***Description*

Corrected value = (factor × value) + offset

---

**Corr. vol factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Corr. vol factor (1856)

**Description** Use this function to enter a quantity factor for the temperature. In each case, this factor refers to the temperature in Kelvin.

**User entry** Positive floating-point number

**Factory setting** 1

---

**Mass flow offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow offset (1841)

**Description** Use this function to enter the zero point shift for the mass flow trim. The mass flow unit on which the shift is based is kg/h.

**User entry** Signed floating-point number

**Factory setting** 0 kg/h

**Additional information** *Description*



Corrected value = (factor × value) + offset

---

**Mass flow factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Mass flow factor (1846)

**Description** Use this function to enter a quantity factor (without time) for the mass flow. This multiplication factor is applied over the mass flow range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*



Corrected value = (factor × value) + offset

**S. veloc. offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → S. veloc. offset (1848)

**Description** Use this function to enter the zero point shift for the sound velocity trim. The sound velocity unit on which the shift is based is m/s.

**User entry** Signed floating-point number

**Factory setting** 0 m/s

**Additional information** *Description*

Corrected value = (factor × value) + offset

**S. veloc. factor**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → S. veloc. factor (1849)

**Description** Use this function to enter a quantity factor (without time) for the sound velocity. This multiplication factor is applied over the sound velocity range.

**User entry** Positive floating-point number

**Factory setting** 1

**Additional information** *Description*

Corrected value = (factor × value) + offset

**Temp. offset**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. offset (1870)

**Description** Use this function to enter the zero point shift for the temperature trim. The temperature unit on which the shift is based is K.

**User entry** Signed floating-point number

**Factory setting** 0 K

**Additional information** *Description*

Corrected value = (factor × value) + offset

---

**Temp. factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Temp. factor (1871)
<b>Description</b>	Use this function to enter a quantity factor for the temperature. In each case, this factor refers to the temperature in K.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

---

**Pressure offset**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Pressure offset (1881)
<b>Description</b>	Use this function to enter the zero point shift for the mass flow trim. The mass flow unit on which the shift is based is 1 kg/s.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0 bar
<b>Additional information</b>	<i>Description</i> Corrected value = (factor × value) + offset

---

**Pressure factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Pressure factor (1882)
<b>Description</b>	Use this function to enter a quantity factor (without time) for the mass flow. This multiplication factor is applied over the mass flow range.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1

**Methane offset**

**Navigation**      Expert → Sensor → Sensor adjustm. → Variable adjust → Methane offset (1873)

**Description**      Use this function to enter the zero point shift for the methane fraction trim.

**User entry**      Signed floating-point number

**Factory setting**      0 %

**Methane factor**

**Navigation**      Expert → Sensor → Sensor adjustm. → Variable adjust → Methane factor (1874)

**Description**      Use this function to enter a quantity factor for the methane fraction.

**User entry**      Positive floating-point number

**Factory setting**      1

**Molar mass offs.**

**Navigation**      Expert → Sensor → Sensor adjustm. → Variable adjust → Molar mass offs. (1875)

**Description**      Use this function to enter the zero point shift for the molar mass trim.

**User entry**      Signed floating-point number

**Factory setting**      0 g/mol

**Mol mass factor**

**Navigation**      Expert → Sensor → Sensor adjustm. → Variable adjust → Mol mass factor (1876)

**Description**      Use this function to enter a quantity factor for the molar mass.

**User entry**      Positive floating-point number

**Factory setting**      1

---

**Density offset**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Density offset (1877)
<b>Description</b>	Use this function to enter the zero point shift for the density trim.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0 kg/m <sup>3</sup>

---

**Density factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Density factor (1878)
<b>Description</b>	Use this function to enter a quantity factor for the density.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1

---

**Dyn.visc. offset**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Dyn.visc. offset (1898)
<b>Description</b>	Use this function to enter the zero point shift for the dynamic viscosity trim.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0 Pa s

---

**Dyn.visc. factor**

<b>Navigation</b>	Expert → Sensor → Sensor adjustm. → Variable adjust → Dyn.visc. factor (1897)
<b>Description</b>	Use this function to enter a quantity factor for the dynamic viscosity.
<b>User entry</b>	Positive floating-point number
<b>Factory setting</b>	1

**Cal. val. offs.**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Cal. val. offs. (1899)

**Description** Use this function to enter the zero point shift for the calorific value trim.

**User entry** Signed floating-point number

**Factory setting** 0 MJ/Nm<sup>3</sup>

**Cal. val. fact.**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Cal. val. fact. (1900)

**Description** Use this function to enter a quantity factor for the calorific value.

**User entry** Positive floating-point number

**Factory setting** 1

**Wobbe index offs**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Wobbe index offs (1879)

**Description** Use this function to enter the zero point shift for the Wobbe index trim.

**User entry** Signed floating-point number

**Factory setting** 0 MJ/Nm<sup>3</sup>

**Additional information** *Description*

Corrected value = (factor × value) + offset

**Wobbe index fact**

**Navigation** Expert → Sensor → Sensor adjustm. → Variable adjust → Wobbe index fact (1880)

**Description** Use this function to enter a quantity factor for the Wobbe index factor.

**User entry** Positive floating-point number

**Factory setting** 1

Additional information	Description
	 Corrected value = (factor × value) + offset

**En. flow offset**

**Navigation**  Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow offset (1866)

**Description** Use this function to enter the zero point shift for the energy flow trim. The energy flow unit on which the shift is based is 1 W.

**User entry** Signed floating-point number

**Factory setting** 0 kW

Additional information	Description
	 Corrected value = (factor × value) + offset

**En. flow factor**

**Navigation**  Expert → Sensor → Sensor adjustm. → Variable adjust → En. flow factor (1867)

**Description** Use this function to enter a quantity factor (without time) for the energy flow. This multiplication factor is applied over the energy flow range.

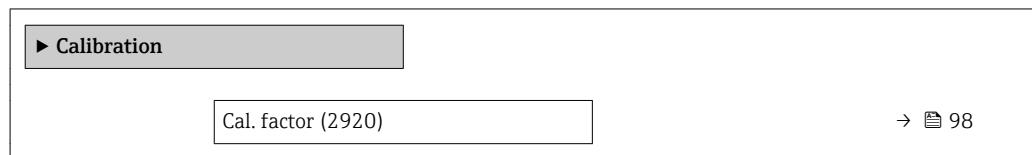
**User entry** Positive floating-point number

**Factory setting** 1

Additional information	Description
	 Corrected value = (factor × value) + offset

**3.2.7 "Calibration" submenu**

**Navigation**  Expert → Sensor → Calibration



Zero point (2921)	→  98
Nominal diameter (2807)	→  98

---

## Cal. factor

---

**Navigation** Expert → Sensor → Calibration → Cal. factor (2920)

**Description** Displays the current calibration factor for the sensor.

**User interface** Signed floating-point number

**Factory setting** 1

---

## Zero point

---

**Navigation** Expert → Sensor → Calibration → Zero point (2921)

**Description** Displays the current zero point correction value for the sensor.

**User interface** Signed floating-point number

**Factory setting** 0

---

## Nominal diameter

---

**Navigation** Expert → Sensor → Calibration → Nominal diameter (2807)

**Description** Displays the nominal diameter of the sensor.

**User interface** DNxx / x"

**Factory setting** Depends on the size of the sensor

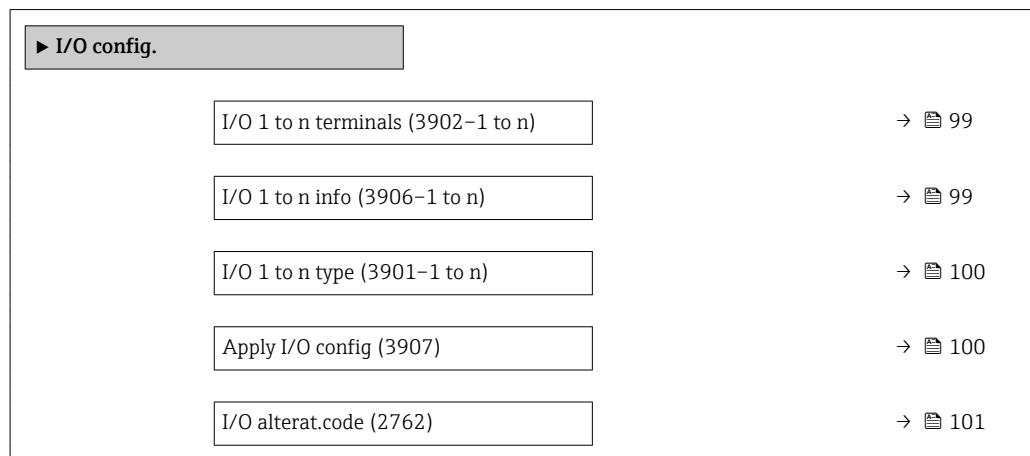
**Additional information** *Description*

The value is also specified on the sensor nameplate.

### 3.3 "I/O configuration" submenu

*Navigation*

◀ ▶ Expert → I/O config.



#### I/O 1 to n terminals

**Navigation**

◀ ▶ Expert → I/O config. → I/O 1 to n terminals (3902-1 to n)

**Description**

Displays the terminal numbers used by the I/O module.

**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

#### I/O 1 to n info

**Navigation**

◀ ▶ Expert → I/O config. → I/O 1 to n info (3906-1 to n)

**Description**

Displays information about the plugged in I/O module.

**User interface**

- Not plugged
- Invalid
- Not configurable
- Configurable
- HART

<b>Additional information</b>	<p><i>"Not plugged"</i> option The I/O module is not plugged in.</p> <p><i>"Invalid"</i> option The I/O module is not plugged correctly.</p> <p><i>"Not configurable"</i> option The I/O module is not configurable.</p> <p><i>"Configurable"</i> option The I/O module is configurable.</p> <p><i>"Fieldbus"</i> option The I/O module is configured for HART.</p>
-------------------------------	---

**I/O 1 to n type**

<b>Navigation</b>	Expert → I/O config. → I/O 1 to n type (3901-1 to n)
<b>Prerequisite</b>	For the following order code: <ul style="list-style-type: none"> <li>■ "Output; input 2", option D "Configurable I/O initial setting off"</li> <li>■ "Output; input 3", option D "Configurable I/O initial setting off"</li> </ul>
<b>Description</b>	Use this function to select the I/O module type for the configuration of the I/O module.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Curr.output*</li> <li>■ Current input*</li> <li>■ Status input*</li> <li>■ PFS output*</li> <li>■ Double pulse out*</li> <li>■ Relay output*</li> </ul>
<b>Factory setting</b>	Off

**Apply I/O config**

<b>Navigation</b>	Expert → I/O config. → Apply I/O config (3907)
<b>Description</b>	Use this function to activate the newly configured I/O module type.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ No</li> <li>■ Yes</li> </ul>
<b>Factory setting</b>	No

\* Visibility depends on order options or device settings

**I/O alterat.code****Navigation**

Expert → I/O config. → I/O alterat.code (2762)

**Description**

Use this function to enter the ordered activation code to activate the I/O configuration change.

**User entry** Positive integer

**Factory setting** 0

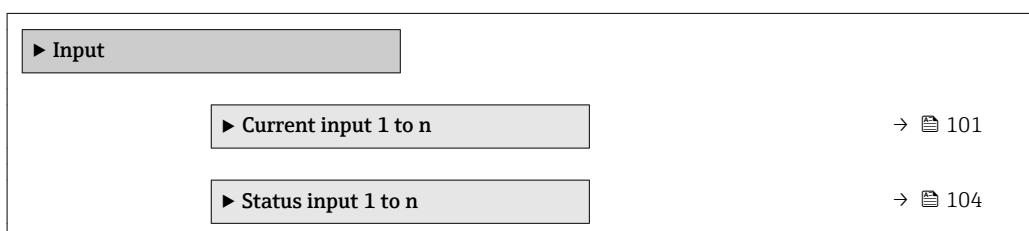
**Additional information** *Description*

The I/O configuration is changed in the **I/O type** parameter (→ 100).

## 3.4 "Input" submenu

*Navigation*

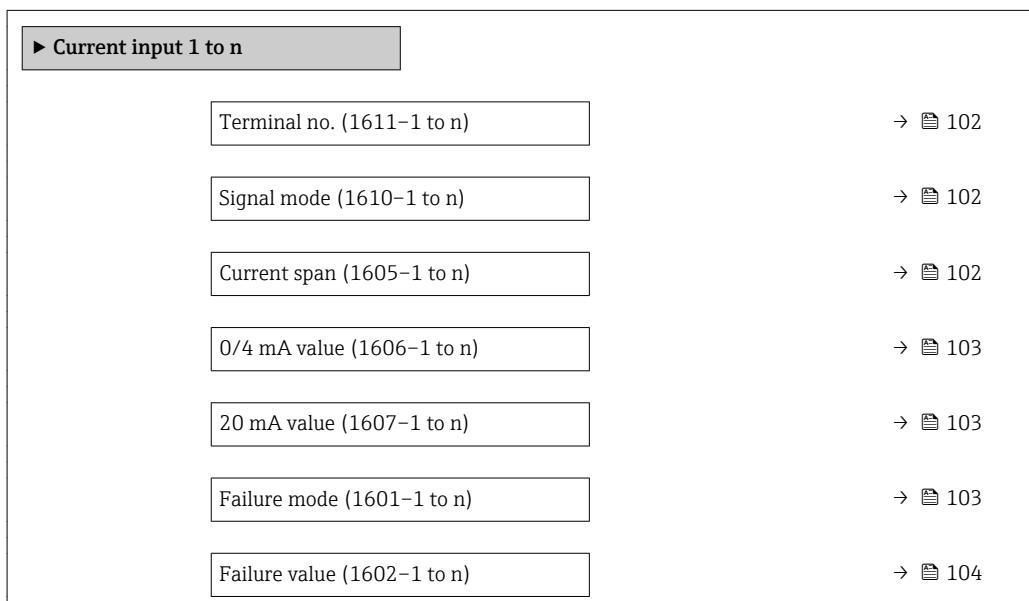
Expert → Input



### 3.4.1 "Current input 1 to n" submenu

*Navigation*

Expert → Input → Current input 1 to n



---

**Terminal no.**

---

**Navigation**  Expert → Input → Current input 1 to n → Terminal no. (1611-1 to n)

**Description** Displays the terminal numbers used by the current input module.

**User interface**

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Additional information** "Not used" option  
The current input module does not use any terminal numbers.

---

**Signal mode**

---



**Navigation**  Expert → Input → Current input 1 to n → Signal mode (1610-1 to n)

**Prerequisite** The measuring device is **not** approved for use in the hazardous area with type of protection Ex-i.

**Description** Use this function to select the signal mode for the current input.

**Selection**

- Passive
- Active

**Factory setting** Active

---

**Current span**

---



**Navigation**  Expert → Input → Current input 1 to n → Current span (1605-1 to n)

**Description** Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.

**Selection**

- 4...20 mA
- 4...20 mA NAMUR
- 4...20 mA US
- 0...20 mA

**Factory setting** Country-specific:  

- 4...20 mA NAMUR
- 4...20 mA US

**Additional information** Examples

 Sample values for the current range: **Current span** parameter (→  108)

---

**0/4 mA value**

**Navigation** Expert → Input → Current input 1 to n → 0/4 mA value (1606–1 to n)

**Description** Use this function to enter a value for the 4 mA current.

**User entry** Signed floating-point number

**Factory setting** 0

**Additional information** *Current input behavior*

The current input behaves differently depending on the settings configured in the following parameters:

- Current span (→ 102)
- Failure mode (→ 103)

*Configuration examples*

Pay attention to the configuration examples for **4 mA value** parameter (→ 110).

---

**20 mA value**

**Navigation** Expert → Input → Current input 1 to n → 20 mA value (1607–1 to n)

**Description** Use this function to enter a value for the 20 mA current.

**User entry** Signed floating-point number

**Factory setting** Depends on country and nominal diameter

**Additional information** *Configuration examples*

Pay attention to the configuration examples for **4 mA value** parameter (→ 110).

---

**Failure mode**

**Navigation** Expert → Input → Current input 1 to n → Failure mode (1601–1 to n)

**Description** Use this function to select the input behavior when measuring a current outside the configured **Current span** parameter (→ 102).

**Selection**

- Alarm
- Last valid value
- Defined value

**Factory setting** Alarm

**Additional information***Options*

- Alarm  
An error message is set.
- Last valid value  
The last valid measured value is used.
- Defined value  
A user-defined measured value is used (**Failure value** parameter (→ 104)).

**Failure value****Navigation**

Expert → Input → Current input 1 to n → Failure value (1602–1 to n)

**Prerequisite**

In the **Failure mode** parameter (→ 103), the **Defined value** option is selected.

**Description**

Use this function to enter the value that the device uses if it does not receive an input signal from the external device, or if the input signal is invalid.

**User entry**

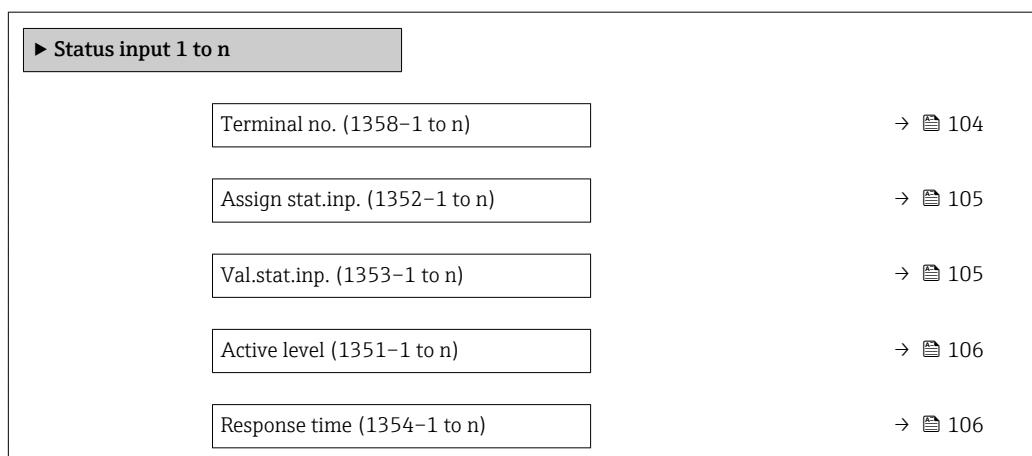
Signed floating-point number

**Factory setting**

0

**3.4.2 "Status input 1 to n" submenu****Navigation**

Expert → Input → Status input 1 to n

**Terminal no.****Navigation**

Expert → Input → Status input 1 to n → Terminal no. (1358–1 to n)

**Description**

Displays the terminal numbers used by the status input module.

<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Not used</li> <li>■ 24-25 (I/O 2)</li> <li>■ 22-23 (I/O 3)</li> </ul>
-----------------------	--

<b>Additional information</b>	<p><i>"Not used" option</i></p> <p>The status input module does not use any terminal numbers.</p>
-------------------------------	---

---

**Assign stat.inp.**

<b>Navigation</b>	Expert → Input → Status input 1 to n → Assign stat.inp. (1352-1 to n)
-------------------	---

<b>Description</b>	Use this function to select the function for the status input.
--------------------	--

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ Reset totaliz. 1</li> <li>■ Reset totaliz. 2</li> <li>■ Reset totaliz. 3</li> <li>■ Reset all tot.</li> <li>■ Flow override</li> </ul>
------------------	--

<b>Factory setting</b>	Off
------------------------	-----

<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ Off The status input is switched off.</li> <li>■ Reset totaliz. 1...3 The individual totalizers are reset.</li> <li>■ Reset all tot. All totalizers are reset.</li> <li>■ Flow override The Flow override (→  74) is activated.</li> </ul> <p> Note on the Flow override (→  74):</p> <ul style="list-style-type: none"> <li>■ The Flow override (→  74) is enabled as long as the level is at the status input (continuous signal).</li> <li>■ All other assignments react to a change in level (pulse) at the status input.</li> </ul>
-------------------------------	---

---

**Val.stat.inp.**

<b>Navigation</b>	Expert → Input → Status input 1 to n → Val.stat.inp. (1353-1 to n)
-------------------	--

<b>Description</b>	Displays the current input signal level.
--------------------	--

<b>User interface</b>	<ul style="list-style-type: none"> <li>■ High</li> <li>■ Low</li> </ul>
-----------------------	---

**Active level****Navigation**

Expert → Input → Status input 1 to n → Active level (1351–1 to n)

**Description**

Use this function to determine the input signal level at which the assigned function is activated.

**Selection**

- High
- Low

**Factory setting**

High

**Response time****Navigation**

Expert → Input → Status input 1 to n → Response time (1354–1 to n)

**Description**

Use this function to enter the minimum time period for which the input signal level must be present before the selected function is activated.

**User entry**

5 to 200 ms

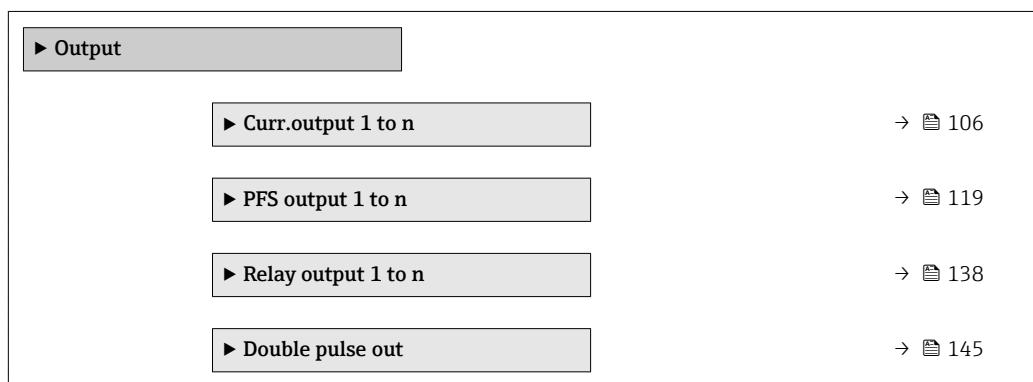
**Factory setting**

50 ms

## 3.5 "Output" submenu

*Navigation*

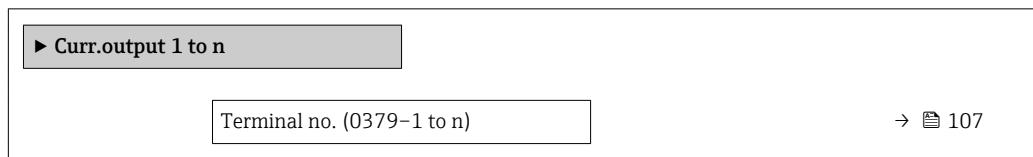
Expert → Output



### 3.5.1 "Current output 1 to n" submenu

*Navigation*

Expert → Output → Curr.output 1 to n



Signal mode (0377-1 to n)	→  107
Assign curr. 1 to n (0359-1 to n)	→  108
Current span (0353-1 to n)	→  108
Fixed current (0365-1 to n)	→  109
0/4 mA value (0367-1 to n)	→  110
20 mA value (0372-1 to n)	→  111
Measuring mode (0351-1 to n)	→  112
Damping out. 1 to n (0363-1 to n)	→  116
Failure mode (0364-1 to n)	→  117
Failure current (0352-1 to n)	→  118
Output curr. 1 to n (0361-1 to n)	→  119
Measur. curr. 1 to n (0366-1 to n)	→  119

---

**Terminal no.****Navigation** Expert → Output → Curr.output 1 to n → Terminal no. (0379-1 to n)**Description** Displays the terminal numbers used by the current output module.**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Additional information***"Not used" option*

The current output module does not use any terminal numbers.

---

**Signal mode****Navigation** Expert → Output → Curr.output 1 to n → Signal mode (0377-1 to n)**Description** Use this function to select the signal mode for the current output.**Selection**

- Passive
- Active

**Factory setting** Active

## Assign curr. 1 to n



**Navigation** Expert → Output → Curr.output 1 to n → Assign curr. 1 to n (0359-1 to n)

**Description** Use this function to select a process variable for the current output.

**Selection**

- Off \*
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.

**Factory setting** Volume flow

## Current span



**Navigation** Expert → Output → Curr.output 1 to n → Current span (0353-1 to n)

**Description** Use this function to select the current range for the process value output and the upper and lower level for signal on alarm.

**Selection**

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA
- Fixed current

**Factory setting** Country-specific:  
 ■ 4...20 mA NAMUR (3.8...20.5 mA)  
 ■ 4...20 mA US (3.9...20.8 mA)

\* Visibility depends on order options or device settings

**Additional information****Description**

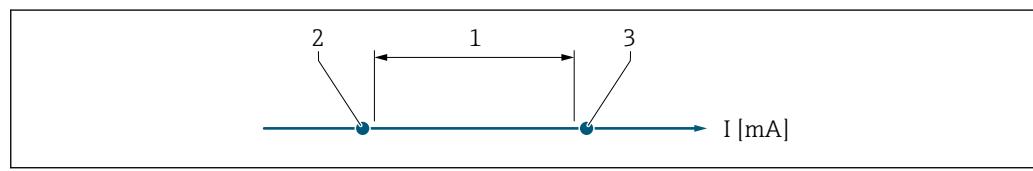
- In the event of a device alarm, the current output adopts the value specified in the **Failure mode** parameter (→ 117).
- If the measured value is outside the measuring range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.
- The measuring range is specified via the **0/4 mA value** parameter (→ 110) and **20 mA value** parameter (→ 111).

*"Fixed current" option*

- This option is used for a HART Multidrop network.
- It can only be used for the 4...20 mA HART current output (current output 1).
- The current value is set via the **Fixed current** parameter (→ 109).

*Example*

Shows the relationship between the current span for the output of the process variable and the lower and upper alarm levels:



A0034351

- 1 Current span for process value  
2 Lower level for signal on alarm  
3 Upper level for signal on alarm

*Selection*

Selection	1	2	3
4...20 mA NAMUR	3.8 to 20.5 mA	< 3.6 mA	> 21.95 mA
4...20 mA US	3.9 to 20.8 mA US	< 3.6 mA	> 21.95 mA
4...20 mA	4 to 20.5 mA	< 3.6 mA	> 21.95 mA
0...20 mA	0 to 20.5 mA	< 0 mA	> 21.95 mA



If the flow exceeds or falls below the upper or lower signal on alarm level, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

**Fixed current****Navigation**

Expert → Output → Curr.output 1 to n → Fixed current (0365–1 to n)

**Prerequisite**

The **Fixed current** option is selected in the **Current span** parameter (→ 108).

**Description**

Use this function to enter a constant current value for the current output.

**User entry**

0 to 22.5 mA

**Factory setting**

22.5 mA

**0/4 mA value****Navigation**

Expert → Output → Curr.output 1 to n → 0/4 mA value (0367–1 to n)

**Prerequisite**

In the **Current span** parameter (→ [108](#)), one of the following options is selected:

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

**Description**

Use this function to enter a value for the 0/4 mA current.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- m<sup>3</sup>/h
- ft<sup>3</sup>/h

**Additional information***Description*

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ [108](#)). In addition, the value can be greater than or smaller than the value assigned for the 20 mA current in the **20 mA value** parameter (→ [111](#)).

*Dependency*

The unit depends on the process variable selected in the **Assign curr.** parameter (→ [108](#)).

*Current output behavior*

The current output behaves differently depending on the settings configured in the following parameters:

- Current span (→ [108](#))
- Failure mode (→ [117](#))

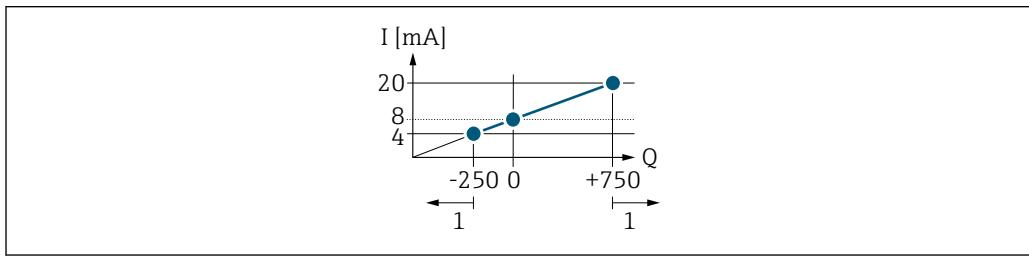
*Configuration examples*

Some examples of parameter settings and their effect on the current output are given in the following section.

**Configuration example A**

Measuring mode with **Forward flow** option

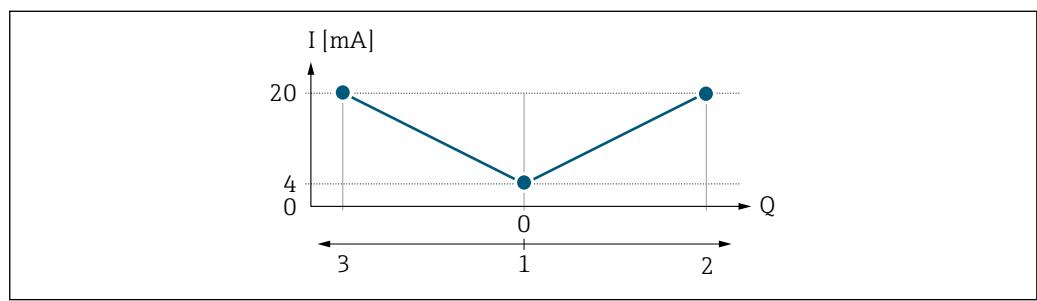
- **0/4 mA value** parameter (→ [110](#)) = not equal to zero flow (e.g. -250 m<sup>3</sup>/h)
- **20 mA value** parameter (→ [111](#)) = not equal to zero flow (e.g. +750 m<sup>3</sup>/h)
- Calculated current value = 8 mA at zero flow



The operational range of the measuring device is defined by the values entered for the **0/4 mA value** parameter (→ 110) and **20 mA value** parameter (→ 111). If the effective flow exceeds or falls below this operational range, the diagnostic message **△S441 Curr.output 1 to n** is displayed.

### Configuration example B

Measuring mode with **Forward/Reverse** option



A0013758

- I* Current
- Q* Flow
- 1 Value assigned to the 0/4 mA current
- 2 Forward flow
- 3 Reverse flow

The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter (→ 110) and **20 mA value** parameter (→ 111) must have the same sign. The value for the **20 mA value** parameter (→ 111) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter (→ 111) (e.g. forward flow).

### Configuration example C

Measuring mode with **Rev. flow comp.** option

If flow is characterized by severe fluctuations (e.g. when using reciprocating pumps), flow components outside the measuring range are buffered, balanced and output after a maximum delay of 60 s → 112.

---

## 20 mA value



### Navigation

Expert → Output → Curr.output 1 to n → 20 mA value (0372–1 to n)

### Prerequisite

One of the following options is selected in the **Current span** parameter (→ 108):

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

### Description

Use this function to enter a value for the 20 mA current.

### User entry

Signed floating-point number

### Factory setting

Depends on country and nominal diameter

### Additional information

#### Description

Positive and negative values are permitted depending on the process variable assigned in the **Assign curr.** parameter (→ 108). In addition, the value can be greater than or

smaller than the value assigned for the 0/4 mA current in the **0/4 mA value** parameter (→ [110](#)).

#### Dependency

 The unit depends on the process variable selected in the **Assign curr.** parameter (→ [108](#)).

#### Example

- Value assigned to 0/4 mA = -250 m<sup>3</sup>/h
- Value assigned to 20 mA = +750 m<sup>3</sup>/h
- Calculated current value = 8 mA (at zero flow)

If the **Forward/Reverse** option is selected in the **Measuring mode** parameter (→ [112](#)), different signs cannot be entered for the values of the **0/4 mA value** parameter (→ [110](#)) and **20 mA value** parameter (→ [111](#)). The diagnostic message **△S441 Curr.output 1 to n** is displayed.

#### Configuration examples

 Observe the configuration examples for the **0/4 mA value** parameter (→ [110](#)).

## Measuring mode



### Navigation

  Expert → Output → Curr.output 1 to n → Measuring mode (0351–1 to n)

### Prerequisite

In the **Current span** parameter (→ [108](#)), one of the following options is selected:

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

### Description

Use this function to select the measuring mode for the current output.

### Selection

- Forward flow
- Forward/Reverse \*
- Rev. flow comp.

### Factory setting

Forward flow

### Additional information

#### Description

 The process variable that is assigned to the current output via the **Assign curr.** parameter (→ [108](#)) is displayed below the parameter.

#### "Forward flow" option

The current output signal is proportional to the process variable assigned. The measuring range is defined by the values that are assigned to the 0/4 mA and 20 mA current value.

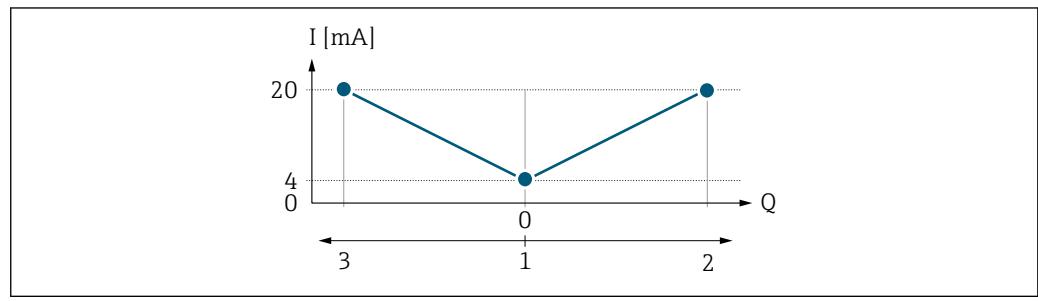
\* Visibility depends on order options or device settings

The flow components outside the scaled measuring range are taken into account for signal output as follows:

Both values are defined such that they are not equal to zero flow e.g.:

- 0/4 mA current value =  $-5 \text{ m}^3/\text{h}$
- 20 mA current value =  $10 \text{ m}^3/\text{h}$

#### *"Forward/Reverse" option*



- |   |                                      |
|---|--------------------------------------|
| I | Current                              |
| Q | Flow                                 |
| 1 | Value assigned to the 0/4 mA current |
| 2 | Forward flow                         |
| 3 | Reverse flow                         |

- The current output signal is independent of the direction of flow (absolute amount of the measured variable). The values for the **0/4 mA value** parameter ( $\rightarrow$  110) and **20 mA value** parameter ( $\rightarrow$  111) must have the same sign.
- The value for the **20 mA value** parameter ( $\rightarrow$  111) (e.g. reverse flow) corresponds to the mirrored value for the **20 mA value** parameter ( $\rightarrow$  111) (e.g. forward flow).

#### *"Rev. flow comp." option*

The **Rev. flow comp.** option is primarily used to compensate for abrupt reverse flow which can occur in connection with positive displacement pumps as a result of wear or high viscosity. The reverse flows are recorded in a buffer and balanced against forward flow the next time flow is in the forward direction.

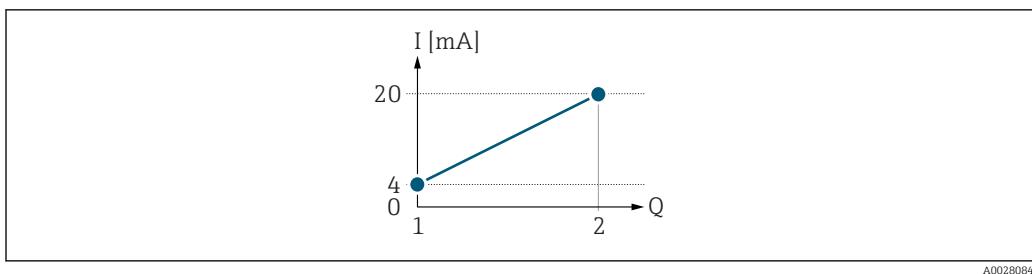
Flow values can aggregate in the buffer in the event of prolonged and unwanted fluid reverse flow. However, these flows are not taken into consideration by the current output configuration, i.e. the reverse flow is not compensated.

If this option is set, the measuring device does not attenuate the flow signal. The flow signal is not attenuated.

#### *Examples of how the current output behaves*

##### **Example 1**

Defined measuring range: lower range value and upper range value with the **same** sign



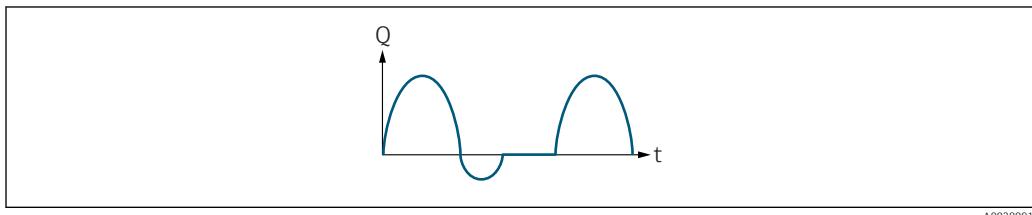
A0028084

**Fig. 3 Measuring range** $I$  Current $Q$  Flow

1 Lower range value (value assigned to 0/4 mA current)

2 Upper range value (value assigned to 20 mA current)

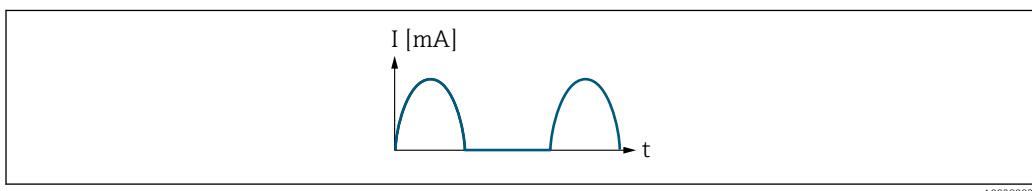
With the following flow response:



A0028091

**Fig. 4 Flow response** $Q$  Flow $t$  TimeWith **Forward** flow option

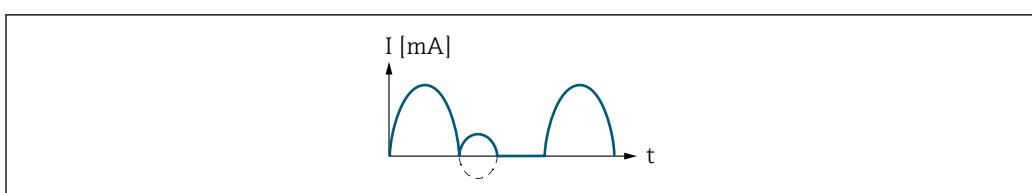
The current output signal is proportional to the process variable assigned. The flow components outside the scaled measuring range are not taken into account for signal output:



A0028092

 $I$  Current $t$  TimeWith **Forward/Reverse** option

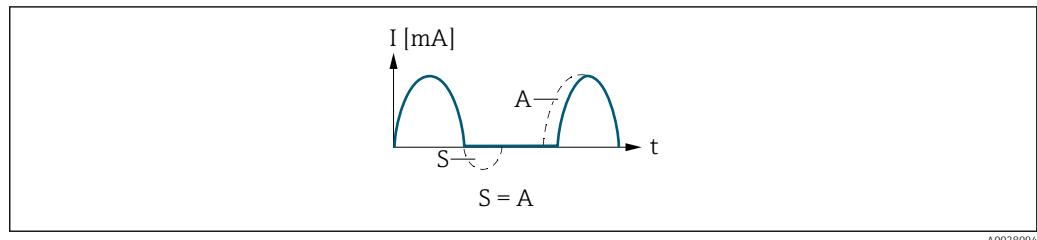
The current output signal is independent of the direction of flow.



A0028093

 $I$  Current $t$  TimeWith **Rev. flow comp.** option

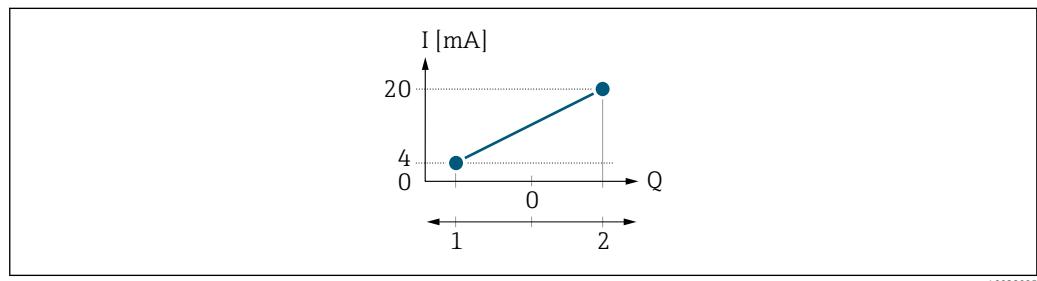
Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



$I$  Current  
 $t$  Time  
 $S$  Flow components saved  
 $A$  Balancing of saved flow components

### Example 2

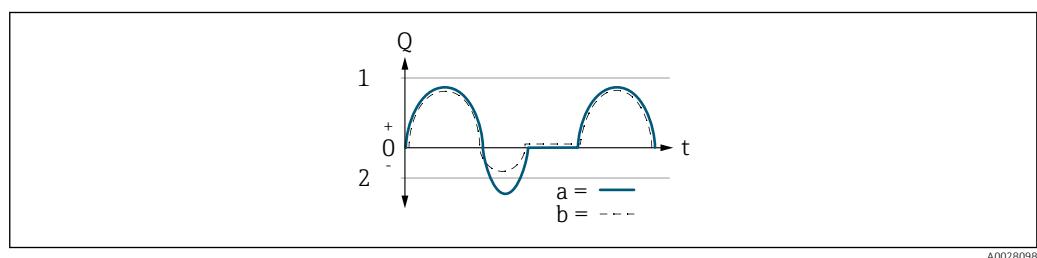
Defined measuring range: lower range value and upper range value with **different** signs



5 Measuring range

$I$  Current  
 $Q$  Flow  
 1 Lower range value (value assigned to 0/4 mA current)  
 2 Upper range value (value assigned to 20 mA current)

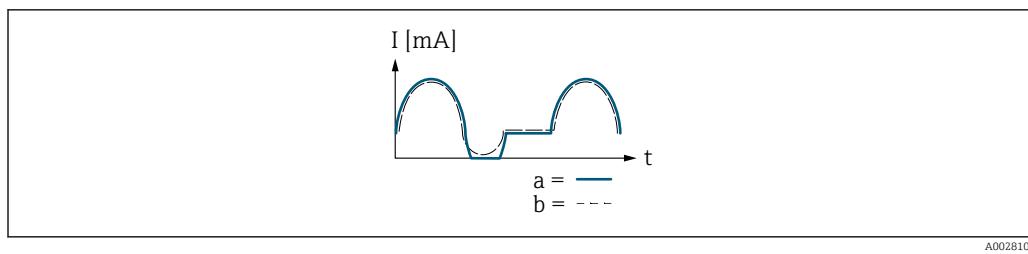
With flow a (-) outside, b (- -) inside the measuring range



$Q$  Flow  
 $t$  Time  
 1 Lower range value (value assigned to 0/4 mA current)  
 2 Upper range value (value assigned to 20 mA current)

With **Forward flow** option

- a (-): The flow components outside the scaled measuring range cannot be taken into account for signal output.
- b (- -): The current output signal is proportional to the process variable assigned.



$I$       Current  
 $t$       Time

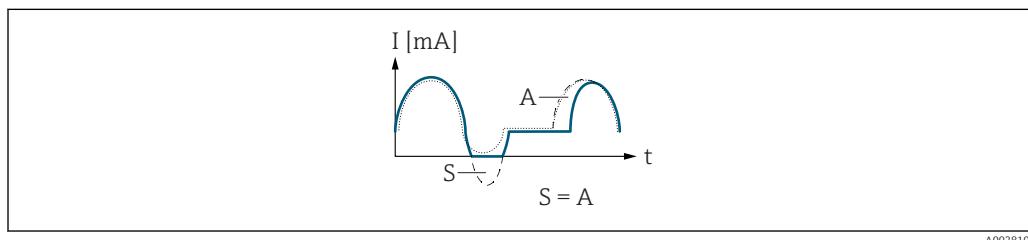
A0028100

### With Forward/Reverse option

This option is not possible in this case as the values for the **0/4 mA value** parameter ( $\rightarrow$  110) and **20 mA value** parameter ( $\rightarrow$  111) have different signs.

### With Rev. flow comp. option

Flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.



$I$       Current  
 $t$       Time  
 $S$       Flow components saved  
 $A$       Balancing of saved flow components

A0028101

## Damping out. 1 to n



### Navigation

Expert → Output → Curr.output 1 to n → Damping out. 1 to n (0363-1 to n)

### Prerequisite

A process variable is selected in the **Assign curr.** parameter ( $\rightarrow$  108) and one of the following options is selected in the **Current span** parameter ( $\rightarrow$  108):

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

### Description

Use this function to enter a time constant for the reaction time of the current output signal to fluctuations in the measured value caused by process conditions.

### User entry

0.0 to 999.9 s

### Factory setting

1.0 s

**Additional information***User entry*

Use this function to enter a time constant (PT1 element<sup>4)</sup>) for current output damping:

- If a low time constant is entered, the current output reacts particularly quickly to fluctuating measured variables.
- On the other hand, the current output reacts more slowly if a high time constant is entered.



Damping is switched off if **0** is entered (factory setting).

**Response time****Navigation**

█ █ Expert → Output → Curr.output 1 to n → Response time (0378–1 to n)

**Prerequisite**

One of the following options is selected in the **Current span** parameter (→ █ 108):

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

**Description**

Displays the response time. This specifies how quickly the current output reaches the measured value change of 63 % of 100 % of the measured value change.

**User interface**

Positive floating-point number

**Additional information***Description*

The response time is made up of the time specified for the following dampings:

- Current output damping → █ 116  
and
- Depending on the measured variable assigned to the output.  
Flow damping

**Failure mode****Navigation**

█ █ Expert → Output → Curr.output 1 to n → Failure mode (0364–1 to n)

**Prerequisite**

A process variable is selected in the **Assign curr.** parameter (→ █ 108) and one of the following options is selected in the **Current span** parameter (→ █ 108):

- 4...20 mA NAMUR
- 4...20 mA US
- 4...20 mA
- 0...20 mA

**Description**

Use this function to select the value of the current output in the event of a device alarm.

4) proportional transmission behavior with first order delay

**Selection**

- Min.
- Max.
- Last valid value
- Actual value
- Defined value

**Factory setting**

Max.

**Additional information***Description*

 This setting does not affect the failsafe mode of other outputs and totalizers. This is specified in separate parameters.

*"Min." option*

The current output adopts the value of the lower level for signal on alarm.

 The signal on alarm level is defined via the **Current span** parameter (→ 108).

*"Max." option*

The current output adopts the value of the upper level for signal on alarm.

 The signal on alarm level is defined via the **Current span** parameter (→ 108).

*"Last valid value" option*

The current output adopts the last measured value that was valid before the device alarm occurred.

*"Actual value" option*

The current output adopts the measured value on the basis of the current flow measurement; the device alarm is ignored.

*"Defined value" option*

The current output adopts a defined measured value.

 The measured value is defined via the **Failure current** parameter (→ 118).

---

**Failure current****Navigation**

 Expert → Output → Curr.output 1 to n → Failure current (0352-1 to n)

**Prerequisite**

The **Defined value** option is selected in the **Failure mode** parameter (→ 117).

**Description**

Use this function to enter a fixed value that the current output adopts in the event of a device alarm.

**User entry**

0 to 22.5 mA

**Factory setting**

22.5 mA

**Output curr. 1 to n**

**Navigation**      Expert → Output → Curr.output 1 to n → Output curr. 1 to n (0361–1 to n)

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

**User interface**      3.59 to 22.5 mA

**Measur. curr. 1 to n**

**Navigation**      Expert → Output → Curr.output 1 to n → Measur. curr. 1 to n (0366–1 to n)

**Description**      Use this function to display the actual measured value of the output current.

**User interface**      0 to 30 mA

**3.5.2 "Pulse/frequency/switch output 1 to n" submenu**

*Navigation*

Expert → Output → PFS output 1 to n

► PFS output 1 to n	
Terminal no. (0492–1 to n)	→  120
Signal mode (0490–1 to n)	→  121
Operating mode (0469–1 to n)	→  121
Assign pulse 1 to n (0460–1 to n)	→  123
Pulse scaling (0455–1 to n)	→  123
Pulse width (0452–1 to n)	→  124
Measuring mode (0457–1 to n)	→  124
Failure mode (0480–1 to n)	→  125
Pulse output 1 to n (0456–1 to n)	→  126
Assign freq. (0478–1 to n)	→  126
Min. freq. value (0453–1 to n)	→  127

Max. freq. value (0454-1 to n)	→  127
Val. at min.freq (0476-1 to n)	→  128
Val. at max.freq (0475-1 to n)	→  128
Measuring mode (0479-1 to n)	→  128
Damping out. 1 to n (0477-1 to n)	→  129
Response time (0491-1 to n)	→  129
Failure mode (0451-1 to n)	→  130
Failure freq. (0474-1 to n)	→  130
Output freq. 1 to n (0471-1 to n)	→  131
Switch out funct (0481-1 to n)	→  131
Assign diag. beh (0482-1 to n)	→  132
Assign limit (0483-1 to n)	→  132
Switch-on value (0466-1 to n)	→  134
Switch-off value (0464-1 to n)	→  135
Assign dir.check (0484-1 to n)	→  135
Assign status (0485-1 to n)	→  136
Switch-on delay (0467-1 to n)	→  136
Switch-off delay (0465-1 to n)	→  136
Failure mode (0486-1 to n)	→  137
Switch status 1 to n (0461-1 to n)	→  137
Invert outp.sig. (0470-1 to n)	→  138

---

Terminal no.

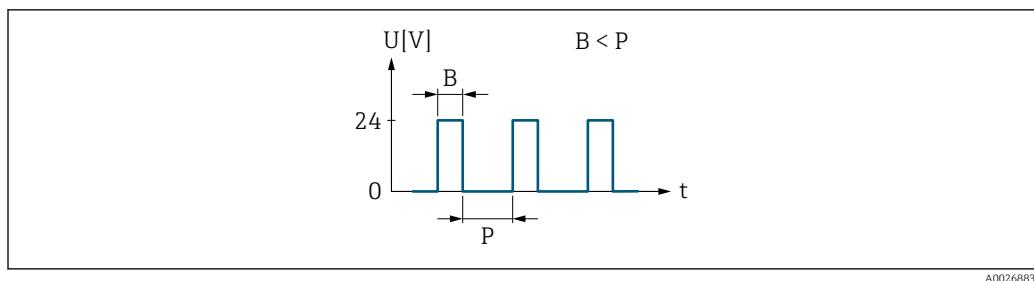
## Navigation

Expert → Output → PFS output 1 to n → Terminal no. (0492-1 to n)

## Description

Displays the terminal numbers used by the pulse/frequency/switch output module.

<b>User interface</b>	<ul style="list-style-type: none"><li>■ Not used</li><li>■ 24-25 (I/O 2)</li><li>■ 22-23 (I/O 3)</li></ul>
<b>Additional information</b>	<p><i>"Not used" option</i></p> <p>The pulse/frequency/switch output module does not use any terminal numbers.</p>
<hr/>	
<b>Signal mode</b>	
<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Signal mode (0490–1 to n)
<b>Description</b>	Use this function to select the signal mode for the pulse/frequency/switch output.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Passive</li><li>■ Active</li><li>■ Passive NAMUR</li></ul>
<b>Factory setting</b>	Passive
<hr/>	
<b>Operating mode</b>	
<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Operating mode (0469–1 to n)
<b>Description</b>	Use this function to select the operating mode of the output as a pulse, frequency or switch output.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Pulse</li><li>■ Frequency</li><li>■ Switch</li></ul>
<b>Factory setting</b>	Pulse
<b>Additional information</b>	<p><i>"Pulse" option</i></p> <p>Quantity-dependent pulse with configurable pulse width</p> <ul style="list-style-type: none"><li>■ Whenever a specific volume or mass is reached (pulse value), a pulse is output, the duration of which was set previously (pulse width).</li><li>■ The pulses are never shorter than the set duration.</li></ul> <p>Example</p> <ul style="list-style-type: none"><li>■ Flow rate approx. 100 g/s</li><li>■ Pulse value 0.1 g</li><li>■ Pulse width 0.05 ms</li><li>■ Pulse rate 1 000 Impuls/s</li></ul>



■ 6 Quantity-proportional pulse (pulse value) with pulse width to be configured

B Pulse width entered

P Pauses between the individual pulses

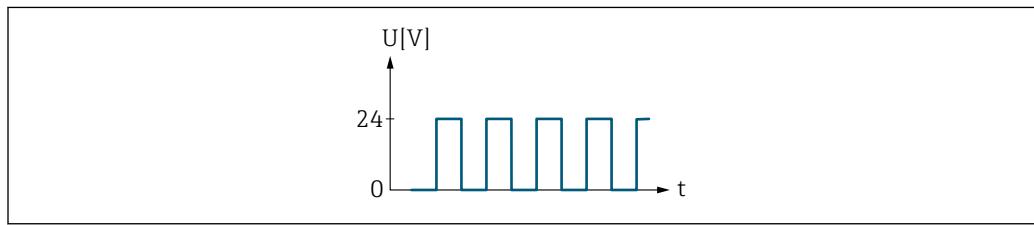
#### "Frequency" option

Flow-proportional frequency output with 1:1 on/off ratio

An output frequency is output that is proportional to the value of a process variable, such as volume flow, mass flow, temperature, sound velocity, flow velocity, acceptance rate, flow asymmetry, turbulence, signal strength or signal-to-noise ratio.

Example

- Flow rate approx. 100 g/s
- Max. frequency 10 kHz
- Flow rate at max. frequency 1000 g/s
- Output frequency approx. 1000 Hz



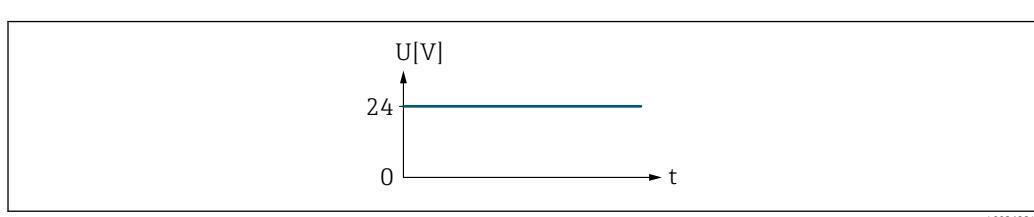
■ 7 Flow-proportional frequency output

#### "Switch" option

Contact for displaying a condition (e.g. alarm or warning if a limit value is reached)

Example

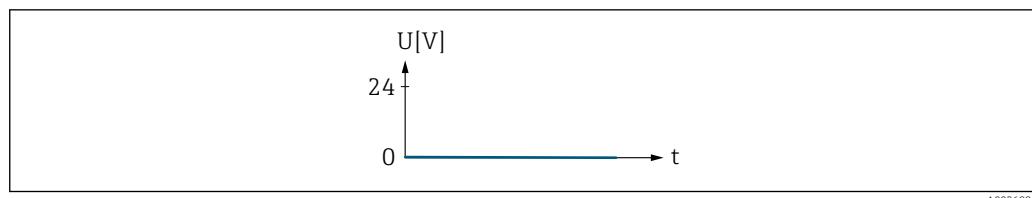
Alarm response without alarm



■ 8 No alarm, high level

Example

Alarm response in case of alarm



A0026885

9 Alarm, low level

**Assign pulse 1 to n****Navigation**

Expert → Output → PFS output 1 to n → Assign pulse 1 to n (0460–1 to n)

**Prerequisite**

The **Pulse** option is selected in the **Operating mode** parameter (→ 121) parameter.

**Description**

Use this function to select the process variable for the pulse output.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Energy flow \*

**Factory setting**

Off

**Pulse scaling****Navigation**

Expert → Output → PFS output 1 to n → Pulse scaling (0455–1 to n)

**Prerequisite**

The **Pulse** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign pulse** parameter (→ 123).

**Description**

Use this function to enter the value for the measured value that a pulse is equivalent to.

**User entry**

Positive floating point number

**Factory setting**

Depends on country and nominal diameter → 238

**Additional information**

*User entry*

Weighting of the pulse output with a quantity.

The lower the pulse value, the

- better the resolution.
- the higher the frequency of the pulse response.

\* Visibility depends on order options or device settings

**Pulse width****Navigation**

Expert → Output → PFS output 1 to n → Pulse width (0452-1 to n)

**Prerequisite**

The **Pulse** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign pulse** parameter (→ 123).

**Description**

Use this function to enter the duration of the output pulse.

**User entry**

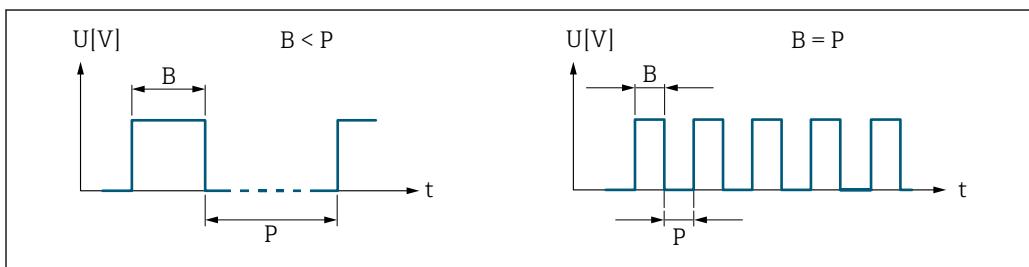
0.05 to 2 000 ms

**Factory setting**

100 ms

**Additional information***Description*

- Define how long a pulse is (duration).
- The maximum pulse rate is defined by  $f_{\max} = 1 / (2 \times \text{pulse width})$ .
- The interval between two pulses lasts at least as long as the set pulse width.
- The maximum flow is defined by  $Q_{\max} = f_{\max} \times \text{pulse value}$ .
- If the flow exceeds these limit values, the measuring device displays the diagnostic message **△S443 Pulse output 1 to n**.



A0026882

B    Pulse width entered  
P    Pauses between the individual pulses

*Example*

- Pulse value: 0.1 g
- Pulse width: 0.1 ms
- $f_{\max} = 1 / (2 \times 0.1 \text{ ms}) = 5 \text{ kHz}$
- $Q_{\max} = 5 \text{ kHz} \times 0.1 \text{ g} = 0.5 \text{ kg/s}$

**Measuring mode****Navigation**

Expert → Output → PFS output 1 to n → Measuring mode (0457-1 to n)

**Description**

Use this function to select the measuring mode for the pulse output.

**Selection**

- Forward flow
- Forward/Reverse
- Reverse flow
- Rev. flow comp.

**Factory setting**

Forward flow

**Additional information***Selection*

- Forward flow  
Positive flow is output, negative flow is not output.
- Forward/Reverse  
Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.
- Reverse flow  
Negative flow is output, positive flow is not output.
- Rev. flow comp.  
The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.

 For a detailed description of the options available, see the **Measuring mode** parameter (→ 112)

*Examples*

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 112)

**Failure mode****Navigation**

Expert → Output → PFS output 1 to n → Failure mode (0480–1 to n)

**Prerequisite**

The **Pulse** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign pulse** parameter (→ 123).

**Description**

Use this function to select the failure mode of the pulse output in the event of a device alarm.

**Selection**

- Actual value
- No pulses

**Factory setting**

No pulses

**Additional information***Description*

The dictates of safety render it advisable to ensure that the pulse output shows a predefined behavior in the event of a device alarm.

*Selection*

- Actual value  
In the event of a device alarm, the pulse output continues on the basis of the current flow measurement. The fault is ignored.
- No pulses  
In the event of a device alarm, the pulse output is "switched off".

**NOTICE!** A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The **Actual value** option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

## Pulse output 1 to n

### Navigation

  Expert → Output → PFS output 1 to n → Pulse output 1 to n (0456–1 to n)

### Prerequisite

The **Pulse** option is selected in the **Operating mode** parameter (→ [121](#)) parameter.

### Description

Displays the pulse frequency currently output.

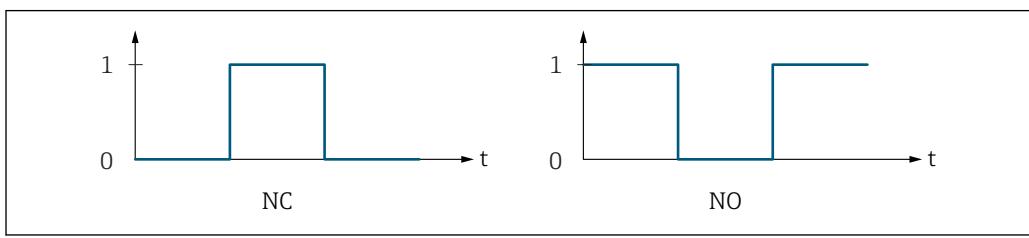
### User interface

Positive floating-point number

### Additional information

#### Description

- The pulse output is an open collector output.
- This is configured at the factory in such a way that the transistor is conductive for the duration of the pulse (NO contact) and is safety-oriented.



A0028726

0 Non-conductive  
 1 Conductive  
 NC NC contact (normally closed)  
 NO NO contact (normally open)

The output behavior can be reversed via the **Invert outp.sig.** parameter (→ [138](#)) i.e. the transistor does not conduct for the duration of the pulse.

In addition, the behavior of the output in the event of a device alarm (**Failure mode** parameter (→ [125](#))) can be configured.

## Assign freq.



### Navigation

  Expert → Output → PFS output 1 to n → Assign freq. (0478–1 to n)

### Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ [121](#)).

### Description

Use this function to select the process variable for the frequency output.

### Selection

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*

\* Visibility depends on order options or device settings

- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.

**Factory setting** Off

### Min. freq. value



**Navigation** Expert → Output → PFS output 1 to n → Min. freq. value (0453-1 to n)

**Prerequisite** The **Frequency** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign freq.** parameter (→ 126).

**Description** Use this function to enter the minimum frequency.

**User entry** 0.0 to 10 000.0 Hz

**Factory setting** 0.0 Hz

### Max. freq. value



**Navigation** Expert → Output → PFS output 1 to n → Max. freq. value (0454-1 to n)

**Prerequisite** The **Frequency** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign freq.** parameter (→ 126).

**Description** Use this function to enter the end value frequency.

**User entry** 0.0 to 10 000.0 Hz

**Factory setting** 10 000.0 Hz

\* Visibility depends on order options or device settings

## Val. at min.freq



### Navigation

Expert → Output → PFS output 1 to n → Val. at min.freq (0476-1 to n)

### Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign freq.** parameter (→ 126).

### Description

Use this function to enter the measured value for the start value frequency.

### User entry

Signed floating-point number

### Factory setting

Depends on country and nominal diameter

### Additional information

#### *Dependency*

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 126).

## Val. at max.freq



### Navigation

Expert → Output → PFS output 1 to n → Val. at max.freq (0475-1 to n)

### Prerequisite

The **Frequency** option is selected in the **Operating mode** parameter (→ 121) and a process variable is selected in the **Assign freq.** parameter (→ 126).

### Description

Use this function to enter the measured value for the end value frequency.

### User entry

Signed floating-point number

### Factory setting

Depends on country and nominal diameter

### Additional information

#### *Description*

Use this function to enter the maximum measured value at the maximum frequency. The selected process variable is output as a proportional frequency.

#### *Dependency*

The entry depends on the process variable selected in the **Assign freq.** parameter (→ 126).

## Measuring mode



### Navigation

Expert → Output → PFS output 1 to n → Measuring mode (0479-1 to n)

### Description

Use this function to select the measuring mode for the frequency output.

### Selection

- Forward flow
- Forward/Reverse
- Rev. flow comp.

**Factory setting** Forward flow

**Additional information** *Selection*

 For a detailed description of the options available, see the **Measuring mode** parameter (→ 112)

*Examples*

 For a detailed description of the configuration examples, see the **Measuring mode** parameter (→ 112)

## Damping out. 1 to n



**Navigation**  Expert → Output → PFS output 1 to n → Damping out. 1 to n (0477–1 to n)

**Description** Use this function to enter a time constant for the reaction time of the output signal to fluctuations in the measured value.

**User entry** 0 to 999.9 s

**Factory setting** 0.0 s

**Additional information** *User entry*

Use this function to enter a time constant (PT1 element<sup>5)</sup>) for frequency output damping:

- If a low time constant is entered, the current output reacts particularly quickly to fluctuating measured variables.
- On the other hand, the current output reacts more slowly if a high time constant is entered.

 Damping is switched off if 0 is entered (factory setting).

The frequency output is subject to separate damping that is independent of all preceding time constants.

## Response time

**Navigation**  Expert → Output → PFS output 1 to n → Response time (0491–1 to n)

**Description** Displays the response time. This specifies how quickly the pulse/frequency/switch output reaches the measured value change of 63 % of 100 % of the measured value change.

**User interface** Positive floating-point number

5) proportional transmission behavior with first order delay

**Additional information***Description*

The response time is made up of the time specified for the following dampings:

- Damping of pulse/frequency/switch output → [116](#)  
and
- Depending on the measured variable assigned to the output.
  - Flow damping  
or
  - Temperature damping

**Failure mode****Navigation**

Expert → Output → PFS output 1 to n → Failure mode (0451–1 to n)

**Prerequisite**

The **Frequency** option is selected in the **Operating mode** parameter (→ [121](#)) and a process variable is selected in the **Assign freq.** parameter (→ [126](#)).

**Description**

Use this function to select the failure mode of the frequency output in the event of a device alarm.

**Selection**

- Actual value
- Defined value
- 0 Hz

**Factory setting**

0 Hz

**Additional information***Selection*

- Actual value

In the event of a device alarm, the frequency output continues on the basis of the current flow measurement. The device alarm is ignored.

- Defined value

In the event of a device alarm, the frequency output continues on the basis of a predefined value. The Failure freq. (→ [130](#)) replaces the current measured value, making it possible to bypass the device alarm. The actual measurement is switched off for the duration of the device alarm.

- 0 Hz

In the event of a device alarm, the frequency output is "switched off".

**NOTICE!** A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The **Actual value** option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.

**Failure freq.****Navigation**

Expert → Output → PFS output 1 to n → Failure freq. (0474–1 to n)

**Prerequisite**

The **Frequency** option is selected in the **Operating mode** parameter (→ [121](#)) and a process variable is selected in the **Assign freq.** parameter (→ [126](#)).

**Description**

Use this function to enter the value for the frequency output in the event of a device alarm in order to bypass the alarm.

---

<b>User entry</b>	0.0 to 12 500.0 Hz
<b>Factory setting</b>	0.0 Hz

---

### Output freq. 1 to n

---

<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Output freq. 1 to n (0471-1 to n)
<b>Prerequisite</b>	In the <b>Operating mode</b> parameter (→ <a href="#">121</a> ), the <b>Frequency</b> option is selected.
<b>Description</b>	Displays the actual value of the output frequency which is currently measured.
<b>User interface</b>	0.0 to 12 500.0 Hz

---

### Switch out funct

---

<b>Navigation</b>	 Expert → Output → PFS output 1 to n → Switch out funct (0481-1 to n)
<b>Prerequisite</b>	The <b>Switch</b> option is selected in the <b>Operating mode</b> parameter (→ <a href="#">121</a> ).
<b>Description</b>	Use this function to select a function for the switch output.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Off</li> <li>▪ On</li> <li>▪ Diag. behavior</li> <li>▪ Limit</li> <li>▪ Fl. direct.check</li> <li>▪ Status</li> </ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"> <li>▪ Off The switch output is permanently switched off (open, non-conductive).</li> <li>▪ On The switch output is permanently switched on (closed, conductive).</li> <li>▪ Diag. behavior Indicates if the diagnostic event is present or not. Is used to output diagnostic information and to react to it appropriately at the system level.</li> <li>▪ Limit Indicates if a specified limit value has been reached for the process variable. Is used to output diagnostic information relating to the process and to react to it appropriately at the system level.</li> <li>▪ Status Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.</li> </ul>

**Assign diag. beh****Navigation**

Expert → Output → PFS output 1 to n → Assign diag. beh (0482–1 to n)

**Prerequisite**

- In the **Operating mode** parameter (→ [121](#)), the **Switch** option is selected.
- In the **Switch out funct** parameter (→ [131](#)), the **Diag. behavior** option is selected.

**Description**

Use this function to select the diagnostic event category that is displayed for the switch output.

**Selection**

- Alarm
- Alarm or warning
- Warning

**Factory setting**

Alarm

**Additional information***Description*

If no diagnostic event is pending, the switch output is closed and conductive.

*Selection*

- Alarm  
The switch output signals only diagnostic events in the alarm category.
- Alarm or warning  
The switch output signals diagnostic events in the alarm and warning category.
- Warning  
The switch output signals only diagnostic events in the warning category.

**Assign limit****Navigation**

Expert → Output → PFS output 1 to n → Assign limit (0483–1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ [121](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [131](#)).

**Description**

Use this function to select a process variable for the limit function.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*

\* Visibility depends on order options or device settings

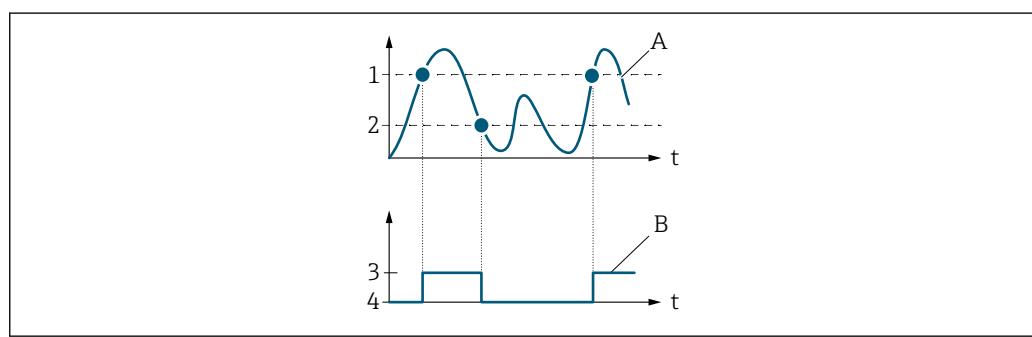
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3

**Factory setting** Volume flow

**Additional information** *Description*

Behavior of status output when Switch-on value > Switch-off value:

- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive

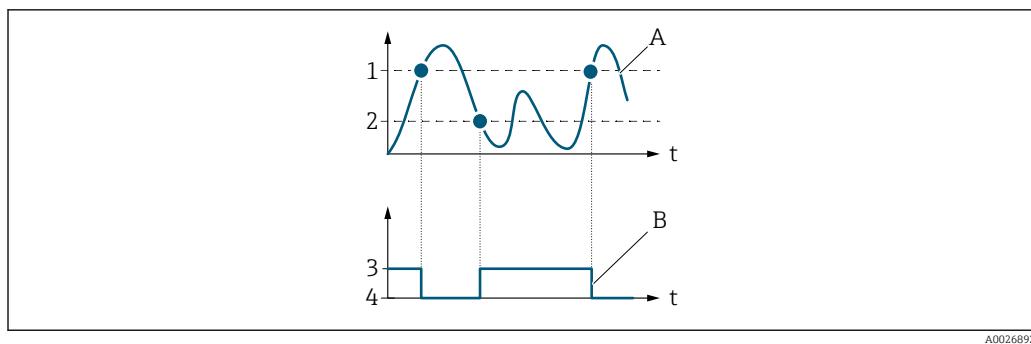


- |   |                  |
|---|------------------|
| 1 | Switch-on value  |
| 2 | Switch-off value |
| 3 | Conductive       |
| 4 | Non-conductive   |
| A | Process variable |
| B | Status output    |

Behavior of status output when Switch-on value < Switch-off value:

- Process variable < Switch-on value: transistor is conductive
- Process variable > Switch-off value: transistor is non-conductive

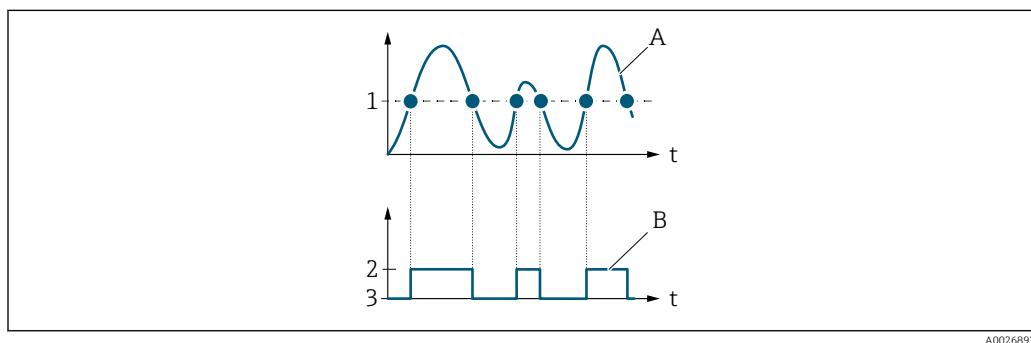
\* Visibility depends on order options or device settings



- 1 Switch-off value
- 2 Switch-on value
- 3 Conductive
- 4 Non-conductive
- A Process variable
- B Status output

Behavior of status output when Switch-on value = Switch-off value:

- Process variable > Switch-on value: transistor is conductive
- Process variable < Switch-off value: transistor is non-conductive



- 1 Switch-on value = Switch-off value
- 2 Conductive
- 3 Non-conductive
- A Process variable
- B Status output

## Switch-on value



### Navigation

Expert → Output → PFS output 1 to n → Switch-on value (0466-1 to n)

### Prerequisite

- The **Switch** option is selected in the **Operating mode** parameter (→ 121).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 131).

### Description

Use this function to enter the measured value for the switch-on point.

### User entry

Signed floating-point number

### Factory setting

Country-dependent

**Additional information***Description*

Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).



When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

The unit depends on the process variable selected in the **Assign limit** parameter (→ 132).

**Switch-off value****Navigation**

Expert → Output → PFS output 1 to n → Switch-off value (0464-1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ 121).
- The **Limit** option is selected in the **Switch out funct** parameter (→ 131).

**Description**

Use this function to enter the measured value for the switch-off point.

**User entry**

Signed floating-point number

**Factory setting**

Country-dependent

**Additional information***Description*

Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive).



When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

The unit depends on the process variable selected in the **Assign limit** parameter (→ 132).

**Assign dir.check****Navigation**

Expert → Output → PFS output 1 to n → Assign dir.check (0484-1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ 121).
- The **Fl. direct.check** option is selected in the **Switch out funct** parameter (→ 131).

**Description**

Use this function to select a process variable for monitoring the flow direction.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*

\* Visibility depends on order options or device settings

- Mass flow
- Flow velocity\*
- Energy flow\*

**Factory setting** Volume flow

## Assign status



**Navigation** Expert → Output → PFS output 1 to n → Assign status (0485-1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ [121](#)).
- The **Status** option is selected in the **Switch out funct** parameter (→ [131](#)).

**Description** Use this function to select a device status for the switch output.

**Selection**

- Off
- Low flow cut off

**Factory setting** Low flow cut off

**Additional information** *Options*

If empty pipe detection or low flow cut off are enabled, the output is conductive. Otherwise, the switch output is non-conductive.

## Switch-on delay



**Navigation** Expert → Output → PFS output 1 to n → Switch-on delay (0467-1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ [121](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [131](#)).

**Description** Use this function to enter a delay time for switching on the switch output.

**User entry** 0.0 to 100.0 s

**Factory setting** 0.0 s

## Switch-off delay



**Navigation** Expert → Output → PFS output 1 to n → Switch-off delay (0465-1 to n)

**Prerequisite**

- The **Switch** option is selected in the **Operating mode** parameter (→ [121](#)).
- The **Limit** option is selected in the **Switch out funct** parameter (→ [131](#)).

\* Visibility depends on order options or device settings

<b>Description</b>	Use this function to enter a delay time for switching off the switch output.
<b>User entry</b>	0.0 to 100.0 s
<b>Factory setting</b>	0.0 s

**Failure mode**

<b>Navigation</b>	Expert → Output → PFS output 1 to n → Failure mode (0486–1 to n)
<b>Description</b>	Use this function to select a failsafe mode for the switch output in the event of a device alarm.
<b>Selection</b>	<ul style="list-style-type: none"> <li>▪ Actual status</li> <li>▪ Open</li> <li>▪ Closed</li> </ul>
<b>Factory setting</b>	Open
<b>Additional information</b>	<p><i>Options</i></p> <ul style="list-style-type: none"> <li>▪ Actual status In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the switch output. The <b>Actual status</b> option behaves in the same way as the current input value.</li> <li>▪ Open In the event of a device alarm, the switch output's transistor is set to <b>non-conductive</b>.</li> <li>▪ Closed In the event of a device alarm, the switch output's transistor is set to <b>conductive</b>.</li> </ul>

**Switch status 1 to n**

<b>Navigation</b>	Expert → Output → PFS output 1 to n → Switch status 1 to n (0461–1 to n)
<b>Prerequisite</b>	The <b>Switch</b> option is selected in the <b>Operating mode</b> parameter (→ 121).
<b>Description</b>	Displays the current switch status of the status output.
<b>User interface</b>	<ul style="list-style-type: none"> <li>▪ Open</li> <li>▪ Closed</li> </ul>
<b>Additional information</b>	<p><i>User interface</i></p> <ul style="list-style-type: none"> <li>▪ Open The switch output is not conductive.</li> <li>▪ Closed The switch output is conductive.</li> </ul>

**Invert outp.sig.****Navigation**

Expert → Output → PFS output 1 to n → Invert outp.sig. (0470–1 to n)

**Description**

Use this function to select whether to invert the output signal.

**Selection**

- No
- Yes

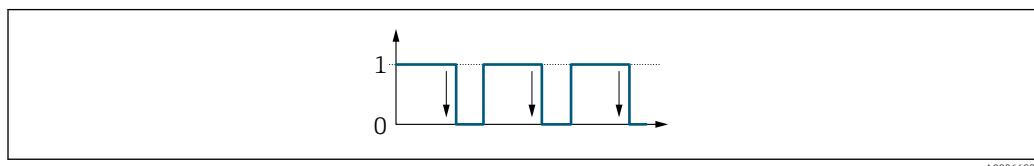
**Factory setting**

No

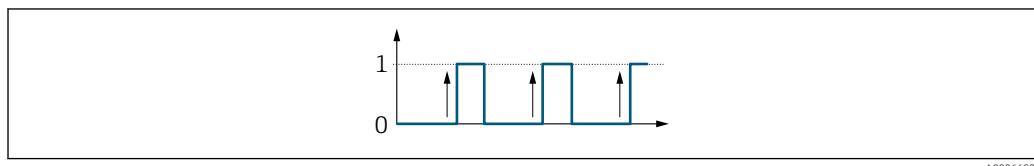
**Additional information**

*Selection*

**No** option (passive - negative)



**Yes** option (passive - positive)



### 3.5.3 "Relay output 1 to n" submenu

**Navigation**

Expert → Output → Relay output 1 to n

► Relay output 1 to n	
Terminal no.	→  139
Relay outp.func.	→  139
Assign dir.check	→  140
Assign limit	→  140
Assign diag. beh	→  141
Assign status	→  142
Switch-off value	→  142

Switch-off delay	→  142
Switch-on value	→  143
Switch-on delay	→  143
Failure mode	→  143
Switch status	→  144
Powerless relay	→  144

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**Terminal no.**

---

**Navigation** Expert → Output → Relay output 1 to n → Terminal no. (0812-1 to n)

**Description** Displays the terminal numbers used by the relay output module.

**User interface**

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Additional information** "Not used" option  
The relay output module does not use any terminal numbers.

---

**Relay outp.func.**

---



**Navigation** Expert → Output → Relay output 1 to n → Relay outp.func. (0804-1 to n)

**Description** Use this function to select an output function for the relay output.

**Selection**

- Closed
- Open
- Diag. behavior
- Limit
- Fl. direct.check
- Digital Output

**Factory setting** Closed

**Additional information***Selection*

- Closed  
The relay output is permanently switched on (closed, conductive).
- Open  
The relay output is permanently switched off (open, non-conductive).
- Diag. behavior  
Indicates if the diagnostic event is present or not. Is used to output diagnostic information and to react to it appropriately at the system level.
- Limit  
Indicates if a specified limit value has been reached for the process variable. Is used to output diagnostic information relating to the process and to react to it appropriately at the system level.
- Fl. direct.check  
Indicates the flow direction (forward or reverse flow).
- Digital Output  
Indicates the device status depending on whether empty pipe detection or low flow cut off is selected.

**Assign dir.check****Navigation**

Expert → Output → Relay output 1 to n → Assign dir.check (0808-1 to n)

**Prerequisite**

In the **Relay outp.func.** parameter (→ 139), the **Fl. direct.check** option is selected.

**Description**

Use this function to select a process variable for monitoring the flow direction.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Energy flow

**Factory setting**

Volume flow

**Assign limit****Navigation**

Expert → Output → Relay output 1 to n → Assign limit (0807-1 to n)

**Prerequisite**

The **Limit** option is selected in the **Relay outp.func.** parameter (→ 139).

**Description**

Use this function to select a process variable for the limit value function.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity

\* Visibility depends on order options or device settings

- Sound velocity\*
- Temperature\*
- Pressure\*
- Methane fraction\*
- Molar mass\*
- Density\*
- Dynam. viscosity\*
- Calorific value\*
- Wobbe index\*
- Energy flow\*
- Signal strength\*
- SNR\*
- Acceptance rate\*
- Turbulence\*
- Flow asymmetry\*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3

**Factory setting** Volume flow

## Assign diag. beh



**Navigation** Expert → Output → Relay output 1 to n → Assign diag. beh (0806-1 to n)

**Prerequisite** In the **Relay outp.func.** parameter (→ 139), the **Diag. behavior** option is selected.

**Description** Use this function to select the category of the diagnostic events that are displayed for the relay output.

**Selection**

- Alarm
- Alarm or warning
- Warning

**Factory setting** Alarm

**Additional information** *Description*

If no diagnostic event is pending, the relay output is closed and conductive.

### *Selection*

- Alarm  
The relay output signals only diagnostic events in the alarm category.
- Alarm or warning  
The relay output signals diagnostic events in the alarm and warning category.
- Warning  
The relay output signals only diagnostic events in the warning category.

\* Visibility depends on order options or device settings

---

**Assign status**

<b>Navigation</b>	Expert → Output → Relay output 1 to n → Assign status (0805–1 to n)
<b>Prerequisite</b>	In the <b>Relay outp.func.</b> parameter (→  139), the <b>Digital Output</b> option is selected.
<b>Description</b>	Use this function to select the device status for the relay output.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Low flow cut off</li></ul>
<b>Factory setting</b>	Off

---

**Switch-off value**

<b>Navigation</b>	Expert → Output → Relay output 1 to n → Switch-off value (0809–1 to n)
<b>Prerequisite</b>	In the <b>Relay outp.func.</b> parameter (→  139), the <b>Limit</b> option is selected.
<b>Description</b>	Use this function to enter the measured value for the switch-off point.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	0 m <sup>3</sup> /h
<b>Additional information</b>	<i>Description</i> Use this function to enter the limit value for the switch-off value (process variable < switch-off value = open, non-conductive). When using a hysteresis: Switch-on value > Switch-off value.
	<i>Dependency</i> The unit is dependent on the process variable selected in the <b>Assign limit</b> parameter (→  140).

---

**Switch-off delay**

<b>Navigation</b>	Expert → Output → Relay output 1 to n → Switch-off delay (0813–1 to n)
<b>Prerequisite</b>	In the <b>Relay outp.func.</b> parameter (→  139), the <b>Limit</b> option is selected.
<b>Description</b>	Use this function to enter a delay time for switching off the switch output.
<b>User entry</b>	0.0 to 100.0 s
<b>Factory setting</b>	0.0 s

---

**Switch-on value**

**Navigation** Expert → Output → Relay output 1 to n → Switch-on value (0810-1 to n)

**Prerequisite** The **Limit** option is selected in the **Relay outp.func.** parameter (→ [139](#)).

**Description** Use this function to enter the measured value for the switch-on point.

**User entry** Signed floating-point number

**Factory setting** 0 m<sup>3</sup>/h

**Additional information** *Description*

Use this function to enter the limit value for the switch-on value (process variable > switch-on value = closed, conductive).

When using a hysteresis: Switch-on value > Switch-off value.

*Dependency*

The unit is dependent on the process variable selected in the **Assign limit** parameter (→ [140](#)).

---

**Switch-on delay**

**Navigation** Expert → Output → Relay output 1 to n → Switch-on delay (0814-1 to n)

**Prerequisite** In the **Relay outp.func.** parameter (→ [139](#)), the **Limit** option is selected.

**Description** Use this function to enter a delay time for switching on the switch output.

**User entry** 0.0 to 100.0 s

**Factory setting** 0.0 s

---

**Failure mode**

**Navigation** Expert → Output → Relay output 1 to n → Failure mode (0811-1 to n)

**Description** Use this function to select the failure mode of the relay output in the event of a device alarm.

**Selection**

- Actual status
- Open
- Closed

**Factory setting** Open

**Additional information***Selection*

## ■ Actual status

In the event of a device alarm, faults are ignored and the current behavior of the input value is output by the relay output. The **Actual status** option behaves in the same way as the current input value.

## ■ Open

In the event of a device alarm, the relay output's transistor is set to **non-conductive**.

## ■ Closed

In the event of a device alarm, the relay output's transistor is set to **conductive**.

---

**Switch status**

---

**Navigation** Expert → Output → Relay output 1 to n → Switch status (0801-1 to n)**Description**

Displays the current status of the relay output.

**User interface**

- Open
- Closed

**Additional information***User interface*

## ■ Open

The relay output is not conductive.

## ■ Closed

The relay output is conductive.

---

**Powerless relay**

---

**Navigation** Expert → Output → Relay output 1 to n → Powerless relay (0816-1 to n)**Description**

Use this function to select the quiescent state for the relay output.

**Selection**

- Open
- Closed

**Factory setting**

Open

**Additional information***Selection*

## ■ Open

The relay output is not conductive.

## ■ Closed

The relay output is conductive.

### 3.5.4 "Double pulse output" submenu

#### Navigation

 Expert → Output → Double pulse out

 Double pulse out	
Master term. no. (0981)	→  145
Slave term. no. (0990)	→  145
Signal mode (0991)	→  146
Assign pulse 1 (0982-1)	→  146
Value per pulse (0983)	→  146
Pulse width (0986)	→  147
Phase shift (0992)	→  147
Measuring mode (0984)	→  147
Failure mode (0985)	→  148
Pulse output (0987)	→  149
Invert outp.sig. (0993)	→  149

---

#### Master term. no.

---

##### Navigation

 Expert → Output → Double pulse out → Master term. no. (0981)

##### Description

Displays the master terminal number for the double pulse output.

##### User interface

- Not used
- 24-25 (I/O 2)
- 22-23 (I/O 3)

##### Additional information

"Not used" option

The double pulse output does not use any terminal numbers.

---

#### Slave term. no.

---

##### Navigation

 Expert → Output → Double pulse out → Slave term. no. (0990)

##### Description

Displays the slave terminal number for the double pulse output.

<b>User interface</b>	<ul style="list-style-type: none"><li>■ Not used</li><li>■ 24-25 (I/O 2)</li><li>■ 22-23 (I/O 3)</li></ul>
<b>Additional information</b>	<p><i>"Not used" option</i></p> <p>The double pulse output does not use any terminal numbers.</p>

---

<b>Signal mode</b>	
<b>Navigation</b>	 Expert → Output → Double pulse out → Signal mode (0991)
<b>Description</b>	Use this function to select the signal mode for the double pulse output.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Passive</li><li>■ Active</li><li>■ Passive NAMUR</li></ul>
<b>Factory setting</b>	Passive

---

<b>Assign pulse 1</b>	
<b>Navigation</b>	 Expert → Output → Double pulse out → Assign pulse 1 (0982-1)
<b>Description</b>	Use this function to select a process variable for the double pulse output.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Off</li><li>■ Volume flow</li><li>■ Correct.vol.flow *</li><li>■ Mass flow</li><li>■ Energy flow *</li></ul>
<b>Factory setting</b>	Off

---

<b>Value per pulse</b>	
<b>Navigation</b>	 Expert → Output → Double pulse out → Value per pulse (0983)
<b>Description</b>	Use this function to enter the value for the measured value that a pulse is equivalent to.
<b>User entry</b>	Signed floating-point number
<b>Factory setting</b>	Depends on country and nominal diameter

\* Visibility depends on order options or device settings

**Additional information***User entry*

Weighting of the pulse output with a quantity.

The lower the pulse value, the

- better the resolution.
- the higher the frequency of the pulse response.

---

**Pulse width****Navigation**

Expert → Output → Double pulse out → Pulse width (0986)

**Description**

Use this function to enter the duration of the output pulse.

**User entry**

0.5 to 2 000 ms

**Factory setting**

0.5 ms

**Additional information**

For a detailed description and example: **Pulse width** parameter (→ [124](#))

---

**Phase shift****Navigation**

Expert → Output → Double pulse out → Phase shift (0992)

**Description**

Use this function to select the degree of phase shift.

**Selection**

- 90°
- 180°

**Factory setting**

90°

**Additional information***Selection*

- 90°

Phase shift by a quarter period.

- 180°

Phase shift by a half period, which is equivalent to a phase reversal.

---

**Measuring mode****Navigation**

Expert → Output → Double pulse out → Measuring mode (0984)

**Description**

Use this function to select the measuring mode for the double pulse output.

**Selection**

- Forward flow
- Forward/Reverse
- Reverse flow
- Rev. flow comp.

<b>Factory setting</b>	Forward flow
<b>Additional information</b>	<i>Selection</i> <ul style="list-style-type: none"><li>■ Forward flow Positive flow is output, negative flow is not output.</li><li>■ Forward/Reverse Positive and negative flow are output (absolute value), but a distinction is not made between positive and negative flow.</li><li>■ Reverse flow Negative flow is output, positive flow is not output.</li><li>■ Rev. flow comp. The flow components outside the span are buffered, balanced and output after a maximum delay of 60 s.</li></ul>
	<b>i</b> For a detailed description of the options available, see the <b>Measuring mode</b> parameter (→ 112)
	<i>Examples</i> <ul style="list-style-type: none"><li><b>i</b> For a detailed description of the configuration examples, see the <b>Measuring mode</b> parameter (→ 112)</li></ul>

## Failure mode



<b>Navigation</b>	Expert → Output → Double pulse out → Failure mode (0985)
<b>Description</b>	Use this function to select the failure mode of the double pulse output in the event of a device alarm.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Actual value</li><li>■ No pulses</li></ul>
<b>Factory setting</b>	No pulses
<b>Additional information</b>	<i>Description</i> <p>The dictates of safety render it advisable to ensure that the double pulse output shows a predefined behavior in the event of a device alarm.</p> <i>Selection</i> <ul style="list-style-type: none"><li>■ Actual value In the event of a device alarm, the double pulse output continues on the basis of the current flow measurement. The fault is ignored.</li><li>■ No pulses In the event of a device alarm, the double pulse output is "switched off".</li></ul> <p><b>NOTICE!</b> A device alarm is a measuring device error that must be taken seriously. It can affect the measurement quality such that the quality can no longer be guaranteed. The <b>Actual value</b> option is only recommended if it can be guaranteed that all possible alarm conditions will not affect the measurement quality.</p>

## Pulse output

**Navigation**

Expert → Output → Double pulse out → Pulse output (0987)

**Description**

Displays the pulse frequency of the double pulse output which is currently output.

**User interface**

Positive floating-point number

**Additional information**

For a detailed description and example: **Pulse output** parameter (→ 59)

## Invert outp.sig.


**Navigation**

Expert → Output → Double pulse out → Invert outp.sig. (0993)

**Description**

Use this function to select whether to invert the output signal.

**Selection**

- No
- Yes

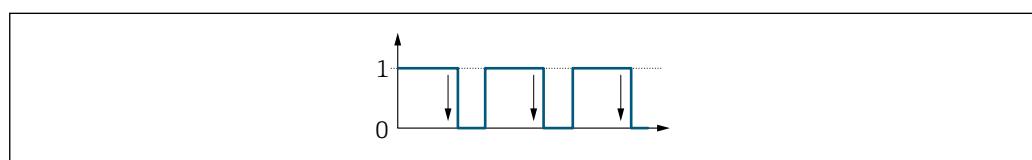
**Factory setting**

No

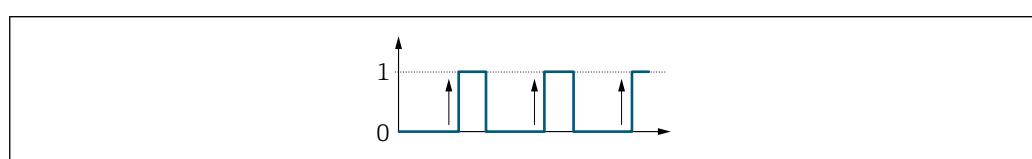
**Additional information**

*Selection*

**No** option (passive - negative)



**Yes** option (passive - positive)



## 3.6 "Communication" submenu

**Navigation**

Expert → Communication

► Communication

► HART input

→ 150

▶ HART output	→  156
▶ Web server	→  173
▶ Diag. config.	→  176
▶ WLAN settings	→  186

### 3.6.1 "HART input" submenu

*Navigation*

Expert → Communication → HART input

▶ HART input	
▶ Configuration	→  150
▶ Input	→  155

#### "Configuration" submenu

*Navigation*

Expert → Communication → HART input → Configuration

▶ Configuration	
Capture mode (7001)	→  151
Device ID (7007)	→  151
Device type (7008)	→  151
Manufacturer ID (7009)	→  152
Burst command (7006)	→  152
Slot number (7010)	→  153
Timeout (7005)	→  153
Failure mode (7011)	→  154
Failure value (7012)	→  154

**Capture mode**

**Navigation** Expert → Communication → HART input → Configuration → Capture mode (7001)

**Description** Use this function to select the capture mode via burst or master communication.

**Selection**

- Off
- Burst network
- Master network

**Factory setting** Off

**Additional information** "Burst network" option

The device records data transmitted via burst in the network.

An external pressure sensor must be in the burst mode.

"Master network" option

In this case, the device must be located in a HART network in which a HART master (control) queries the measured values of the up to 64 network participants. The device reacts only to the responses of a specific device in the network. Device ID, device type, manufacturer ID and the HART commands used by the master must be defined.

**Device ID**

**Navigation** Expert → Communication → HART input → Configuration → Device ID (7007)

**Prerequisite** The **Master network** option is selected in the **Capture mode** parameter (→ 151).

**Description** Use this function to enter the device ID of the HART slave device whose data are to be recorded.

**User entry** 6-digit value:

- Via local operation: enter as hexadecimal or decimal number
- Via operating tool: enter as decimal number

**Factory setting** 0

**Additional information** In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

**Device type**

**Navigation** Expert → Communication → HART input → Configuration → Device type (7008)

**Prerequisite** In the **Capture mode** parameter (→ 151), the **Master network** option is selected.

---

<b>Description</b>	Use this function to enter the device type of the HART slave device whose data are to be recorded.
<b>User entry</b>	2-digit hexadecimal number
<b>Factory setting</b>	0x00
<b>Additional information</b>	 In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

---

## Manufacturer ID



<b>Navigation</b>	 Expert → Communication → HART input → Configuration → Manufacturer ID (7009)
<b>Prerequisite</b>	The <b>Master network</b> option is selected in the <b>Capture mode</b> parameter (→ 151).
<b>Description</b>	Use this function to enter the manufacturer ID of the HART slave device whose data are to be recorded.
<b>User entry</b>	2-digit value: <ul style="list-style-type: none"><li>▪ Via local operation: enter as hexadecimal or decimal number</li><li>▪ Via operating tool: enter as decimal number</li></ul>
<b>Factory setting</b>	0
<b>Additional information</b>	 In addition to the device ID and manufacturer ID, the device type is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

---

## Burst command



<b>Navigation</b>	 Expert → Communication → HART input → Configuration → Burst command (7006)
<b>Prerequisite</b>	The <b>Burst network</b> option or the <b>Master network</b> option are selected in the <b>Capture mode</b> parameter (→ 151).
<b>Description</b>	Use this function to select the burst command to be recorded.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Command 1</li><li>▪ Command 3</li><li>▪ Command 9</li><li>▪ Command 33</li></ul>
<b>Factory setting</b>	Command 1

**Additional information***Selection*

- Command 1  
Use this function to capture the primary variable.
- Command 3  
Use this function to capture the dynamic HART variables and the current.
- Command 9  
Use this function to capture the dynamic HART variables including the associated status.
- Command 33  
Use this function to capture the dynamic HART variables including the associated unit.

**Slot number****Navigation**

Expert → Communication → HART input → Configuration → Slot number (7010)

**Prerequisite**

The **Burst network** option or the **Master network** option is selected in the **Capture mode** parameter (→ [151](#)).

**Description**

Use this function to enter the position of the process variable to be recorded in the burst command.

**User entry**

1 to 8

**Factory setting**

1

**Additional information***User entry*

Slot	Command			
	1	3	9	33
1	PV	PV	HART variable (slot 1)	HART variable (slot 1)
2	–	SV	HART variable (slot 2)	HART variable (slot 2)
3	–	TV	HART variable (slot 3)	HART variable (slot 3)
4	–	QV	HART variable (slot 4)	HART variable (slot 4)
5	–	–	HART variable (slot 5)	–
6	–	–	HART variable (slot 6)	–
7	–	–	HART variable (slot 7)	–
8	–	–	HART variable (slot 8)	–

**Timeout****Navigation**

Expert → Communication → HART input → Configuration → Timeout (7005)

**Prerequisite**

The **Burst network** option or the **Master network** option is selected in the **Capture mode** parameter (→ [151](#)).

**Description**

Use this function to enter the maximum permitted interval between two HART frames.

**User entry**

1 to 120 s

**Factory setting** 5 s

**Additional information** *Description*

-  If the interval is exceeded, the measuring device displays the diagnostic message **F882 Input signal.**

## Failure mode



**Navigation**  Expert → Communication → HART input → Configuration → Failure mode (7011)

**Prerequisite** In the **Capture mode** parameter (→ 151), the **Burst network** option or **Master network** option is selected.

**Description** Use this function to select the device behavior if no data are recorded within the maximum permitted interval.

### Selection

- Alarm
- Last valid value
- Defined value

**Factory setting** Alarm

**Additional information** *Options*

- Alarm  
An error message is set.
- Last valid value  
The last valid measured value is used.
- Defined value  
A user-defined measured value is used: (**Failure value** parameter (→ 154)).

## Failure value



**Navigation**  Expert → Communication → HART input → Configuration → Failure value (7012)

**Prerequisite** The following conditions are met:

- In the **Capture mode** parameter (→ 151), the **Burst network** option or **Master network** option is selected.
- In the **Failure mode** parameter (→ 154), the **Defined value** option is selected.

**Description** Use this function to enter the measured value to be used if no data are recorded within the maximum permitted interval.

**User entry** Signed floating-point number

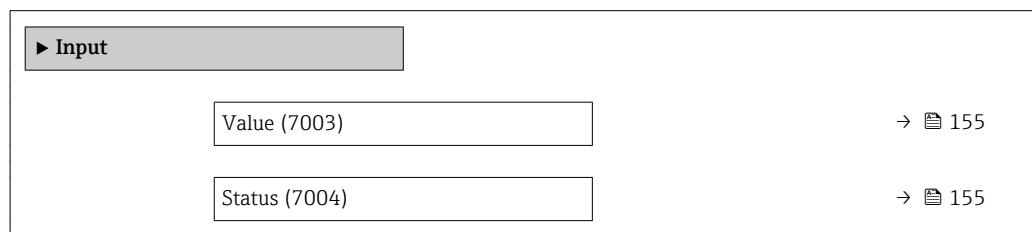
**Factory setting** 1.01325 bar

**Additional information***Dependency*

The unit is taken from the **Pressure unit** parameter (→ [69](#))

**"Input" submenu***Navigation*

Expert → Communication → HART input → Input



---

**Value**

---

**Navigation**

Expert → Communication → HART input → Input → Value (7003)

**Description**

Displays the value of the device variable recorded by the HART input.

**User interface**

Signed floating-point number

---

**Status**

---

**Navigation**

Expert → Communication → HART input → Input → Status (7004)

**Description**

Displays the value of the device variable recorded by the HART input in accordance with the HART specification.

**User interface**

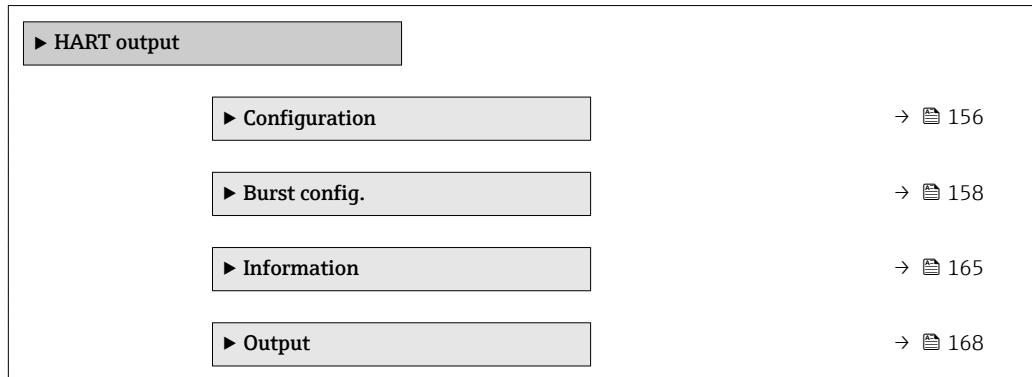
- Manual/Fixed
- Good
- Poor accuracy
- Bad

**Additional information***Description*

If the measuring device reads in an invalid pressure measured value, the diagnostic message **XF882 Input signal** is output

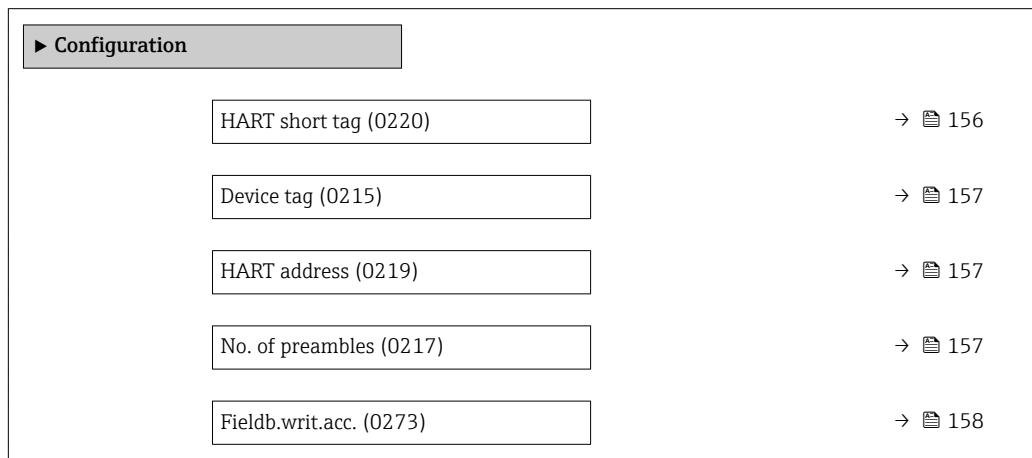
### 3.6.2 "HART output" submenu

Navigation

 Expert → Communication → HART output


#### "Configuration" submenu

Navigation

 Expert → Communication → HART output → Configuration



---

#### HART short tag



## Navigation

 Expert → Communication → HART output → Configuration → HART short tag (0220)

## Description

Use this function to enter a brief description for the measuring point. This can be edited and displayed via HART protocol or using the local display.

## User entry

Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

## Factory setting

PROSONIC

---

**Device tag**

<b>Navigation</b>	Expert → Communication → HART output → Configuration → Device tag (0215)
<b>Description</b>	Use this function to enter the name for the measuring point.
<b>User entry</b>	Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).
<b>Factory setting</b>	Prosonic Flow

---

**HART address**

<b>Navigation</b>	Expert → Communication → HART output → Configuration → HART address (0219)
<b>Description</b>	Use this function to enter the address via which the data exchange takes place via HART protocol.
<b>User entry</b>	0 to 63
<b>Factory setting</b>	0
<b>Additional information</b>	<i>Description</i> For addressing in a HART Multidrop network, the <b>Fixed current</b> option must be set in the <b>Current span</b> parameter (→  108) (current output 1).

---

**No. of preambles**

<b>Navigation</b>	Expert → Communication → HART output → Configuration → No. of preambles (0217)
<b>Description</b>	Use this function to enter the number of preambles in the HART protocol.
<b>User entry</b>	2 to 20
<b>Factory setting</b>	5
<b>Additional information</b>	<i>User entry</i> As every modem component can "swallow" a byte, 2-byte preambles at least must be defined.

**Fieldb.writ.acc.****Navigation**

Expert → Communication → HART output → Configuration → Fieldb.writ.acc. (0273)

**Description**

Use this function to restrict access to the measuring device via fieldbus (HART interface).

**Selection**

- Read + write
- Read only

**Factory setting**

Read + write

**Additional information****Description**

If read and/or write protection is enabled, the parameter can only be controlled and reset via local operation. Access is no longer possible via operating tools.

**Selection**

- Read + write  
The parameters are readable and writable.
- Read only  
The parameters are only readable.

**"Burst configuration 1 to n" submenu****Navigation** Expert → Communication → HART output → Burst config.  
→ Burst config. 1 to n

▶ Burst config.	
▶ Burst config. 1 to n	
Burst mode 1 to n (2032-1 to n)	→  159
Burst command 1 to n (2031-1 to n)	→  159
Burst variable 0 (2033)	→  160
Burst variable 1 (2034)	→  161
Burst variable 2 (2035)	→  162
Burst variable 3 (2036)	→  162
Burst variable 4 (2037)	→  162
Burst variable 5 (2038)	→  162
Burst variable 6 (2039)	→  163

Burst variable 7 (2040)	→  163
Trigger mode (2044–1 to n)	→  163
Trigger level (2043–1 to n)	→  164
Min. upd. per. (2042–1 to n)	→  164
Max. upd. per. (2041–1 to n)	→  165

**Burst mode 1 to n**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst mode 1 to n (2032–1 to n)
<b>Description</b>	Use this function to select whether to activate the HART burst mode for burst message X.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ On</li> </ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<p><i>Options</i></p> <ul style="list-style-type: none"> <li>■ Off The measuring device transmits data only when requested by the HART master.</li> <li>■ On The measuring device transmits data regularly without being requested.</li> </ul>

**Burst command 1 to n**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst command 1 to n (2031–1 to n)
<b>Description</b>	Use this function to select the HART command that is sent to the HART master.
<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Command 1</li> <li>■ Command 2</li> <li>■ Command 3</li> <li>■ Command 9</li> <li>■ Command 33</li> <li>■ Command 48</li> </ul>
<b>Factory setting</b>	Command 2

**Additional information***Selection*

- Command 1  
Read out the primary variable.
- Command 2  
Read out the current and the main measured value as a percentage.
- Command 3  
Read out the dynamic HART variables and the current.
- Command 9  
Read out the dynamic HART variables including the related status.
- Command 33  
Read out the dynamic HART variables including the related unit.
- Command 48  
Read out the complete device diagnostics.

*"Command 33" option*

The HART device variables are defined via Command 107.

The following measured variables (HART device variables) can be read out:

- Volume flow
- Mass flow
- Temperature
- Totalizer 1...3
- Sound velocity
- Flow velocity
- Acceptance rate \*
- Turbulence \*
- Signal strength \*
- SNR \*
- Percent of range
- Measur. curr.
- Primary var (PV)
- Second.var(SV)
- Tertiary var(TV)
- Quaterna.var(QV)

*Commands*

- Information about the defined details of the command: HART specifications
- The measured variables (HART device variables) are assigned to the dynamic variables in the **Output** submenu (→ 106).

**Burst variable 0****Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 0 (2033)

**Description**

For HART command 9 and 33: select the HART device variable or the process variable.

**Selection**

- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity

\* Visibility depends on order options or device settings

- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Percent of range
- Measur. curr.
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*
- HART input
- Primary var (PV)
- Second.var(SV)
- Tertiary var(TV)
- Quaterna.var(QV)
- Not used

**Factory setting** Volume flow

**Additional information** *Selection*

The **Not used** option is set if a burst message is not configured.

#### Burst variable 1



**Navigation** Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 1 (2034)

**Description** For HART command 9 and 33: select the HART device variable or the process variable.

**Selection** See the **Burst variable 0** parameter (→ 160).

**Factory setting** Not used

\* Visibility depends on order options or device settings

**Burst variable 2**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 2 (2035)
<b>Description</b>	For HART command 9 and 33: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).
<b>Factory setting</b>	Not used

**Burst variable 3**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 3 (2036)
<b>Description</b>	For HART command 9 and 33: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).
<b>Factory setting</b>	Not used

**Burst variable 4**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 4 (2037)
<b>Description</b>	For HART command 9: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).
<b>Factory setting</b>	Not used

**Burst variable 5**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 5 (2038)
<b>Description</b>	For HART command 9: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).
<b>Factory setting</b>	Not used

---

**Burst variable 6**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 6 (2039)
<b>Description</b>	For HART command 9: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).

---

**Burst variable 7**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Burst variable 7 (2040)
<b>Description</b>	For HART command 9: select the HART device variable or the process variable.
<b>Selection</b>	See the <b>Burst variable 0</b> parameter (→  160).
<b>Factory setting</b>	Not used

---

**Trigger mode**

<b>Navigation</b>	Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Trigger mode (2044-1 to n)
<b>Description</b>	Use this function to select the event that triggers burst message X.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Continuous</li><li>■ Window</li><li>■ Rising</li><li>■ Falling</li><li>■ On change</li></ul>
<b>Factory setting</b>	Continuous

**Additional information***Selection*

- Continuous  
The message is sent continuously, at least at intervals corresponding to the time frame specified in the **Burst min per** parameter (→ 164).
- Window  
The message is sent if the specified measured value has changed by the value in the **Trigger level** parameter (→ 164).
- Rising  
The message is sent if the specified measured value exceeds the value in the **Trigger level** parameter (→ 164).
- Falling  
The message is sent if the specified measured value drops below the value in the **Trigger level** parameter (→ 164).
- On change  
The message is sent if a measured value changes in the burst message.

**Trigger level****Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n  
→ Trigger level (2043–1 to n)

**Description**

For entering the burst trigger value.

**User entry**

Signed floating-point number

**Additional information***Description*

Together with the option selected in the **Trigger mode** parameter (→ 163) the burst trigger value determines the time of burst message X.

**Min. upd. per.****Navigation**

Expert → Communication → HART output → Burst config. → Burst config. 1 to n  
→ Min. upd. per. (2042–1 to n)

**Description**

Use this function to enter the minimum time span between two burst commands of burst message X.

**User entry**

Positive integer

**Factory setting**

1 000 ms

**Max. upd. per.**

<b>Navigation</b>	 Expert → Communication → HART output → Burst config. → Burst config. 1 to n → Max. upd. per. (2041-1 to n)
<b>Description</b>	Use this function to enter the maximum time span between two burst commands of burst message X.
<b>User entry</b>	Positive integer
<b>Factory setting</b>	2 000 ms

**"Information" submenu**

*Navigation*       Expert → Communication → HART output → Information

 Information	
Device revision (0204)	→  165
Device ID (0221)	→  166
Device type (0209)	→  166
Manufacturer ID (0259)	→  166
HART revision (0205)	→  167
HART descriptor (0212)	→  167
HART message (0216)	→  167
Hardware rev. (0206)	→  167
Software rev. (0224)	→  168
HART date code (0202)	→  168

**Device revision**

<b>Navigation</b>	 Expert → Communication → HART output → Information → Device revision (0204)
<b>Description</b>	Displays the device revision with which the device is registered with the HART Communication Foundation.

<b>User interface</b>	2-digit hexadecimal number
<b>Factory setting</b>	1
<b>Additional information</b>	<i>Description</i>  The device revision is needed to assign the appropriate device description file (DD) to the device.

---

## Device ID

---

<b>Navigation</b>	 Expert → Communication → HART output → Information → Device ID (0221)
<b>Description</b>	Use this function to view the device ID for identifying the measuring device in a HART network.
<b>User interface</b>	6-digit hexadecimal number
<b>Additional information</b>	<i>Description</i>  In addition to the device type and manufacturer ID, the device ID is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

---

## Device type

---

<b>Navigation</b>	 Expert → Communication → HART output → Information → Device type (0209)
<b>Description</b>	Displays the device type with which the measuring device is registered with the HART Communication Foundation.
<b>User interface</b>	2-digit hexadecimal number
<b>Factory setting</b>	0x3B (for Prosonic Flow 300/500)
<b>Additional information</b>	<i>Description</i>  The device type is specified by the manufacturer. It is needed to assign the appropriate device description file (DD) to the device.

---

## Manufacturer ID

---

<b>Navigation</b>	 Expert → Communication → HART output → Information → Manufacturer ID (0259)
<b>Description</b>	Use this function to view the manufacturer ID with which the measuring device is registered with the HART Communication Foundation.
<b>User interface</b>	2-digit hexadecimal number

**Factory setting** 0x11 (for Endress+Hauser)

### HART revision

<b>Navigation</b>	 Expert → Communication → HART output → Information → HART revision (0205)
<b>Description</b>	Use this function to display the HART protocol revision of the measuring device.
<b>User interface</b>	5 to 7
<b>Factory setting</b>	7

### HART descriptor



<b>Navigation</b>	 Expert → Communication → HART output → Information → HART descriptor (0212)
<b>Description</b>	Use this function to enter a description for the measuring point. This can be edited and displayed via HART protocol or using the local display.
<b>User entry</b>	Max. 16 characters such as letters, numbers or special characters (e.g. @, %, /)
<b>Factory setting</b>	Pros.Flow300/500

### HART message



<b>Navigation</b>	 Expert → Communication → HART output → Information → HART message (0216)
<b>Description</b>	Use this function to enter a HART message which is sent via the HART protocol when requested by the master.
<b>User entry</b>	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /)
<b>Factory setting</b>	Pros.Flow300/500

### Hardware rev.

<b>Navigation</b>	 Expert → Communication → HART output → Information → Hardware rev. (0206)
<b>Description</b>	Displays the hardware revision of the measuring device.
<b>User interface</b>	0 to 30
<b>Factory setting</b>	1

**Software rev.**

**Navigation**   Expert → Communication → HART output → Information → Software rev. (0224)

**Description** Displays the software revision of the measuring device.

**User interface** 0 to 255

**Factory setting** 1

**HART date code**

**Navigation**   Expert → Communication → HART output → Information → HART date code (0202)

**Description** Use this function to enter the date information for individual use.

**User entry** Date entry format: yyyy-mm-dd

**Factory setting** 2009-07-20

**Additional information** *Example*

Device installation date

**"Output" submenu**

**Navigation**   Expert → Communication → HART output → Output

 <b>Output</b>	
Assign PV (0234)	→  169
Primary var (PV) (0201)	→  169
Assign SV (0235)	→  170
Second.var(SV) (0226)	→  170
Assign TV (0236)	→  171
Tertiary var(TV) (0228)	→  172
Assign QV (0237)	→  172
Quaterna.var(QV) (0203)	→  173

**Assign PV****Navigation**

Expert → Communication → HART output → Output → Assign PV (0234)

**Description**

Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

**Selection**

- Off \*
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.

**Factory setting**

Volume flow

**Primary var (PV)****Navigation**

Expert → Communication → HART output → Output → Primary var (PV) (0201)

**Description**

Displays the current measured value of the primary dynamic variable (PV).

**User interface**

Signed floating-point number

**Additional information**

*User interface*

The measured value displayed depends on the process variable selected in the **Assign PV** parameter (→ 169).

*Dependency*

The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

\* Visibility depends on order options or device settings

**Assign SV****Navigation**

Expert → Communication → HART output → Output → Assign SV (0235)

**Description**

Use this function to select a measured variable (HART device variable) for the secondary dynamic variable (SV).

**Selection**

- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*
- HART input

**Factory setting**

Totalizer 1

**Second.var(SV)****Navigation**

Expert → Communication → HART output → Output → Second.var(SV) (0226)

**Description**

Displays the current measured value of the secondary dynamic variable (SV).

**User interface**

Signed floating-point number

\* Visibility depends on order options or device settings

**Additional information***User interface*

The measured value displayed depends on the process variable selected in the **Assign SV** parameter (→ 170).

*Dependency*

 The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

---

**Assign TV****Navigation**

Expert → Communication → HART output → Output → Assign TV (0236)

**Description**

Use this function to select a measured variable (HART device variable) for the tertiary (third) dynamic variable (TV).

**Selection**

- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*
- HART input

**Factory setting**

Totalizer 2

---

\* Visibility depends on order options or device settings

## Tertiary var(TV)

**Navigation**  Expert → Communication → HART output → Output → Tertiary var(TV) (0228)

**Description** Displays the current measured value of the tertiary dynamic variable (TV).

**User interface** Signed floating-point number

**Additional information** *User interface*

The measured value displayed depends on the process variable selected in the **Assign TV** parameter (→  171).

*Dependency*

 The unit of the displayed measured value is taken from the **System units** submenu (→  62).

## Assign QV



**Navigation**  Expert → Communication → HART output → Output → Assign QV (0237)

**Description** Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).

**Selection**

- Volume flow \*
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature \*
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*
- Signal strength \*
- SNR \*
- Acceptance rate \*
- Turbulence \*
- Flow asymmetry \*
- Electronic temp.
- Totalizer 1
- Totalizer 2
- Totalizer 3
- Current input 1 \*
- Current input 2 \*
- Current input 3 \*
- HART input

\* Visibility depends on order options or device settings

**Factory setting** Totalizer 3

### Quaterna.var(QV)

**Navigation**  Expert → Communication → HART output → Output → Quaterna.var(QV) (0203)

**Description** Displays the current measured value of the quaternary dynamic variable (QV).

**User interface** Signed floating-point number

**Additional information** *User interface*

The measured value displayed depends on the process variable selected in the **Assign QV** parameter (→  172).

*Dependency*

 The unit of the displayed measured value is taken from the **System units** submenu (→  62).

### 3.6.3 "Web server" submenu

*Navigation*  Expert → Communication → Web server

 Web server	
Webserv.language (7221)	→  174
MAC Address (7214)	→  174
DHCP client (7212)	→  174
IP address (7209)	→  175
Subnet mask (7211)	→  175
Default gateway (7210)	→  175
Webserver funct. (7222)	→  176
Login page (7273)	→  176

---

**Webserv.language**

---

<b>Navigation</b>	  Expert → Communication → Web server → Webserv.language (7221)
<b>Description</b>	Use this function to select the Web server language setting.
<b>Selection</b>	<ul style="list-style-type: none"><li>■ English</li><li>■ Deutsch</li><li>■ Français</li><li>■ Español</li><li>■ Italiano</li><li>■ Nederlands</li><li>■ Portuguesa</li><li>■ Polski</li><li>■ русский язык(Ru)</li><li>■ Svenska</li><li>■ Türkçe</li><li>■ 中文 (Chinese)</li><li>■ 日本語 (Japanese)</li><li>■ 한국어 (Korean)</li><li>■ الْعَرَبِيَّةُ (Ara)</li><li>■ Bahasa Indonesia</li><li>■ ภาษาไทย (Thai)</li><li>■ tiếng Việt (Viet)</li><li>■ čeština (Czech)</li></ul>
<b>Factory setting</b>	English

---

**MAC Address**

---

<b>Navigation</b>	  Expert → Communication → Web server → MAC Address (7214)
<b>Description</b>	Displays the MAC <sup>6)</sup> address of the measuring device.
<b>User interface</b>	Unique 12-digit character string comprising letters and numbers
<b>Factory setting</b>	Each measuring device is given an individual address.
<b>Additional information</b>	<i>Example</i> For the display format 00:07:05:10:01:5F

---

**DHCP client**

---



<b>Navigation</b>	  Expert → Communication → Web server → DHCP client (7212)
<b>Description</b>	Use this function to activate and deactivate the DHCP client functionality.

---

6) Media Access Control

<b>Selection</b>	<ul style="list-style-type: none"> <li>■ Off</li> <li>■ On</li> </ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<p><i>Result</i></p> <p>If the DHCP client functionality of the Web server is activated, the IP address (→ 175), Subnet mask (→ 175) and Default gateway (→ 175) are set automatically.</p>
	 <ul style="list-style-type: none"> <li>■ Identification is via the MAC address of the measuring device.</li> <li>■ The IP address (→ 175) in the <b>IP address</b> parameter (→ 175) is ignored as long as the <b>DHCP client</b> parameter (→ 174) is active. This is also the case, in particular, if the DHCP server cannot be reached. The IP address (→ 175) in the parameter of the same name is only used if the <b>DHCP client</b> parameter (→ 174) is inactive.</li> </ul>

---

**IP address**

<b>Navigation</b>	 Expert → Communication → Web server → IP address (7209)
<b>Description</b>	Display or enter the IP address of the Web server integrated in the measuring device.
<b>User entry</b>	4 octet: 0 to 255 (in the particular octet)
<b>Factory setting</b>	192.168.1.212

---

**Subnet mask**

<b>Navigation</b>	 Expert → Communication → Web server → Subnet mask (7211)
<b>Description</b>	Display or enter the subnet mask.
<b>User entry</b>	4 octet: 0 to 255 (in the particular octet)
<b>Factory setting</b>	255.255.255.0

---

**Default gateway**

<b>Navigation</b>	 Expert → Communication → Web server → Default gateway (7210)
<b>Description</b>	Display or enter the Default gateway (→ 175).
<b>User entry</b>	4 octet: 0 to 255 (in the particular octet)
<b>Factory setting</b>	0.0.0.0

**Webserver funct.****Navigation**

Expert → Communication → Web server → Webserver funct. (7222)

**Description**

Use this function to switch the Web server on and off.

**Selection**

- Off
- HTML Off
- On

**Factory setting**

On

**Additional information***Description*

Once disabled, the Webserver funct. can only be re-enabled via or the operating tool FieldCare.

*Selection*

Option	Description
Off	<ul style="list-style-type: none"> <li>▪ The web server is completely disabled.</li> <li>▪ Port 80 is locked.</li> </ul>
HTML Off	The HTML version of the web server is not available.
On	<ul style="list-style-type: none"> <li>▪ The complete functionality of the web server is available.</li> <li>▪ JavaScript is used.</li> <li>▪ The password is transferred in an encrypted state.</li> <li>▪ Any change to the password is also transferred in an encrypted state.</li> </ul>

**Login page****Navigation**

Expert → Communication → Web server → Login page (7273)

**Description**

Use this function to select the format of the login page.

**Selection**

- Without header
- With header

**Factory setting**

With header

**3.6.4 "Diag. config." submenu**

For a list of all the diagnostic events, see the Operating Instructions for the device  
→ 7

*Assign a category to the particular diagnostic event:*

Category	Meaning
Failure (F)	A device error is present. The measured value is no longer valid.
Funct. check (C)	The device is in service mode (e.g. during a simulation).

Category	Meaning
Out of spec. (S)	The device is being operated: ■ Outside its technical specification limits (e.g. outside the process temperature range) ■ Outside of the configuration carried out by the user (e.g. maximum flow in parameter 20 mA value)
Mainten. req.(M)	Maintenance is required. The measured value is still valid.
No effect (N)	Has no effect on the condensed status <sup>1)</sup> .

1) Condensed status according to NAMUR recommendation NE107

### *Navigation*

Expert → Communication → Diag. config.

► Diag. config.	
Event category 124 (0270)	→ 178
Event category 125 (0271)	→ 178
Event category 160 (0272)	→ 178
Event category 441 (0210)	→ 179
Event category 442 (0230)	→ 179
Event category 443 (0231)	→ 180
Event category 444 (0211)	→ 180
Event category 452 (0265)	→ 180
Event category 543 (0276)	→ 181
Event category 832 (0218)	→ 181
Event category 833 (0225)	→ 182
Event category 834 (0227)	→ 182
Event category 835 (0229)	→ 182
Event category 837 (0266)	→ 183
Event category 840 (0267)	→ 183
Event category 842 (0295)	→ 183
Event category 881 (0268)	→ 184
Event category 930 (0296)	→ 184

Event category 931 (0297)	→  185
Event category 953 (0292)	→  185
Event category 954 (0293)	→  185

## Event category 124 (Rel.sig.strength)



### Navigation

Expert → Communication → Diag. config. → Event category 124 (0270)

### Description

Use this function to select a category for the diagnostic message **124 Rel.sig.strength**.

### Selection

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

### Factory setting

Mainten. req.(M)

### Additional information

For a detailed description of the event categories available for selection: → 176

## Event category 125 (Rel. sound vel.)



### Navigation

Expert → Communication → Diag. config. → Event category 125 (0271)

### Description

Use this function to select a category for the diagnostic message **125 Rel. sound vel.**.

### Selection

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

### Factory setting

Mainten. req.(M)

### Additional information

For a detailed description of the event categories available for selection: → 176

## Event category 160 (Signal path off)



### Navigation

Expert → Communication → Diag. config. → Event category 160 (0272)

### Description

Use this function to select a category for the diagnostic message **160 Signal path off**.

---

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Mainten. req.(M)
<b>Additional information</b>	 For a detailed description of the event categories available for selection: → <a href="#">176</a>

---

#### Event category 441 (Curr.output 1 to n)

<b>Navigation</b>	 Expert → Communication → Diag. config. → Event category 441 (0210)
<b>Description</b>	Use this function to select a category for the diagnostic message <b>441 Curr.output 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	 For a detailed description of the event categories available for selection: → <a href="#">176</a>

---

#### Event category 442 (Freq. output 1 to n)

<b>Navigation</b>	 Expert → Communication → Diag. config. → Event category 442 (0230)
<b>Prerequisite</b>	The pulse/frequency/switch output is available.
<b>Description</b>	Use this function to select a category for the diagnostic message <b>442 Freq. output 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	 For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 443 (Pulse output 1 to n)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 443 (0231)
<b>Prerequisite</b>	The pulse/frequency/switch output is available.
<b>Description</b>	Use this function to select a category for the diagnostic message <b>443 Pulse output 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Failure (F)</li><li>▪ Funct. check (C)</li><li>▪ Out of spec. (S)</li><li>▪ Mainten. req.(M)</li><li>▪ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 444 (Current input 1 to n)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 444 (0211)
<b>Prerequisite</b>	The current input is available.
<b>Description</b>	Use this function to select a category for the diagnostic message <b>444 Current input 1 to n</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Failure (F)</li><li>▪ Funct. check (C)</li><li>▪ Out of spec. (S)</li><li>▪ Mainten. req.(M)</li><li>▪ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	<i>Selection</i> For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 452 (Calc. error)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 452 (0265)
<b>Description</b>	Use this function to select a category for the diagnostic message <b>452 Calc. error</b> .

---

<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	 For a detailed description of the event categories available for selection: → <a href="#">176</a>

---

#### Event category 543 (Double pulse out)

<b>Navigation</b>	 Expert → Communication → Diag. config. → Event category 543 (0276)
<b>Description</b>	Use this option to select a category for the diagnostic message <b>543 Double pulse out</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	 For a detailed description of the event categories available for selection: → <a href="#">176</a>

---

#### Event category 832 (Electronic temp.)

<b>Navigation</b>	 Expert → Communication → Diag. config. → Event category 832 (0218)
<b>Description</b>	Use this function to select a category for the diagnostic message <b>832 Electronic temp.</b> .
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	<i>Selection</i>  For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 833 (Electronic temp.)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 833 (0225)
<b>Description</b>	Use this option to select a category for the diagnostic message <b>833 Electronic temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	<i>Selection</i> For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 834 (Process temp.)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 834 (0227)
<b>Description</b>	Use this option to select a category for the diagnostic message <b>834 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)
<b>Additional information</b>	<i>Selection</i> For a detailed description of the event categories available for selection: → <a href="#">176</a>

**Event category 835 (Process temp.)**

<b>Navigation</b>	Expert → Communication → Diag. config. → Event category 835 (0229)
<b>Description</b>	Use this option to select a category for the diagnostic message <b>835 Process temp..</b>
<b>Selection</b>	<ul style="list-style-type: none"><li>■ Failure (F)</li><li>■ Funct. check (C)</li><li>■ Out of spec. (S)</li><li>■ Mainten. req.(M)</li><li>■ No effect (N)</li></ul>
<b>Factory setting</b>	Out of spec. (S)

**Additional information***Selection*For a detailed description of the event categories available for selection: → [176](#)**Event category 837 (Process pressure)****Navigation**

Expert → Communication → Diag. config. → Event category 837 (0266)

**Description**Use this function to select a category for the diagnostic message **837 Process pressure**.**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting**

Out of spec. (S)

**Additional information**For a detailed description of the event categories available for selection: → [176](#)**Event category 841 (Sensor range)****Navigation**

Expert → Communication → Diag. config. → Event category 840 (0267)

**Description**Use this function to select a category for the diagnostic message **841 Sensor range**.**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting**

Out of spec. (S)

**Additional information**For a detailed description of the event categories available for selection: → [176](#)**Event category 842 (Process limit)****Navigation**

Expert → Communication → Diag. config. → Event category 842 (0295)

**Description**Use this function to select a category for the diagnostic message **△S842 Process limit**.

**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting**

Out of spec. (S)

**Additional information***Selection* For a detailed description of the event categories available for selection: →  176

---

**Event category 881 (Sen.sig. path 1 to n)****Navigation** Expert → Communication → Diag. config. → Event category 881 (0268)**Description**Use this function to select a category for the diagnostic message **881 Sen.sig. path 1 to n.****Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting**

Mainten. req.(M)

**Additional information** For a detailed description of the event categories available for selection: →  176

---

**Event category 930 (Process fluid)****Navigation** Expert → Communication → Diag. config. → Event category 930 (0296)**Description**Use this function to select a category for the diagnostic message **△S930 Process fluid.****Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting**

Out of spec. (S)

**Additional information***Selection* For a detailed description of the event categories available for selection: →  176

---

**Event category 931 (Process fluid)**

**Navigation** Expert → Communication → Diag. config. → Event category 931 (0297)

**Description** Use this function to select a category for the diagnostic message **△S931 Process fluid**.

**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting** Out of spec. (S)

**Additional information** *Selection*

For a detailed description of the event categories available for selection: → [176](#)

---

**Event category 953 (Asy.noise path 1 to n)**

**Navigation** Expert → Communication → Diag. config. → Event category 953 (0292)

**Description** Use this function to select a category for the diagnostic message **△M953 Asy.noise path 1 to n**.

**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting** Mainten. req.(M)

**Additional information** *Selection*

For a detailed description of the event categories available for selection: → [176](#)

---

**Event category 954 (Sound v. dev. hi)**

**Navigation** Expert → Communication → Diag. config. → Event category 954 (0293)

**Description** Use this function to select a category for the diagnostic message **△S954 Sound v. dev. hi**.

**Selection**

- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- No effect (N)

**Factory setting** Out of spec. (S)

**Additional information** *Selection*

 For a detailed description of the event categories available for selection: → [176](#)

### 3.6.5 "WLAN settings" submenu

*Navigation*

 Expert → Communication → WLAN settings

► WLAN settings	
WLAN (2702)	→ <a href="#">187</a>
WLAN mode (2717)	→ <a href="#">187</a>
SSID name (2714)	→ <a href="#">187</a>
Network security (2705)	→ <a href="#">188</a>
Sec. identific. (2718)	→ <a href="#">188</a>
User name (2715)	→ <a href="#">188</a>
WLAN password (2716)	→ <a href="#">189</a>
WLAN IP address (2711)	→ <a href="#">189</a>
WLAN MAC address (2703)	→ <a href="#">189</a>
WLAN subnet mask (2709)	→ <a href="#">189</a>
WLAN MAC address (2703)	→ <a href="#">189</a>
WLAN passphrase (2706)	→ <a href="#">190</a>
WLAN MAC address (2703)	→ <a href="#">189</a>
Assign SSID name (2708)	→ <a href="#">190</a>
SSID name (2707)	→ <a href="#">190</a>
WLAN channel (2704)	→ <a href="#">191</a>
Select antenna (2713)	→ <a href="#">191</a>
Connection state (2722)	→ <a href="#">191</a>

Rec.sig.strength (2721)	→  192
WLAN IP address (2711)	→  189
Gateway IP addr. (2719)	→  192
IP address DNS (2720)	→  192

**WLAN**

**Navigation** Expert → Communication → WLAN settings → WLAN (2702)

**Description** Use this function to enable and disable the WLAN connection.

**Selection**

- Disable
- Enable

**Factory setting** Enable

**WLAN mode**

**Navigation** Expert → Communication → WLAN settings → WLAN mode (2717)

**Description** Use this function to select the WLAN mode.

**Selection**

- Access point
- WLAN Client

**Factory setting** Access point

**SSID name**

**Navigation** Expert → Communication → WLAN settings → SSID name (2714)

**Prerequisite** The client is activated.

**Description** Use this function to enter the user-defined SSID name (max. 32 characters) of the WLAN network.

**User entry** –

**Factory setting** –

**Network security**

**Navigation** Expert → Communication → WLAN settings → Network security (2705)

**Description** Use this function to select the type of security for the WLAN interface.

**Selection**

- Unsecured
- WPA2-PSK
- EAP-PEAP MSCHAP2 \*
- EAP-PEAP NoAuth.\*
- EAP-TLS\*

**Factory setting** WPA2-PSK

**Additional information** *Selection*

- Unsecured  
Access the WLAN connection without identification.
- WPA2-PSK  
Access the WLAN connection with a network key.

---

**Sec. identific.**

**Navigation** Expert → Communication → WLAN settings → Sec. identific. (2718)

**Description** Use this function to select the security settings (download via the menu: Data Management > Security > Download WLAN).

**User interface**

- Trust. iss.cert.
- Device certific.
- Dev. private key

---

**User name**

**Navigation** Expert → Communication → WLAN settings → User name (2715)

**Description** Use this function to enter the username of the WLAN network.

**User entry**

–

**Factory setting**

–

---

\* Visibility depends on order options or device settings

---

**WLAN password**

**Navigation** Expert → Communication → WLAN settings → WLAN password (2716)

**Description** Use this function to enter the WLAN password for the WLAN network.

**User entry** –

**Factory setting** –

---

**WLAN IP address**

**Navigation** Expert → Communication → WLAN settings → WLAN IP address (2711)

**Description** Use this function to enter the IP address of the measuring device's WLAN connection.

**User entry** 4 octet: 0 to 255 (in the particular octet)

**Factory setting** 192.168.1.212

---

**WLAN MAC address**

**Navigation** Expert → Communication → WLAN settings → WLAN MAC address (2703)

**Description** Displays the MAC<sup>7)</sup> address of the measuring device.

**User interface** Unique 12-digit character string comprising letters and numbers

**Factory setting** Each measuring device is given an individual address.

**Additional information** *Example*

For the display format

00:07:05:10:01:5F

---

**WLAN subnet mask**

**Navigation** Expert → Communication → WLAN settings → WLAN subnet mask (2709)

**Description** Use this function to enter the subnet mask.

**User entry** 4 octet: 0 to 255 (in the particular octet)

---

7) Media Access Control

**Factory setting** 255.255.255.0

---

## WLAN passphrase



**Navigation** Expert → Communication → WLAN settings → WLAN passphrase (2706)

**Prerequisite** The **WPA2-PSK** option is selected in the **Security type** parameter (→ 188).

**Description** Use this function to enter the network key.

**User entry** 8 to 32-digit character string comprising numbers, letters and special characters (without spaces)

**Factory setting** Serial number of the measuring device (e.g. L100A802000)

---

## Assign SSID name



**Navigation** Expert → Communication → WLAN settings → Assign SSID name (2708)

**Description** Use this function to select which name is used for the SSID<sup>8)</sup>.

**Selection**

- Device tag
- User-defined

**Factory setting** User-defined

**Additional information** *Selection*

- Device tag  
The device tag name is used as the SSID.
- User-defined  
A user-defined name is used as the SSID.

---

## SSID name



**Navigation** Expert → Communication → WLAN settings → SSID name (2707)

**Prerequisite**

- The **User-defined** option is selected in the **Assign SSID name** parameter (→ 190).
- The **Access point** option is selected in the **WLAN mode** parameter (→ 187).

**Description** Use this function to enter a user-defined SSID name.

**User entry** Max. 32-digit character string comprising numbers, letters and special characters

---

8) Service Set Identifier

---

<b>Factory setting</b>	EH_device designation_last 7 digits of the serial number (e.g. EH_Prosonic_Flow_300_A802000)
------------------------	---

---

## WLAN channel



**Navigation** Expert → Communication → WLAN settings → WLAN channel (2704)

**Description** Use this function to enter the WLAN channel.

**User entry** 1 to 11

**Factory setting** 6

**Additional information** *Description*



- It is only necessary to enter a WLAN channel if multiple WLAN devices are in use.
- If just one measuring device is in use, it is recommended to keep the factory setting.

---

## Select antenna



**Navigation** Expert → Communication → WLAN settings → Select antenna (2713)

**Description** Use this function to select whether the external or internal antenna is used for reception.

**Selection**

- External antenna
- Internal antenna

**Factory setting** Internal antenna

---

## Connection state

**Navigation** Expert → Communication → WLAN settings → Connection state (2722)

**Description** The connection status is displayed.

**User interface**

- Connected
- Not connected

**Factory setting** Not connected

**Rec.sig.strength**

<b>Navigation</b>	  Expert → Communication → WLAN settings → Rec.sig.strength (2721)
<b>Description</b>	Displays the signal strength received.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Low</li><li>■ Medium</li><li>■ High</li></ul>
<b>Factory setting</b>	High

**Gateway IP addr.**

<b>Navigation</b>	  Expert → Communication → WLAN settings → Gateway IP addr. (2719)
<b>Description</b>	Use this function to enter the IP address of the gateway.
<b>Factory setting</b>	192.168.1.212

**IP address DNS**

<b>Navigation</b>	 Expert → Communication → WLAN settings → IP address DNS (2720)
	 Expert → Communication → WLAN settings → IP address DNS (2720)
<b>Description</b>	Use this function to enter the IP address of the domain name server.
<b>Factory setting</b>	192.168.1.212

### 3.7 "Application" submenu

<b>Navigation</b>	  Expert → Application
 <b>Application</b>	
Reset all tot. (2806)	→  193
 <b>Totalizer 1 to n</b>	→  193
Assign variable (0914-1 to n)	→  194
Unit totalizer 1 to n (0915-1 to n)	→  194

Operation mode (0908-1 to n)	→ 196
Control Tot. 1 to n (0912-1 to n)	→ 196
Preset value 1 to n (0913-1 to n)	→ 197
Failure mode (0901-1 to n)	→ 197

**Reset all tot.****Navigation**
 Expert → Application → Reset all tot. (2806)
**Description**

Use this function to reset all totalizers to the value **0** and restart the totaling process. This deletes all the flow values previously totalized.

**Selection**

- Cancel
- Reset + totalize

**Factory setting**

Cancel

**Additional information***Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
Reset + totalize	Resets all totalizers to 0 and restarts the totaling process. This deletes all the flow values previously totalized.

**3.7.1 "Totalizer 1 to n" submenu***Navigation*
 Expert → Application → Totalizer 1 to n

► Totalizer 1 to n	
Assign variable (0914-1 to n)	→ 194
Unit totalizer 1 to n (0915-1 to n)	→ 194
Operation mode (0908-1 to n)	→ 196
Control Tot. 1 to n (0912-1 to n)	→ 196
Preset value 1 to n (0913-1 to n)	→ 197
Failure mode (0901-1 to n)	→ 197

**Assign variable****Navigation**

Expert → Application → Totalizer 1 to n → Assign variable (0914–1 to n)

**Description**

Use this function to select a process variable for the Totalizer 1 to n.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Energy flow \*

**Factory setting**

Volume flow

**Additional information***Description*

If the option selected is changed, the device resets the totalizer to 0.

*Selection*

If the **Off** option is selected, only **Assign variable** parameter (→ 194) is still displayed in the **Totalizer 1 to n** submenu. All other parameters in the submenu are hidden.

**Unit totalizer 1 to n****Navigation**

Expert → Application → Totalizer 1 to n → Unit totalizer 1 to n (0915–1 to n)

**Prerequisite**

A process variable is selected in the **Assign variable** parameter (→ 194) of the **Totalizer 1 to n** submenu.

**Description**

Use this function to select the process variable unit for the Totalizer 1 to n (→ 193).

**Selection***SI units*

- g \*
- kg \*
- t

*US units*

- oz \*
- lb \*
- STon \*

\* Visibility depends on order options or device settings

or

\* Visibility depends on order options or device settings

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ cm <sup>3</sup> *	■ af*	■ gal (imp)*
■ dm <sup>3</sup> *	■ ft <sup>3</sup> *	■ Mgal (imp)*
■ m <sup>3</sup> *	■ Mft <sup>3</sup> *	■ bbl (imp;beer)*
■ ml*	■ fl oz (us)*	■ bbl (imp;oil)*
■ l*	■ gal (us)*	
■ hl*	■ kgal (us)*	
■ Ml Mega*	■ Mgal (us)*	
	■ bbl (us;liq.)*	
	■ bbl (us;beer)*	
	■ bbl (us;oil)*	
	■ bbl (us;tank)*	

\* Visibility depends on order options or device settings

or

<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
■ NI*	■ Sft <sup>3</sup> *	Sgal (imp)*
■ Nhl*	■ MMSft <sup>3</sup> *	
■ Nm <sup>3</sup> *	■ Sgal (us)*	
■ SI*	■ Sbbl (us;liq.)*	
■ Sm <sup>3</sup> *	■ Sbbl (us;oil)*	

\* Visibility depends on order options or device settings

or

<i>SI units</i>	<i>Imperial units</i>
■ kWh*	■ Btu*
■ MWh*	■ MBtu*
■ GWh*	■ MMBtu*
■ kJ*	
■ MJ*	
■ GJ*	
■ kcal*	
■ Mcal*	
■ Gcal*	

\* Visibility depends on order options or device settings

or

<i>Other units</i>
None*

\* Visibility depends on order options or device settings

#### Factory setting

Country-specific:

- m<sup>3</sup>
- ft<sup>3</sup>

**Additional information***Description*

 The unit is selected separately for each totalizer. It is independent of the selection made in the **System units** submenu (→ 62).

*Selection*

The selection is dependent on the process variable selected in the **Assign variable** parameter (→ 194).

**Operation mode****Navigation**

 Expert → Application → Totalizer 1 to n → Operation mode (0908-1 to n)

**Prerequisite**

A process variable is selected in the **Assign variable** parameter (→ 194) of the **Totalizer 1 to n** submenu.

**Description**

Use this function to select how the totalizer summates the flow.

**Selection**

- Net flow total
- Forward total
- Reverse total

**Factory setting**

Net flow total

**Additional information***Selection*

- Net flow total  
Flow values in the forward and reverse flow direction are totalized and balanced against one another. Net flow is registered in the flow direction.
- Forward total  
Only the flow in the forward flow direction is totalized.
- Reverse total  
Only the flow in the reverse flow direction is totalized (= reverse flow quantity).

**Control Tot. 1 to n****Navigation**

 Expert → Application → Totalizer 1 to n → Control Tot. 1 to n (0912-1 to n)

**Prerequisite**

A process variable is selected in the **Assign variable** parameter (→ 194) of the **Totalizer 1 to n** submenu.

**Description**

Use this function to select the control of totalizer value 1-3.

**Selection**

- Totalize
- Reset + hold
- Preset + hold
- Reset + totalize
- Preset+totalize
- Hold

**Factory setting**

Totalize

**Additional information***Selection*

Options	Description
Totalize	The totalizer is started or continues running.
Reset + hold	The totaling process is stopped and the totalizer is reset to 0.
Preset + hold	The totaling process is stopped and the totalizer is set to its defined start value from the <b>Preset value</b> parameter.
Reset + totalize	The totalizer is reset to 0 and the totaling process is restarted.
Preset+totalize	The totalizer is set to the defined start value from the <b>Preset value</b> parameter and the totaling process is restarted.
Hold	Totalizing is stopped.

**Preset value 1 to n****Navigation**

Diagram: Expert → Application → Totalizer 1 to n → Preset value 1 to n (0913–1 to n)

**Prerequisite**

A process variable is selected in the **Assign variable** parameter (→ 194) of the **Totalizer 1 to n** submenu.

**Description**

Use this function to enter a start value for the Totalizer 1 to n.

**User entry**

Signed floating-point number

**Factory setting**

Country-specific:

- 0 m<sup>3</sup>
- 0 ft<sup>3</sup>

**Additional information***User entry*

 The unit of the selected process variable is specified for the totalizer in the **Unit totalizer** parameter (→ 194).

*Example*

This configuration is suitable for applications such as iterative filling processes with a fixed batch quantity.

**Failure mode****Navigation**

Diagram: Expert → Application → Totalizer 1 to n → Failure mode (0901–1 to n)

**Prerequisite**

A process variable is selected in the **Assign variable** parameter (→ 194) of the **Totalizer 1 to n** submenu.

**Description**

Use this function to select how a totalizer behaves in the event of a device alarm.

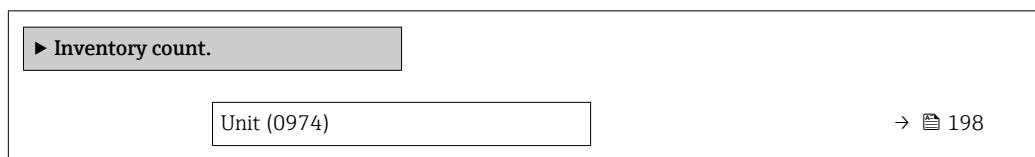
**Selection**

- Stop
- Actual value
- Last valid value

<b>Factory setting</b>	Stop
<b>Additional information</b>	<i>Description</i>
	 This setting does not affect the failsafe mode of other totalizers and the outputs. This is specified in separate parameters.
	<i>Selection</i>
	<ul style="list-style-type: none"> <li>■ Stop The totalizer is stopped in the event of a device alarm.</li> <li>■ Actual value The totalizer continues to count based on the actual measured value; the device alarm is ignored.</li> <li>■ Last valid value The totalizer continues to count based on the last valid measured value before the device alarm occurred.</li> </ul>

### 3.7.2 "Inventory count." submenu

Navigation

 Expert → Application → Inventory count.



---

## Unit

---

Navigation

 Expert → Application → Inventory count. → Unit (0974)

Description

Displays the unit of the inventory counter.

User interface

	<i>SI units</i>	<i>US units</i>	<i>Imperial units</i>
	■ cm <sup>3</sup>	■ ft <sup>3</sup>	■ gal (imp)
	■ dm <sup>3</sup>	■ af	■ Mgal (imp)
	■ m <sup>3</sup>	■ fl oz (us)	■ bbl (imp;beer)
	■ ml	■ gal (us)	■ bbl (imp;oil)
	■ l	■ kgal (us)	
	■ hl	■ Mgal (us)	
	■ Ml Mega	■ bbl (us;oil)	
		■ bbl (us;liq.)	
		■ bbl (us;beer)	
		■ bbl (us;tank)	

Additional information

*Description*
 The parameter cannot be configured or reset.

### 3.8 "Diagnostics" submenu

*Navigation*

◀ ▶ Expert → Diagnostics

► Diagnostics	
Actual diagnos. (0691)	→ 199
Prev.diagnostics (0690)	→ 200
Time fr. restart (0653)	→ 201
Operating time (0652)	→ 201
► Diagnostic list	
► Event logbook	→ 206
► Device info	→ 208
► Main elec.+I/O1	→ 212
► Sens. electronic	→ 213
► I/O module 2	→ 215
► I/O module 3	→ 216
► I/O module 4	→ 214
► Display module	→ 218
► Data logging	→ 219
► Heartbeat	→ 226
► Simulation	→ 227

---

#### Actual diagnos.

---

**Navigation**

◀ ▶ Expert → Diagnostics → Actual diagnos. (0691)

**Prerequisite**

A diagnostic event has occurred.

**Description**

Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information***Display*

 Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu (→ [202](#)).

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

*Example*

For the display format:  
F271 Main electronics

---

**Timestamp****Navigation**

 Expert → Diagnostics → Timestamp

**Description**

Displays the operating time when the current diagnostic message occurred.

**User interface**

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***Display*

 The diagnostic message can be viewed via the **Actual diagnos.** parameter (→ [199](#)).

*Example*

For the display format:  
24d12h13m00s

---

**Prev.diagnostics****Navigation**

  Expert → Diagnostics → Prev.diagnostics (0690)

**Prerequisite**

Two diagnostic events have already occurred.

**Description**

Displays the diagnostic message that occurred before the current message.

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information***Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

*Example*

For the display format:  
F271 Main electronics

---

**Timestamp**

---

<b>Navigation</b>	 Expert → Diagnostics → Timestamp
<b>Description</b>	Displays the operating time when the last diagnostic message before the current message occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>Display</i>  The diagnostic message can be viewed via the <b>Prev.diagnostics</b> parameter (→  200).
	<i>Example</i> For the display format: 24d12h13m00s

---

**Time fr. restart**

---

<b>Navigation</b>	  Expert → Diagnostics → Time fr. restart (0653)
<b>Description</b>	Use this function to display the time the device has been in operation since the last device restart.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)

---

**Operating time**

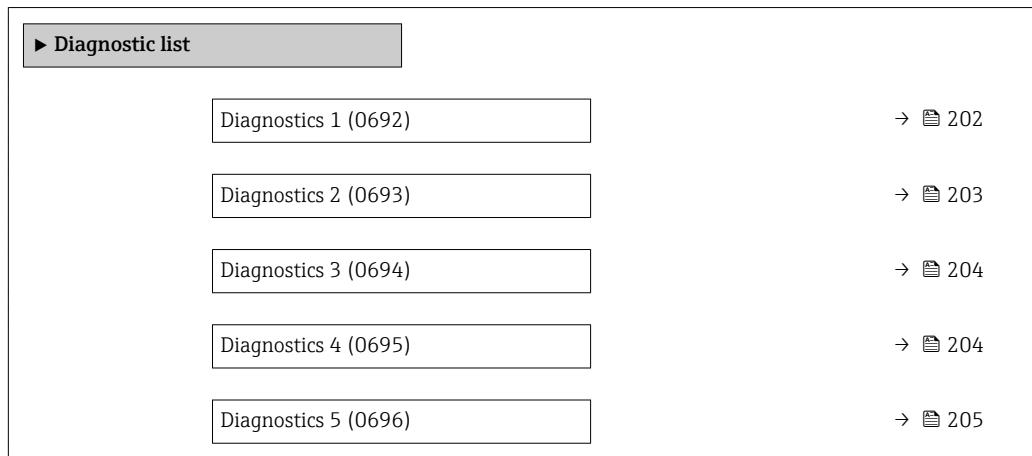
---

<b>Navigation</b>	  Expert → Diagnostics → Operating time (0652)
<b>Description</b>	Use this function to display the length of time the device has been in operation.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>User interface</i> The maximum number of days is 9999, which is equivalent to 27 years.

### 3.8.1 "Diagnostic list" submenu

Navigation

Expert → Diagnostics → Diagnostic list



---

#### Diagnostics 1

---

Navigation

Expert → Diagnostics → Diagnostic list → Diagnostics 1 (0692)

Description

Displays the current diagnostics message with the highest priority.

User interface

Symbol for diagnostic behavior, diagnostic code and short message.

Additional information

*Display*

**i** Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the **E** key.

*Examples*

For the display format:

- **F271** Main electronics
- **F276** I/O module

---

#### Timestamp

---

Navigation

Expert → Diagnostics → Diagnostic list → Timestamp

Description

Displays the operating time when the diagnostic message with the highest priority occurred.

User interface

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***Display*

The diagnostic message can be viewed via the **Diagnostics 1** parameter (→ 202).

*Example*

For the display format:

24d12h13m00s

---

**Diagnostics 2**

---

**Navigation**

Expert → Diagnostics → Diagnostic list → Diagnostics 2 (0693)

**Description**

Displays the current diagnostics message with the second-highest priority.

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information***Display*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the key.

*Examples*

For the display format:

- F271 Main electronics
- F276 I/O module

---

**Timestamp**

---

**Navigation**

Expert → Diagnostics → Diagnostic list → Timestamp

**Description**

Displays the operating time when the diagnostic message with the second-highest priority occurred.

**User interface**

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***Display*

The diagnostic message can be viewed via the **Diagnostics 2** parameter (→ 203).

*Example*

For the display format:

24d12h13m00s

---

## Diagnostics 3

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 3 (0694)
<b>Description</b>	Displays the current diagnostics message with the third-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.
<b>Additional information</b>	<i>Display</i>  Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.
	<i>Examples</i> For the display format: ■  F271 Main electronics ■  F276 I/O module

---

## Timestamp

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Timestamp
<b>Description</b>	Displays the operating time when the diagnostic message with the third-highest priority occurred.
<b>User interface</b>	Days (d), hours (h), minutes (m) and seconds (s)
<b>Additional information</b>	<i>Display</i>  The diagnostic message can be viewed via the <b>Diagnostics 3</b> parameter (→  204).
	<i>Example</i> For the display format: 24d12h13m00s

---

## Diagnostics 4

---

<b>Navigation</b>	  Expert → Diagnostics → Diagnostic list → Diagnostics 4 (0695)
<b>Description</b>	Displays the current diagnostics message with the fourth-highest priority.
<b>User interface</b>	Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information***Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

*Examples*

For the display format:

-  F271 Main electronics
-  F276 I/O module

---

**Timestamp**

---

**Navigation**

 Expert → Diagnostics → Diagnostic list → Timestamp

**Description**

Displays the operating time when the diagnostic message with the fourth-highest priority occurred.

**User interface**

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***Display*

 The diagnostic message can be viewed via the **Diagnostics 4** parameter (→  204).

*Example*

For the display format:

24d12h13m00s

---

**Diagnostics 5**

---

**Navigation**

  Expert → Diagnostics → Diagnostic list → Diagnostics 5 (0696)

**Description**

Displays the current diagnostics message with the fifth-highest priority.

**User interface**

Symbol for diagnostic behavior, diagnostic code and short message.

**Additional information***Display*

 Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.

*Examples*

For the display format:

-  F271 Main electronics
-  F276 I/O module

---

**Timestamp**

---

**Navigation**

█ Expert → Diagnostics → Diagnostic list → Timestamp

**Description**

Displays the operating time when the diagnostic message with the fifth-highest priority occurred.

**User interface**

Days (d), hours (h), minutes (m) and seconds (s)

**Additional information***Display*

**i** The diagnostic message can be viewed via the **Diagnostics 5** parameter (→ [205](#)).

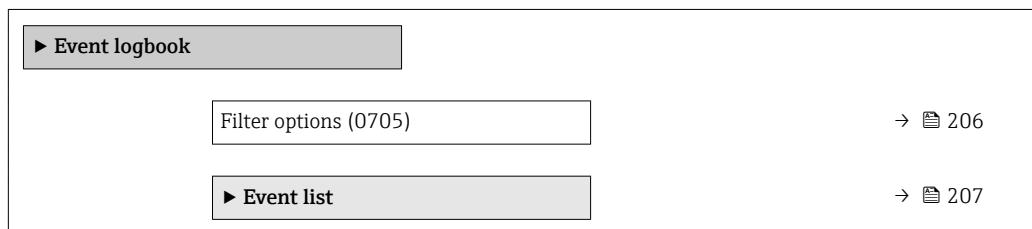
*Example*

For the display format:  
24d12h13m00s

### 3.8.2 "Event logbook" submenu

**Navigation**

█ Expert → Diagnostics → Event logbook



---

**Filter options****Navigation**

█ Expert → Diagnostics → Event logbook → Filter options (0705)

**Description**

Use this function to select the category whose event messages are displayed in the event list of the local display.

**Selection**

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

**Factory setting**

All

**Additional information***Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:

- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

**Filter options****Navigation**

Expert → Diagnostics → Event logbook → Filter options

**Description**

Use this function to select the category whose event messages are displayed in the event list of the operating tool.

**Selection**

- All
- Failure (F)
- Funct. check (C)
- Out of spec. (S)
- Mainten. req.(M)
- Information (I)

**Factory setting**

All

**Additional information***Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:

- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

**"Event list" submenu**

The **Event list** submenu is only displayed if operating via the local display.

If operating via the FieldCare operating tool, the event list can be read out with a separate FieldCare module.

If operating via the Web browser, the event messages can be found directly in the **Event logbook** submenu.

**Navigation**

Expert → Diagnostics → Event logbook → Event list



**Event list****Navigation**

 Expert → Diagnostics → Event logbook → Event list

**Description**

Displays the history of event messages of the category selected in the **Filter options** parameter (→  206).

**User interface**

- For a "Category I" event message  
Information event, short message, symbol for event recording and operating time when error occurred
- For a "Category F, C, S, M" event message (status signal)  
Diagnostics code, short message, symbol for event recording and operating time when error occurred

**Additional information***Description*

A maximum of 20 event messages are displayed in chronological order.

If the **Extended HistoROM** application package (order option) is enabled in the device, the event list can contain up to 100 entries .

The following symbols indicate whether an event has occurred or has ended:

-  Occurrence of the event
-  End of the event

*Examples*

For the display format:

- I1091 Configuration modified  
 24d12h13m00s
-  F271 Main electronics  
 01d04h12min30s

*HistoROM*

A HistoROM is a "non-volatile" device memory in the form of an EEPROM.

**3.8.3 "Device info" submenu***Navigation*

  Expert → Diagnostics → Device info

 Device info	
Device tag (0011)	→  209
Serial number (0009)	→  209
Firmware version (0010)	→  210
Device name (0020)	→  210
Order code (0008)	→  210

Ext. order cd. 1 (0023)	→  211
Ext. order cd. 2 (0021)	→  211
Ext. order cd. 3 (0022)	→  211
Config. counter (0233)	→  211
ENP version (0012)	→  212

## Device tag

### Navigation

Expert → Diagnostics → Device info → Device tag (0011)

### Description

Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

### User interface

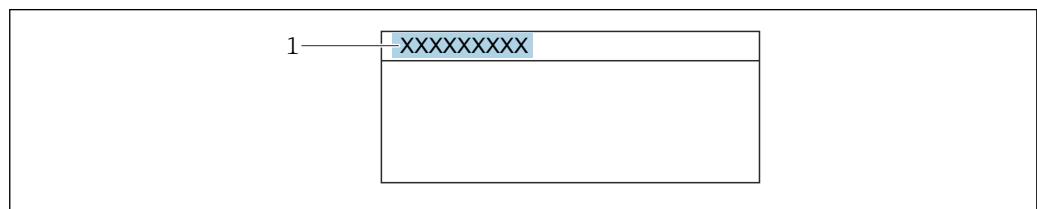
Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

### Factory setting

Prosonic Flow

### Additional information

*User interface*



A0029422

1 Position of the header text on the display

The number of characters displayed depends on the characters used.

## Serial number

### Navigation

Expert → Diagnostics → Device info → Serial number (0009)

### Description

Displays the serial number of the measuring device.



The number can be found on the nameplate of the sensor and transmitter.

### User interface

Max. 11-digit character string comprising letters and numbers.

**Additional information***Description***Uses of the serial number**

- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer:  
[www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)

---

**Firmware version**

---

**Navigation**

Expert → Diagnostics → Device info → Firmware version (0010)

**Description**

Displays the device firmware version installed.

**User interface**

Character string in the format xx.yy.zz

**Additional information***Display*

The Firmware version is also located:

- On the title page of the Operating instructions
- On the transmitter nameplate

---

**Device name**

---

**Navigation**

Expert → Diagnostics → Device info → Device name (0020)

**Description**

Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

**User interface**

Prosonic Flow 300

---

**Order code**

---

**Navigation**

Expert → Diagnostics → Device info → Order code (0008)

**Description**

Displays the device order code.

**User interface**

Character string composed of letters, numbers and certain punctuation marks (e.g. /).

**Additional information***Description*

The order code can be found on the nameplate of the sensor and transmitter in the "Order code" field.

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

**Uses of the order code**

- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

---

**Ext. order cd. 1****Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 1 (0023)

**Description**

Displays the first part of the extended order code.

On account of length restrictions, the extended order code is split into a maximum of 3 parameters.

**User interface**

Character string

**Additional information***Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

---

**Ext. order cd. 2****Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 2 (0021)

**Description**

Displays the second part of the extended order code.

**User interface**

Character string

**Additional information**

For additional information, see **Ext. order cd. 1** parameter (→ 211)

---

**Ext. order cd. 3****Navigation**

Expert → Diagnostics → Device info → Ext. order cd. 3 (0022)

**Description**

Displays the third part of the extended order code.

**User interface**

Character string

**Additional information**

For additional information, see **Ext. order cd. 1** parameter (→ 211)

---

**Config. counter****Navigation**

Expert → Diagnostics → Device info → Config. counter (0233)

**Description**

Displays the number of parameter modifications for the device. When the user changes a parameter setting, this counter is incremented.

**User interface**

0 to 65 535

---

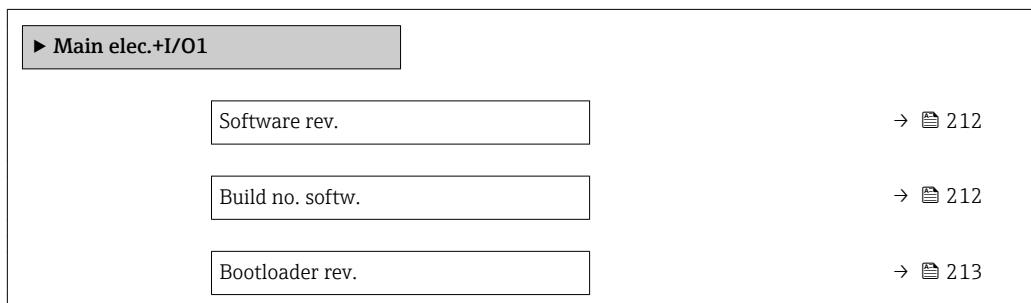
**ENP version**

---

<b>Navigation</b>	Expert → Diagnostics → Device info → ENP version (0012)
<b>Description</b>	Displays the version of the electronic nameplate.
<b>User interface</b>	Character string
<b>Factory setting</b>	2.02.00
<b>Additional information</b>	<i>Description</i> This electronic nameplate stores a data record for device identification that includes more data than the nameplates attached to the outside of the device.

### 3.8.4 "Main elec.+I/O1" submenu

*Navigation*      Expert → Diagnostics → Mainboard I/O1



---

**Software rev.**

---

**Navigation**      Expert → Diagnostics → Mainboard I/O1 → Software rev. (0072)

**Description**      Use this function to display the software revision of the module.

**User interface**      Positive integer

---

**Build no. softw.**

---

**Navigation**      Expert → Diagnostics → Mainboard I/O1 → Build no. softw. (0079)

**Description**      Use this function to display the software build number of the module.

**User interface**      Positive integer

---

**Bootloader rev.**

---

**Navigation**        Expert → Diagnostics → Mainboard I/O1 → Bootloader rev. (0073)

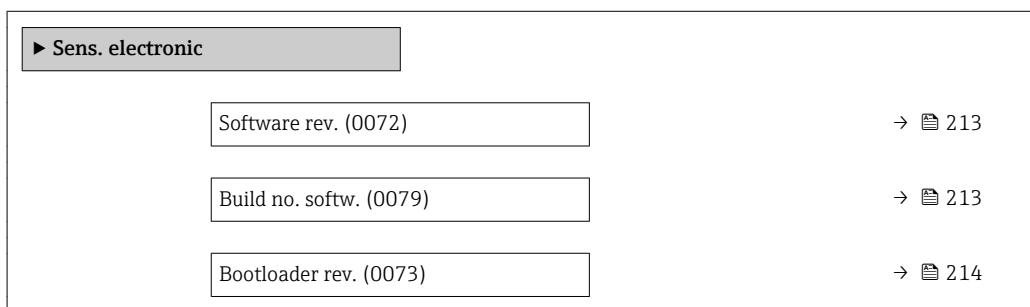
**Description**      Use this function to display the bootloader revision of the software.

**User interface**      Positive integer

### 3.8.5 "Sens. electronic" submenu

*Navigation*

  Expert → Diagnostics → Sens. electronic



---

**Software rev.**

---

**Navigation**        Expert → Diagnostics → Sens. electronic → Software rev. (0072)

**Description**      Use this function to display the software revision of the module.

**User interface**      Positive integer

---

**Build no. softw.**

---

**Navigation**        Expert → Diagnostics → Sens. electronic → Build no. softw. (0079)

**Description**      Use this function to display the software build number of the module.

**User interface**      Positive integer

**Bootloader rev.**

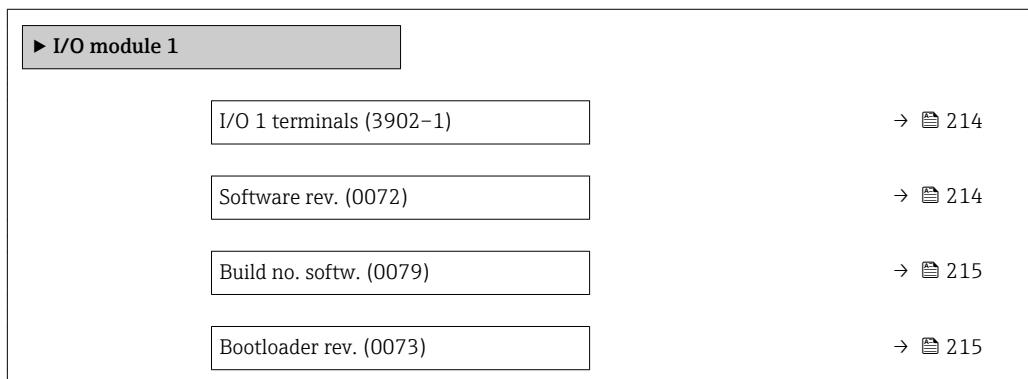
**Navigation**  Expert → Diagnostics → Sens. electronic → Bootloader rev. (0073)

**Description** Use this function to display the bootloader revision of the software.

**User interface** Positive integer

### 3.8.6 "I/O module 1" submenu

*Navigation*  Expert → Diagnostics → I/O module 1

**I/O 1 terminals**

**Navigation**  Expert → Diagnostics → I/O module 1 → I/O 1 terminals (3902-1)

**Description** Displays the terminal numbers used by the I/O module.

**User interface**

- Not used
- 26-27 (I/O 1)
- 24-25 (I/O 2)
- 22-23 (I/O 3)

**Software rev.**

**Navigation**  Expert → Diagnostics → I/O module → Software rev. (0072)

**Description** Use this function to display the software revision of the module.

**User interface** Positive integer

**Build no. softw.**

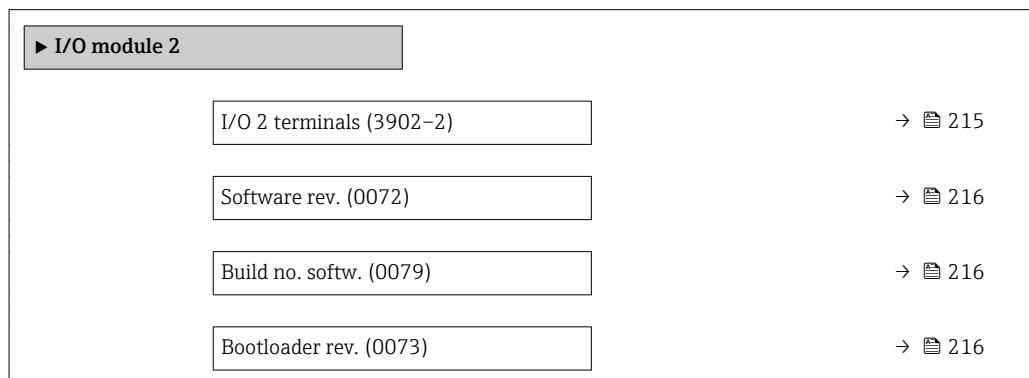
<b>Navigation</b>	  Expert → Diagnostics → I/O module → Build no. softw. (0079)
<b>Description</b>	Use this function to display the software build number of the module.
<b>User interface</b>	Positive integer

**Bootloader rev.**

<b>Navigation</b>	  Expert → Diagnostics → I/O module → Bootloader rev. (0073)
<b>Description</b>	Use this function to display the bootloader revision of the software.
<b>User interface</b>	Positive integer

**3.8.7 "I/O module 2" submenu**

*Navigation*   Expert → Diagnostics → I/O module 2

**I/O 2 terminals**

<b>Navigation</b>	  Expert → Diagnostics → I/O module 2 → I/O 2 terminals (3902-2)
<b>Description</b>	Displays the terminal numbers used by the I/O module.
<b>User interface</b>	<ul style="list-style-type: none"> <li>■ Not used</li> <li>■ 26-27 (I/O 1)</li> <li>■ 24-25 (I/O 2)</li> <li>■ 22-23 (I/O 3)</li> </ul>

---

**Software rev.**

---

**Navigation**       Expert → Diagnostics → I/O module → Software rev. (0072)

**Description**      Use this function to display the software revision of the module.

**User interface**      Positive integer

---

**Build no. softw.**

---

**Navigation**       Expert → Diagnostics → I/O module → Build no. softw. (0079)

**Description**      Use this function to display the software build number of the module.

**User interface**      Positive integer

---

**Bootloader rev.**

---

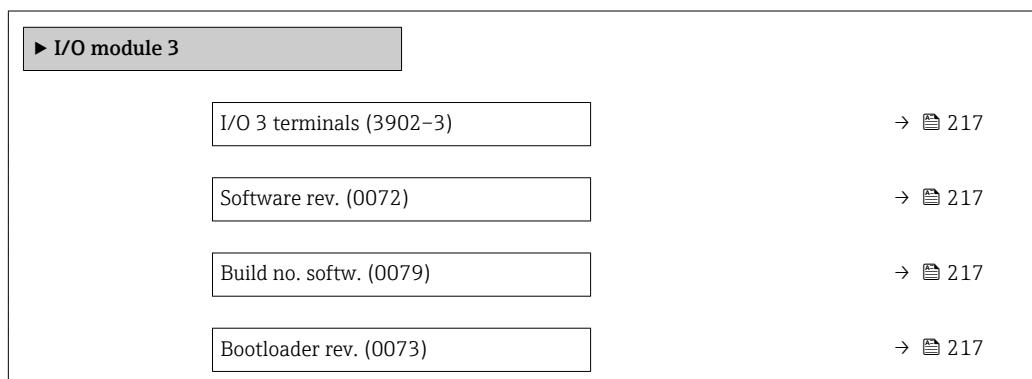
**Navigation**       Expert → Diagnostics → I/O module → Bootloader rev. (0073)

**Description**      Use this function to display the bootloader revision of the software.

**User interface**      Positive integer

### 3.8.8 "I/O module 3" submenu

*Navigation*       Expert → Diagnostics → I/O module 3



---

**I/O 3 terminals**

---

<b>Navigation</b>	  Expert → Diagnostics → I/O module 3 → I/O 3 terminals (3902-3)
<b>Description</b>	Displays the terminal numbers used by the I/O module.
<b>User interface</b>	<ul style="list-style-type: none"><li>■ Not used</li><li>■ 26-27 (I/O 1)</li><li>■ 24-25 (I/O 2)</li><li>■ 22-23 (I/O 3)</li></ul>

---

**Software rev.**

---

<b>Navigation</b>	  Expert → Diagnostics → I/O module → Software rev. (0072)
<b>Description</b>	Use this function to display the software revision of the module.
<b>User interface</b>	Positive integer

---

**Build no. softw.**

---

<b>Navigation</b>	  Expert → Diagnostics → I/O module → Build no. softw. (0079)
<b>Description</b>	Use this function to display the software build number of the module.
<b>User interface</b>	Positive integer

---

**Bootloader rev.**

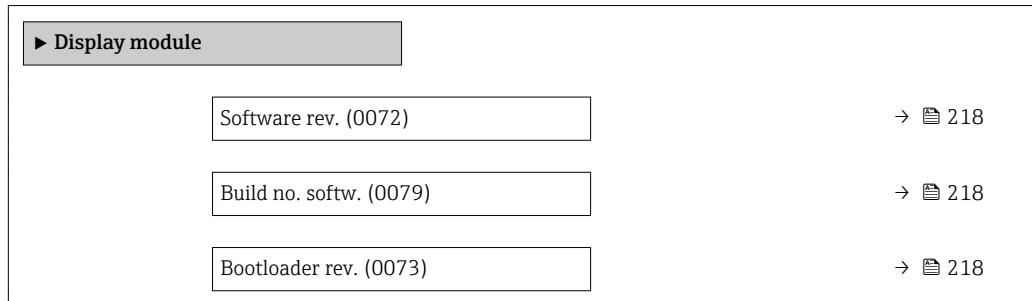
---

<b>Navigation</b>	  Expert → Diagnostics → I/O module → Bootloader rev. (0073)
<b>Description</b>	Use this function to display the bootloader revision of the software.
<b>User interface</b>	Positive integer

### 3.8.9 "Display module" submenu

Navigation

Expert → Diagnostics → Display module



---

#### Software rev.

---

Navigation

Expert → Diagnostics → Display module → Software rev. (0072)

Description

Use this function to display the software revision of the module.

User interface

Positive integer

---

#### Build no. softw.

---

Navigation

Expert → Diagnostics → Display module → Build no. softw. (0079)

Description

Use this function to display the software build number of the module.

User interface

Positive integer

---

#### Bootloader rev.

---

Navigation

Expert → Diagnostics → Display module → Bootloader rev. (0073)

Description

Use this function to display the bootloader revision of the software.

User interface

Positive integer

### 3.8.10 "Data logging" submenu

*Navigation*

Expert → Diagnostics → Data logging

► Data logging	
Assign chan. 1 (0851)	→ 219
Assign chan. 2 (0852)	→ 220
Assign chan. 3 (0853)	→ 221
Assign chan. 4 (0854)	→ 221
Logging interval (0856)	→ 221
Clear logging (0855)	→ 222
Data logging (0860)	→ 222
Logging delay (0859)	→ 223
Data log.control (0857)	→ 223
Data log. status (0858)	→ 224
Logging duration (0861)	→ 224
► Displ.channel 1	→ 224
► Displ.channel 2	→ 225
► Displ.channel 3	→ 226
► Displ.channel 4	→ 226

#### Assign chan. 1



**Navigation**

Expert → Diagnostics → Data logging → Assign chan. 1 (0851)

**Prerequisite**

The **Extended HistoROM** application package is available.

**i** The software options currently enabled are displayed in the **SW option overv.** parameter (→ 45).

**Description**

Use this function to select a process variable for the data logging channel.

**Selection**

- Off
- Volume flow
- Correct.vol.flow
- Mass flow
- Flow velocity
- Sound velocity\*
- Temperature\*
- Pressure\*
- Methane fraction\*
- Molar mass\*
- Density\*
- Dynam. viscosity\*
- Calorific value\*
- Wobbe index\*
- Energy flow
- Signal strength\*
- SNR\*
- Acceptance rate\*
- Turbulence\*
- Flow asymmetry\*
- Electronic temp.
- Curr.output 2\*
- Curr.output 3\*
- Curr.output 4\*
- Curr.output 1

**Factory setting**

Off

**Additional information***Description*

A total of 1000 measured values can be logged. This means:

- 1000 data points if 1 logging channel is used
- 500 data points if 2 logging channels are used
- 333 data points if 3 logging channels are used
- 250 data points if 4 logging channels are used

Once the maximum number of data points is reached, the oldest data points in the data log are cyclically overwritten in such a way that the last 1000, 500, 333 or 250 measured values are always in the log (ring memory principle).

 The log contents are cleared if the option selected is changed.

---

**Assign chan. 2****Navigation**

 Expert → Diagnostics → Data logging → Assign chan. 2 (0852)

**Prerequisite**

The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

**Description**

Options for the assignment of a process variable to the data logging channel.

**Selection**

Picklist, see **Assign channel 1** parameter (→  219)

---

\* Visibility depends on order options or device settings

---

Factory setting	Off
-----------------	-----

---

## Assign chan. 3



Navigation	Expert → Diagnostics → Data logging → Assign chan. 3 (0853)
Prerequisite	The <b>Extended HistoROM</b> application package is available. The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  45).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see <b>Assign channel 1</b> parameter (→  219)
Factory setting	Off

---

## Assign chan. 4



Navigation	Expert → Diagnostics → Data logging → Assign chan. 4 (0854)
Prerequisite	The <b>Extended HistoROM</b> application package is available. The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  45).
Description	Options for the assignment of a process variable to the data logging channel.
Selection	Picklist, see <b>Assign channel 1</b> parameter (→  219)
Factory setting	Off

---

## Logging interval



Navigation	Expert → Diagnostics → Data logging → Logging interval (0856)
Prerequisite	The <b>Extended HistoROM</b> application package is available. The software options currently enabled are displayed in the <b>SW option overv.</b> parameter (→  45).
Description	Use this function to enter the logging interval $T_{log}$ for data logging.
User entry	0.1 to 3 600.0 s
Factory setting	1.0 s

**Additional information****Description**

This defines the interval between the individual data points in the data log, and thus the maximum loggable process time  $T_{\log}$ :

- If 1 logging channel is used:  $T_{\log} = 1000 \times t_{\log}$
- If 2 logging channels are used:  $T_{\log} = 500 \times t_{\log}$
- If 3 logging channels are used:  $T_{\log} = 333 \times t_{\log}$
- If 4 logging channels are used:  $T_{\log} = 250 \times t_{\log}$

Once this time elapses, the oldest data points in the data log are cyclically overwritten such that a time of  $T_{\log}$  always remains in the memory (ring memory principle).

 The log contents are cleared if the length of the logging interval is changed.

*Example*

If 1 logging channel is used:

- $T_{\log} = 1000 \times 1 \text{ s} = 1 \text{ 000 s} \approx 15 \text{ min}$
- $T_{\log} = 1000 \times 10 \text{ s} = 10 \text{ 000 s} \approx 3 \text{ h}$
- $T_{\log} = 1000 \times 80 \text{ s} = 80 \text{ 000 s} \approx 1 \text{ d}$
- $T_{\log} = 1000 \times 3 \text{ 600 s} = 3 \text{ 600 000 s} \approx 41 \text{ d}$

**Clear logging****Navigation**

 Expert → Diagnostics → Data logging → Clear logging (0855)

**Prerequisite**

The **Extended HistoROM** application package is available.

 The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

**Description**

Use this function to clear the entire logging data.

**Selection**

- Cancel
- Clear data

**Factory setting**

Cancel

**Additional information***Selection*

- Cancel  
The data is not cleared. All the data is retained.
- Clear data  
The logging data is cleared. The logging process starts from the beginning.

**Data logging****Navigation**

 Expert → Diagnostics → Data logging → Data logging (0860)

**Description**

Use this function to select the data logging method.

**Selection**

- Overwriting
- Not overwriting

---

<b>Factory setting</b>	Overwriting
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>▪ Overwriting The device memory applies the FIFO principle.</li><li>▪ Not overwriting Data logging is canceled if the measured value memory is full (single shot).</li></ul>

---

## Logging delay



<b>Navigation</b>	Expert → Diagnostics → Data logging → Logging delay (0859)
<b>Prerequisite</b>	In the <b>Data logging</b> parameter (→ 222), the <b>Not overwriting</b> option is selected.
<b>Description</b>	Use this function to enter the time delay for measured value logging.
<b>User entry</b>	0 to 999 h
<b>Factory setting</b>	0 h
<b>Additional information</b>	<p><i>Description</i></p> <p>Once measured value logging has been started with the <b>Data log.control</b> parameter (→ 223), the device does not save any data for the duration of the time delay entered.</p>

---

## Data log.control



<b>Navigation</b>	Expert → Diagnostics → Data logging → Data log.control (0857)
<b>Prerequisite</b>	In the <b>Data logging</b> parameter (→ 222), the <b>Not overwriting</b> option is selected.
<b>Description</b>	Use this function to start and stop measured value logging.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ None</li><li>▪ Delete + start</li><li>▪ Stop</li></ul>
<b>Factory setting</b>	None
<b>Additional information</b>	<p><i>Selection</i></p> <ul style="list-style-type: none"><li>▪ None Initial measured value logging status.</li><li>▪ Delete + start All the measured values recorded for all the channels are deleted and measured value logging starts again.</li><li>▪ Stop Measured value logging is stopped.</li></ul>

---

## Data log. status

---

**Navigation**  Expert → Diagnostics → Data logging → Data log. status (0858)

**Prerequisite** In the **Data logging** parameter (→ 222), the **Not overwriting** option is selected.

**Description** Displays the measured value logging status.

**User interface**

- Done
- Delay active
- Active
- Stopped

**Factory setting** Done

**Additional information** Selection

- Done  
Measured value logging has been performed and completed successfully.
- Delay active  
Measured value logging has been started but the logging interval has not yet elapsed.
- Active  
The logging interval has elapsed and measured value logging is active.
- Stopped  
Measured value logging is stopped.

---

## Logging duration

---

**Navigation**  Expert → Diagnostics → Data logging → Logging duration (0861)

**Prerequisite** In the **Data logging** parameter (→ 222), the **Not overwriting** option is selected.

**Description** Displays the total logging duration.

**User interface** Positive floating-point number

**Factory setting** 0 s

### "Displ.channel 1" submenu

*Navigation*  Expert → Diagnostics → Data logging → Displ.channel 1



## Display channel 1

### Navigation

 Expert → Diagnostics → Data logging → Displ.channel 1

### Prerequisite

The **Extended HistoROM** application package is available.

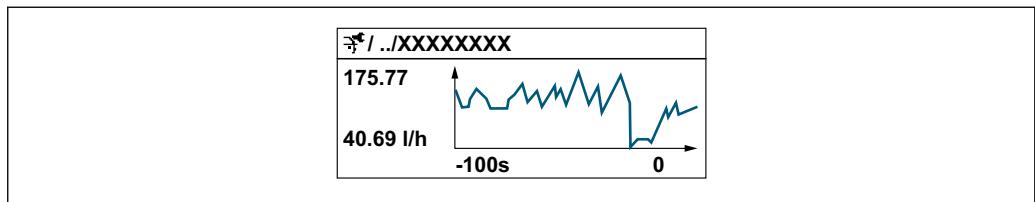
 The software options currently enabled are displayed in the **SW option overv.** parameter (→  45).

### Description

Displays the measured value trend for the logging channel in the form of a chart.

### Additional information

#### Description



A0034352

 10 Chart of a measured value trend

- x-axis: depending on the number of channels selected displays 250 to 1000 measured values of a process variable.
- y-axis: displays the approximate measured value span and constantly adapts this to the ongoing measurement.

## "Displ.channel 2" submenu

### Navigation

 Expert → Diagnostics → Data logging → Displ.channel 2



## Display channel 2

### Navigation

 Expert → Diagnostics → Data logging → Displ.channel 2

### Prerequisite

A process variable is defined in the **Assign chan. 2** parameter.

### Description

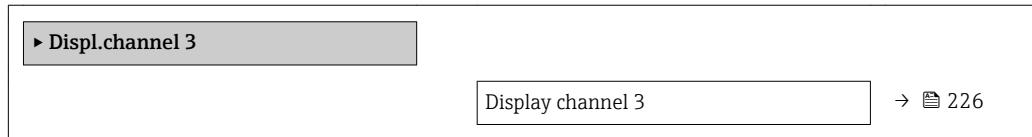
See the **Display channel 1** parameter →  225

### "Displ.channel 3" submenu

*Navigation*



Expert → Diagnostics → Data logging → Displ.channel 3



---

## Display channel 3

---

**Navigation**



Expert → Diagnostics → Data logging → Displ.channel 3

**Prerequisite**

A process variable is defined in the **Assign chan. 3** parameter.

**Description**

See the **Display channel 1** parameter → [225](#)

### "Displ.channel 4" submenu

*Navigation*



Expert → Diagnostics → Data logging → Displ.channel 4



---

## Display channel 4

---

**Navigation**



Expert → Diagnostics → Data logging → Displ.channel 4

**Prerequisite**

A process variable is defined in the **Assign chan. 4** parameter.

**Description**

See the **Display channel 1** parameter → [225](#)

### 3.8.11 "Heartbeat" submenu



For detailed information on the parameter descriptions for the **Heartbeat Verification+Monitoring** refer to the Special Documentation for the device → [7](#)

*Navigation*



Expert → Diagnostics → Heartbeat



### 3.8.12 "Simulation" submenu

*Navigation*

Expert → Diagnostics → Simulation

► Simulation	
Assign proc.var. (1810)	→ 228
Proc. var. value (1811)	→ 228
Status inp.sim (1355)	→ 229
Signal level (1356)	→ 229
Curr.inp 1 to n sim. (1608–1 to n)	→ 229
Value curr.inp 1 to n (1609–1 to n)	→ 230
Curr.out. 1 to n sim. (0354–1 to n)	→ 230
Value curr.out 1 to n (0355–1 to n)	→ 231
FreqOutputSim 1 to n (0472–1 to n)	→ 231
Freq value 1 to n (0473–1 to n)	→ 231
Puls.outp.sim. 1 to n (0458–1 to n)	→ 232
Pulse value 1 to n (0459–1 to n)	→ 232
Switch sim. 1 to n (0462–1 to n)	→ 233
Switch status 1 to n (0463–1 to n)	→ 233
Relay out. 1 to n sim (0802–1 to n)	→ 234
Switch status 1 to n (0803–1 to n)	→ 234
Puls.outp.sim. (0988)	→ 235
Pulse value (0989)	→ 235
Dev. alarm sim. (0654)	→ 235
Event category (0738)	→ 236
Diag. event sim. (0737)	→ 236

**Assign proc.var.****Navigation**

Expert → Diagnostics → Simulation → Assign proc.var. (1810)

**Description**

Use this function to select a process variable for the simulation process that is activated. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- Volume flow
- Correct.vol.flow \*
- Mass flow
- Flow velocity
- Sound velocity \*
- Temperature
- Pressure \*
- Methane fraction \*
- Molar mass \*
- Density \*
- Dynam. viscosity \*
- Calorific value \*
- Wobbe index \*
- Energy flow \*

**Factory setting**

Off

**Additional information***Description*

The simulation value of the process variable selected is defined in the **Proc. var. value** parameter (→ 228).

**Proc. var. value****Navigation**

Expert → Diagnostics → Simulation → Proc. var. value (1811)

**Prerequisite**

A process variable is selected in the **Assign proc.var.** parameter (→ 228).

**Description**

Use this function to enter a simulation value for the selected process variable. Subsequent measured value processing and the signal output use this simulation value. In this way, users can verify whether the measuring device has been configured correctly.

**User entry**

Depends on the process variable selected

**Factory setting**

0

**Additional information***User entry*

The unit of the displayed measured value is taken from the **System units** submenu (→ 62).

\* Visibility depends on order options or device settings

---

**Status inp.sim 1 to n****Navigation**

Expert → Diagnostics → Simulation → Status inp.sim 1 to n (1355–1 to n)

**Description**

Use this function to switch simulation of the status input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- On

**Factory setting**

Off

**Additional information***Description*

The desired simulation value is defined in the **Signal level** parameter (→ 229).

*Selection*

- Off  
Simulation for the status input is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On  
Simulation for the status input is active.

---

**Signal level 1 to n****Navigation**

Expert → Diagnostics → Simulation → Signal level 1 to n (1356–1 to n)

**Prerequisite**

In the **Status inp.sim** parameter (→ 229), the **On** option is selected.

**Description**

Use this function to select the signal level for the simulation of the status input. In this way, users can verify the correct configuration of the status input and the correct function of upstream feed-in units.

**Selection**

- High
- Low

---

**Curr.inp 1 to n sim.****Navigation**

Expert → Diagnostics → Simulation → Curr.inp 1 to n sim. (1608–1 to n)

**Description**

Option for switching simulation of the current input on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

The desired simulation value is defined in the **Value curr.inp 1 to n** parameter.

**Selection**

- Off
- On

<b>Factory setting</b>	Off
<b>Additional information</b>	<i>Selection</i> <ul style="list-style-type: none"><li>▪ Off Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.</li><li>▪ On Current simulation is active.</li></ul>

---

**Value curr.inp 1 to n**

**Navigation** Expert → Diagnostics → Simulation → Value curr.inp 1 to n (1609–1 to n)

**Prerequisite** In the **Curr.inp 1 to n sim.** parameter, the **On** option is selected.

**Description** Use this function to enter the current value for the simulation. In this way, users can verify the correct configuration of the current input and the correct function of upstream feed-in units.

**User entry** 0 to 22.5 mA

---

**Curr.out. 1 to n sim.**

**Navigation** Expert → Diagnostics → Simulation → Curr.out. 1 to n sim. (0354–1 to n)

**Description** Use this function to switch simulation of the current output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- On

**Factory setting** Off

**Additional information** *Description*

The desired simulation value is defined in the **Value curr.out 1 to n** parameter.

*Selection*

- Off  
Current simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On  
Current simulation is active.

---

**Value curr.out 1 to n**

<b>Navigation</b>	Expert → Diagnostics → Simulation → Value curr.out 1 to n (0355–1 to n)
<b>Prerequisite</b>	In the <b>Curr.out. 1 to n sim.</b> parameter, the <b>On</b> option is selected.
<b>Description</b>	Use this function to enter a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.
<b>User entry</b>	3.59 to 22.5 mA
<b>Additional information</b>	<i>Dependency</i> The input range is dependent on the option selected in the <b>Current span</b> parameter (→  108).

---

**FreqOutputSim 1 to n**

<b>Navigation</b>	Expert → Diagnostics → Simulation → FreqOutputSim 1 to n (0472–1 to n)
<b>Prerequisite</b>	In the <b>Operating mode</b> parameter (→  121), the <b>Frequency</b> option is selected.
<b>Description</b>	Use this function to switch simulation of the frequency output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.
<b>Selection</b>	<ul style="list-style-type: none"><li>▪ Off</li><li>▪ On</li></ul>
<b>Factory setting</b>	Off
<b>Additional information</b>	<i>Description</i> The desired simulation value is defined in the <b>Freq value 1 to n</b> parameter.  <i>Selection</i> <ul style="list-style-type: none"><li>▪ Off Frequency simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.</li><li>▪ On Frequency simulation is active.</li></ul>

---

**Freq value 1 to n**

<b>Navigation</b>	Expert → Diagnostics → Simulation → Freq value 1 to n (0473–1 to n)
<b>Prerequisite</b>	In the <b>FreqOutputSim 1 to n</b> parameter, the <b>On</b> option is selected.

**Description** Use this function to enter a frequency value for the simulation. In this way, users can verify the correct adjustment of the frequency output and the correct function of downstream switching units.

**User entry** 0.0 to 12 500.0 Hz

## Puls.outp.sim. 1 to n



**Navigation** Expert → Diagnostics → Simulation → Puls.outp.sim. 1 to n (0458–1 to n)

**Prerequisite** In the **Operating mode** parameter (→ 121), the **Pulse** option is selected.

**Description** Use this function to switch simulation of the pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- Fixed value
- Down-count. val.

**Factory setting** Off

**Additional information** *Description*

The desired simulation value is defined in the **Pulse value 1 to n** parameter.

*Selection*

- Off  
Pulse simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Fixed value  
Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 124).
- Down-count. val.  
The pulses specified in the **Pulse value** parameter (→ 232) are output.

## Pulse value 1 to n



**Navigation** Expert → Diagnostics → Simulation → Pulse value 1 to n (0459–1 to n)

**Prerequisite** In the **Puls.outp.sim. 1 to n** parameter, the **Down-count. val.** option is selected.

**Description** Use this function to enter a pulse value for the simulation. In this way, users can verify the correct adjustment of the pulse output and the correct function of downstream switching units.

**User entry** 0 to 65 535

---

**Switch sim. 1 to n**

**Navigation** Expert → Diagnostics → Simulation → Switch sim. 1 to n (0462-1 to n)

**Prerequisite** In the **Operating mode** parameter (→ 121), the **Switch** option is selected.

**Description** Use this function to switch simulation of the switch output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- On

**Factory setting** Off

**Additional information** *Description*

The desired simulation value is defined in the **Switch status 1 to n** parameter.

*Selection*

- Off  
Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On  
Switch simulation is active.

---

**Switch status 1 to n**

**Navigation** Expert → Diagnostics → Simulation → Switch status 1 to n (0463-1 to n)

**Description** Use this function to select a switch value for the simulation. In this way, users can verify the correct adjustment of the switch output and the correct function of downstream switching units.

**Selection**

- Open
- Closed

**Additional information** *Selection*

- Open  
Switch simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed  
Switch simulation is active.

## Relay out. 1 to n sim



### Navigation

Expert → Diagnostics → Simulation → Relay out. 1 to n sim (0802–1 to n)

### Description

Use this function to switch simulation of the relay output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

### Selection

- Off
- On

### Factory setting

Off

### Additional information

#### Description

The desired simulation value is defined in the **Switch status 1 to n** parameter.

#### Selection

- Off  
Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- On  
Relay simulation is active.

## Switch status 1 to n



### Navigation

Expert → Diagnostics → Simulation → Switch status 1 to n (0803–1 to n)

### Prerequisite

The **On** option is selected in the **Switch sim. 1 to n** parameter parameter.

### Description

Use this function to select a relay value for the simulation. In this way, users can verify the correct adjustment of the relay output and the correct function of downstream switching units.

### Selection

- Open
- Closed

### Additional information

#### Selection

- Open  
Relay simulation is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Closed  
Relay simulation is active.

---

**Puls.outp.sim.****Navigation**

Expert → Diagnostics → Simulation → Puls.outp.sim. (0988)

**Description**

Use this function to switch simulation of the double pulse output on and off. The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

**Selection**

- Off
- Fixed value
- Down-count. val.

**Factory setting**

Off

**Additional information***Description*

The desired simulation value is defined in the **Pulse value** parameter (→ 235).

*Selection*

- Off  
Simulation of the double pulse output is switched off. The device is in normal measuring mode or another process variable is being simulated.
- Fixed value  
Pulses are continuously output with the pulse width specified in the **Pulse width** parameter (→ 147).
- Down-count. val.  
The pulses specified in the **Pulse value** parameter (→ 235) are output.

---

**Pulse value****Navigation**

Expert → Diagnostics → Simulation → Pulse value (0989)

**Prerequisite**

In the **Puls.outp.sim.** parameter (→ 235), the **Down-count. val.** option is selected.

**Description**

Use this function to enter a pulse value for simulation of the double pulse output. In this way, users can verify the correct adjustment of the double pulse output and the correct function of downstream switching units.

**User entry**

0 to 65 535

---

**Dev. alarm sim.****Navigation**

Expert → Diagnostics → Simulation → Dev. alarm sim. (0654)

**Description**

Use this function to switch the device alarm on and off.

**Selection**

- Off
- On

**Factory setting** Off

**Additional information** *Description*

The display alternates between the measured value and a diagnostic message of the "Function check" category (C) while simulation is in progress.

---

## Event category



**Navigation** Expert → Diagnostics → Simulation → Event category (0738)

**Description** Use this function to select the category of the diagnostic events that are displayed for the simulation in the **Diag. event sim.** parameter (→ 236).

**Selection**

- Sensor
- Electronics
- Configuration
- Process

**Factory setting** Process

---

## Diag. event sim.



**Navigation** Expert → Diagnostics → Simulation → Diag. event sim. (0737)

**Description** Use this function to select a diagnostic event for the simulation process that is activated.

**Selection**

- Off
- Diagnostic event picklist (depends on the category selected)

**Factory setting** Off

**Additional information** *Description*

For the simulation, you can choose from the diagnostic events of the category selected in the **Event category** parameter (→ 236).

## 4 Country-specific factory settings

### 4.1 SI units

 Not valid for USA and Canada.

#### 4.1.1 System units

Mass	kg
Mass flow	kg/h
Volume	m <sup>3</sup>
Volume flow	m <sup>3</sup> /h
Corrected volume	Nm <sup>3</sup>
Corrected volume flow	Nm <sup>3</sup> /h
Density	kg/l
Reference density	kg/Nl
Energy	kWh
Energy flow	kW
Calorific value	kWh/Nm <sup>3</sup>
Velocity	m/s
Dynamic viscosity	Pa s
Spec. heat capacity	kJ/(kgK)
Temperature	°C
Pressure	mbar a

#### 4.1.2 Full scale values

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [mm]	[m <sup>3</sup> /h]
25	50
50	210
80	460
100	800
150	1 800
200	3 200
250	5 000
300	7 100

#### 4.1.3 Output current span

Current output 1 to n	4 to 20 mA NAMUR
-----------------------	------------------

#### 4.1.4 Pulse value

Nominal diameter [mm]	[m <sup>3</sup> /pulse]
25	0.007
50	0.03
80	0.06
100	0.1
150	0.3
200	0.4
250	0.7
300	1.0

#### 4.1.5 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [mm]	Switch-on point [m <sup>3</sup> /h]
25	0.17
50	0.68
80	1.5
100	2.7
150	6.0
200	11
250	17
300	24

## 4.2 US units

 Only valid for USA and Canada.

### 4.2.1 System units

Mass	lb
Mass flow	lb/min
Volume	ft <sup>3</sup>
Volume flow	ft <sup>3</sup> /min
Corrected volume	Sft <sup>3</sup>
Corrected volume flow	Sft <sup>3</sup> /h
Density	lb/ft <sup>3</sup>
Reference density	lb/Sft <sup>3</sup>
Energy	Btu
Energy flow	Btu/h
Calorific value	Btu/Sft <sup>3</sup>
Velocity	ft/s

Temperature	°F
Pressure	psi a

#### 4.2.2 Full scale values

 The factory settings apply to the following parameters:

- 20 mA value (full scale value of the current output)
- 100% bar graph value 1

Nominal diameter [in]	[ft <sup>3</sup> /hr]
1	1800
2	7300
3	16000
4	28000
6	64000
8	110000
10	180000
12	250000

#### 4.2.3 Output current span

Current output 1 to n	4 to 20 mA US
-----------------------	---------------

#### 4.2.4 Pulse value

Nominal diameter [in]	[ft <sup>3</sup> /pulse]
1	0.2
2	1
3	2
4	4
6	9
8	16
10	25
12	35

#### 4.2.5 On value low flow cut off

 The switch-on point depends on the type of medium and the nominal diameter.

Nominal diameter [in]	Switch-on point [ft <sup>3</sup> /hr]
1	5.9
2	24
3	54
4	94

Nominal diameter [in]	Switch-on point [ft <sup>3</sup> /hr]
6	213
8	374
10	588
12	832

## 5 Explanation of abbreviated units

### 5.1 SI units

Process variable	Units	Explanation
Mass	g, kg, t	Gram, kilogram, metric ton
Mass flow	g/s, g/min	Gram/time unit
	kg/s, kg/min, kg/h, kg/d	Kilogram/time unit
	t/h, t/d	Metric ton/time unit
Volume	cm <sup>3</sup> , dm <sup>3</sup> , m <sup>3</sup>	Cubic centimeter, cubic decimeter, cubic meter
	ml, l	Milliliter, liter
Volume flow	dm <sup>3</sup> /s, dm <sup>3</sup> /min, dm <sup>3</sup> /h, dm <sup>3</sup> /d	Cubic decimeter/time unit
	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d	Cubic meter/time unit
	l/s, l/min, l/h, l/d	Liter/time unit
Corrected volume	Nl, Nm <sup>3</sup> , Sm <sup>3</sup>	Normal liter, normal cubic meter, standard cubic meter
Corrected volume flow	Nl/s, Nl/min, Nl/h, Nl/d	Normal liter/time unit
	Nm <sup>3</sup> /s, Nm <sup>3</sup> /min, Nm <sup>3</sup> /h, Nm <sup>3</sup> /d	Normal cubic meter/time unit
	Sm <sup>3</sup> /s, Sm <sup>3</sup> /min, Sm <sup>3</sup> /h, Sm <sup>3</sup> /d	Standard cubic meter/time unit
Density	kg/l	Kilogram/liter
Reference density	kg/Nl	Kilogram/standard liter
Energy	kWh, MWh, GWh	Kilowatt hour, megawatt hour, gigawatt hour
	kJ, MJ, GJ	Kilojoule, megajoule, gigajoule
	kcal, Mcal	Kilocalories, megacalories
Energy flow	kW, MW	Kilowatt, megawatt
	kJ/s, kJ/min, kJ/h, kJ/d	Kilojoule/time unit
	MJ/h, MJ/d	Megajoule/time unit
	kcal/s, kcal/min, kcal/h, kcal/d	Kilocalories/time unit
	Mcal/h, Mcal/d	Megacalories/time unit
Calorific value	kWh/Nm <sup>3</sup> , kJ/Nm <sup>3</sup>	Kilowatt hour/standard cubic meter, kilojoule/standard cubic meter
	kWh/Sm <sup>3</sup> , kJ/Sm <sup>3</sup>	Kilowatt hour/standard cubic meter, kilojoule/standard cubic meter
Velocity	m/s	Meter/time unit
Dynamic viscosity	Pa s	Pascal second
Specific heat capacity	kJ/(kgK)	Kilojoule/(kilogram Kelvin)
Temperature	°C, K	Celsius, Kelvin
Pressure	Pa, kPa, MPa	Pascal, kilopascal, megapascal
	mbar, bar	Millibar, bar
Time	m, h, d, y	Minute, hour, day, year

## 5.2 US units

Process variable	Units	Explanation
Mass	oz, lb, STon	Ounce, pound, standard ton
Mass flow	oz/s, oz/min	Ounce/time unit
	lb/s, lb/min, lb/h, lb/d	Pound/time unit
	STon/h, STon/d	Standard ton/time unit
Volume	ft <sup>3</sup>	Cubic foot
Volume flow	ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d	Cubic foot/time unit
Corrected volume	Sft <sup>3</sup>	Standard cubic foot
Corrected volume flow	Sft <sup>3</sup> /s, Sft <sup>3</sup> /min, Sft <sup>3</sup> /h, Sft <sup>3</sup> /d	Standard cubic foot/time unit
Density	lb/ft <sup>3</sup>	Pound/cubic foot
Reference density	lb/Sft <sup>3</sup>	Pound/standard cubic foot
Energy	kWh, MWh, GWh	Kilowatt hour, megawatt hour, gigawatt hour
	kJ, MJ, GJ	Kilojoule, megajoule, gigajoule
	kcal, Mcal	Kilocalories, megacalories
Energy flow	kW, MW	Kilowatt, megawatt
	kJ/s, kJ/min, kJ/h, kJ/d	Kilojoule/time unit
	MJ/h, MJ/d	Megajoule/time unit
	kcal/s, kcal/min, kcal/h, kcal/d	Kilocalories/time unit
	Mcal/h, Mcal/d	Megacalories/time unit
Calorific value	kWh/Sft <sup>3</sup> , kJ/Sft <sup>3</sup>	Kilowatt hour/standard cubic foot, kilojoule/standard cubic foot
Velocity	ft/s	Foot/time unit
Temperature	°F, °R	Fahrenheit, Rankine
Pressure	psi a	Psi absolute
Time	m, h, d, y	Minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

## 5.3 Imperial units

Process variable	Units	Explanation
Volume	bbl (imp;beer)	Barrel (beer)
Volume flow	bbl/s (imp;beer), bbl/min (imp;beer), bbl/h (imp;beer), bbl/d (imp;beer)	Barrel /time unit (beer) Beer: 36.0 gal/bbl
Energy	Btu, MBtu, MMBtu	British thermal unit, thousand British thermal units, million British thermal units
Energy flow	Btu/s, Btu/min, Btu/h, Btu/day	British thermal unit/time unit
	MBtu/min, MBtu/h, MBtu/d	Thousand British thermal units/time unit
	MMBtu/h, MMBtu/d	Million British thermal units/time unit
Calorific value	Btu/Sm <sup>3</sup> , MBtu/Sm <sup>3</sup>	British thermal unit/standard cubic meter, thousand British thermal units/standard cubic meter

Process variable	Units	Explanation
	Btu/Sft <sup>3</sup> , MBtu/Sft <sup>3</sup>	British thermal unit/standard cubic foot, thousand British thermal units/standard cubic foot
Time	m, h, d, y	Minute, hour, day, year
	am, pm	Ante meridiem (before midday), post meridiem (after midday)

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